Magoosh

COMPLETE GUIDE TO THE ACT

Updated for the Enhanced ACT

Table of Contents

Meet the ACT

1) How Hard is the ACT?
2) Top 10 Tips for Prepping for the ACT
3) When to take the ACT
4) How Long Should I Study?
5) Why You Should Take the ACT Your Junior Year

General ACT Tips and Strategies

1) How to Study for the ACT
2) Pacing
3) Common ACT Mistakes

ACT Scoring

1) Introduction to ACT Scores
2) Average ACT Scores

ACT English Test

1) Intro to ACT English
2) Top 3 Tips to Improve Your ACT English Score
3) Usage and Mechanics Questions
    a) Punctuation
        i) Colons
        ii) Semicolons
        iii) Dashes
    b) Subject-Verb Agreement
    c) Verb Tense
    d) The Perfect Tense
    e) Adverbs
    f) Adjectives vs. Adverbs
    g) Pronouns
    h) Subject vs. Object Pronouns: “And I” vs. “And me”
4) Sentence Structure
    a) Sentence Fragments
    b) Comma Splices (and Run-On Sentences)
    c) Conjunctions

    d) Misplaced Modifiers
    e) Parallelism
5) Rhetorical Skills
    a) Strategy Questions
    b) Organization Questions
    c) Style Questions

ACT Math Test

1) Introduction to ACT Math
2) Top 3 Tips to Improve Your ACT Math Score
3) Number Basics
4) The Dreaded Exponent
5) Geometry
6) Coordinate Geometry
7) Algebra
8) Combination vs. Substitution
9) ACT Shortcut: Avoid Algebra by Drawing Word Problems
10) Word Problems
11) Simplifying ACT Word Problems Using Elimination
12) Plugging In and Ball-parking
13) Averages
14) Statistics
15) Weighted Averages
16) Functions
17) Percentages
18) Absolute Values
19) Sequences
20) Probability
21) Fundamental Counting Principle
22) Permutations
23) Combinations
24) Matrices
25) Complex Numbers
26) Trigonometry
27) How to Graph Sine and Cosine
28) How to Use Your Calculator Wisely
29) ACT Math Formulas

ACT Reading Test

1) Introduction to the ACT Reading Test
2) Ten Tips to Quickly Improve Your Reading Score
3) Passage Types
4) Question Types on the ACT Reading Test
5) Comparison Passages
6) Pacing for ACT Reading
7) Why You Might Need to Skip A Passage to Get a Higher Score

The ACT Science Test

1) Introduction to the ACT Science Test
2) Top 3 Tips to Improve Your ACT Science Score
3) Science Knowledge on the ACT
4) Passage Types
5) More on the Conflicting Viewpoints Passage
6) Using Key Terms
7) Finding Trends and Patterns
8) Linking Tables and Graphs

The ACT Writing Test (Essay)

1) Introduction to the ACT Writing Test
2) Top Tips for the ACT Writing Test
3) ACT Essay Sample Prompt

ACT Study Schedules

1) Making the Most of Your Study Schedule
2) Study Schedules
3) Magoosh ACT Study Plans

Resources

1) Test Day Tips
2) Free Practice Materials
3) Additional Test Prep Resources
4) Magoosh ACT YouTube Channel
5) ACT Challenge Questions
6) SAT Prep Resources
7) Your College Search
8) Free College Search Resources
9) Intro to Financial Aid

This eBook is meant to serve as a fun roadmap that provides a comprehensive overview of the ACT, combining crucial information on test structure and question types and providing essential strategies and tips for doing the best you can on test day. The information in this eBook is a synthesis of some of the best content on the Magoosh ACT blog. No matter where you are in your studies, if you're preparing for the ACT, this eBook is for you!

If you're reading this eBook as a PDF on a computer or tablet, you can click on specific sections in the Table of Contents if you want to skip around.

If you're already familiar with the exam and are looking for more study material, head over to the Resources section!

Meet the ACT

How Hard is the ACT?

Difficulty is a relative term. On a difficulty scale that ranges from learning your ABC's to building a space shuttle, the ACT probably ranks about here:

Compared to your ABC's and a typical state standardized test, the ACT probably ranks about here:

Of course, this is just an illustration. For some people, learning the alphabet is hard–maybe they are non-native English speakers or struggle with a learning difference such as dyslexia. But multivariable calculus might be a piece of cake. The point is that it is ultimately impossible to answer the question "How hard is the ACT?" because the answer is going to be different for everyone.

But we know you aren't reading this to discover that very unsatisfying answer. So here are some things we can tell you about how "hard" the ACT is:

It's hard because there is significant time-pressure.

The ACT gives you 2 hours and 5 minutes to answer 131 questions for the Core Tests that everyone must take. If you opt to take either Science (an additional 40 questions) *or* Writing (1 essay), your testing time will be 2 hours and 45 minutes. If you opt to take both Science *and* Writing, you'll be testing for 3 hours and 25 minutes.

It's hard because of the concentration and amount of reading demanded by the test.

On the ACT, there are multiple reading passages, long math word problems, and complex science scenarios to sort through. It can really tax your attention span. This is why full-length practice tests are so important–you need to build the endurance and focus this test demands.

It is NOT hard because it is tricky.

The ACT is a pretty straightforward test. It's not trying to play mind games with you (a common sentiment students have about the SAT). The ACT requires you to be very detail-oriented so you don't make silly mistakes, but the answer is always in plain sight.

It is NOT hard because it has difficult vocabulary.

You can catch a break here. The ACT does not directly test vocabulary, and the vocabulary level of its passages is not as high as the SAT's. The ACT, however, does reward reading speed. The faster you can read and understand a passage, the more time you will have to find the answers to the straightforward questions that follow.

The math level is "harder" than the SAT.

The ACT covers a few more higher-level math concepts than the SAT. It also does not provide test-takers with formulas, and some questions will require you to apply common math formulas from memory. But remember! ACT math is very straightforward: the problems will more often look like the ones you encounter in school than the "brain teaser"-style questions of the SAT.

Above all, it's important to remember that the ACT is specifically designed so that not everyone can ace it. Only a small number of students score at the top, so this means that for the vast majority of students, the ACT is going to be a "hard" test. The best advice we can give is to set a goal score for yourself and then measure your success against that, not the perfect 36. If you hit your goal score, then consider yourself as having aced the test!

Top 10 Tips for Prepping for the ACT

A good ACT score can help you get into your top college choices, as well as qualify you for college scholarships! So where do you start your ACT test prep? These ten ACT test prep tips will help you start your study plan off right.

1. Practice with official or close to official materials

Start studying with the ACT Official Guide and the material offered through act.org. Books from reputable companies such as Barron's or The ACT Prep Black Book can be excellent supplemental materials. Be sure to look for books (or free online materials) with a lot of practice tests!

2. Use the entire time for each section

Even if you are naturally a fast test taker, make sure to use the entire given time. If you finish a test (AKA a section) early, go back and review the questions, slowly "re-taking" them and checking for simple mistakes. Even the smartest students get easy questions wrong when rushing.

3. Get inside the heads of the test writers

Try to develop an understanding of what the test writers "prefer" in terms of the answer choices. For example, after studying the ACT English test for some time you'll notice how the ACT test makers prefer concise answers. This kind of understanding will help you make better educated guesses on harder problems.

4. Learn the most frequently tested concepts

For the ACT English and the ACT Math tests, there are a finite number of tested concepts: grammar, algebra, geometry, trig, etc. You will need to figure out what you already know and what you need to work on. The good news: The questions are predictable! If you learn these concepts, you'll see them pop up over and over again.

5. Plan out a reasonable study schedule

To make sure you get the ACT test date and testing center you want, register early, at least 3 months before the exam. That way you can create a study schedule that you can reasonably complete between now and your test. Be realistic with yourself. How much time can you commit each week to ACT practice questions? It's better to study 20-30 minutes a day than 4 hours once a week. Aim to work on ACT material at least four days a week.

6. Pinpoint your weaknesses and attack them

Are you a slow reader? Is your ACT Math knowledge so-so? Grammar got you down? Know going in to your ACT test prep what areas need more work, and plan to address them first. You'll need more time for the weaknesses. Don't put off studying for a section just because you dread it! Just learn the strategies, and you'll begin to answer these questions with confidence!

7. Remember that test taking is a learned skill, not an inherent gift

Some people may seem to be “naturally” good at the ACT, but even if you’re not one of them, you can still learn how to score highly! Think positively, and focus on your progress in your ACT test prep. Recognize that making mistakes is necessary for improvement. Incorrect practice questions help you hone in on areas that need more work. Welcome them! (Just make sure you understand why you got them wrong, so you can avoid repeating the same mistakes in the future.)

8. Do some timed practice to check in on your pacing

The ACT consists of three core and two optional tests: English, Math, Reading, are the core tests. Science, and Writing are the optional tests. These sections have different challenges regarding pacing, with different numbers of questions and different time limits. You will need to develop a pacing strategy for each unique test, and practice so you are confident you can finish within the allotted time.

9. Memorize the instructions for each test

Don’t waste valuable time on your ACT test day reading and re-reading instructions. Each test has its own set of directions. Familiarize yourself with them beforehand and don’t worry about them on test day.

10. Be kind to yourself

Improvement will not typically happen overnight. But, if you approach the ACT like a subject that can be learned, memorize and apply the relevant techniques and strategies, accept that you are a unique test-taker with your own strengths and weaknesses, and devote yourself to consistent practice and review, you will see the results.

When to take the ACT

One of the most important decisions you have to make when studying for the ACT is when to actually take the exam. We all have different schedules and goals, and so there's no one "right" time to take it. However, there are some important things to keep in mind about the ACT when deciding when to register and take the test.

ACT Test Dates

The ACT is offered six times a year — September, October, December, February, April and June. There is a July test; however, that test is not available in all testing locations. ACT releases the test dates for this and next year on its site.

Allow for a Retake

While we wouldn't necessarily recommend everyone take the ACT more than once, we would recommend that you leave yourself the option. Saving the exam for your senior year means that you likely won't be able to study and retake the exam if your scores are lower than you want.

The best bet is to take the ACT for the first time during spring of your Junior year. If you achieve your goal score, then rejoice and be glad! If you don't — or if you decide that a higher score will help improve your application — you'll have the summer to prep and can still take the test again in the fall.

So how do you decide between the various dates? Really, there's not much of a difference. In the spring, it's really all about your schedule. Either the April or June dates will give you plenty of time to study throughout your junior year, and will still allow you plenty of time to retake if you don't hit your target scores.

In the fall, you should take the September test if you're applying Early Decision (E.D.) anywhere. If you're not applying E.D., either September or October is fine. December may be too late for some schools, so check the application deadlines closely. Even if it works with your schools, we'd recommend not waiting for the December exam. If you get sick or something goes wrong on test day in September or October, you can then take the exam in December as a last resort.

ACT Registration

If you've never taken the test before, you'll want to set aside some time to register for the ACT. You'll need to create an account on MyACT. There you will fill out lots of information about your college goals and plans. Some of this information is optional, but it will help ACT connect you with colleges and scholarships that might be beneficial.

What about taking the ACT as a Sophomore or Freshman?

People are increasingly taking the ACT even earlier than Junior year. Honestly, there's not much of a point. Yes, it's good practice, but you can get just as good experience taking practice exams at home. And the best practice will probably involve some study and review, not just throwing yourself at practice tests.

And keep in mind that your test scores are just one part of your application. Spending the time earning good grades, volunteering, or pursuing interesting extracurriculars will probably have a much larger impact on your college applications than taking the ACT five times.

The ACT is conquerable! With thoughtful planning and studying, you'll be able to get the scores you need to take you where you want to go.

How Long Should I Study?

What a great question. We know some students who have been preparing for college admissions tests since sixth grade. We also know students who don't think about them until their mom flashes the lights on and off to force them out of bed the morning of the test. (You'll thank her later.)

But if you are reading this, you probably fall somewhere in the middle. And there are a few important questions you should consider to determine how long you need to study for the ACT.

Here are the biggies:

1. How far are you from your goal score?

2. How much time do you realistically have to study?

3. What are the average scores of admitted students at your target/dream schools?

One of your first steps should be to take a diagnostic test to figure out your baseline scores. Then, research the scores of admitted students at the colleges you are most interested in. If you don't know yet, look at a sampling of colleges you might be interested in, whether that means a highly selective private liberal arts college, your state university system, or international schools. Finally, consider how much time you have to devote to studying on a daily and weekly basis–taking into account your school, work, extracurricular, and general life schedules. If your schedule is chock full of things to do, you may need a more extended study timeline to achieve the score that your heart desires.

Everyone is different, and it takes some students more or less time than others to see the gains they want to see on the ACT. But the categories below should give you some indication of approximately how long you need to hit the books to achieve your goal.

3 Point Composite Score Increase = 1 to 2 Months

A 3-point increase (say from a composite score of 26 to 29) is reasonable to achieve within a month or two if you can devote yourself to study three days a week for a couple hours, with at least 2-3 full-length practice tests on weekends. The ACT is a very predictable test, and with good study materials and/or a good teacher or tutor, you can quickly learn the strategies that can help you achieve this goal. (Our One Month ACT Study Schedule might be able to help.)

5-6 Point Composite Score Increase = 3 to 4 Months

This is a more lofty goal, although it is certainly an achievable one for many students. You'll need to take practice tests at least every other week and go through your results with a good teacher/tutor who can help you target your weaknesses and build on your strengths. You can also achieve this gain through disciplined self-study with quality resources and answer explanations. But you can't slack. The ACT should be built into your life like any other school subject, and you should be doing your homework every week.

7-10 Point Composite Score Increase = 6 Months to 1 Year

Once you start talking about this kind of score increase, you need a much longer-term prep plan. You should start your prep by the summer after your sophomore year (some students even start in spring) and block out two to three official test weekends for the winter and spring of your junior year with a back-up test in the fall of your senior year if necessary. If you find yourself hitting a score plateau, you may need to devote extra time to conquering other issues that may have an effect on your performance such as test anxiety, time management, or attention span. You'll need a good structured test prep program with a teacher or tutor you can

rely on–in person or online. And if you qualify, you'll need to apply for testing accommodations such as extra time as early as you can and allow time for an appeal if necessary.

It's also important to remember that the higher your baseline score, the harder it is to make this kind of a jump. It is impossible to make a 10-point increase if you are starting at a 29, of course, but even a 7-point increase from 29 to 36 may not be possible. Getting a 36 on the ACT is extraordinarily difficult to do. My suggestion is that you start with baby steps. Begin by aiming for a 3-point increase, then a 5-point increase, and only then a 7-point increase if you are still chugging along. Three points may not sound like a lot, but on the ACT scale, it is a solid improvement.

For the 32+ Club...

Let's say you are starting at a 32, which already puts you in the 98th percentile and you want to claw your way a little higher in the ranks to a 33, a 34, maybe even a 35. At this level, there's almost no room for error. You may need anywhere from six weeks to six months to make these jumps, and I would suggest practice tests every single weekend if you are at the shorter end of this range. I also suggest personalized prep if possible (rather than a structured class) where you can control what you study. This could be with an in-person tutor or online. At this level, you just need to figure out what your personal weaknesses are and target them.

Remember that ACT prep always works best when it is comfortably built into your life like any other class or activity. Cramming is a terrible idea and so is starting your prep in preschool. Figure out your target score, determine how long you need to prep to make the Varsity squad, achieve a black belt, or insert-other-high-school-life-metaphor-here, and start accomplishing your goals :).

Why You Should Take the ACT Your Junior Year

1. You'll be well-prepared

By the time junior year rolls around, you'll be well into the coursework required to get a good score on the ACT. High-level math concepts like trigonometry, logarithms, and the quadratic formula will be old hat by junior year. So, when you see these concepts on the ACT, you won't be panicked by new information and strange symbols.

Also, for most students, junior year is the most rigorous year of high school. Though you may be overwhelmed by AP and honors classes, extracurricular activities, volunteer hours, sports, etc., you'll already be in study mode. You'll be used to tackling long reading and math assignments each night. Plus, you'll be used to taking standardized tests and thinking critically about challenging problems. There is no better time to take the ACT.

2. You'll have the opportunity to re-test

Imagine that you take the ACT and fall short of your goal score. It happens to a lot of students the first time they take the test. Maybe you didn't prepare at all (and your scores reflect this), you had a bad day, or you just missed your goal score by a few points.

Now, imagine that your college apps are due in two months and you don't have time to take the test again. That's very overwhelming, and not how you want to enter college app season.

Whatever the reason for your lower-than-desired score, taking the ACT junior year allows you to avoid this unfortunate situation. You can always take the test a second time junior year, or spend the summer studying and then schedule your retake for fall of senior year. This time around, you'll know your strengths and weaknesses, and will be able to structure your ACT prep accordingly.

3. You'll have the opportunity to take the SAT

Maybe the ACT isn't your test. Some students prefer the ACT to the SAT, but the reverse is also true. If you take the ACT and completely bomb the math and science sections, but do well on the reading and writing sections, you might be more of an SAT person.

The SAT and ACT aren't just scored differently – they are pretty different exams in a lot of ways. For example, the SAT's questions are a bit less straightforward than the ACT's questions, plus the SAT includes more complex vocabulary.

If you're the type of person who is naturally better at one than at the other, you need to give yourself time to take both. Preferably not back to back.

4. You'll have your scores before deciding where to apply to college

Knowing your ACT score before you make your college list is invaluable. Maybe you'll score higher than your goal, and will have more options than you expected. Or, maybe you'll have to hedge your bets by applying to a safer safety school. Either way, you'll be making your college list with realistic expectations.

When you visit college campuses, you'll have more information about yourself, which will make your visits more focused. Also, colleges will know more about you and your interests in time to contact you during the summer before your senior year. They'll send you admissions brochures, scholarship information, swag … be prepared for a deluge of mail.

5. You won't be cramming senior year

The first semester of senior year is nuts. It's just as bad as junior year, if not worse because of the stress of looming college applications.

You'll be taking challenging courses and performing leadership roles for your sports teams, clubs, and extracurricular activities. Plus, you'll be making your college list and prepping your

applications. Don’t underestimate the toll that this type of stress can take on you. Give yourself a break by not adding the ACT to your long list of activities.

Seriously – anticipate senioritis and take your ACT junior year. Even if you have to retake the ACT early on in senior year, you won’t be spending tons of time prepping for it. You’ll have done this over the summer and will just need to brush up before your test.

General ACT Tips and Strategies

Let's say it's winter break of junior year. For the holidays, your parents have gifted you a stack of ACT prep books with a card that says "Get started."

Or maybe it's the week before the test, and you suddenly remember you can't go to a Saturday movie with your boyfriend or girlfriend because you're going to be holed up in a testing room with nothing but your number two pencils to hold tight.

Or maybe it's seventh grade, and you are already scoping out Harvard guidebooks.

Regardless of where you are in your test prep timeline or what your attitude towards the test is, standardized test preparation can essentially be boiled down into the following three categories:

1. **Knowledge Review**
2. **Test Prep Strategy**
3. **Practice Tests**

Let's take a look at each of these in a little more detail:

Knowledge Review

There are going to be concepts tested by the ACT that you haven't studied in a long time, haven't studied ever, or never fully understood when you did study them. Some of these might be quick fixes ("Oh right, *that's* the formula for the area of a trapezoid"); some might take a lot more work ("The last time I read a book was.....ummmm....."). As you begin your ACT prep, you should start by diagnosing your weaknesses. Take care of as many of the "quick fixes" as possible and put in the extra work on the bigger issues like improving reading comprehension

or time management. Depending on how much time you have, you may need to prioritize based on what is fastest and easiest for you to tackle. And nothing boosts confidence like a quick boost in your score!

Test Prep Strategy

There's a reason why there are so many prep books, classes, websites, and tutors out there. It's because the ACT is something that can be learned. To get your best score on the ACT, you need to know not only *what* it tests, but *how* it tests. Test prep resources can teach you how to use the structure of the test to your advantage. You can learn how to substitute numbers to make an algebra problem easier to solve. You can learn to recognize answer choices that are too broad or too narrow on the ACT Reading test. Treat the ACT like any other subject or skill you want to learn and study specifically for it.

Practice Tests

There's no getting around it. You *must* practice under conditions as close to the test as possible. Whether you are taking complete practice tests (which you should definitely do) or individual timed sections, it's crucial that you learn how to develop the endurance the test requires, manage your time, and deal with distractions. The only way to truly feel prepared for the test is to take the test. This makes official practice materials your best friend, in addition to the other practice test resources you are using.

Studying for the ACT doesn't have to be overwhelming if you break down the task into manageable chunks. So make sure your prep plan includes work in each of these three categories, and you are bound to see improvements in your score!

Pacing

Four out of the five tests that make up the ACT are multiple choice: ACT English, ACT Math, ACT Reading, and ACT Science (which, again, is the optional test).. The most challenging aspect of the ACT test overall is managing the pacing within each section so you can get to as many of the multiple choice questions as possible.

1. Don't get bogged down in the middle!

Students usually find that time starts to run away from them when they start seeing harder questions that they refuse to "give up" on. Don't let a few hard questions ruin your chance to finish all of them! If you're spending more than 2 minutes on a single question, it's time to guess and move on. Always do the easiest questions first.

2. Rushing to finish the ACT English Test? Pick "OMIT"!

The ACT hates redundancy and wordiness, so a shorter answer choice is always better as long as it doesn't 1) change the meaning of the sentence in a way that doesn't make sense, or 2) introduce a new grammar error.

3. Learn the most commonly tested grammar errors.

Knowing the usage of proper punctuation and grammar will help you move quickly through the English test. There are really only a few you need to know.

4. Don't leave any questions blank!

Remember that there's no wrong answer penalty on the ACT test, so if you feel the clock ticking down and you've still not been able to get to the last few questions, always bubble

something in on your answer grid or select a choice on the screen for you digital testers out there.

5. Ask yourself questions as you read the ACT Reading passages.

Questions such as, “What’s the author’s point of view?”, “What is the function of each paragraph?” and “What is the main point of the whole passage?” are invaluable to help you answer the questions. Take notes as you go and you’ll move through the ACT Reading test questions much more quickly.

6. Write down your prediction for the right answer.

Before you look at the Reading answer choices, use the passage to predict your own answer. Then match your prediction to the answer choices. This will save you time. Don’t get stuck weighing answer choices. Match your prediction and move on!

7. Bring a calculator you’re comfortable using.

ACT test day is not the place to try out your brand new calculator, or to borrow one from your friend. Use a calculator that you know how to use already. And, if you’re taking the digital ACT, get used to the built-in Desmos calculator or bring your own. You can use your own calculator even if you're taking the digital test.

8. Know each test’s format like the back of your hand.

Always be aware of how many questions you have left! The number of questions per section never changes, and part of preparing for the ACT is knowing its format cold and practicing. The ACT English Test has 50 test questions. The ACT Math test has 45 questions. The ACT Reading Test has 36 test questions, and the optional ACT Science test has 40 test questions. Keep track of where you are in a section at all times.

9. If you're opting for Science, do your favorite type of Science passage first.

There is no rule that states you must do the ACT Science passages in the order in which they are presented, so if you're not a fan of Research Summaries, skip it and do the Data Rep and Conflicting Viewpoints first. Using this test strategy doesn't mean you won't answer those questions, it just means you can always come back to them at the end.

10. Take 10 minutes to plan out your essay before you start writing it.

If you're opting to take the Writing test, a high level of organization is essential to better scores on the ACT Writing section. If you don't take this time to plan, you run the risk of rambling, contradicting yourself, or going off topic.

11. Stressed out over a hard ACT Math question? Skip it!

Don't get bogged down in the middle of the ACT Math Test as the questions get more challenging. If you are stuck on a particularly hard test question, mark it for later. Don't spend more than 2 minutes on any one Math Test question. Bad ACT scores often result from students who linger too long in the middle of the test and do not finish.

12. Even if you finish an ACT test early, you aren't done!

Now is the time to go back and check your work, not to take a nap! Don't second-guess yourself to the extreme, but re-check your work on the medium-hard level test questions. Start practicing this tactic when you work on your ACT practice tests, and you will be more likely to naturally apply this strategy on test day!

Common ACT Mistakes

If we had a nickel for every time a student hit his or her forehead and exclaimed, “Aaah! That was a stupid mistake!” we’d have….a lot of nickels. Nothing is more frustrating than knowing you could have correctly solved a problem, but instead made a silly error and lost that opportunity.

Here are some of the most common mistakes students make on the ACT so you can be on guard.

On the Test Overall

Rushing.

Most students struggle with time on at least one section of the ACT. Rushing to get to every single question is not necessarily a good idea if you are making careless mistakes along the way. Focusing all of your attention on only three-quarters of the questions, or even two-thirds, may in fact get you your best score.

Not selecting answers for everything.

There’s no penalty for guessing on the ACT, so it’s a real shame to not get some points for lucky guesses.

On the English Test

Avoiding “No Change.”

Some students think answer choices like “No change” are traps, but this is not true, particularly on the ACT English section. The vast majority of questions have “No change” as a potential answer, and it is just as likely to be correct as any other answer choice.

Not reading the entire sentence.

The ACT often asks a question about one small part of a really long, complex sentence. Make sure to read your answer choice into the entire sentence–there may be a punctuation mark that doesn't work with your answer, or your answer may inadvertently create redundancy or a sentence fragment.

Answering questions on the entire passage or paragraph too soon.

Sometimes questions that pertain to a whole paragraph or passage appear before you've gotten through the entire thing. Skip these questions and save them for last once you have read everything.

On the Math Test

Not answering the right question.

It's easy to get caught up in calculations and forget that the question asked you to find the value of 2y instead of y. Circle what the question is asking for and double-check before you answer.

Not using your calculator enough.

You are allowed to use a calculator, so use it for all but the simplest calculations. It's easy to make a mistake dividing 84 by 6 with long division; you are less likely to do that on a calculator. If you have a graphing calculator, you can also use the graphing function to solve some coordinate geometry problems or the sin, cos, tan buttons to solve trig problems.

Not writing down your work.

If you are using hypothetical numbers to help solve a word problem, make sure to write down the numbers you are using. The last thing you want to do is get to your solution and forget the original numbers you had used. Or if you are plugging negative numbers into an algebra

equation, make sure to use parentheses so you don't forget about the signs. For example, if you know x = -6 and y = 14 – x, write y = 14 – (-6).

On the Reading Test

Inferring too much.

The ACT is very literal. Most of the answers will be directly stated in the passage. If they aren't, then the ACT only wants you to make teeny tiny inferences, not grand leaps in thinking. If you find yourself rationalizing how an answer could be true, stop. You're going down the wrong path.

Not noticing transitions.

If there is a change in perspective or a new counterargument or direction introduced, the ACT will almost always ask you about it, so note those transition words and phrases.

Answering questions in order.

The Reading questions are all mixed together. If you can't figure out the answer to one, skip it and come back to it after you answer the others;; you may stumble upon the answer as you work through the other questions.

On the Optional Science Test

Mixing up labels and data.

The ACT Science test will often give you multiple charts, diagrams, and figures that include the same or similar information. Always make sure you are looking at the right table or the right line on a line graph.

Not noticing NOT and EXCEPT in the questions.

Sometimes it seems like putting words in all caps is a signal for your brain to ignore them rather than notice them. When you see “NOT” or “EXCEPT” in a question, circle it, draw arrows to it, whatever it takes for you to remember you are looking for what doesn’t fit, not what does.

On the Essay

Not addressing all three perspectives.

You have to address all three perspectives; the prompt says so. If you don’t, you will lose quite a few points.

Not having an argument.

It’s easy to focus too much on the analyzing the perspectives part and forget that the most important thing is that you present your own perspective. This means that you need to have a thesis statement and you should be supporting it throughout. Your thesis needs to present an argument. (A good test is to ask yourself if someone could disagree with your argument. If not, it’s not an arguable thesis.)

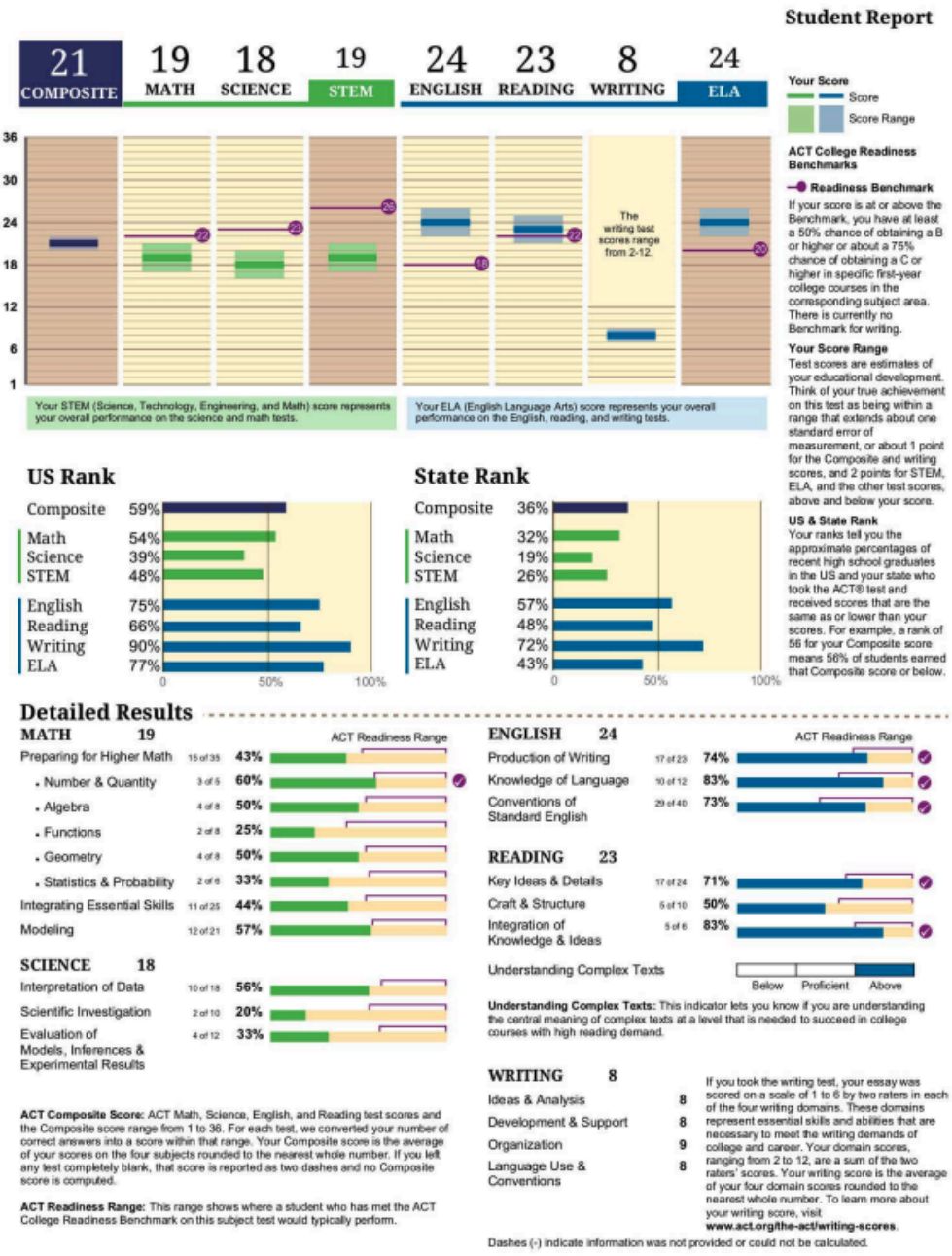
Straying too far from the question.

The ACT essay question always gives you the option to “present a different point of view” on the topic. For all but the strongest writers, I strongly advise against this. It’s too easy for you to go off-topic, which will get you a very low score. Stick with agreeing with one of the provided perspectives.

ACT Scoring

Introduction to ACT Scores

When you receive your ACT score report, it'll look something like this:



(from http://www.actstudent.org/scores/understand/studentreport.html)

So, as you can see, there is quite a bit going on.

Let's break down what's important:

Composite Score

Your overall composite score is the most important number on your report. Your composite score can range from 1 to 36, and it is an average of the individual scaled scores you received on the three, core multiple-choice sections of the test.

The ACT does round its averages. So if the exact calculation of your average worked out to 20.5, you're in luck: the test would round you up to a 21. If your average worked out to 20.25, however, you would receive a 20.

Scaled Scores

But what do these numbers even mean? How do you get an 18 or 21 or 36? This is where it gets a little more complicated.

When scoring, the ACT takes your raw score (the exact number of questions you got right) on a section and converts it to a scaled score of 1 to 36.

The exact relationship between raw score and scaled score varies slightly between tests. So, for example, a raw score of 54 questions right on the English might get you a 22 on one test and a 24 on another. This is because the difficulty level can vary a bit between tests. The ACT uses a process called equating to hash this out: it measures your results against the results of all the other students who took the same test, as well as against some other factors.

Using scaled scores instead of raw scores or percentages means that the ACT can assure colleges that your score can accurately be compared to any other version of the test given. In other words, a 28 on one test should mean the same thing as a 28 on another test.

Unless you order the Test Information Release service (available in December, April, and June), the ACT won't tell you what your raw score was, so ultimately the precise relationship between the actual number of questions you got right and your 1 to 36 score will remain a mystery to you.

Percentiles

The percentages you see next to your scores compare you to other students who have taken the ACT, so you can see where you rank among other test takers. If your percentile ranking is 73%, that means you did the same or better than 73% of test takers. Not too shabby.

Subscores

The ACT will also provide you with subscores on the English, Math, and Reading sections. Subscores tell you how well you did on different question types. The ACT has its own formula for calculating these subscores, so the numbers listed here are relatively useless to students. What is useful, however, are the percentages for these subscores. If you scored better than 88% of test takers on Algebra, but only better than 37% of test takers on Plane Geometry/Trigonometry...well, then you know you need to work on your advanced geometry and trig.

STEM Score

You'll receive a STEM score if you opt to take the Science section. The STEM score is the average of your Science and Math scores.

ELA Score

You'll get these scores if you opt to write the essay. The ELA score is the average of your English, Reading, and Writing scores.

Writing Score

If you took the optional essay, you will receive an essay score between 1 and 36, which is a combined scaled score from two different graders who score you on four different "writing domains". You'll also receive what is called an English Language Arts score, which is a score combining your performance on the multiple choice English section and the Writing test.

Receiving Your Score Report

When will you get your ACT score report? The short answer is 2-8 weeks after you take the test. Yep, you read that right. Sometime between two weeks and two months from when you take the test. Though, to be honest, you'll probably receive your scores at or just after two weeks. The ACT just gives you a long range of dates in case something weird happens.

The Difference Between Your Score Report and Your Schools' Reports

The score report you receive will be different from the report that gets sent to your high school, which is different from the one that's sent to the colleges or scholarship programs that you're applying to. There are three types of ACT score reports:

1. Student Report

The report that you'll receive from The ACT is called a Student Report. You'll be able to access it online, through your MyACT account. It'll include your ACT scores (by test and combined), as well as college and career information.

2. High School Report

The report that your high school receives is called a High School Report. Not a very inspired name, but it gets the job done. This report includes all the same information that's in the Student Report, plus an image of your essay if you chose to take the ACT Plus Writing test.

3. College Report

Finally, there's the College Report, which you'll eventually need to send to each university or scholarship agency that you apply to. The College Report is a bit different from the Student and High School Reports, in that it contains additional information.

The ACT College Report includes your ACT scores, an image of your ACT Plus Writing essay, the grades you reported on up to 30 courses that you took in high school, and predictions for your performance in specific college programs and courses. Yeah, it's pretty serious.

Sending Score Reports

When you register for the ACT, you can select up to four schools to receive your score report. The advantage of this is that these first four score reports are free. The disadvantage is that your scores are going to be sent before you have a chance to see them yourself. If you have the means to wait, I recommend waiting to see your scores first, and then deciding to send a paid score report to your colleges once you know what they are. That way if you are unhappy with your score, you have control over the situation.

Average ACT Scores

In such a numbers-obsessed world, it's easy to become obsessed with comparing your own "numbers" to the numbers of others. Who has more Instagram followers? Who has the better GPA? Who can eat the most Peeps in 30 seconds?

So it's easy to understand why we want to know how our test scores compare to average ACT scores, although there is not always an easy answer.

First, the typical answer...

Average ACT Scores by the Numbers:

Here are the last few years and their US student averages:

Table 1.3. Five Year Trends—Average ACT Scores Nationwide

Year	Number of Students Tested	Average ACT Scores				
		English	Mathematics	Reading	Science	Composite
2020	1,670,497	19.9	20.2	21.2	20.6	20.6
2021	1,295,349	19.6	19.9	20.9	20.4	20.3
2022	1,349,644	19.0	19.3	20.4	19.9	19.8
2023	1,386,335	18.6	19.0	20.1	19.6	19.5
2024	**1,374,791**	**18.6**	**19.0**	**20.1**	**19.6**	**19.4**

However, keep in mind that these numbers are being drawn from an incredibly large pool of students each of whom is taking the ACT for different reasons: because it counts as their high school assessment, because they are trying to get into Harvard, because their parents made them, because they couldn't think of anything better to do on a Saturday morning...

So it's really not all that helpful.

A Better Answer:

To get a better idea of how your scores compare to an average ACT score, it's better to look at a smaller pool of students.

- First of all, you can look at average ACT scores for your state.

Although you will find that scores don't vary drastically between states, you may live in a slightly less or more competitive one.

- You can look at average ACT scores for your school.

Many students can access this data on their high school's "Profile" sheet. This might be posted on your school's website or you can ask your college counseling department for it. In fact, this is a really crucial piece of paper. Did you know that this is the cheat sheet colleges use to understand how your high school compares with other high schools and how you compare with your fellow students? So, yeah, you might want to have it too.

An Even Better Answer:

You need to know how your ACT scores compare to the average ACT scores at the colleges or universities you are targeting.

You can typically find average test scores directly on admissions websites. But if you don't have a college list yet (or even if you do), I highly recommend doing some exploratory searches on College Navigator, a great free tool you can use to find the average test scores at any U.S. college or university along with a ton of other useful statistics.

Some colleges are still stuck in the stone ages of only publishing average SAT scores, but if this is the case, you can easily convert this SAT score to an ACT score to see where your scores shake out.

The Magoosh Answer:

True, your ACT score can be a very important factor in determining college admissions. So make sure to arm yourself with all of the above facts and figures before you set your ACT goals. But it's also important to keep in mind that your ACT scores are only one part of who you are as an applicant–you have lots of other talents, both quantifiable and unquantifiable, to offer a college.

And, don't forget the most important person to be comparing yourself to is...you. If you studied hard and increased your ACT score from a 16 to a 20, that is a huge win, and to heck with

charts on average ACT scores! You are now way more awesome than “average you” was before.

ACT English Test

Intro to ACT English

The ACT English Test assesses your knowledge of the conventions of standard written English. This means your understanding of usage/mechanics issues such as grammar, punctuation, and sentence structure and also your comprehension of rhetorical skills, such as effective writing strategy, organization, and style.

What to Know:

- It's the first section of the ACT
- You have a 35-minute time limit
- You will see 50 multiple choice questions (yeah, that is a lot!)

What to Study:

- Punctuation (including commas, apostrophes, colons, semicolons, and dashes)
- Subject-verb agreement
- Verb forms and verb agreement
- Pronoun forms and pronoun agreement
- Adjectives and adverbs
- Comparative and superlative modifiers (such as "Magoosh is more fun than my most entertaining friend.")
- Idioms (common English phrases or two-part phrases that always go together like "Not only did Magoosh help me improve my grammar, but also it helped me learn math.")

- Sentence structure (such as independent and dependent clauses, misplaced modifiers, run-on sentences and comma splices)
- Effective essay and paragraph organization and clear, concise writing style

What Not to Study:

- Spelling
- Vocabulary
- Rote memorization of grammar rules (you will be asked to correct grammar, but not asked to explain why)

Top 3 Tips to Improve Your ACT English Score

Sometimes you just want the quickest and most effective ways to give your ACT score a boost–maybe it's the week before the test or maybe you just need a surge of confidence early on in your test prep. Well, we hear you. Here's three tips for fast improvement:

Tip 1: Read well before and after the underlined portion

This is both a rookie mistake and a veteran one (heck, even we do it when we're not being careful). Many times an answer choice will seem just fine in the part of the sentence where it is, but it is not fine in the grander scheme of things. Something earlier in the same sentence, or–even trickier–something later in the following sentences may make this answer choice incorrect. So make sure you are vigilant!

Tip 2: Learn Punctuation

There are SO many punctuation questions on this test. Around 20% of the questions have something to do with commas alone, so you can see *huge* gains by studying the major punctuation marks: commas, semicolons, colons, apostrophes, and dashes.

Tip 3: Be Concise

The correct answer is often the shortest one, particularly on questions that provide different phrasing options for a portion of a sentence. It is not *always* correct, so you need to be careful to check for errors, but when in doubt, keep it short and simple. Generally speaking, the ACT really likes for you to choose the answer that states things in the simplest, most direct manner.

Usage and Mechanics Questions

Punctuation

Commas

The rules governing commas can be tricky; often, there's some flexibility for your personal style. For the ACT, the "style" rules either have one "right" answer or are just not tested.

So, for our purposes here, it's easiest to think of commas as separators: they point out information that, for whatever reason, needs to be set apart from the rest of the sentence. Here are some examples to show you what I mean.

Lists

Here, the commas are separating the individual items in a list of three or more items:

Othello didn't realize that Iago was conniving, two-faced, and evil.

See those commas there? They're pointing out all of Iago's finer qualities, of which Othello is unaware. We have to use commas to separate them or the end of the sentence would be a bit of a mushy mess.

(Note: the comma before the "and" is called the "Oxford comma." In real life, the Oxford comma is largely a matter of style, but it can make certain sentences clearer. On the ACT, always include the Oxford comma in lists. It's unlikely that an Oxford comma will be the only difference between two answer choices, but the ACT prefers it, so, as far as the test is concerned, so should you!)

Adjectives

You use a comma to separate two adjectives when the word “and” could be inserted between them.

Romeo’s choice to take poison was a rash, foolish decision.

(It was a rash and foolish decision. The comma is necessary.)

Hamlet was a sad young man.

(Hamlet was a sad and young man? No, that sounds odd. Don’t use a comma here.)

Additional (Parenthetical) Information

Let’s say I’m telling you a story about a guy named James. Here’s my beginning:

James is rather fond of “Slim Jim’s.”

A simple enough sentence, no? But it leaves us with a major unanswered question:*who is James*? Clearly, he must be someone I know, or I wouldn’t be able to discuss his dietary preferences, but I haven’t told you who he is or how I know him.

Well, James is my cousin. I know he likes “Slim Jim’s” because we’re family. I need to put that information into the sentence to satisfy my readers’ burning curiosity about James. I could rephrase it to say “My cousin James is rather fond of ‘Slim Jim’s’,” and it would be 100% grammatical, or I could do this:

James, my cousin, is rather fond of “Slim Jim’s.”

The difference here is one of style, and neither one is “more right” than the other. However, if I’m going to include the information that James is my cousin *after* I introduce his name, I need to separate it in commas.

The two-commas rule works in many cases. If the extra information isn’t grammatically necessary to the sentence, you can separate it with two — *only and always two* — commas.

(You can also use dashes or parentheses for a similar effect. Again, it's a style thing, and differences in style won't be tested on the ACT.)

Here's another example:

James is rather fond of "Slim Jim's." My aunt, however, would rather starve than eat them.

The sentence would be perfectly understandable without the word "however," but I wanted to include it anyway. It's additional information, a non-essential word. Therefore, I separate it with two commas.

Introductions

This point is closely related to the last one. If you're starting a sentence with a transition or other introductory word or phrase, separate it from the rest of the sentence with a comma.

In my life, I've made many mistakes. Very few of them were grammatical.

Clauses

In case you don't remember or were never taught, here's a quick run-down on clauses, phrases, and the differences between the two. Don't worry, it's mostly painless.

- Phrases are groups of related words that *don't* have a subject or verb.
  (Examples: "over the rainbow," "singing in the rain," "a tale as old as time," etc.)
- Clauses are groups of related words that *do* have a subject and verb. They come in two types.
  Independent clauses are complete sentences.
  (Examples: "I think I'll try defying gravity," "The sun'll come out tomorrow, etc.)

Dependent clauses have a subject and verb, but are not complete sentences.

(Examples: “under the sea,” “if I only had a brain,” etc.)

Independent – Dependent

You can use commas to separate independent clauses from dependent clauses. Usually, a dependent clause will have a *subordinating conjunction* at the beginning. Sadly, there are too many subordinating conjunctions to list them all, but here are some of the most common ones:

until, if, since, because, although, once, as, when, where, why, before, than, that, though, unless

If you see these words (or similar ones) at the beginning of a clause, that clause is *dependent* and needs an independent clause to be a complete sentence. An example for you (and bonus points if you can name that musical):

Once I’m with the Wizard, my whole life will change.

(dependent clause) (independent clause)

The word “once” in this sentence is the subordinating conjunction. The clause that has the word “once” in it is the dependent clause, so it leans on the other half to make one complete, grammatically correct sentence.

Independent – Independent

In one and only one situation, you can use a comma to separate two independent clauses. This is *only* permissible if you have a *coordinating conjunction* immediately following the comma.

If we just made your brain seize up with the grammatical jargon there, don’t worry! We have a nifty mnemonic for you. A coordinating conjunction is one of your FANBOYS:

For

And

Nor

But

Or

Yet

So

You can use a comma and one of your FANBOYS to separate two complete sentences. Make sure you're using the *right* FANBOYS for your situation, and you will *never ever* need more than one in a row. (We're looking at you, students who use "but yet" in sentences! One or the other will do!)

Here's a few examples:

Most students find grammar dull, so I try to spice it up a bit with silly pop culture references.

I always enjoyed grammar, but I understand why some people might not.

Did you want to continue talking about commas, or should we discuss something else?

Colons

The colon (:) is a fairly straightforward punctuation mark. The rules for colon usage are clear-cut and don't leave much room for error. Master these, and the day is yours!

Colons are used after *independent clauses* (a.k.a. "complete sentences") in four situations. You can remember them by remembering the letters LEQ.

L

No, it doesn't mean "for the way you *look* at me," like in one of our favorite songs. Here, the L stands for *list*. You use a colon after an independent clause to introduce a series of items.

I have three things on my to-do list for this summer: sitting, loafing, and goofing off.

E

The E stands for *explanation*. You can use a colon after a complete sentence to expand on what you're talking about.

This I know: Do or do not. There is no 'try.' – Yoda, *The Empire Strikes Back*

While I was in Ireland, I had heaven in a cup: a Cadbury "Flake" bar in vanilla ice cream.

Q

The Q stands for *quote*. You can use a colon to introduce a quotation.

Well, it's like Ralph Waldo Emerson once said: "I hate quotations."

Semicolons

Semicolons are great. They're our favorite punctuation mark—no, seriously. They're sophisticated; use them properly, and people will be impressed at your mastery of the English language.

Here are the rules for semicolons:

- Use a semicolon to separate two closely related independent sentences. When we say "closely related," we mean that they *clearly belong as part of the same thought.* The

two sentences are grammatically complete, but make much more sense when joined together.

With educated people, I suppose, punctuation is a matter of rule; with me it is a matter of feeling. But I must say I have a great respect for the semi-colon; it's a useful little chap. – Abraham Lincoln

- Use a semicolon to separate items in a list that *already* contain commas. In this example, the narrator is meeting with *three people*. If we hadn't used semicolons, you might think the narrator was meeting *five* people.

I have a meeting with Donna Jones, the school principal; Ms. Hawkins, my daughter's English teacher; and Jim Jackman, the volleyball coach.

Unclear version: *I have a meeting with Donna Jones, the school principal, Ms. Hawkins, my daughter's English teacher, and Jim Jackman, the volleyball coach.*

Dashes

Before we start talking about this, we need some clarity of language. A *hyphen* (–) is often used to join words together. We'll talk about those later in this section. A *dash* (—) is a versatile and often dramatic punctuation mark, and since it's more fun to talk about, we'll discuss it first.

There are actually two different kinds of dashes. The *en dash,* which is slightly shorter, and the *em dash*, which is the one you can see in the previous paragraph. The good news is that the ACT isn't going to test you on the differences between the two. You will only be tested on the rules of the *em dash*, which is what we'll cover here.

There are three major uses for the *em dash*, and they're fairly straightforward.

- Use an *em dash* to show a change in flow in the middle of a sentence. Here, a pair of *em dashes* set off additional information in the same way commas or parentheses would.

Critics of the Pokémon *video game franchise—also known as people who have no fun—say that each game in the series feels exactly the same.*

(Note: The difference here is style only, so you won't have a question on the ACT that will ask you to choose from among dashes, commas, or parentheses. You may be asked to make sure that they are used in pairs or that the additional information *really* needs to be separated from the rest of the sentence.)

- Use an *em dash* to introduce an explanation in the same way you would use a colon. Remember: always make sure you have an independent clause before the colon or *em dash*!

I'm not a big fan of Skyrim*—if I can't figure out where the story is going in the first hour, then I don't want to play the game!*

- Use an *em dash* to indicate a change in thought or a humorous or dramatic addition to the sentence.

Pac-Man*, at its core, is a game about consuming food pellets and pieces of fruit while trying to outrun beings who are out to destroy you—sounds like a typical day in high school to me!*

Wait! What About Hyphens?

Oh. Right. I promised you we'd talk about those.

Well, to be honest, the ACT isn't really going to test you much on hyphen usage. You should know the rules anyway, just in case it comes up, but it's not one of their favorite topics.

Use a hyphen to join two or more adjectives together when they act as a single idea and come before the noun they modify.

- *a 5-page paper*
- *a one-year-old girl*
- *an all-too-common mistake*
- *a friendly-looking dog* (remember, even though it ends in *-ly*, “friendly” is an adjective!)

Don’t use a hyphen when you have an adjective and an adverb before a noun. Adverbs can’t modify nouns, so it’s already clear without the hyphen.

- *Katie was terribly tired.*
- *Danny was really generous.*

Use a hyphen for all spelled-out numbers from *twenty-one* to *ninety-nine* and fractions.

- *one-third of high school students*
- *seventy-six trombones*

Use a hyphen for most compound last names.

- *Lady Guinevere Hopkins-Drake will attend the soirée.*

Use a hyphen for *some* compound nouns.

- *sister-in-law*
- *master-at-arms*
- *commander-in-chief*

Subject-Verb Agreement

When working on any type of ACT English question, you should be watching for verbs that are underlined. Of course, part of the reason for that is that the ACT tests tense problems, but there's also the matter of subject-verb agreement.

What does subject-verb agreement mean?

Let's look at some simple examples. Which is correct?

Rihanna win hot-dog eating competitions all the time.

Rihanna wins hot-dog eating competitions all the time.

The verb "win" has to match up with the subject of the sentence, Rihanna, which means it has to have an "s" at the end, like in the second sentence. Even if you think these sentences sound alright without the "s", they're not proper English; you can't write them like that—definitely not on the ACT.

If the subject is singular (he, it, the pope, white-pepper ice cream), then it needs a singular verb (does, was, is prancing, has congealed).

If the subject is plural (they, we, the Spice Girls), then it needs a plural verb (do, are speeding, have mutated).

Subjects separated from their verbs

The verb may not be next to its subject like it is in the examples above. Instead, it might be separated by a pretty big chunk of text.

The results of the contest, hotly debated by the members of the audience, was announced soon after the first contestant became sick.

If you haven't already noticed the problem there, take a look at the verb "was announced." Can you find the subject that it refers to? It's all the way back at the beginning of the sentence.

Since that subject—the results—is plural, the verb should be "were announced."

Neither, either, everyone, everything, and each are singular

Some nouns aren't so clear in number. "Everything" sounds like a lot, right? So it should be plural, right? Well, no.

All of the words listed above refer to the individual pieces of a group. The verbs that get paired with them will also be singular to reflect that.

✗ Neither of us think that competitive eating is a good career choice for pop singers.

✓Neither of us **thinks...**

✗ Everyone who watched the show were simultaneously entranced and disgusted.

✓Everyone who watched the show **was...**

These can be especially tricky, so keep an eye out.

Automatically check for matches

Every time you see a verb whose subject isn't immediately obvious, go back and find it in the sentence. Do it again and again until it's second nature. It should only take a fraction of a second by the time you're doing it on your ACT.

The Basics: Verb Tenses on the ACT

Are you a native English speaker? If you are, then forget the ACT for a moment and just be grateful that you don't have to learn our language, because it's riddled with some really complicated verb patterns. Whereas some languages are happy enough to live simpler lives and only use a few patterns for past, present, and future, English has flashy tastes and likes to overindulge. Take for example, this sentence:

That stadium will have been being built for three years come May.

There are five words in that verb construction. *Five*. It's like a gaudy necklace of helping verbs. And they're mostly just there to show when the verb happens.

The good news is that you don't need to know the names or explanations of English tenses for the ACT. And there's no bad news! Instead, there's actually some more good news.

You already know which tenses are right in ACT English.

To be fair, that's only really true if you are a native speaker. If you're not, then we won't lie: you do have an extra obstacle to overcome.

But the point is that for English speakers, the different times that different tenses signify are already hard-wired into your thought patterns. All you have to do on the ACT is make sure the times given in the sentence are consistent and logical. Any time you see a verb underlined in the English section, you should check that the tense given feels natural with the times that the rest of the sentence presents. Do you smell anything fishy in this example?

Ernest Hemingway's short stories, including the favorite "Indian Camp," continue to be highly influential pieces of fiction despite the fact that they have been written over fifty years ago.

If you do, then you might be onto something. It might be rotten.

The time "over fifty years ago" sounds pretty strange when put next to "have been written." You don't need to know why; you just need to know it's wrong. When you see that verb underlined, think twice about the time it refers to.

If there's a sequence of events, make sure their tenses put them in the right logical order. *"Having just been swimming, Maria smelled like chlorine"* makes much more sense than *"Having just been swimming, Maria had smelled like chlorine."*

Speaking of swimming, there's something else you need to watch out for.

Swim, swam... swammed?

Each English verb has a few basic forms. Kids who learn English in other countries can often rattle off lists like *do/did/done* and *eat/ate/eaten* faster than we native speakers can. And there are some verbs, like *swim*, which we get a little confused about at times. Take a look and make sure you know these sets.

- *Swim/swam/swum*
- *Ring/rang/rung*

- *Forget/forgot/forgotten*
- *Forgive/forgave/forgiven*
- *Lay/laid/laid*
- *Rise/rose/risen*
- *Swing/swung/swung*

There are countless others, most of which you wouldn't think twice about. But some of them might have you making things up in conversation (e.g., "I would've swang if I'd known he was going to keep throwing strikes.") that the ACT just won't stand for.

Preparing for ACT English is all about getting into the habit of looking for specific problems associated with the type of word that's underlined. If you see a verb underlined, look for one of the problems above.

The Perfect Tense

Two of the more confusing tenses in English are the present perfect and the past perfect. What makes them so is both describe continuous actions. To illustrate, let's take a look at the following sentences:

1) Last night, I walked my dog.

2) I have walked Bucky every night for the last two years.

In the first sentence, I am doing the action, 'walk', only once. In the second sentence, I am describing something that has taken place on a number of occasions in the past and continues on till today (meaning tonight I will most likely walk Bucky).

The first tense is the simple past (if you look at our description it is very simple). The perfect tenses, on the other hand, aren't so simple. To show you what we mean, let's take a look at the past perfect.

1) Before I moved to California, I had walked Bucky in the mornings, not at nights.

Whenever we use the past perfect, we want to use the following tense:

Past Perfect: Had + Participle (plus another verb in the Simple Past)

Why use past perfect in this sentence? Well, if you notice, we am talking about two events that happened in the past: my walking Bucky and my moving to California.

Whenever you are dealing with two events in the past, one of which started or happened before the other, you must use the past perfect tense to describe the event that started first.

First Event: I walked Bucky in the morning = Past Perfect Construction

Second Event: I moved to California = Simple Past

Another way to think of the past perfect is with specific dates. Let's say I moved to California in 1984. I walked Bucky every morning from 1981 to 1984. The sentence implies that once I moved to California I no longer walked Bucky in the morning. That is, an event that happened repeatedly in the past stopped when another event happened. That interrupting event uses the simple past.

Now let's try a couple of practice questions:

1) After she graduated/had graduated from high school, Jessica decided/had decided to backpack through Europe.

2) Though he studied/had studied the entire weekend, Bobby was only able to get a B- on his Calculus midterm.

For sentence #1, we have the first event: Jessica graduating. This event must be in the past perfect tense: *had graduated*. The more recent event, her deciding to backpack, is in the simple past: *backpacked*.

For #2, the first action is the studying, so we need had studied.

Key Points

1. Present Perfect: Has/Have + Participle = describes action/event that happened in the past and continues in the present.

2. Past Perfect: Had + Participle = describes an action/event in the past that happened before another action in the past.

3. Whenever we use the past perfect, we must also have another verb in the sentence that is in the simple past.

ACT Verb Tense Quiz

Do you know your perfect tense from your past tense? Do you know whether you can mix past tense with present perfect? Below are a few questions to help you hone your grammar chops!

1. Before moving to New York, she has lived in California for five years.

2. Ever since I was a child, the Wizard of Oz was my favorite movie.

3. We waited for Mary for an hour before she had finally shown up.

4. She has been at the top of her class for four consecutive quarters.

5. In 1994, few have known of the Internet; by 2020, few in the developed world will have been without an Internet connection.

Check your answers on the next page!

Answers:

1. had lived

We want the past perfect because we are describing an ongoing event in the past that happened before another event (*moving to New York*).

2. has been

Present perfect is used to describe an event that started in the past and continues in the present.

3. had waited...showed up

We need the past perfect to describe the event that happened first: waited. The second event in the past, takes the simple past.

4. Correct

5. Knew...will be

Simple past is used to refer to an event at a specific point in the past (1994). Simple future is used to describe an event at a fixed point in the future (in 2020 few will be without an....).

Adverbs

You thought you were safe with your parts of speech once you left the sixth grade. Well, think again! The ACT English section, while testing advanced grammatical concepts, will try to nail you on one type of parts of speech: the adverb.

An adverb is a word that modifies a verb or adjective. It usually answers any of the following questions: How much, how often, and where.

He frequently studied (how often did he do the verb 'study.')

She was extremely displeased (to what extent was she the adjective displeased).

He was known to run through the mountains (where did he do the verb 'run')

The ACT's focus on the adverb is not that surprising. Few people in everyday speech use adverbs properly. And when there is a disconnect between the way people speak and the proper way to speak, you can bet the ACT will test it on a difficult English question.

To see how we can fail to spot the proper use of the adverb, consider the following examples:

Mary yelled to Tina, "Drive safe – it's wet out there."

The new PC was the most clever designed computer the market had seen in years.

If you rely on your ear, you will probably think that both sentences are fine as is. When looking for an adverb in a sentence, determine if there are any words modifying a verb or adverb.

In the first case, the verb is 'drive.' The word that modifies 'drive' is 'safe.' 'Safe' is an adjective, and you cannot modify a verb with an adjective—you need an adverb. To make 'safe' an adverb simply add –ly: Drive safely.

For the second sentence, we need an adverb to describe how a computer is designed. ‘Clever’ is an adjective. So by adding –ly, we now have an adverb: most cleverly designed computer.

Takeaway

Know your adverbs, and always be on the lookout for them on the ACT English test—they are very difficult to spot, especially if you rely on your ear.

Adjectives vs. Adverbs

If you did many Madlibs as a kid, you know your parts of speech already. But in case you didn't, let's make the distinction between adjectives and adverbs clear.

Adjective: Modifies a noun. "Big," "noxious," and "friendly" are adjectives. (Putting those words together makes me think of a guy I used to sit next to in chemistry.)

Adverb: Modifies a verb, adjective, or adverb. Some examples are "completely," "carefully," and "soon." (Those ones, on the other hand, describe how students say they'll do their homework.)

How to tell the difference between adjectives and adverbs

The easiest difference to spot is the *–ly* construction. Adverbs end in *–ly*, and adjectives don't. But wait a minute...looking back at those examples above, you see that's not always true. "Friendly" is an adjective; at the same time, "soon" is an adverb. Use *–ly* just as a rule of thumb. To be certain, you have to check what the words modify.

If you can do that, the problem is usually pretty easy to spot. But they can be tricky, sometimes—the test makers always have a trick up their sleeves.

Adjectives with sensation words

The ACT uses adverbs after sensation verbs to make modifier problems that aren't so blatant. If I say, "She put her hand on mine because she felt badly," there's a problem, however subtle.

In this case, "badly" doesn't describe the action of feeling. Instead, it describes her emotions. Or at least, it should. But if we want that to be the case, we have to change it to "bad."

If you used the words “feel” and “badly” together, it would describe an action: the action of physically feeling something, i.e. touching.

If the words “smell,” “feel,” “taste,” and “look” are followed by an adverb, think twice. Is the verb supposed to be an action or not?

Allen looked quick. = Allen seemed fast.

Allen looked quickly. = Allen glanced at something.

Subconscious error correction

Sometimes these problems are hard to see not because of anything so tricky as sensation words but because of our own reading habits. Because the difference between a correct and incorrect answer is often just two letters (*-ly*), we sometimes read the sentence wrong, substituting the correct word for the error.

You may know that “heavy loaded” is wrong, but if you read quickly, you might think it says “heavily loaded” and miss the problem.

This is why you should always read ACT English questions again if you don’t see a problem the first time around. Go through systematically, checking each word for the problems it could create.

If, while going through piece by piece, you come to an adverb or adjective, link it to the word it should modify and check whether or not you want the *–ly*.

Pronouns

Here are the two big things you have to know about pronouns. A pronoun refers to a noun in the sentence. A pronoun can either take the Subject Case or the Object Case.

Mary lent her book to Tom. She told him to return it to her soon.

In these two sentences we have the nouns, Mary and Tom. Instead of repeating Mary and Tom, we use the pronouns *she* and *he* (*she* for Mary and *he* for Tom, of course).

Notice that the sentence does not use he but him. If we are talking about the subject of the sentence and we are referring to Tom, then we want to use *he*. If Tom is the object of the sentence, then we want to substitute *him*. Therefore *he* is the subject case and him is the object case.

For Mary, *she* is the subject pronoun and *her* is the object pronoun. Notice how in the second sentence, the recipient of the action is Mary, which means the pronoun must be in the object case. So we use *her*.

Singular Pronouns

I gave Tom an apple. Tom handed it back to me.

I is the first person subject pronoun. Me is the first person object pronoun. It refers to the apple and is a third-person singular pronoun.

Plural Pronouns

We gave them a call. They did not answer but called us back later.

We is the first-person plural subject pronoun (We know, that's a mouthful). And *us* is the first-person plural object pronoun. *They* is the third-person plural subject pronoun and *them* is the third-person plural object pronoun.

Subject vs. Object Pronouns: "And I" vs. "And me"

The stereotypical English teacher has a few grammar rule favorites, some of which are, unfortunately, not even real rules.

Do you remember the childhood saying "step on a crack, break your mother's back"? Imagine if that was so ubiquitous (a good vocab word—look it up!) that everyone repeated it any time you stepped on a sidewalk crack, even now? And what if they *believed* it?

Although it's not quite to that extreme, the sad truth is that some "common knowledge" about English grammar isn't so different. It's been repeated and repeated and repeated, but it's pretty much just a myth. And the ACT does not peddle in myths.

My friend and I? My friend and me?

There is, admittedly, plenty of truth in the rule touted by your 8th grade English teacher: When you're listing other people as well as yourself, I or me should come last. Think of it as being polite and holding the door for the other names.

However, on the ACT, it's important that you get the "I" or "me" right. When the names are the subject, use I. If they are not—a notable example being after prepositions—then use me, the object form. If we always used I when making lists of people, we'd be confusing subjects and objects.

✓ My pinkie toe and I have been through some hard times.

✗ The world is against my pinkie toe and I.

✗ A polar bear ate my pinkie toe and I.

That second example comes after a preposition (against) and should take the object form, me. "And I" can be wrong even without the preposition, though, as long as those two or more people are objects in the sentence, as in the third example above. The correct forms are:

✓ The world is against my pinkie toe and me.

✓ A polar bear ate my pinkie toe and me.

By the same token, don't start a sentence with "... and me."

✗ My pinkie toe and me fought off a polar bear.

✓ My pinkie toe and I fought off a polar bear.

Just focus on whether or not it's the subject of the sentence. If that distinction isn't clear for you, then take out the other player (e.g. "my pinkie toe") and see how it sounds. That's the best

method to decide. Saying “A polar bear ate I” sounds good to approximately nobody, so don’t write it—even if there’s a pinkie toe that comes first.

And if it’s still a bit unclear, then you can roughly assume that *I* is more likely correct near the beginning of the sentence, while *me* is more common at the middle or end.

Sentence Fragments

Sentence fragments are like fish without gills, birds without feathers, sneakers without shoelaces. They just can't be themselves. They are incomplete.

Here are a few examples:

Biking through the wilderness.
The great wizard of the west.
Without a dream to hold on to.
For example, chocolate-dipped strawberries.

Sentence fragments are usually missing either a subject or a verb (and sometimes both).

To fix a sentence fragment, we need to add the missing element(s):

My girlfriend is biking through the wilderness.
The great wizard of the west **broke the spell**.
I am like a drifter without a dream to hold on to.
For example, chocolate-dipped strawberries **are her favorite breakfast**.

On the ACT, you want to particularly watch out for gerunds (-ing words).

> *Example*: Finishing his lab experiment before the rest of the class, then deciding to leave early. ← **Sentence Fragment**

The Fix: Finishing his lab experiment before the rest of the class, **he decided** to leave early. ← **add a subject and change the verb form.**

Sometimes gerunds can make it look like you have a complete sentence, but a gerund does not act alone as a verb; it needs a helping verb (such as “She *is* running.”).

You also want to watch out for sneaky sentence fragments that seem to be connected to the previous sentence, but can’t grammatically stand along.

Example: She was a wonderful professor. The *most* wonderful professor ← **Sentence Fragment**

The Fix: She was a wonderful professor. In fact, she was the most wonderful professor. ← **add a subject “she”.**

Sentence fragments pretend to be sentences, but they are lacking all of the elements of an independent clause. By turning them into independent clauses (with subjects and verbs) or attaching them to an independent clause, all can be mended.

Comma Splices (and Run-On Sentences)

We have a friend who likes to put commas everywhere in his sentences; he jokingly calls them "artistic commas." And while artistic commas might be fine when you are writing poetry, a diary entry, or an email to your friend, they are not ok when they are breaking a fundamental English grammar rule--one of the biggest there is. **This offender is called the "comma splice."** Dun-dun-DUUNNN.

You might be familiar with splicing from horror films. To splice is to join two things together by interweaving their parts. In everyday life, you might splice together two cable wires. In horror movies, sometimes two scary beasts are spliced together to create one ultra-scary beast. A grammatical comma splice is almost as bad. Maybe worse.

Comma splices join together two independent clauses that would really rather be apart.

Here's an example:

I run five miles along the river on Saturdays, I do this even when it's raining.

That little offending comma in the middle is creating a comma splice.

"I run five miles along the river on Saturdays" is a complete sentence (an independent clause).

“I do this even when it’s raining” is a complete sentence (an independent clause).

And we can’t join them with just a comma.

To fix a comma splice, we can do one of four things:

1. We can separate these two disagreeable independent clauses with a period.
   Example: I run five miles along the river on Saturdays. I do this even when it’s raining.
2. We can join them together with a friendly coordinating conjunction that says “Hey, guys, let’s hold hands.” There are seven of these happy mediators we can choose from: for, and, nor, but, or, yet, so.
   a. *Example*: I run five miles along the river on Saturdays, and I do this even when it’s raining.
3. We can force them together with a semicolon. Semicolons are sophisticated and sometimes this makes for a rather elegant solution.
   a. *Example*: I run five miles along the river on Saturdays; I do this even when it’s raining.
4. We can subordinate one clause to the other, so that it becomes a dependent clause, not an independent clause.
   a. *Example*: I run five miles along the river on Saturdays, even when it’s raining.

So don’t let the horror of comma splices keep you at night up any longer. They are all over the ACT, and they often appear in far more complex sentences. So if you see two independent clauses spliced together with only a comma, make sure you bring in some reinforcements so they can live in harmony.

Run-on Sentences

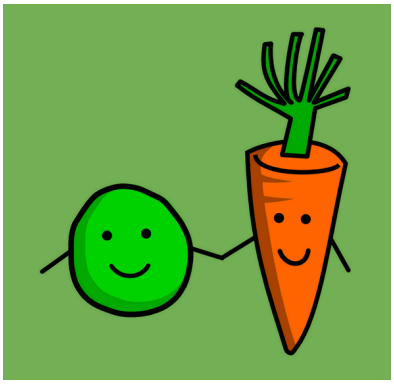
Run-on sentences have the same problem as comma splices, except there is no comma. A run-on sentence mashes two independent clauses together. Like this:

I had a hard childhood my mother was constantly forcing me to do extra homework.

“I had a hard childhood” can stand alone as a sentence, and so can “My mother was constantly forcing me to do extra homework” so we have a run-on sentence. To fix this run-on we can apply any of the same fixes we did to the comma splice.

Conjunctions

Conjunctions are the mediators of the grammar world. They bring words and phrases together and say, “Hey, you guys go together like peas **AND** carrots.”



Or, they agree to disagree: “You’re cool, **BUT** we have really different opinions.”

Or they sometimes get feisty and issue ultimatums: “We are going to have to break up **UNLESS** you come up with a really amazing promposal.”

You get the idea. Conjunctions bring words and phrases together to the table to talk, and we all find out how they relate to one another.

The ACT is all about conjunctions. It will test you not only to make sure you know how to use conjunctions correctly grammatically but also that you know how to pick which one to use to convey the intentions of a sentence or sentence(s).

There are two major categories of conjunctions you need to be familiar with: coordinating conjunctions and subordinating conjunctions.

Coordinating Conjunctions

Coordinating conjunctions are the FANBOYS: for, and, nor, but, or, yet, so. They are the ones used to create compound sentences when combined with a comma, but they can also just

connect any words or phrases and show how they relate. (“I like pizza **and** ice cream.” “I like pizza, **but** I don’t like ice cream.”)

Subordinating Conjunctions

Subordinating conjunctions provide a transition between ideas and *subordinate* a clause to a main clause. There are many subordinating conjunctions. Here are a few common ones:

> after, although, because, if, than, that, when, where, while, before, as soon as, since, though, unless, until, once

For example, “I plan to launch my career as a poet **once** I finish this novel I am writing **because** my English teacher told me I could do it for extra credit.”

In this example above, the main clause is, “I plan to launch my career as a poet.” The subordinating conjunction “once” gives us more information on when the speaker plans to launch her poetic career and the second subordinating conjunction “because” gives more information on why the writer is writing a novel first. These subordinating conjunctions are *subordinating* the phrases to the main clause and clearly showing how they build on the main clause.

The Logic of Conjunctions

Often the ACT will check to make sure you understand the underlying message a sentence is trying to convey and that you can pick the correct conjunction to do this.

Take a look at this example:

The first few months have been relatively dry **because/although** weather forecasters predicted a rainy year.

Should it be “because” or “although”?

“Because” doesn’t quite make sense because if forecasters predicted a rainy year we wouldn’t expect the first few months to be relatively dry. And they definitely aren’t dry *because* forecasters said they would be rainy.

“Although” correctly sets up the contradiction between the two parts. And we’ve nailed what the sentence is trying to convey: even though forecasters said it would be rainy, it’s actually been dry so far. Of course, it gets a little more complicated on the ACT, but the important thing when it comes to conjunctions is that you are on the lookout not only for grammar but also for sense.

Misplaced Modifiers

Caused by a fatal error in design, the airship S.S. Doanblowup met its tragic end in 1915 in a sudden, ironic explosion.

If you saw a sentence like this on the ACT English test, you'd definitely want to make a correction. If you haven't spotted what the problem is already, go back and look at the first part of the sentence, up until "airship." Then ask yourself what exactly was "caused by a fatal error." Was it the airship? No.

Everything that comes before that first comma is supposed to modify or give details about one specific noun in the main sentence. If we go back and try to find that noun, we'll come pretty naturally to the word "implosion." Those two pieces—the noun and the modifier, have to be placed near each other in the sentence for the reader to make clear sense of it. As it is now, it's just plain old wrong, and the ACT English section is going to test whether you know that.

How to spot modifier problems on the ACT

Any time you see an introduction like that set off by a comma, check to see if it should modify one specific noun in the sentence. Then check if that noun comes soon after the comma. If it doesn't, and there's another noun instead, then you've found the error.

How to fix the problem

There are two ways to fix this. First, we can move the modifier.
The airship S.S. Doanblowup met its tragic end in 1915 in a sudden, ironic explosion caused by a fatal error in design.

The other option is rearranging the main sentence.

Caused by a fatal error in design, a sudden, ironic explosion brought the airship S.S. Doanblowup to its tragic end in 1915.

In both cases, that modifier now falls next to the noun it's meant to give details about, which is the explosion.

Parallelism

Below, we are going to take a look at errors in parallel structure, how to find them, and examine how to correct them on the ACT.

Did you catch the mistake we made in the above sentence?

If you did, gold star to you. If you didn't, that's completely ok. People mess this up all the time. So let's get to work.

Lists of items

When two or more items are given equal weight in a sentence, they should be written as similarly as possible. The simplest example of this is a list of items:

For breakfast, I like to eat cereal, fruit, and I also like yogurt.

"Yogurt" is getting a little extra love there, and grammatically-speaking, that's a no-no.

To correct the parallel structure we need to get rid of the stuff in front of "yogurt" so we just have a list of three nouns:

For breakfast, I like to eat cereal, fruit, and ~~I also like~~ yogurt.

Lists in a sentence don't necessarily have to be a group of nouns; they could be verb phrases, for example.

To escape the wicked witch, the boy ran out of the gingerbread house, rolled down the hill, and went jumping across a river of fire. ← wrong

To escape the wicked witch, the boy ran out of the gingerbread house, rolled down the hill, and ~~went jumping~~ jumped across a river of fire. ← right

So let's go back to the sentence we started with:

Below, we are going to take a look at errors in parallel structure, how to find them, and examine how to correct them on the ACT.

See that extra verb in the third part? All of the items in the list follow from "take a look..." We are "taking a look" at errors in parallel structures, how to find them, and how to correct them.

Here's the smoothed out version:

Below, we are going to take a look at errors in parallel structure, how to find them, and how to correct them on the ACT.

Parallel Comparisons

Trickier parallelism questions will make an appearance in comparisons.

Take a look at the following sentence:

Danny's test scores weren't as good as Bryan.

In this case, you know what the sentence means, so in ordinary life, you might just go right past a question like this one. But on the ACT English test, you need to have eagle eyes. A closer look reveals the parallel structure is faulty. We are comparing Danny's test scores to Bryan's *test scores*. Not Danny's test scores to Bryan, the person.

Danny's test scores weren't as good as Bryan's test scores.

So when you see comparisons on the test, make sure they are comparing apples to apples and not apples to oranges.

Prepositional Phrases

Sometimes even trickier parallel structure questions have to do with prepositional phrases.

Take a look at the following sentence:

I wasn't informed or interested in the after-dance party.

You may have a feeling something is off here, but may not be sure what. Well, let's take out "or interested" for a moment. Then we just have "I wasn't informed in the after-dance party," which

doesn't make sense. We need a preposition to go with "informed" that works with that verb and sets up the parallel structure with "interested in."

Here's one solution:

I wasn't informed about or interested in the after-dance party.

So when it comes to parallelism on the ACT English test, make sure you watch out for three specific scenarios:

1. List of items that are supposed to be weighed equally (nouns, verb phrases, etc.). Remember: a "list" could just be two items!
2. Comparison of two or more items. Make sure that, grammatically-speaking, the lists are comparing the same type of thing.
3. Multiple prepositional phrases in the same sentence. Take care that a preposition essential to understanding the meaning (and maintaining elegant parallel structure) isn't dropped!

Strategy Questions

Strategy questions on the ACT English test fall under the broader category of “Rhetorical Skills” questions.

Strategy questions, like all rhetorical skills questions, don’t test specific grammar or usage issues; rather, they focus on larger issues about the choices a writer makes in order to communicate ideas clearly and effectively to an audience. This might mean helping the writer improve a sentence or paragraph so that it is more clearly written or more relevant to the topic or audience. The most common type of strategy questions ask test-takers to determine the effect of adding, revising or deleting a phrase or sentence.

Here’s an excerpt from an ACT English passage and a strategy question:

> The following winter, a blizzard shut down banks in the city for days, and ATM usage suddenly increased by 20 percent. This blizzard also launched Citibank’s long-running “The Citi Never Sleeps” campaign, with posters and billboards showing customers trudging through snow drifts to get to Citibank ATMs. After Citibank’s success, other banks followed suit, and ATMs popped up in every major city in the world.

1. If the writer were to delete the underlined portion, deleting the comma and ending the sentence with a period, the paragraph would primarily lose:
    A. an explanation of why so many people used ATMs during the blizzard.
    B. descriptive detail about the imagery of the advertising campaign.
    C. a restatement of an idea expressed earlier in the paragraph.

D. an explanation of why ATMs became necessary in the late 1970s.

(The answer is B. See below for the strategy for approaching a question like this one.)

Here's another example of a common ACT English question stem that asks you whether or not a writer *should* make an addition or deletion:

2. At this point, the writer wishes to add the following sentence:

   The Liberator was founded in 1831 and was published in Massachusetts.

   Should the writer make this addition here?

   A. Yes, because it gives the reader specific information regarding *The Liberator*.
   B. Yes, because it helps the reader understand why Garrison could not speak about slavery from personal knowledge.
   C. No, because the reader can infer the date *The Liberator* was founded from the paragraph.
   D. No, because it distracts the reader from the focus of the paragraph.

(see below for the answer and explanation for this one)

As you can see in the above examples, strategy questions are about the *content* of a selected section, not the *grammar.* You should always be answering strategy questions in the context of the whole passage and particularly the paragraph in which it appears.

How to Approach ACT English Strategy Questions

1. Read well above and below the referenced portion.

ACT English questions are often best answered as you go. Read through the passage until you get to a question, answer it, and keep moving. But with strategy questions, you need to be very careful that you are reading well above and below the highlighted portion. Sometimes, what comes *after* the section in question will give you the clues you need to answer the question correctly. If a question specifically says "In the context of the passage as a whole," be extra careful that you are considering the entirety of the passage, and if need be, wait to answer this question until you have read the entire passage.

2. Focus on whether or not an underlined portion is on topic.

Most of the answers to the strategy questions on the ACT will revolve around adding sentences that help clarify a point or help support the development of an important point and deleting those that don't. If a paragraph is missing an introductory or concluding sentence, the test may be looking for you to add one. If it is missing a connection between ideas or a supporting detail or example that would help a reader understand the content, the test will be looking for you to add that as well. If there is information that is off-topic or unnecessary, the test will be looking for you to get rid of that excess.

3. *For "Yes/No" Questions, make eliminations based on the rationale first.*

In questions such as the second example above, the rationale is the reason that comes after the "Yes" or "No." On these questions, ignore the yes or no at first and just focus on eliminating

reasons that are not true regardless. So, for example, let's look at the above question on *The Liberator* again:

> At this point, the writer wishes to add the following sentence:
>
> *The Liberator* was founded in 1831 and was published in Massachusetts.
>
> Should the writer make this addition here?

A. Yes, because it gives the reader specific information regarding *The Liberator*.
B. Yes, because it helps the reader understand why Garrison could not speak about slavery from personal knowledge.
C. No, because the reader can infer the date *The Liberator* was founded from the paragraph.
D. No, because it distracts the reader from the focus of the paragraph.

Without even reading this passage, we can eliminate answer choice B because that sentence says nothing about Garrison or why he could not speak about slavery from personal knowledge, so it cannot possibly be the answer.

Now here is the paragraph in question (the highlighted portion indicates the point referred to in the question):

> What made Angelina and Sarah unique and defined within abolitionist circles was neither their oratorical and literary talents nor their energetic commitment to the causes of racial and gender equality. Rather, it was their firsthand experience with the institution of slavery and its negative effect on slaves. [ ] Abolitionists such as William Lloyd Garrison, editor of *The Liberator*, and Theodore Weld, who Angelina married in 1838,

could give stirring speeches about the need to abolish slavery. However, they could not testify to either its impact on African Americans or on their masters from personal knowledge.

After reading this paragraph, we can eliminate answer choice C because there is no reference to when *The Liberator* was founded elsewhere in this paragraph.

So now we are down to A and D and need to apply the principles in point #2 above and decide whether or not the proposed sentence is on topic and helps develop the paragraph. Since this paragraph is focused on two women named Angela and Sarah and their contributions to the abolitionist movement, it's not crucial to this paragraph that we give so many specifics about *The Liberator*. It's simply mentioned in passing, and so our answer is D.

4. Don't overthink.

If a question asks you what a sentence will lose or gain by deleting or adding certain information, think to yourself, "This sentence will lose/gain exactly the content in the underlined phrase." That means in our first example above, we should think to ourselves, "This sentence will lose the fact that posters and billboards showing customers trudging through snow drifts to get to Citibank ATMs." This means the answer is B. It would lose specific descriptive detail of the campaign (what's on the posters and billboards). Be careful not to over think and rationalize one of the other answer choices as true. Be VERY literal.

Once you get the hang of them, strategy questions often become quite easy because the ACT repeats the same pattern over and over with these questions. Knowing what to look for is more than half the battle!

Organization Questions

ACT English essays are organization freaks; your English teacher would love them. If they don't have clear topic sentences, they want one; if sentences aren't in chronological order, they flip out. Well not really, but your score might if you don't look out for these question types. So here are the most important things you need to know about organization questions on the ACT English section.

There are three particularly common types of organization questions:

1. Ordering sentences or paragraphs
2. Choosing the best introduction or conclusion
3. Choosing the best transition word or phrase

Ordering sentences or paragraphs

If a question asks you to reorder sentences or paragraphs to present the most "logical" order, you are looking for one of two things: 1. chronology or 2. coherence.

Chronology is pretty straightforward. If the passage is working through a biography of a famous person's life starting with their childhood and ending with their death, then you want to make sure a paragraph about their college years does not appear at the end. Sometimes, chronology questions will be about putting seasons or other things with a clear order in line.

Coherence means that every sentence should follow from the previous one in terms of how it builds on content. Take a look at this challenging example:

What is the most logical placement for sentence 2?

(1) Many scholars believe that Thomas Kyd wrote a play about Hamlet a decade before Shakespeare's famous play. (2) Although Kyd's "Ur-Hamlet" is now lost, it is believed that it probably bore many similarities to Kyd's *The Spanish Tragedy*, or rather that *The Spanish Tragedy* bore many similarities to it. (3) This is a revelation that surprises many fans who believe that *Hamlet* was solely a product of Shakespeare's imagination.

This is a tricky one, and you need to look closely at it. The best way to tackle a question like this is to paraphrase the essence of each sentence in your head. Sentence 1 tells us Kyd wrote a play about Hamlet before Shakespeare. Sentence 2 tells us it bore many similarities to *The Spanish Tragedy*. Sentence 3 tells us that the fact that Kyd wrote a play about Hamlet surprises many Shakespeare aficionados.

Ah, ha, there's the kicker. It's not the stuff about *The Spanish Tragedy* (sentence 2) that surprises Shakespeare's fans. It's the fact that Kyd wrote a play about Hamlet. So this means sentence 3 should follow after sentence 1. And sentence 2 should be moved to after sentence 3.

Choosing the best introduction or conclusion

In order to answer these types of organization questions correctly, it's important that you review the main idea of the paragraph and make sure you pick an option that best accomplishes two things:

1. summarizes the main idea of the paragraph
2. connects to what comes before and after it (this means the previous paragraph if we are talking about an intro sentence and the current paragraph and following paragraph if we are talking about a concluding sentence.)

Be wary of answer choices that are too broad or too narrow: the ones that seem to encompass more than what the paragraph talks about or only give one specific detail.

Choosing the best transition

Let's jump right into an ACT example for this one:

As she got older, Katerina did not find ice skating as appealing as she once did. Though, she cut back on her practice time and spent more time on other activities.

A. NO CHANGE
B. Therefore,
C. In fact,
D. Furthermore,

On a question like this, we need to pick the transition that best communicates the relationship these sentences are trying to express. One way to handle this is to temporarily put a blank in the sentence where the transition is supposed to go, ignore the answer choices, and try to come up with your own connection ➔ Katerina did not find ice skating appealing. _____, she cut back on her practice time and spent more time on other activities.

The connection between these two ideas is about cause and effect (Katerina didn't like ice skating so much anymore, **so** she cut back on her training), so we need a word or phrase that communicates this. Words and phrases such as "so," "as a result," or "consequently" would best achieve this goal and, so, answer choice B "therefore" consequently fits in best with this group.

Style Questions

Some ACT English questions are about choosing the best answer not based on grammatical correctness, but rather style or tone.

Quite frequently on the test, you'll come across a phrase or sentence that isn't technically grammatically incorrect, but nevertheless is confusing, wordy, or poorly written. Your job in these instances is to help the writer out with his or her style. Not everyone can be as cool as you.

(Shakespeare knew a lot about style.)

In other instances, you'll need to change a word or phrase that clashes with the tone of the essay. Or you might need to eliminate ambiguous pronoun references, redundant material, or awkward expressions. Since there aren't hard rules about style, style questions on the ACT can

sometimes be a little tricky, so let's break down the common types roughly from the easiest to hardest errors to spot.

Redundancy

If you don't know to be looking out for redundancy, you may not catch these errors. But once you know to watch out for them, points galore!

Here's an example:

Annually, I donate to the scholarship fund each year.

Since "annually" means every year, we don't need to say "each year."

Most of the time, redundancy questions are easy to spot as long as you make sure to read before and after the underlined portion in case the repetitiveness is elsewhere in the sentence.

A **BIG CLUE** to look out for is an answer choice that says "OMIT the underlined portion." That doesn't always mean you should, but it is a big flashing signal that you very well might be dealing with a redundancy question and that omitting the underlined portion would fix it.

Ambiguous Pronouns

Sometimes a pronoun might not be grammatically incorrect, but it is unclear to whom or what the pronoun is referring to. Take a look at this example:

Because Samantha is less interested in her Calculus homework than in her English reading assignments, she sometimes neglects it.

Now, you may be thinking that logically "it" is referring to Samantha's Calculus work because she is less interested in it. But this isn't good enough for the ACT. We have two things that "it" could be referring to--Calculus homework or English reading assignments--so we need to clarify what "it" is referring to. Here's one way to do it:

Because Samantha is more interested in her English reading assignments, she sometimes neglects her Calculus homework.

Tone

Sometimes an underlined portion will be in the wrong style for the essay in which it appears. Maybe it's too formal for a personal narrative about the writer's first pet. Maybe it's too informal for a serious biographical study. Generally speaking, most of the tone errors on the test fall into the second category. When in doubt, choose the phrase you would turn in in a paper to your English teacher (in other words, standard written English).

This question type isn't incredibly common on the ACT, but you should be aware of it. Here's an example:

Instead of presenting a rebuttal to my argument, she simply nodded and <u>went</u> that it sounded fine.

Some people tend to use "went" in informal conversation describing dialogue they had with others, but it's not grammatically correct. We would need to replace this phrase with something along the lines of "muttered," "replied," or "responded."

Vague phrases

Quite often on the ACT, you'll be asked to pick the phrase that best illustrates a certain situation. In this case, you are always looking for the most specific, most vividly detailed response. Take a look at the following ACT example:

The weather forecast prepared us for a deluge of rain; instead we emerged from our vacation tired of sunshine.

Which choice most effectively uses ironic imagery to emphasize that the weather was the opposite of what was expected?

A. NO CHANGE
B. basking in
C. having received our fill of
D. soaking wet

Since we are looking for "ironic imagery," our best and most vivid descriptor is answer choice D "soaking wet." Obviously you can't literally be soaking wet in sunshine, but that is what makes it ironic. And most importantly, it is the most vivid expression of the bunch.

Wordiness and Awkward Expressions

One of the most common types of style questions asks students to choose the clearest expression of a phrase. Sometimes these questions can be very easy: three of the answer choices are noticeably confusing or awkward. At other times they can be quite tricky because, again, this is a matter of trusting your ear over finding specific grammar errors.

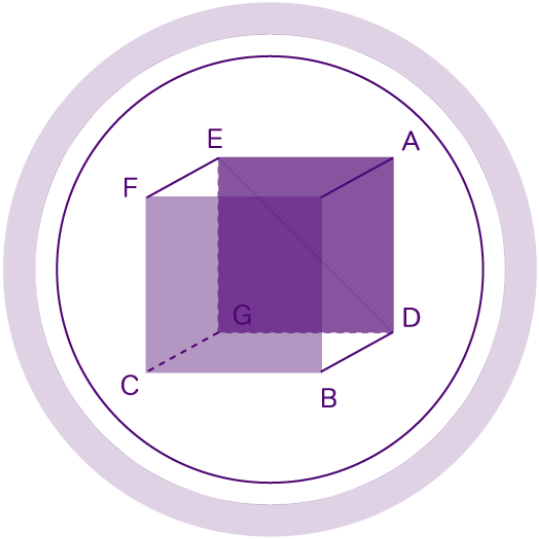
Here's an ACT test example:

No one meteorological model is fully being able to account for the sweltering summers that have brought nearly fifty consecutive days of triple-digit highs to some parts of the country.

A. NO CHANGE
B. is able to be accountable to
C. can fully account for
D. has been able to account fully for

The answer is C. It uses the least amount of words and chooses active voice over passive voice. When in doubt, choose the shortest answer choice. But BE CAREFUL. Just because an answer choice uses fewer words doesn't mean there isn't an error in it that makes it wrong. So avoid the temptation to always choose the shortest phrase until you check it thoroughly for grammar mistakes.

ACT Math Test



Introduction to ACT Math

The ACT Math Test assesses the mathematical skills students are expected to obtain before grade 12 (meaning through advanced algebra and basic trigonometry, but not calculus).

What to Know:

- It's the second section of the ACT
- You have a 50-minute time limit
- You will face 45 multiple choice questions
- You get to use a calculator for the whole test (but it must be an approved one)

What to Study:

- Geometry formulas for the area, volume, and surface area of basic shapes (unlike the SAT, the ACT won't give you these!)
- Multiple-choice math test strategies such as "backsolving" the problem using the answer choices, substituting in numbers, and estimating.
- Pre-Algebra
    - decimals, fractions, integers, positive and negative numbers, square roots, scientific notation, factors, ratios, proportions, percents, charts and graphs of statistics
- Elementary Algebra
    - exponents, evaluating algebraic expressions through substitution, using variables to express relationships, algebraic operations, and factoring quadratic equations
- Intermediate Algebra
    - quadratic formula, rational and radical expressions, absolute value equations

and inequalities, sequences and series, systems of equations, quadratic inequalities, functions, matrices, roots of polynomials, probability, and complex numbers

- Coordinate Geometry
    - evaluating points and lines on a graph, polynomials, circles and other curves, graphing inequalities, slope, parallel and perpendicular lines, distance, midpoints, and conics
- Plane Geometry
    - angles and relationships among perpendicular and parallel lines, properties of circles, ellipses, rectangles, triangles, parallelograms, trapezoids, transformations, area, volume, three-dimensional geometry
- Trigonometry (on a very basic level)
    - trigonometric relations in right angles, values and properties of trig functions, graphing trig functions, using trig identities, solving trig equations

What Not to Study:

- Trigonometry beyond the very basics.
    - However, what you SHOULD definitely study as far as trig goes includes:
        - SOH-CAH-TOA
        - how to solve right triangles
        - the unit circle
        - $\tan \theta = \sin \theta / \cos \theta$
        - $\sin^2 \theta + \cos^2 \theta = 1$
        - what sine, cosine, and tangent graphs look like

Top 3 Tips to Improve Your ACT Math Score

Quick, pop quiz!

Approximately how long is a new, standard, unsharpened #2 pencil?

A. 7 centimeters

B. 7 inches

C. 7 feet

D. 7 yards

You may not know the exact length of a standard pencil, but I bet you could take a REALLY good guess among the above answer choices just by using a little common sense. But so often we forget to use this common sense on the ACT Math test. We get caught up in our calculations and forget to measure our answer against the original problem to see if it checks out. Let's say an $80 dress is on sale for 20% off. if you do the math and get an answer of $96....well, that sounds like a really bad sale. That couldn't possibly be the answer, so don't pick it. And that's why being realistic is our first tip to help you improve your ACT Math score.

Tip 1: Think Realistically

So many of the ACT word problems are based on real-world situations, and they usually present realistic scenarios, so make sure the answer you get makes sense in the context of the problem. Thinking realistically also applies in a slightly different way to the geometry problems on the test. So, even if you don't know how to solve a problem, you can use visual estimation to narrow down the answer choices, sometimes even to the correct answer, without doing any work at all.

Tip 2: Use the Answer Choices

On every single ACT question, the correct answer is literally sitting right in front of your face. You just have to pick it out of a multiple choice lineup. This means you can do things on the ACT you can't do on a lot of school math problems, such as plug in answer choices to see which one works. So don't forget about working backwards. There are so many questions on the test that are just begging to be solved this way.

Tip 3: Move Quickly

The questions on the ACT Math test aren't exactly arranged easy to hard. They do tend to get more advanced in concept as you move through the section, but most students find there isn't an exponential increase in difficulty level. If you just studied identities in your trig class, for example, you might find question 37 to be easier than question 12. This means you can't let yourself get stuck on any one problem. Make quick decisions to skip and come back to problems if there is time. It's a real shame to spend 3 minutes wrestling with a question you ultimately will get wrong and run out of time to see a problem you could absolutely get right.

What do you need to know for the ACT math section, at a basic level? Well, below is a pretty good answer. Though the information below won't pertain to every question, it contains important fundamentals/terminology that you should know walking into the test.

Prime numbers

A prime number is a number divisible by itself AND 1.

1 is not a prime number because 1 IS itself. Don't worry if your head can't wrap around that logic. Just remember, 1 is not a prime number.

2 is the lowest prime number and the only even prime. It is good to be familiar with the prime numbers up to 30, though you don't have to memorize them.

Multiples, divisors, and factors

A multiple of n results if you multiply n by any positive integer. For instance,

$3 \times 1 = 3$

$3 \times 2 = 6$

$3 \times 3 = 9$

$3 \times 4 = 12$

These are all multiples of 3.

A factor is a smaller part of a larger number. Mathematically, factors are the numbers that form a larger number when you multiply them. In the example using 24 below, '2' and '12' are factors of '24' because when you multiply them together you get 24.

24: 1, 2, 3, 4, 6, 8, 12, and 24 are factors of 24 (note that '24' is both a factor and a multiple of '24'. In math terms, for every integer n, n is both a factor and a multiple of itself.

The prime factors of a number are the factors broken down to prime numbers. To find the prime factors, choose two factors of a number, say '3' and '8' (3 x 8 = 24). Keep figuring out the factors for the number(s) that remain that are not primes. '3' is a prime; however, '8' is not. It can be broken into 2 x 2 x 2. Therefore, the prime factors of '24' are 2, 2, 2, and 3.

Evens and odds

Odd + odd = even

Odd + even = odd

Even + even = even

Don't feel you have to memorize these. You can just plug in any odd or even number to derive the relationships.

Percent = fraction = decimal conversion

1% = 1/100 = .01

10% = 1/10 = .10

50% = 1/2 = .5

Adding fractions and multiplying fractions

A quick trick for adding two fractions in which the numerator for both is the number 1:

The numerator equals the sum of the numbers in the denominator; the denominator is the product of these two numbers. In the fraction below, all I have to do is add 2 and 3 for the top (giving me 5) and multiply 2 x 3 for the bottom (giving me 6).

$$\frac{1}{2}+\frac{1}{3}=\frac{5}{6}$$

Some other examples:

$$\frac{1}{4}+\frac{1}{6}=\frac{10}{24}=\frac{5}{12}$$

$$\frac{1}{5}+\frac{1}{7}=\frac{12}{35}$$

$$\frac{1}{3}+\frac{1}{4}=\frac{7}{12}$$

For multiplying fractions, just multiply across the numerator and across the denominator.

The Dreaded Exponent

Exponent Basics

Exponents often scare the bejeezus out of students. The word exponent alone conjures up numbers so big that they seemingly dwarf the number of atoms in the known universe. But do not fear: there are no atoms on the test, and the exponents on the ACT deal with far smaller numbers.

Let's rewind to well before you started thinking about the ACT. Do you remember learning addition and subtraction? All right, so it was a long time ago, and most of us don't have very clear memories from first grade, other than that time Amy Carson ate a dead fly off the radiator and you got in trouble for it. But you probably remember being posed with a question along the lines of "If I have 30 gummy bears, and you eat the arms off 17 of them, how many gummy bears that can do pushups do I have left?" An unimaginative kid might've said zero, believing gummy bears don't buff up, but the rest of us learned how to "take away" using concrete images like that.

We could picture the situation that the equation described. Moving up to multiplication, it was still relatively quick to find real world applications. By the time we got to exponents, though, things started getting kind of abstract, especially when dealing with roots.

So knowing how to deal with exponents on your SAT might get you a little confused at points if you can't remember a few rules that aren't so easy to figure out by yourself. You'll need to remember them, even if you don't quite understand why they are true.

Radicals other than square roots

Numbers over radicals occasionally throw people off. Just remember that it's the opposite process of exponents. So if is 2*2*2=8, then $\sqrt[3]{8} = 2$. This is totally fundamental, but it's a good place to start.

Fractions in exponents

These are just the same as above. If you see a fraction in an exponent on your ACT, go right ahead and convert it into a radical. So $8^{1/3}$ equals 2, just the same as $\sqrt[3]{8} = 2$.

If you have something other than a 1 in the numerator, like $8^{2/3}$, then just put the denominator into the radical and keep the numerator as an exponent: $\sqrt[3]{8^{-2}}$. From there, it doesn't matter which operation you carry out first. $2^2 = 4$ just as $\sqrt[3]{64} = 4$.

0 in an exponent

Any number to the 0th power is one. 2^0=1 and $9{,}999^0$=1. We don't need to worry about why for the purposes of the ACT (but if you enjoy math puzzles and want to figure it out, here's a hint: it has to do with the next fact).

Negatives in exponents

Careful not to get x^{-2} confused with $x^{1/2}$. Instead, $x^{-2} = \frac{1}{x^2}$. Although fractions in exponents are tested more often, negatives are also liable to show up on your ACT, so you should get comfortable with this if you aren't already.

How you can imagine using gummy bears, we're not sure, but that doesn't make it difficult to use—and that's true for all of the rules above. As long as you know the facts, you can work pretty easily with exponents on your ACT that might seem daunting at first.

The 4 Rules of Exponents

You can almost bet there will be an exponent problem on the ACT. In fact, you can bank on there being several. Here is what you have to know:

#1: The base (it's the big number)

An exponent all alone would be nothing more than a tiny speck floating in space. Every exponent needs a base:

3^2: base 3

2^5: base 2

#2: Don't add the bases

$3^2 + 2^2$ DOES NOT equal 5^2

$3^2 + 3^2$ DOES NOT equal 6^2

#3: When multiplying similar bases add the exponents

$3^2 \times 3^5 = 3^7$

$2^4 \times 2^4 = 2^8$

#4: When taking an exponent to an exponent multiply the exponents

$(4^2)^3$ DOES NOT equal 4^8 or 4^5

$(4^2)^3 = 4^6$

Combining Exponents

While the basic rules of exponents will really help on your ACT, you're also going to need to know how to combine exponents. There are a number of common mistakes here, and they'll all lose you points if you're not careful.

$$x^y \times x^z = x^{y+z}$$

$$\frac{x^y}{x^z} = x^{y-z}$$

If you're multiplying two powers with the same bases (which is x, here), then you can just add the two exponents. Let's use actual numbers:

$2^2 \times 2^3 = 2^5$

It's pretty easy to see why if we expand the equation.

$2^2 = 2x2$

$2^3 = 2x2x2$

$2^4 = 2x2x2x2$

Similarly, if we divide powers that have a common base, then we can just subtract the exponent in the denominator from the one in the numerator.

$$\frac{2^3}{2^2} = 2^1 = 2$$

Be careful that you only do this when the bases are the same!

When to multiply or divide exponents

$$x^{y^z} = x^{y \times x}$$

$$\sqrt[z]{x^y} = x^{\frac{y}{z}}$$

When you have a power of a power, you can multiply those exponents. Don't add them!

Since roots are the opposite operation of powers, just like division is the opposite of multiplication, you can divide an exponent by the radical.

Again, if we use real numbers and expand it, the reasons why are pretty clear.

$$(2^3)^2 = (2\times2\times2) \times (2\times2\times2) = 2^6$$

$$\sqrt[3]{2^6} = \sqrt[3]{(2\times2)\times(2\times2)\times(2\times2)} = (2\times2) = 2^2$$

When to distribute exponents and roots

$$(xy)^z = x^z y^z$$

$$\sqrt[z]{xy} = \sqrt[z]{x}\sqrt[z]{x}$$

If you have an exponent outside of parentheses that contain two multiplied numbers, you need to find the power of both factors.

$(2x3)^2 = 6^2 = 36$

$(2x3)^2 = 2^2 \times 3^2 = 4 \times 9 = 36$

$(2x3)^2$ DOES NOT equal $2x3^2$ *The FOIL method makes it pretty clear why that doesn't work.*

Radicals follow the same rules. If you have numbers under the radical that are added, then you can't just find the root of each one. You have to combine them first.

But you can take a number under a radical, break it into factors, and simplify it that way.

$$\sqrt[3]{56} = \sqrt[3]{8\times7} = \sqrt[3]{2^3}\sqrt[3]{7} = 2\sqrt[3]{7}$$

And that comes in handy on the ACT.

Keep in mind:

Don't treat exponents and radicals like other operations—they have their own set of rules to follow.

Geometry

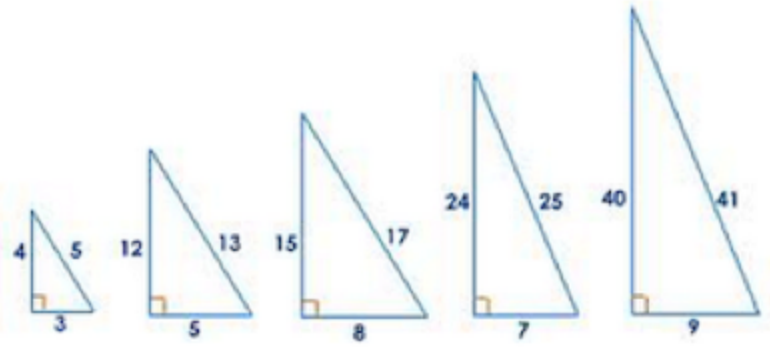
Geometry Basics

A quarter of ACT Math problems need some geometry skills to be solved, and most of these ask you to use geometry knowledge alone. Those ACT geometry questions are mostly about three topics: triangles, circles, and angles.

Triangles (and angles) in ACT geometry

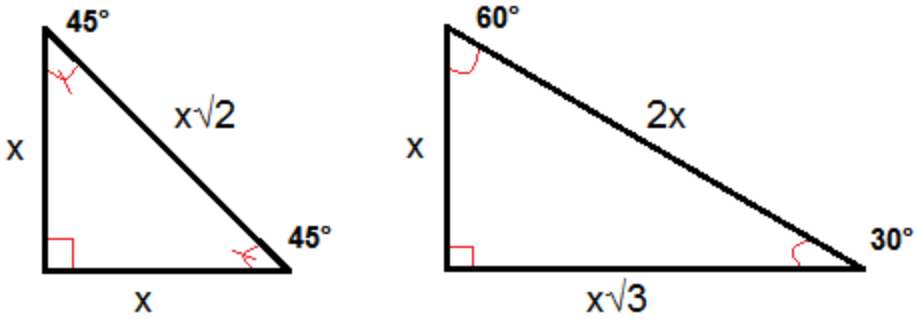
The most important of these three is triangles. The ACT loves triangles. Specifically, the ACT uses a lot of right triangles in questions. You'll get plenty of chances to use the Pythagorean theorem. If that sounds dull, then make it easier by knowing some Pythagorean triples ahead of

time. Here are a few:



The smaller the triples are, the more common they are on the ACT (so 3-4-5 triangles are the most common). Of course, they show up as their multiples pretty often too; instead of a 3-4-5, you might see a 6-8-10 triangle. If you have two sides of a right triangle that match up to any of the ones above, then you know the third side even without using the Pythagorean theorem.

The special right triangles are also among the ACT's favorites. Recognize and know the proportions of 30°-60°-90° and 45°-45°-90° triangles and you'll save yourself time and energy both.



You might not even see a triangle at first. A lot of times, the question doesn't ask you specifically about a triangle, but if you add a bit of info to the figure (or draw your own figure), you'll see a triangle appear. And more often than not it's going to be a right triangle.

Circles in SAT geometry

Circles don't just appear like triangles do. They'll be given to you specifically, so when you see the word circle, a picture of one, or a picture of a piece of a circle (like an arc), then you should be pretty clear on where to start.

Take a quick look at the formulas for circle measurements.

Diameter = $2r$

Circumference = $2\pi r$

Area = πr^2

Area of a cylinder = $\pi r^2 h$

Also, it's good to remember a couple other things about the radius of a circle:

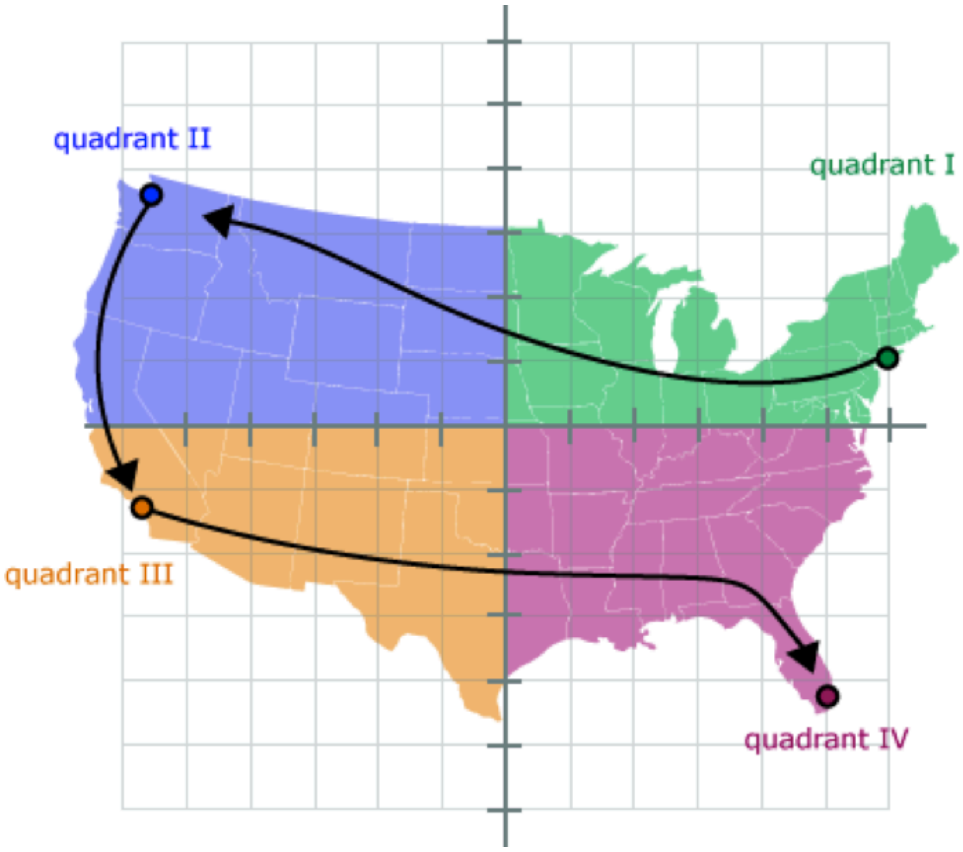
- Any two radii of one circle are equal in length
- A line tangent to the circle is perpendicular to a radius line

Using circles and triangles on the SAT

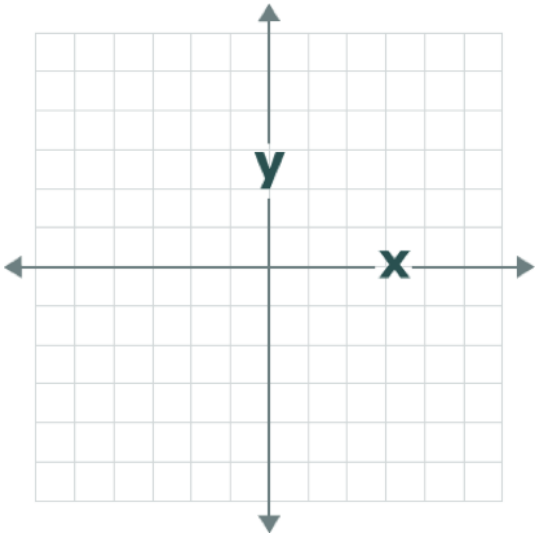
There are a lot of problems that aren't as simple as "What is the length of side XY?" or "What is the area of circle O?" on the SAT.

In fact, you'll need to combine those skills on several SAT questions. Be ready to move information around, and always remember to write in any information that's not given to you in the figure.

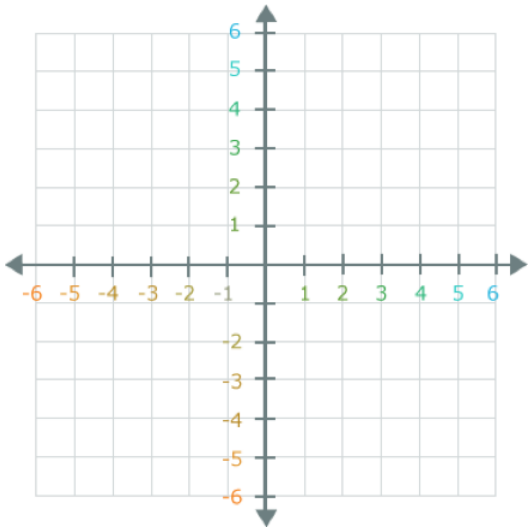
The first thing you got to know is that there are four quadrants in a coordinate plane. What's wacky is how these quadrants are arranged:



A good way to think of it is to imagine yourself on a cross-country trip in which you start off in New York (the northeast = quadrant I), drive on over to Seattle (the northwest = quadrant II), then drive down to Los Angeles (southwest = quadrant III) and finally end up in Miami (southeast = quadrant IV).



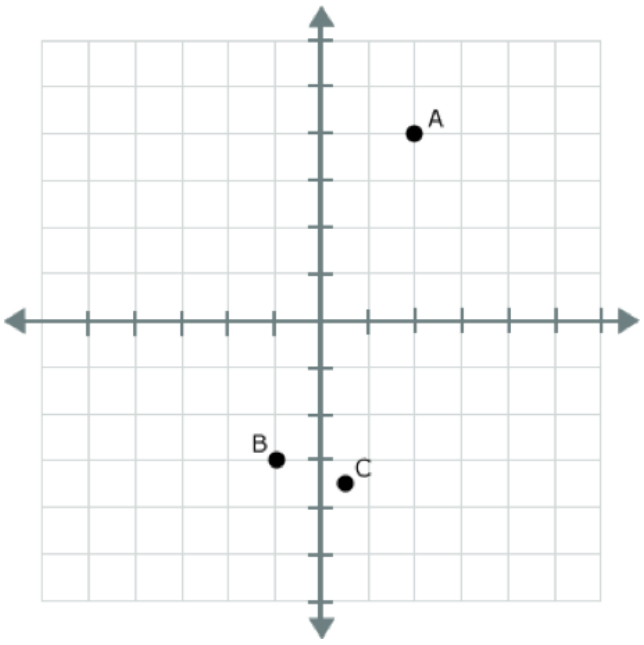
The next two important things you have to learn are the x-axis and the y-axis. The x-axis runs from left to right (this is the horizontal line), whereas the y-axis runs up and down (this is the vertical line).



Next, it's all about integers, or what I call "people numbers": you can have one more person or one person fewer. However, you can't have .3 people or ½ a person. In coordinate geometry land you'll have integers running from left to right, like on a number line, from negative to positive. On the left hand side the negative numbers will decrease until they hit the middle of the graph (the intersection of the x- and y-axis—of what's known as the origin). At that point,

you'll see the number zero. Then the numbers continue up from zero (1, 2, 3, etc.).

For the y-axis, the vertical one, the negative numbers start at the bottom, decreasing until they get to zero. Then, from the origin going up, each number will go up by one for each "notch" in the graph.

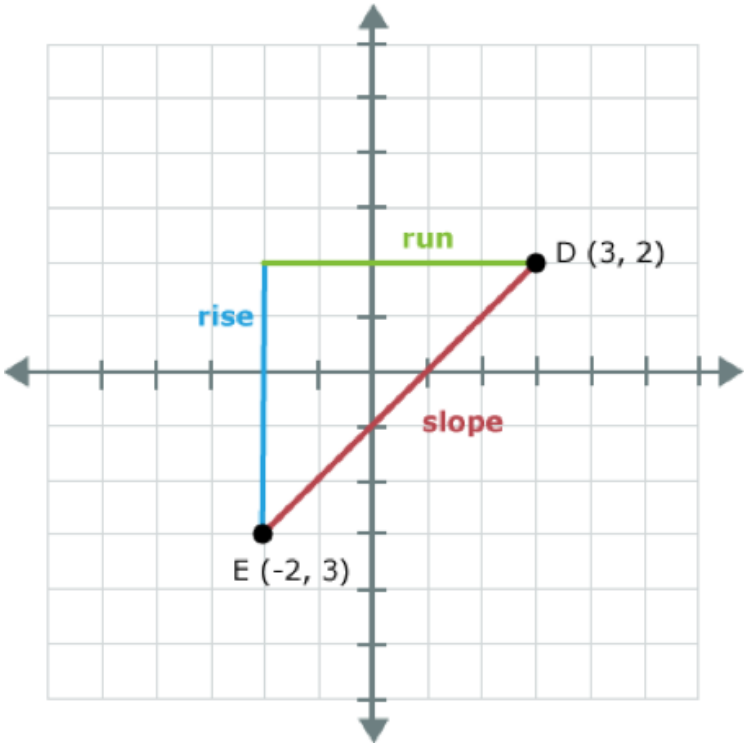


Next up are the coordinates. Coordinates are always presented as two numbers, the first number corresponding to the x-axis, and the second one to the y-axis. For instance, point A has the coordinates (2, 4). That is you "go over" two points to the right on the x-axis and up four points on the y-axis. Point B has the coordinates (-1, -3).

Even though the numbers on the x-axis and y-axis are always broken down via integers, coordinates can have fractions, as point C shows (1/2, -7/2).

The slope

Now that we've gone over the "basic basics," next up is something that might sound familiar to you: rise over run. You've probably had this hammered in for so long you can't even remember when you first heard it. Sadly, most people forget exactly what it means. So here it is: you can figure out the slope of a line by seeing how many squares on the coordinate plane one point is above the other. In the graph below, point D has a y-coordinate of 3 and point E has a y-coordinate of -2. So point D is five squares higher than point E. This is the "rise," how far up it goes from the lowest point, is 5.



When you are figuring out the slope, which consists of a fraction, always put the "rise" in the numerator.

As for the "run," "it" is how far away two points are in a left-to-right sense. If you count how many squares point D (3, 2) is from point E (-2, -3), in a left-to-right sense, you'll get the "run,"

which in this case is 5. I know, you are probably thinking, why the heck is that called the “run.” You can run from left to right, right to left, up to down, and just about everything in between. It’s just one of those conventions you have to learn. The key is you always put the “run,” or whatever you want to call it, in the denominator.

You might have already figured out that there is a faster way of doing this besides counting squares. All you have to do is take the y-coordinate from point E and subtract it from point D, which gives you (2-(-3)) = 5. And to find the “run” just subtract the x-coordinate of point E from the x-coordinate of point D, which gives you (3-(-2)) = 5, so the slope is 5/5 = 1.

Now as far as the slope goes, I’ve left something out that would make your geometry teacher’s face turn red.

$$\frac{y_2 - y_1}{x_2 - x_1}$$

As you can tell, this is pretty ugly. It’s useful for sure, but it’s just not that most straightforward way of dealing with the slope. For one, students usually get flustered trying to remember which one is the y_2 and which one the y_1. It actually doesn’t matter—as long as you make sure to start with the same point for both coordinates. So above we have the y-coordinate in D – the x coordinate in E. Therefore, we have to make sure that we have the x-coordinate in D – the x-coordinate in E.

It’s also okay to switch the points D and E around, as long as you do it for both coordinates. You will end up getting the same thing.

Equation of a line

There are several ways to write the equation of a line. The most important one to remember is slope intercept form:

$y=mx+b$

where *m* stands for the slope and *b* stands for the y-intercept. If you move an equation around to this form, you can easily see what the line's slope or y-intercept is.

Algebra

The Basics

The good news: the algebra tested on the ACT is pretty straightforward. The bad news: if you are not up on your basics, then you are in trouble. Below, is the one major tip that will help you solve almost any algebraic problem you encounter.

Balancing the equation

In an algebra equation in which there is an equal sign, think of the equation in balance. If you do anything to one side you do the exact same thing to the other side. If you multiply one side by 4, you have to multiply the other side by 4. If you subtract 3 from one side, you subtract 3 from the other side.

The goal in balancing the equation is isolation. That's right – you want to isolate x, or get x (or whatever variable happens to be in the equation) by itself. Think of the variable as the unpopular person in the room. Everyone – that is the other numbers – wants to get away.

4x + 3 = 15

To get x by itself, first subtract 3 from both sides of the equation.

4x + 3 = 15

-3 -3

4x = 12

Now divide both sides of the equation by 4:

4x/4 = 12/4

x = 3

Let's try one more:

$\sqrt{x} = 9$

Notice how x has a square root sign on top of it. We want x to be all by itself. Therefore we have to get rid of the square root sign by squaring both sides:

$(\sqrt{x})^2 = 9^2$

$x = 81$

By correctly isolating x by balancing the equation, you are well on you way to solving most of the algebra on the ACT!

FOIL Method

The ACT loves testing questions that rely on the FOIL method. A subset of algebra, FOIL relates to polynomials, and, unlike many other algebra sections, you cannot rely on plugging in (a method I otherwise encourage you to use often).

Before I tell you exactly how to use FOIL, it is important that I tell you what a polynomial is. Take a look at the equation below:

(x - y)(x + y) = 0

Remember that parentheses stand for multiplication. Multiplying x and y may seem daunting but using the FOIL method makes things easy!

Think of the position of the x's and the y's above. The first position in each parenthesis consists of x's. The last position consists of y's.' Using this logic, let's apply the FOIL method:

F: First, x^2

O: Outer, xy

I: Inner, -xy

L: Last, $-y^2$

Now think of the variables above as part of a large addition problem:

$x^2 + xy - xy - y^2 = 0$

$x^2 - y^2 = 0$.

Practice FOIL-ing!

$(x + 2)(x - 4) = 0$

F: x^2

O: -4x

I: 2x

L: -8

$x^2 - 2x - 8 = 0$

You can also reverse the direction in which you do FOIL. For instance:

$x^2 - 4x + 4 = 0$

First, set up the parentheses.

(x - ?)(x - ?) = 0

The question marks are in the last position. When we multiply them together we get 4 (notice the +4 at the end of the equation). So we know that the last numbers (the question marks), when multiplied, have to equal +4.

Now note, the -4x in the middle of the equation. The outer (x * ?) + (x * ?) = -4x. Which two numbers, when multiplied equal +4, and when added = -4? You may have to play around with the factors a little, but since the only factors of 4 are 2, 2 and 4, 1, this problem isn't too tough. 4 and 1 would add up to 5. Therefore, 2 and 2 are the answers, and we can replace the question marks with 2's, giving us:

(x - 2)(x - 2) = 0

Practice Question:

Which of the following is a root of the equation $2x^2 - 20x = 48$?

A. -4

B. 2

C. 6

D. 8

E. 12

*This question is from the old version of the ACT. The current test will not include answer choice (E).

Answer and Explanation:

Which of the following is a root of the equation $2x^2 - 20x = 48$?

(A) -4
(B) 2
(C) 6
(D) 8
(E) 12

$$2x^2 - 20x = 48$$
$$2x^2 - 20x - 48 = 0$$
$$2(x^2 - 10x - 24) = 0$$
$$2(x-12)(x+2) = 0 \rightleftharpoons \begin{matrix} x-12=0 \rightarrow x=12 \\ x+2=0 \rightarrow x=-2 \end{matrix}$$

Combination vs. Substitution

Algebra is by far the most important part of ACT Math. Isolating a variable is a step in many ACT Math problems, depending on whether or not you use elimination strategies. That's as it should be; after all, you've been doing that in math class for the entirety of your high school career, and it's the foundational block that most other math is built on. It'd be worrying if ACT Math didn't use a lot of algebra.

Of course, that algebra comes in many shapes and forms. Some of it's relatively basic, while other questions involve so many steps that little slip-ups become a serious threat. One way to make that algebra longer is to include two variables (or more). If you have as many equations as variables, then it's only a matter of using substitution or combination to get your answer.

You've seen at least one of these methods in school, of course, but you may not be equally comfortable with the two. If that's the case, then take some time getting familiar with the other; you'll want to have both options to choose from during your ACT.

When substitution is better

If either x or y (or whatever variable you have) stands alone on one side of the equation or can be isolated really quickly, substitution is the way to go. Take a look at the example below.

If $x=(11-y)$, and $y^2=x+(y-1)^2$, then what is the value of x?

This is also ideal for substitution because of the other somewhat complicated stuff going on... if you used combination, you might make a mistake when combining the y terms of the two equations.

So let's solve it.

First, substitute the x out of the second equation by plugging in the right side of the first equation.

$$y^2 = x + (y-1)^2$$

$$y^2 = (11-y) + (y-1)^2$$

$$y^2 = (11-y) + (y^2 - 2y + 1)$$

$$y^2 = 11 - y + y^2 - 2y + 1$$

$$y^2 = 12 - 3y + y^2$$

$$0 = 12 - 3y$$

$$3y = 12$$

$$y = 4$$

And we're done, right?

Nope. Almost done.

Remember to check what the question is asking for. In this case it's the value of x, not y.

But that's not hard. Just plug that value of y back into the simpler of the two equations we were given.

$$x = 11 - y$$

$$x = 11 - (4)$$

$$x = 7$$

Now it's done.

When combination is better

If there's one variable that has the same coefficient in both equations, then combination is probably a good idea. Or better yet, if the coefficient in one equation is the negative of that in the other equation, then we're set.

What does that mean? Good combination questions look like this:

If $3x - \frac{y}{2} = 19$, *and* $5y - 3x + 1 = 0$, *then what is the value of* x *?*

With that 3x in one equation and -3x in the other equation, it's pretty quick to cancel them out. So let's line up the two equations over each other, and then combine them into one.

$$3x - \frac{y}{2} = 19$$

$$5y - 3x + 1 = 0$$

$$3x - \frac{y}{2} = 19$$

$$-3x + 5y + 1 = 0$$

Add the two equations together, cancelling the 3x and -3x.

$$5y + 1 - \frac{y}{2} = 19$$

$$5y - \frac{y}{2} = 18$$

$$10y - y = 36$$

$$9y = 36$$

$$y = 4$$

If you fell for that trap the first time, we hope you're not going to do it again. Find x.

$$3x - \frac{y}{2} = 19$$

$$3x - \left(\frac{4}{2}\right) = 19$$

$$3x - (2) = 19$$

$$3x = 21$$

$$x = 7$$

And now we're done.

Use whichever method is easier on the day of your ACT

While you're practicing, it's a good idea to try to vary which method you use, so you have both tools at your disposal. But on the day of your test, you don't want to spend any time deliberating. Just pick whichever seems easiest and go for it.

ACT Shortcut: Avoid Algebra by Drawing Word Problems

It's pretty often on the ACT that you'll have the choice of doing something algebraically or by some other route. While you might be pretty comfortable working with equations, it's often not so easy to figure out how to translate the words on the page into a workable algebra problem. And you might not even have to; sometimes, just figuring out the logic behind a problem is all you need to do. And the best way to do that is to start sketching the situation out.

Why creating equations can be difficult

> *Carrie invites some friends to a party. For every two friends who bring snacks, there are five who bring nothing with them. If the number of friends who bring nothing is 15 more than the number of friends who contribute snacks, how many friends in total arrive at the party?*

We're missing a couple pieces of information in this question. We don't know the total number of friends who bring Hot Cheetos and Takis, nor do we know how many of her friends are total bums. (We do know that Carrie needs to find better friends, though).

But let's try writing out an equation, if we can.

We're trying to arrive at the total number of people at the party, which we'll call g (for guests). That's the sum of two numbers that have a difference of 15. Let's call those numbers f (friends with Funyuns) and m (moochers).

$g=f+m$

and

m-f=15

Hm. So far, nothing's jumping out. But we do know something else: there are 2 friends with Funyuns for every 5 moochers. That means that of the guests, g, have Funyuns, f, and of g are moochers, m.

That's

$$f = 2\frac{g}{7}$$

and

$$m = 5\frac{g}{7}$$

And from here, things are relatively simple. Plug those into our equation for the difference of m and f.

$$5\frac{g}{7} - 2\frac{g}{7} = 15$$

$$5g - 2g = 105$$

$$3g = 105$$

$$g - 35$$

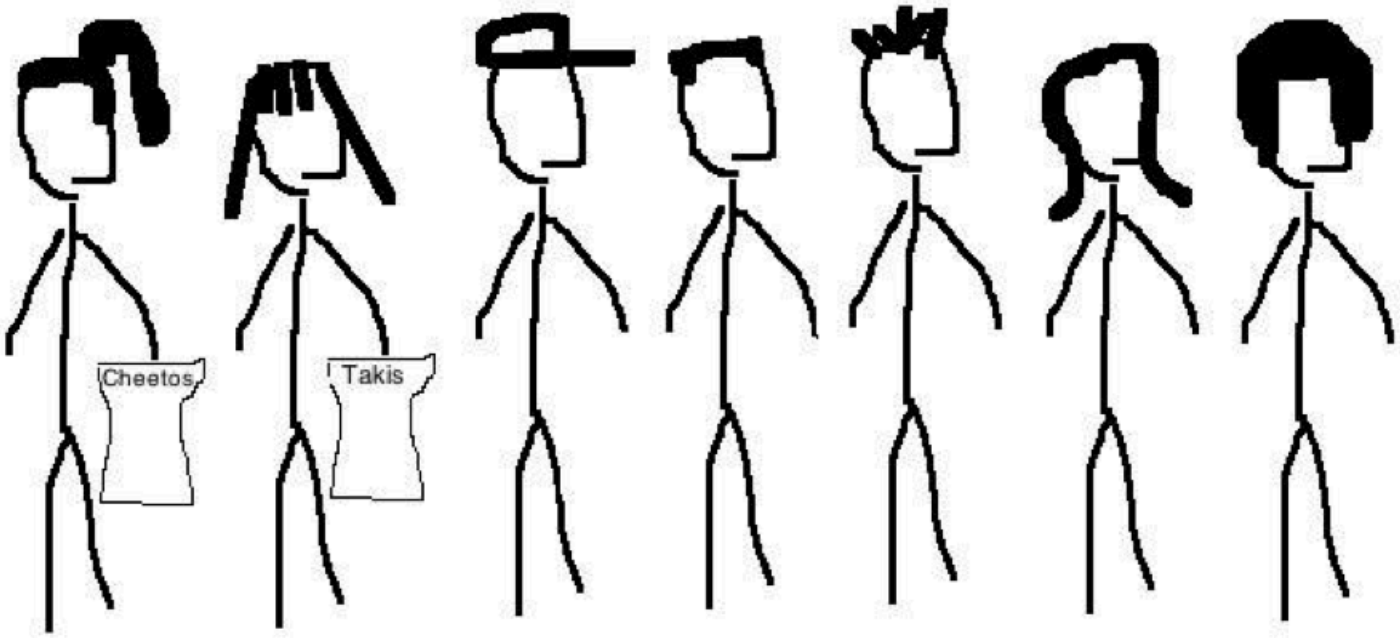
And there's our answer. But...

Drawing the Word Problem is faster

If the equation above isn't totally clear, don't worry. This problem is about to get easier.

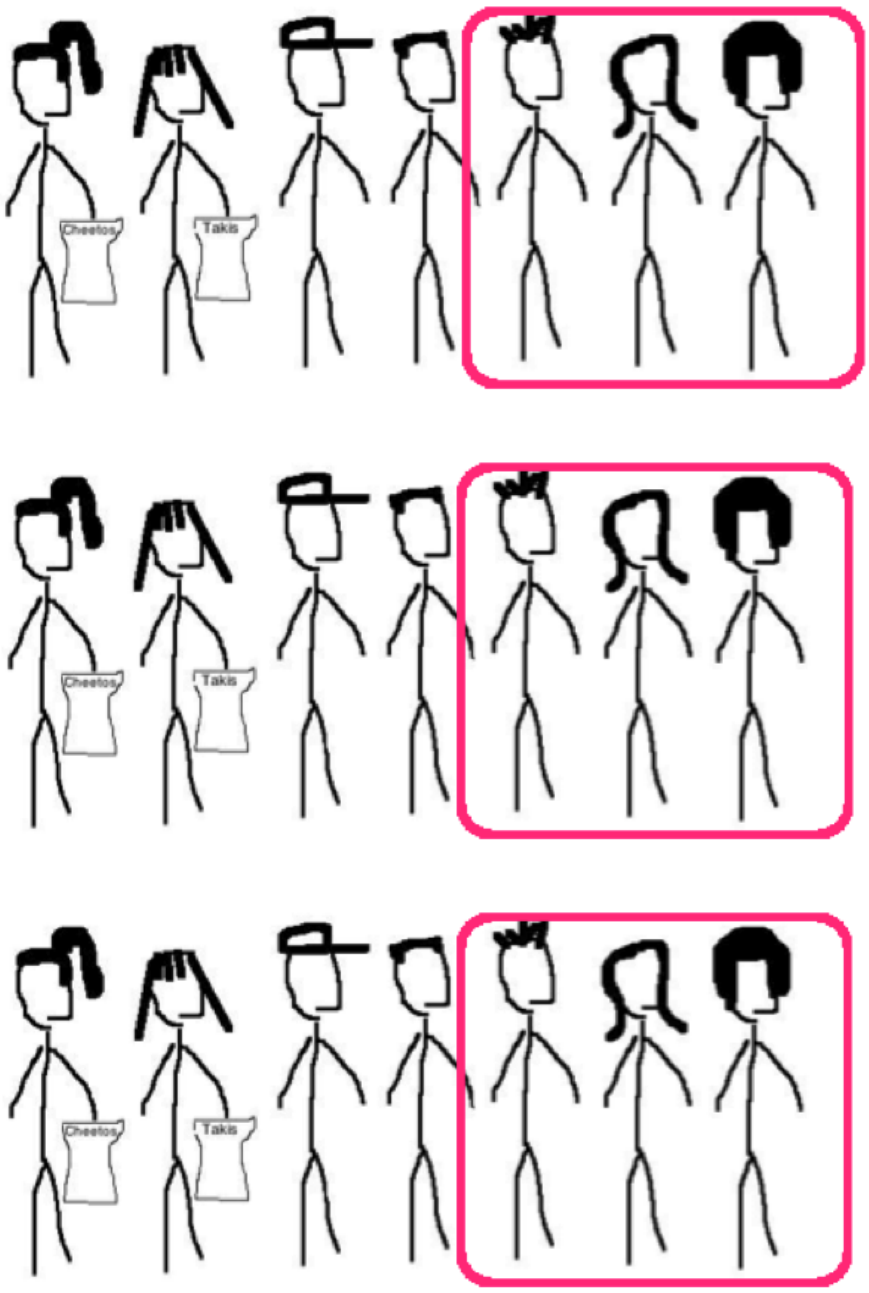
But maybe you got the right answer pretty comfortably with the algebra—and if that's true, then great—but remember that the ACT is timed, which means that the fastest way is the best way.

By just drawing some of Carrie's crummy friends, we'll get there faster.



Alright, so on the actual ACT, you won't have the luxury of this Microsoft Paint masterpiece. You'll just draw some circles and squares, or something similar.

It's pretty clear on seeing this that 2 of the friends have snacks and 5 don't. You can also see what the difference is... that's 3. So just do a little mental highlighting and copy/pasting of that picture.



...How many groups of these guys will we need to make the difference be 15? If there are 3 in each group, we'll need 5 groups. Five groups of seven people total? That's... 35 total. Right.

Pictures and diagrams help keep you focused on the ACT

It's a lot easier to stay focused and get your foot in the door of a Word Problem if you start sketching out the situation like this. Even if you saw the mathematical relationship pretty quickly in this example, there will almost definitely be more difficult problems on the ACT that are best drawn, at least in the beginning. And if the math becomes clear soon after, then great—the picture has served its purpose.

Word Problems

The Basics

ACT Word Problems are notoriously convoluted. Especially during a lengthy test, you can easily become ruffled, sorting through all the words, trying to figure out what the question is asking. Below are several vital points you need to remember when dealing with Word Problems. Additionally, there are also three questions, from medium to challenging, which will apply to the different points.

Strategies for Word Problems

1. *One piece at a time*

ACT Word Problems were not written so that they would be easy to understand. Indeed, there is simply too much information for the question to be easy to understand. However, many students try to read the entire problem at once, instead of slowing down to absorb each piece of information. So slow down. And bite off only as much as you can chew.

2. *Always remember the question*

Sometimes it is easy to get lost in all the words. When we finally have figured out what the question is asking, we rush to come up with a solution, forgetting that the problem had thrown in a specific word at the very end ("even," "integer," "positive," "not" are some of the usual suspects). If you find yourself making many careless errors along these lines, make sure to underline the actual question. That way, once you've come up with your answer, you'll be to make sure that the question is actually asking for that.

3. *It's probably not that easy*

If it seems way too easy, it probably is (unless you are on the first few questions). Make sure you've read the question carefully.

4. *It's not about just the formula; it's about thinking*

ACT problems aren't just about plugging numbers into some formula and having the answer appear magically before you. A formula is just one part of the unraveling process. So understand what the question is about, follow the necessary steps, and at the very end–and only then–a formula will be handy.

Point #4 especially applies for the more difficult questions. Also, there are sometimes shortcuts, so you don't have to even use the formula (as you'll see in one of the questions below).

Practice Word Problems

Below are several questions that will incorporate aspects from the four points above. In doing these problems, you should constantly refer to points #1-4, and see which one(s) are most relevant.

The problems below are labeled according to difficulty. If you are dealing with a difficult

question, and it seems easy...well, just keep in mind point 3.

Easier

Kyle drives 40 miles due north and stops. He then heads due west for 60 miles and stops. Finally, he heads north another 40 miles and stops. How far is he from his starting point?

A. 50 miles

B. 80 miles

C. 92 miles

D. 100 miles

Medium

A bag contains only red, blue, and yellow beads. If half of the beads are red and a third of the remaining marbles are blue, how many beads are yellow if there are a total of 36 beads in the bag?

A. 6

B. 12

C. 15

D. 18

Harder

A book setter wants to print pages from a book. For each number at the top of the page, she has to pay 5 cents. For example, printing page 1 would cost her 5 cents, whereas printing page 100 would cost her 15 cents. If the book setter pays a total of $1.05 for 11 consecutive pages, what is the highest page number the book setter decides to print?

A. 9

B. 11

C. 19

D. 20

Answers

Easier" Kyle drives 40 miles due north and stops. He then heads due west for 60 miles and stops. Finally, he heads north another 40 miles and stops. How far is he from his starting point?

A. 50 miles

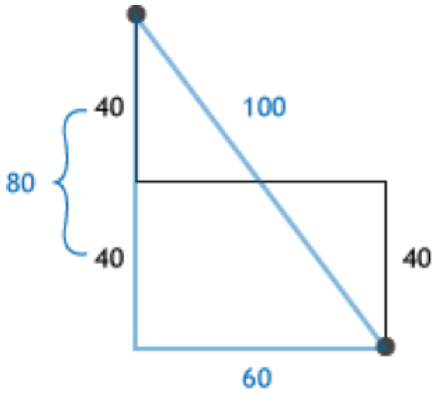
B. 80 miles

C. 92 miles

D. 100 miles

For this one, you want Point #1 to be your guide: bite off one piece of info at a time. First off, draw the picture out by using a straight, vertical line. This line should denote 40 miles north. At the top of the line, next draw a line branching out perpendicularly to the first line (this will be the 60 miles due west line). Finally, draw a vertical line at a right angle to the horizontal line.

This line will be the last leg of Kyle's trip.



Now if you found yourself reading and re-reading the question several times, only to give up in frustration, know that it is not you or your math aptitude, but your approach (something easily changed!). So, again, start with one piece of info at a time.

Next, we can complete this vertical line so that we end up getting a triangle. And, just like that, we have our 3:4:5 ratio. So, the answer is 100 miles. (D). If you found yourself scrambling to the calculator after wracking your brain for the Pythagorean formula, remember point 4 and shortcuts.

Medium: A bag contains only red, blue, and yellow beads. If half of the beads are red and a third of the remaining marbles are blue, how many beads are yellow if there are a total of 36 beads in the bag?

A. 6

B. 12

C. 15

D. 18

The trick to this problem is noticing the wording “remaining” marbles. If you just sped through the question, thinking, heck, that’s easy, I’ll just add and the remaining fraction times 36 will give me 6, answer (A), remember point #3: it’s probably not that easy.

See, once you throw the “remaining” in there, it changes how many beads are yellow, and, by extension, how many are blue. So if one of the beads are red, of the remaining 18, (or 6) are yellow, then that leaves us with 12 blue beads, or answer (B).

So make sure to slow down and read carefully.

Harder: A book setter wants to print pages from a book. For each number at the top of the page, she has to pay 5 cents. For example, printing page 1 would cost her 5 cents, whereas printing page 100 would cost her 15 cents. If the book setter pays a total of $1.05 for 11 consecutive pages, what is the highest page number the book setter decides to print?

A. 9

B. 11

C. 19

D. 20

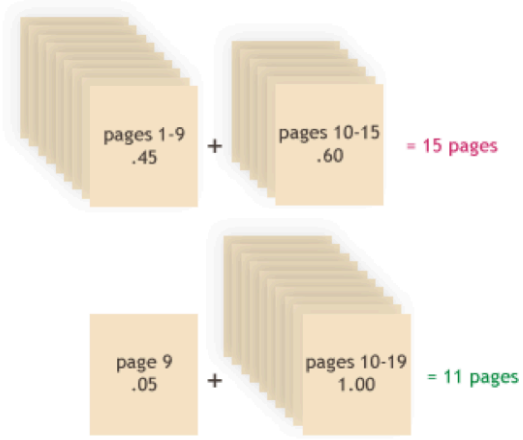
This is the toughest of the questions. Mostly, because both the context (pages and book setters) and what the question is asking seem vague. But read slowly, bite off a piece at a time, and you should be able to get it.

At first, the question may seem unsolvable. For there are a number of different ways in which she could print eleven pages and end up spending $1.05, right? So isn't the answer just (E)? Well, remember point #3. It's probably not going to be that straightforward. There has to be exactly one set up that conforms to 11 pages/$1.05. At this point, you may think, Oh, but I need to know some formula for that ... and I don't know the formula.

But remember Point #4: it's not about the formulas. This question tests your raw thinking mechanisms. In others, you have to experiment a little. How many ways can you get 1.05? Well, if you start from page 1 and move up to page 9, you get 45 cents worth. Then you would need 6 more two-digit pages (page 10, page 11, etc.). That would give us 15 pages, which is way over eleven.

We can't use an even number of single-digit pages, or we won't get the .05. Since 15 is way off, it is good to start from the other side of the spectrum. What if we only have one single-digit page, meaning page 9. Well, that costs 5 cents. And that leaves me with 1.00, which

corresponds to, at 10 cents a page, the double-digit numbers (10, 11, and so on).



But we are not out of the woods yet. What is the 10th double-digit page? You may be tempted to add 10 + 10 =20, but that answer is wrong. See, the number 10 counts as one of the numbers, and therefore costs 10 cents. You wouldn't say that two pages, including page 10, would give you 10 + 2 = 12. That would be three pages – 10, 11, and 12 – and therefore 30 cents. So, since we are including page 10 in our 10-page count, we just want to add 9 to 10 to give us page 19. Answer (C).

Takeaway

The takeaway from this lesson is to apply the above to questions that are at your difficulty level. If question #17 completely blew your mind, that is fine. You don't have to be able to get the toughest Word Problems right off the bat. If all three questions were tough, then you can start with Word Problems under question #10. The key is to improve from your current level.

Simplifying ACT Word Problems Using Elimination

How to make Word Problems easier to work with

Because the ACT is multiple-choice, you don't really have to understand how to transform Word Problems into equations for a lot of the questions. You can use the answers to your advantage and totally circumvent it.

You don't know where to start on a question? Did drawing the situation fall flat?

Then take a look at the answer choices. If there are concrete numbers there (and not algebraic expressions), then you should try putting some of them through the process that the Word Problem describes.

Using a number from the answer choices

Here's a relatively low-level Word Problem:

At 8:00 a.m., there are exactly as many chocolate donuts as there are jelly donuts on a table in the teacher's lounge. Within five minutes, 15 of the chocolate donuts are eaten, but nobody has eaten the jelly donuts. There are then four times as many jelly donuts as there are chocolate donuts on the table. How many jelly donuts are left?

A. 5

B. 10

C. 16

D. 20

So maybe you're totally fine writing out the equation here. But like a lot of ACT questions, it can be a little hard to picture the math (especially if you're feeling test anxiety).

In that case, you would definitely want to start checking the answers. Sometimes that may be a

bit too slow, but most of the time it's actually really fast.

Let's say that a little more clearly. *A lot of the time, process of elimination is faster than straightforward math.*

So where should you start? How about with (C). After all, Neither (A) nor (B) is divisible by four, which the answer probably will be, since the number of jelly donuts is four times that of the chocolate. And (A) is definitely too small.

In (C), there are 16 jelly donuts left, which means there must be 4 chocolate. If there are 4 chocolate donuts after the five minutes are up, there must have been 19 at the start. 19 chocolate and 16 jelly don't match up, so that's no good.

Let's try (D), then, so we'll have more jelly donuts. 20 jelly means 5 chocolate left. 5 chocolate remaining means 20 chocolate at the start. 20 and 20 match up.

And we're done. Doing that in your head is even faster.

Practicing important math strategies like this

You should be using answer choices to work backwards as often as you can when you first start your ACT prep. You want to learn how the strategy works, when it works, and when it's not applicable (because sometimes it isn't). The best way to learn that is by experience.

Need practice problems? Magoosh has hundreds of them waiting for you.

The Basics of Plugging In

All too often, I find students reluctant to pick numbers when trying to solve a problem. Some balk saying, “Doesn’t that take too much time?” Others exclaim, “Are you allowed to do that?”

So the bottom-line: if you want to be successful on the ACT Math Section, plug in whenever you can. And if you are unsure whether a problem lends itself to plugging in, plug in! Don’t hold back and dilly-dally, unsure how to approach a problem. That wastes time.

For instance, a great problem type to plug in involves variables and inequality signs, arranged with Roman Numerals. The words MUST BE TRUE or COULD BE TRUE accompany the problem. Let’s have a look:

1. *If $a > b > c$, and a, b, and c are integers, which of the following MUST be true.*

I. $a + b > b + c$

II. $a^2 < b^2$

III. $(a - b)(b - c)$ is even.

A. I only

B. III only

C. I and II

D. II and III

Explanation:

For (I) if we plug in any numbers, this equation will always hold true. Note we can drop b from both sides of the equation. If you are unsure, plug in numbers. (I) MUST always be true.

For II, your initial hunch is that this condition MUST be true. However, do not simply rely on your first instinct (it may be wrong). Plug in and test using numbers. Remember, 'MUST be true' means that the condition must hold in every case. If you find that one exception, then the condition must not always be true. If you plug in a negative number for b that has an absolute value that is greater than a, then you have found a case where (II) doesn't hold true. For instance, plug in -2 for b, and -1 for a. And we have a case where b is greater than a.

For III, plug in a = 3, b = 1, c = 0. Just like that we've found a case where III is odd.

Therefore the answer is (A) I only.

More Practice

The following question could be solved by a formula. Yes, I already can sense some of you cringing. But that's the beauty of the ACT – you don't need no stinking formulas!

Think of it this way – you already have the answer. It's one of the five below the question. If you've ball-parked, you can get the number of possible answers down to two: answer choice B or answer choice C (assuming you recognize that it can't be A because it wouldn't make sense for the original price to be more than the sale price and estimate that D and E are too big).

Mike saved 20% on a shirt before taxes. If he paid $60 for the shirt, what was the original price of the shirt?

A. 48

B. 64.60

C. 75

D. 80

One of these is the answer. Which one? Let's choose (C) and plug it back into the problem. If the shirt was originally 75 dollars, and he saved 20%, let's take 20% of 75. You can use your calculator, or you can use the shortcut.

What's 10% of 75? 7.50. 20% is twice 10%. So twice 7.50 is 15. So what's 15 dollars less than 75? 60. The answer.

If we do the same with answer (D), we get 20% off 80, which is 80 – 16 = 64. Mike did not pay 64 for the shirt so we know this is not the answer.

And just like that – no boring formulas – we were able to get the answer. See, we told you – ACT Math can be fun. Just don't carried away and start scribbling numbers on your bedroom wall!

Takeaways

1. When dealing with variables presented in three Roman numerals, plug in. It will make the question much less abstract and help you quickly hone in on the right answer.
2. When you see numbers in the answer choices, treat it as a sign that backsolving, or plugging in the answer choices, might be a better route than solving the problem from the top-down.

The Basics of Ball-Parking

If you are thinking of greasy hotdogs and the seventh-inning stretch, you are in the wrong ballpark. In the ACT world, ballpark means 'guess-timating' and is a quick trick to get a solution.

For instance, take a look at the following question (it's the same one we used earlier):

Mike saved 20% on a shirt before taxes. If he paid $60 for the shirt, what was the original price of the shirt?

A. 48

B. 64.60

C. 75

D. 80

We know that Mike paid $60 for the shirt after the 20% discount. On what planet would the shirt have cost less before the discount? Obviously not Earth – so we can get rid of (A). (B) is also suspect because it is so close to 60. A 20% is pretty decent drop in price.

That leaves us with either (C) or (D). Ballparking won't always help you get the answer, but it is a very effective way of eliminating most of the answers.

To figure out whether it is (C) or (D), use the trick we just learned: plugging in.

Averages

In math class, you probably learned a formula to find the average of a series of numbers. You still have to know that formula, but instead of applying it robotically to a bunch of similar questions, you have to first figure out how to crack the problem. That is, you are not going to have all the numbers neatly arranged waiting for you to plug them into the equation that will cough up the answer.

Below are several average problems. Note how they are all Word Problems – this is how almost all of the average problems will be on the ACT. And by the way, in some cases (though not in all!) you will need the formula: Average = Total/Number of Elements.

1. *Mike scored 78, 77, and 82 on his first three algebra tests. If he wants to average 80, what is the least he can score on his fourth test?*

A. 80

B. 83

C. 84

D. 89

Solution:

This is the ACT! Don't take the long road – find the quick solution, and eliminate wrong answer choices when possible.

So instead of plugging these numbers into the formula (yeah, you can tell by now that I'm not a fan of the formula!), let's find a short cut. Notice that Mike has scored 78 (which is 2 less 80), 77 (which is 3 less than 80) and 82 (which is 2 more than 80).

Let's put this information together: -2 -3 + 2 = -3. So we are 3 lower than 80. To balance things out – remember we are looking for an average of 80 – the next test score has to be three

more than 80: 83. (B).

Let's not forget smart elimination: 80 – too low. 89, 90 too high. Even if you have no idea where to go from there you still have a 50/50 chance.

2. *w, x, y, and z are distinct positive integers. If w + x + y + z = 100, what is the greatest possible value of w?*

A. 13

B. 25

C. 26

D. 94

Solution:

If you follow the formula and reason that the average is 25 (100/4 = 25), then you will fall for the ACT's trap. *25 is not the answer*.

Think of it this way: none of the integers can equal 100, because then the other three integers would have to all be zero (which they can't be because they are distinct positive integers). Since we want to know the greatest possible value of w, let's start high and work our way down.

Can w = 99? Nope. 98? Nope. Using logic, we can see that if w is a big number, that's close to 100, then the other integers have to be small numbers. What are the smallest numbers they can be and still be distinct, positive integers? 1, 2, and 3. If x = 1, y = 2, and z = 3, what is w? It has to be 94.

Let's check that that works:

Are 1, 2, 3, and 94 distinct integers? Yes. They're all different.

Are they positive integers? Yes.

Do they add up to 100? 1+2+3+94=100. Yes!

The answer is D.

Statistics

Types of Averages

There are three basic types of averages on the SAT that you should be pretty comfortable with at this point, and all of them start with the letter “m.” Those are the mean, the median, and the mode. In case those aren’t second nature, let’s define them, quickly.

Mean

This is the most commonly used type of average and the most commonly tested on the SAT. The formula is simple enough.

$$\frac{a+b+c+\cdots}{n}$$

where n is the number of terms added in the numerator. In the set of numbers {2,3,4,5}, 3.5 would be the mean, because 2 + 3 + 4 + 5 = 14, and 14/4 = 3.5

Median

If the numbers in a set are listed in order, the median is the middle number. In the set {1,5,130}, 5 is the median. In the set above, {2,3,4,5}, the median is 3.5, which is the mean of the middle

two terms since there's an odd number of them.

Mode

The mode is just the number that shows up the most often. It's perfectly possible that there is no mode or that there are several modes. In the set {5,7,7,9,18,18}, both 7 and 18 are modes.

What's important to know about averages on the ACT

Averages come up in Algebra or Word Problems. You'll usually have to find some value using the formula for a mean, but it may not be as simple as finding the average of a few numbers. Instead, you'll have to plug some numbers into the formula and then use a bit of algebra or logic to get at what's missing.

For example, you might see a question like this:

> *If the arithmetic mean of x, 2x, and 7x is 127, what is the value of x?*

To solve the question, you'll need to plug it all into the formula and then do some variable manipulation.

$$\frac{x + 2x + 7x}{3} = 126$$

$$x + 2x + 7x = 378$$

$$x = 42$$

Medians and modes, on the other hand, don't show up all that often. Definitely be sure that you

can remember which is which, but expect questions on means, most of the time.

One more average practice problem

If three sisters have an average (arithmetic mean) age of 24, and the youngest sister is 16, what is the sum of the ages of the two older sisters?

A. 28

B. 32

C. 56

D. 72

If you're careful to remember that the question is asking you for the sum of the sisters' ages, you can solve this one pretty quickly. Keep in mind that we can't find their individual ages, though. There's not enough information for that. First we find the total combined age of the three, which must be 72, since 24*3=72. Careful not to fall for the trap that is (D), we take the last step and subtract 16 from that total age to find the leftover sum, which is 56, or (C).

Weighted Averages

The phrase “weighted average” may be a little scary sounding, but it’s nothing to get freaked out over. Usually weighted averages on the ACT will use the basic formula for finding the mean. It’s pretty much the same skill.

$$\frac{150 + 200}{2} = 175$$

What is a “weighted average”?

Basically, weighted means uneven, here; the numbers that you’re looking at don’t carry the same importance. For example, if I’m trying to find the average number of fleas that my pets have, and each cat has 150 while each dog has 200, then those two numbers have equal “weight” only if I have the same number of cats as dogs. Let’s say I have 1 of each.

That’s just a normal mean, so that’s no problem. Well, the fleas are a problem, I guess. And the fact that I’m counting fleas might have my family a little worried…anyway, the math is easy. But that’s a non-weighted average.

For a weighted average, I would have a different number of cats than dogs. Let’s say I had 3 cats and 2 dogs. (And they all have fleas…things are starting to get kinda gross. Sorry.)

In order to give them the appropriate weight, we’d have to multiply each piece appropriately and change the total (denominator) to reflect it.

$$\frac{3(150) + 2(200)}{5} = 170$$

But if you expand that, you’ll see that it’s the same as the standard mean formula.

$$\frac{150 + 150 + 150 + 200 + 200}{5} = 170$$

Just make sure you divide by five (because I have seven pets) not two (for two types of pets).

Finding average rates

Average rates are a type of weighted average. Your SAT will include a problem or two about these, and you need to be sure not to fall for the common trap.

Maria's drive to the supermarket takes her 20 minutes, during which she averages a speed of 21 miles per hour. She takes the same route home, but it only takes 15 minutes to cover the equal distance. What was Maria's average speed while driving?

A. 15.5 mph

B. 21 mph

C. 24 mph

D. 24.5 mph

This is a tricky, multi-step problem, and you can't plug in the answer choices to solve it, sadly.

Let's first find all of our information, because the question has only given you part of it. You need to know the formula:

$$r = \frac{d}{t} \left(rate = \frac{distance}{time}\right)$$

This formula can also be expressed as *d=rt* (easily remembered as the "dirt" formula). We're going to use it both ways.

Using that formula, let's look at the first leg of her trip. She travelled for ⅓ of an hour at 21 mph, so she must have travelled 7 miles.

That's 21x0.333 = 7

Using that info, we can figure out the rate of her trip back home. Going 7 miles in ¼ of an hour on the way home, she went an average of 28 mph.

That's 7/0.25 = 28

So now we need to find the total average. That's not the average of the two numbers we have! Because each mile she travelled on the way there took more time than each mile on the way home, they have different weights!

so NOT $\frac{21+28}{2} = 24.5$

Instead, you need to take the total of each piece—total time and total distance—to find the total, average rate.

$$\frac{14\ miles}{0.333\ hours+0.25\ hours} = \frac{14\ miles}{0.5833\ hours} = 24\ mph$$

Simply put

If you're finding the average of two sets of information that already are averages in their own right, like the number of fleas per cat and the number fleas per dog, you can't just take the mean of those averages. You have to find the totals and then plug them into the formula. You should be excited for these kinds of problems, if for nothing more than having the opportunity to bust out your handy-dandy, brand-spankin' new ACT calculator.

Functions

You're going to find about 2-6 function questions on your ACT, and if you haven't been working with them recently in math class, they might throw you for a loop. Just to be clear, we're talking about equations that look a bit like this:

$$g(x) = \frac{x-4}{2}$$

And that format might bring to mind a couple of things. You might be getting ready to graph it right off the bat, which is great, but not necessarily what you'll need to do on the ACT. Or if you're not so familiar with the type of equation, you might make a lethal error and assume the g here is a variable. It's not, by any means, but...

...these functions aren't always a separate skill. They're just wearing costumes.

Some good news: the majority of ACT function questions are actually designed to test the same skills as non-function equation questions. The biggest difference is that they come later on in the section, being categorized as harder, which is great; that's a medium to high-difficulty question that's solvable in low-difficulty time.

Let's take a look at an example of a relatively simple function question.

If $(x) = \frac{x-4}{2}$, *and* $g(a) = \frac{a}{3}$, *what is the value of* a *?*

g(x) is basically just another variable, here. Let's replace it with a *y*. As an equation question, it would look like this:

If $= \frac{x-4}{2}$, *at what value of x does* $y = \frac{x}{3}$ *?*

The algebra from here on will bring you to the same result for either question (because they're

the same question!).

That g is just shorthand

Let's say you have a neurotic friend. Most of us have one or two... but let's go even more neurotic than whoever you have in mind. More toward obsessive-compulsive. Let's call her Gina.

Gina brings grapes to school every day, but she has a really bizarre habit: she eats four, splits the rest into two equal piles, then throws away one of the piles and gives away what's left. The thing is that she brings a different number of grapes every day. What she gives away at the end, then, also varies. You might recognize this process from above... It's just an example of that earlier function *g(x).*

x is how many grapes Gina comes to school with. Everything done to *x* (on the right side of the equation) just details her bizarre habit. What she has left at the end—what she gives away—is *g(x)* or *y*, depending on the equation.

What that *g* really means is to follow Gina's process with the number *x*. She brings *x* grapes, and she then "*g*s" the grapes. In a way, it's a verb, not a noun. It indicates the process, not the piece, without writing out each step of the way.

Functions inside functions?

So let's say you've got a whole group of neurotic friends. Gina does her grape ritual and then hands off what's left to Hailey. Hailey gets a bit weird, too, and goes through a whole other process. She won't eat them unless she gets the same amount of grapes from somebody else, and she then squashes one of them under her foot. So Hailey's equation would be $h(x) = 2x - 1$. What she has, then, is described by $h(x)$. But first we need to think about how many Gina gave away.

So let's put the two processes together into one: $h(g(x))$. Take it from the inside out, and you'll have no problem. Gina brought 20 grapes? First find how many she'll end up giving away with her function, g(x), then put it through the process that Hailey uses, $h(g(x))$, to find out how many end up going down her gullet (it would be 15). More friends with more weirdo habits? Just keep nesting the function, e.g. $f(h(g(x)))$.

In the end, ACT functions like this will end up being no different than the simpler-seeming ACT equations.

Percentages

Percentages can be surprisingly complicated on the ACT. Part of that is because we can't always translate them into fractions, which are easier to work with algebraically. While it's easy enough to think of 50% as ½, it's rarely so easy to make the conversion on the ACT, especially when the percentages given are, say, 35% or 15%.

To make matters worse, the ACT won't just test you on the simple process of finding the percentage of a number (like calculating a tip). Instead, it'll ask you to calculate in reverse (finding the whole from the part), find a combination of percentages, find a percent change, or give some other scenario-specific piece of information.

The percentage formula

Finding a percent is pretty easy, as long as you have a calculator. Just divide the part by the whole and multiply the decimal that comes out by 100. So if you ate 10 out of a serving of 12 buffalo wings, then you ate (10/12) x 100 = 83.33%. Remembering that formula can save you some grief when you have to use it algebraically.

Matt and two of his cousins ordered a plate of 24 buffalo wings at a restaurant. Matt ate x wings, while his cousin Laura ate half as many. If Matt's cousin Alli ate four times as many wings as Laura, and the three together finished 87.5% of the wings, how many buffalo wings did Laura eat?

A. 3

B. 6

C. 12

D. 18

The first thing to do here is change that Word Problem into an algebraic expression.

$$\frac{x + 0.5x + 2x}{24} \times 100 = 87.5$$

But let's make sure that equation is clear. On the left, we have the fraction of wings eaten. x + 0.5x + 2x represents the number that Matt and his cousins went through. x is Matt's share, 0.5x (equal to half) is Laura's share, and 2x is what wing-lover Alli picked clean (since 0.5x x *4* = *2*x). Divide that by the total number, and multiply by 100, and we've followed the percentage formula.

Then, it's just a matter of isolating x.

$$\frac{x + 0.5x + 2x}{24} = 0.875$$

$$x + 0.5x + 2x = 21$$

$$3.5x = 21$$

$$x = 6$$

And you can be sure that 6 is going to show up in our answer choices.

BUT take a look at our question one more time. What's the number we're looking for? That's exactly the kind of trap the ACT might set up for you.

The number of wings that Laura ate is half of *x*, which would be 3.

Avoiding the formula

It's perfectly possible to avoid having to use the formula on a lot of ACT percentage questions—specifically, you can do that by plugging in some values.

And if the answer choices don't have number values that you can test out? Check out this problem:

A pair of shoes went on sale for a 40% discount. Then, in a clearance event, the reduced price was lowered once again by 25%. If the original price was x dollars, what was the final price in terms of x?

A. $\frac{3x}{10}$
B. $\frac{9x}{20}$
C. $\frac{x}{2}$
D. $\frac{11x}{20}$

You can still plug in, but you'll have to choose your own number to use for *x*. In this case, you want something that's easy to take 40% of. What's the easiest number to get a percentage of?

Try out either 10 or 100; I prefer the second. And 40% of 100 is 40, so after the first sale, the shoes were 60 bucks. Then, after 25% was taken off of that, they were 45 dollars. If you plug in $x = 100$ to all of the answer choices, only one of them comes out to 45, and that's answer

choice (C).

While it's good to know the percentages formula, remember that you don't usually need formulas on ACT Math that aren't given to you in the beginning of the section.

Absolute Values

Before we get into the rules, let's see an example of an ACT question that uses absolute values:

$2 \times |x - 9| = 24$

$|y \times x| = 15$

1. In the equations above, x < 0 < y. What is the value of x + y?

(A) -8

(B) -5

(C) 2

(D) 16

Rule 1: Absolute values are grouping symbols

In the question above, there are two ways that we can deal with the first equation.

The first way is to treat the absolute value bars like parentheses. They serve a very similar purpose (the operations inside them have to be carried out before you can do any addition or subtraction), and you can distribute them in the same way. So we can figure this:

$|2x - 18| = 24$

Rule 2: Isolate absolute values

Alright, so maybe you saw the other way to work with that equation. Instead of distributing, you could just divide out the 2 from both sides. It works the same way, in the end.

$|x - 9| = 12$

In either case, you've done exactly what you need to: get that absolute value alone. Only then can you get rid of the bars.

Rule 3: Make two equations

Getting rid of the bars means splitting the equation into two: one positive equation and one negative. So that first equation ends up like this.

$|x - 9| = 12 \Rightarrow x - 9 = 12 \; or \; x - 9 = -12$

$x = 21 \; or \; x = -3$

By following the instructions in the question, we know that only one of those is possible.

$x = -3$

After we plug that into the second equation, we'll take away the absolute value bars and, again, split it into two equations.

$|y \times -3| = 15$

$y \times -3 = 15 \; or \; y \times -3 = -15$

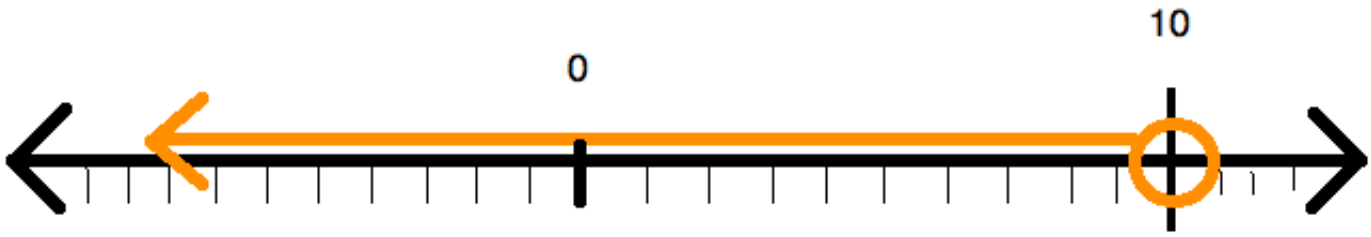
$y = -5 \; or \; y = 5$

The rest is pretty straight forward. Since y is greater than 0 according to the question, we know y=5, so the answer must be 2, which is (C).

Rule 4: Reverse inequalities for the negative value

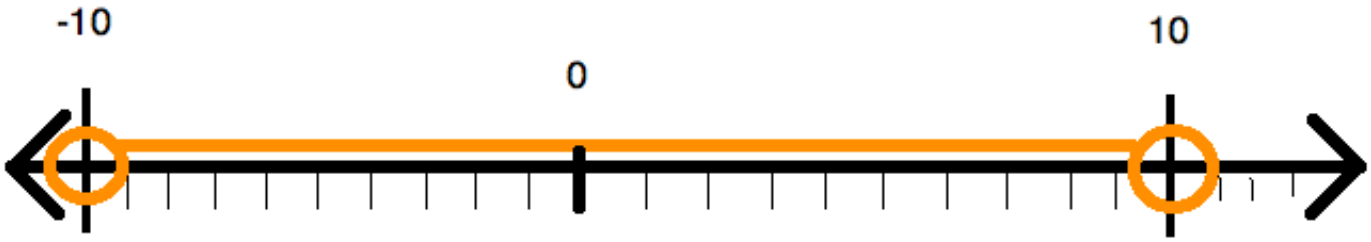
If you have an inequality rather than an equation, you still have to split it into two possibilities. But you could also put those two possibilities into one expression. Let's look at an example of that.

Without any absolute value, the inequality $y < 10$ looks like this on a number line:



But if we put in some absolute value bars, it'll look different.

$|y| < 10$



That's because while y can be -2 or -9, it can't be -11. If it were -11, the absolute value would be 11, which is too high.

Splitting the inequalities, then, gives you this:

$|y| < 10$

$y < 10 \, and \, y > -10$

Double check the rules

When you have absolute values on your ACT, always double check what information the question gives you. Does it define whether anything is positive or negative? Then, after you split the equation, be ready to scrap the value which doesn't work.

Sequences

You'll probably get one or two questions about sequences on your ACT. Since they're not a really big deal, don't start your ACT studies here. Instead, spend some time on the bigger issues, like ACT geometry and ACT graphs. But if you've already mastered those, then it certainly doesn't hurt to dig into the smaller details.

Before getting into the ACT's dirty tricks, we'll review the two basic types of sequences.

Arithmetic sequences

An arithmetic sequence increases by addition. It might look like this:

1, 3, 5, 7, ...

If a is the first term, (1 in the example), and r is the change (2 in the example), an arithmetic sequence just adds one more r for each term of the sequence.

$a, a + r, a + 2r, a + 3r, ...$

The formula for any one term in an arithmetic sequence is:

$an = a + r(n - 1)$

But don't just memorize that formula. Look back at that sequence of odd numbers and ask yourself why the formula is true. You'll be much better off on your ACT if you can understand

how systems work. You want to be able to come up with the formula yourself without knowing it by heart.

Geometric sequences

Geometric sequences increase by multiplication. For example:

3, 6, 12, 24, ...

Each number is the previous term multiplied by some constant. In this case, (the first term) is 3, and (the change) is 2. Since you're multiplying that again with each term of the sequence, the change is exponential.

a, *ar, ar2, ar3, ...*

Again, look closely at how that example sequence represents the pattern. You should be able to create the formula yourself after spending enough time looking at the variables and the example.

The formula to find the value of a term, then, is:

$an = ar(n - 1)$

How the ACT uses sequences: easier questions

If you get an easier sequence question, it'll probably just be about finding some the value of a term in the first few numbers of a sequence. You might see something like this:

1 ,3, 9, *x*, 81,...

1. In the sequence above, what is the value of x?

On a harder question, there might just be some simple twist

x, 3, 9, *y*, 81, ...

2. In the sequence above, what is the value of y–x?

If you don't know whether a sequence is geometric or arithmetic, you need three terms to decide. Without that 81 above, this could easily have been an arithmetic sequence where x = -3 and y = 15.

Harder ACT sequences

Of course, you might get a whole other kind of sequence with its own made up rules. In that case, those formulas won't really help. Or, similarly, you might be asked how many numbers in a sequence share some property.

If you're not sure what to do, it's a good idea to write out a few terms (or a few more terms) of a sequence and look for patterns.

As a matter of fact, that's a good idea when you're stuck on any ACT Math problem. Map out the situation and look for a pattern.

Probability

Probability is actually pretty rare on the ACT. So don't freak out about this topic. In fact, we'd only recommend this section for those looking for a near perfect score—those who want to make sure they have all their bases covered.

What you'll have to know is the following:

Probability (Likelihood of something happening) = #of desired outcomes/# of possible outcomes

Let's say we want to know what is the probability of rolling "snake eyes," or two '1''s, on a pair of fair dice. Well, how many ways can you roll two '1's? There is only one way. So for a desired outcome—the quantity in the numerator—we are going to write '1'.

Now how many different ways can you roll two six-sided dice? (For a review of the Fundamental Counting Principle, see below). Well, there are six possibilities on each die, so that gives us 6 x 6 = 36.

Therefore, the probability of rolling "snake eyes" with two dice is 1/36.

Of course things do get a little more complicated with probability—that's why so many people dread it. Below are some medium- to medium-difficult questions for you to sink your teeth into. If you nail all three, the probability of you struggling with a probability question on the test is very low.

If not, make sure you understand the concepts (see explanations below), and you should do just fine on the probability questions the SAT throws at you.

1. *A basket contains a total of 24 balls of yarn. ⅓ are white, ¼ are red, ⅛ are blue, and the rest are black. What is the probability, if you reach into the basket, of pulling out either a red or black yarn?*

A. 1/4
B. 1/3
C. 1/2
D. 7/12

2. *A six-sided die is thrown three times. What is the probability that on all three rolls a prime number will never come up?*

A. 1/2
B. 1/6
C. 1/8
D. 1/64

3. *A coin is tossed three times. What is the probability that three "tails" in a row will not show up?*

A. 1/8
B. 3/16
C. 1/2
D. 7/8

Explanations:

1. Hey, a little fun with fractions never hurt! So, if we do the math, we get 8 white, 6 red, and 4 blue. That means the remaining 6 are black. Since the question asks for red AND black, that gives us 12 (desired outcomes) out of 24 (total outcomes), or 1/2. Answer: (C).

2. First off, there are three prime numbers on a six-sided die: 2, 3, and 5. What is the probability of NOT rolling one of these three numbers? 1/2, since rolling a 1, 4, or 6 would count. Now, the probability of rolling an outcome of 1/2 (or 50%) is much like tossing a coin. In this case, we are tossing the coin, or rolling a die with a '1', '4' or '6', three times ½ x ½ x ½ = ⅛. Answer: (C).

3. Speaking of coins! A quick way of doing this problem is subtracting the probability of getting all tails by the total probability. Before we do that a quick thing on the probability space. Usually, we talk about something definitely happening as having a probability of 100%. However, 1 also represents a 100%. How? Well, if the probability of something happening is ½ or 50%, what happens when you multiply both those numbers by 2? You get '1' and 100%. So probability can be defined along a scale from '0' to '1'. So for the coin toss, '1' represents all possible outcomes. Subtracting the probability of all tails from '1' will give us the probability of NOT getting on tails: $1 - (½)^3 = 1 = ⅛ = ⅞$. (D).

Fundamental Counting Principle

Knowing this rule–or principle as it is called–will make certain questions on the ACT much, much easier. Before I tell you the rule though, let's take a look at the following scenario.

Jane has white socks, red socks, and black socks (she must be a baseball fan!). Additionally, she has four different shoes: tennis, basketball, casual, and golf shoes. If she can wear any pair of socks with any pair of shoes, how many different ways can she dress?

The big question here is whether you should add the number of shoes and socks or multiply them. One good way to answer this is by doing a little thought experiment (something you can repeat if the solution slips your mind).

Let's say Jane has got her white socks on. How many different shoe choices does she have? Four, since there are that many pairs of shoes. Now, how many different shoes can she choose from if she has red socks on? The answer, again, is four. At this point, she is already at 8 different shoe-sock getups. So you know that when you are seeing how many ways you can combine two different sets of things, always multiply. Another way of looking at it is for each pair of socks (there are 3 total), Jane has four choices: 3 x 4 = 12.

And that brings us to the Fundamental Counting Principle:

If option #1 has P alternatives and option #2 has Q alternatives (assuming that the two sets of alternatives have no overlap), then total number of different pairs we can form is P*Q.

I know that sounds scary. So don't labor to wrap your head around it–just remember the logic from Jane and her socks.

Easier

Hailey, a dog-walker, has to look after three poodles and two dachshunds. There is one bowl for the poodles, since they are quite picky when it comes to cleanliness, and another for the dachshunds, who aren't nearly as finicky. If a feeding consists of one dachshund and one poodle eating at the same time, how many different ways can Hailey pair off the dogs for feedings?

A. 3

B. 5

C. 6

D. 9

Medium

A youth symphony orchestra is to consist of five violinists, three clarinetists, and two bassoonists. The conductor wants to put together a trio of each instrumentalist. How many different possible trios are there?

A. 5

B. 8

C. 15

D. 24

Challenging

A rectangle is broken up into 4 squares. A modern artist can use any of 6 colors to paint the four squares. If no square can be the same color as an adjacent square, and the extreme left square and the extreme right squares are the same colors, how many unique ways can the artist paint the square?

A. 120

B. 150

C. 360

D. 750

Explanations:

1. There is a lot of verbiage in this problem. All the question is really asking is how many ways can you pair two dachshunds with three poodles: 2 x 3 = 6. (C).

2. We are seeing how many ways we can combine three different sets, so we just multiply the three groups together: 2 x 3 x 5 = 30. Answer (D).

3. Tricky question. The first square can be painted any color. The square next to it can be painted any color, except for the color of the first square. So we have 5 choices for the second square. For the third square, it can be any color (even the same color as the first square), except for the color of the second square. So we also have 5 options for the third square.

And for the last square? Well, the twist is that it must be the same color as the first square, so we actually don't have a choice. In the end, we are left with 6 possibilities for the first square, 5 for the second square, and 5 for the third square: 6 x 5 x 5 = 150. Answer (B).

Permutations

The name alone conjures up something arcane and impenetrable. Once students learn the concept, it only intensifies their fears. All that said about how scary permutations are, by keeping your cool, you will be able to handle this tough concept and show the ACT who is boss.

Number One Thing You Have to Know: Arrangement = Permutation

If we were the Gods of math and could decree the way things should be, we would call permutations arrangements. Of course that is because we would be a nice math Gods, and would want to make math seem as easy possible. It is not that mathematicians are evil math Gods, their wrath raining down upon us in the form of tongue-twisting concepts. Simply put, every field has its jargon and if you want to learn that field you have to know the lingo.

Anyhow, I'm here to make things easier.

Rule #1: Whenever you are dealing with the total number of ways things can be arranged, use permutations.

If you have five students sitting in a row and want to see how many ways there are to arrange them, use permutations. With this example all you would have to do is take the number of things being arranged (five students), and put a (!) next to it. This sign is called a factorial and means the following:

$5! = 5 \times 4 \times 3 \times 2 \times 1 = 120$.

An easy way to think of how to deal with factorial is what I call the Space Shuttle Countdown: Whatever number you are 'factorial-ing,' countdown a number at a time—as though you are the

guy announcing the takeoff of the space shuttle. So 10! = 10 x 9 x 8... x 3 x 2 x 1 = Takeoff!

Well, actually a very large product.

The good news is the factorials on the ACT usually won't be over 5!

Whenever you are asked to find the total number of ways you can arrange something, use permutations (and don't forget the factorial!).

Combinations

Like permutations, combinations is a concept that unnecessarily frightens students: there are very few, if any combination questions, on a test that a student may have to take the ACT for an entire year to even see one or two of these question types.

Why then even talk about combinations? Well, to make the announcement above (basically, don't sweat it). But if you want to make sure you have all your math bases covered, then read on.

"C"ombinations are about "C"hoosing

The 'C' in combinations equals 'c'hoosing. A silly mnemonic perhaps, but one that will hopefully help you tell the difference between permutations and combinations.

Mark has a brown, white, blue, red, and black T-shirt. If he wants to pack two T-shirts for a weekend trip, then how many different T-shirts can he take with him?

Notice that, unlike a permutation question, Mark is not arranging his shirts in an order. He is choosing two to take with him. We do not care whether his red T-shirt is packed on top of his white T-shirt. This ordering (or arrangement) is key to a permutation problem but does not relate to a combination problem.

So now that we know we are dealing with a combination problem (after all this is a section on

combinations), we need to use the following formula:

$$\frac{(Total\ number\ of\ things)!}{(Number\ of\ things\ chosen)! \times (Number\ of\ things\ not\ chosen)!}$$

$$\frac{5!}{2! \times 3!} = \frac{5 \times 4 \times 3 \times 2 \times 1}{(2 \times 1) \times (3 \times 2 \times 1)}$$

Notice how we can easily cancel out the 3 x 2 x 1 from both the numerator and the denominator. This leaves us with 5 x 4/2 = 10. Therefore, Mark can take a total of 10 shirts.

Don't fret combinations. They aren't very likely to show up on the test, and when they do, they are no more difficult than the question above.

Matrices

Lots of students have minor panic attacks when they are first faced with a matrix on the ACT Math Test, but never fear! Even if matrices look completely foreign to you, a quick read through this blog will calm your nerves.

Luckily, matrix questions are quite rare on the ACT (you might not see a single one throughout the 60 questions on the ACT Math Test!), and require only basic addition and subtraction skills (or *cough* a TI-83 calculator *cough*) to solve. If you can add 5 and 6, you'll be fine!

The word matrix refers to a rectangular-looking box filled with numbers arranged in rows and columns. Each number in the matrix is called an element.

Here's How to Add Two Matrices

$$\begin{bmatrix} -3 & 4 & x \\ 4 & -7 & 0 \end{bmatrix} + \begin{bmatrix} -2 & -1 & 9 \\ y & 5 & -8 \end{bmatrix} = \begin{bmatrix} -5 & 3 & 11 \\ -1 & -2 & -8 \end{bmatrix}$$

Notice that the size of the matrices is the same, and that each element in the first matrix is added to the corresponding element in the second matrix to get the corresponding element in the third matrix. -3 + -2 = -5.

With that understanding, we can solve for x by writing a simple equation: x + 9 = 11; x = 2.

Let's look at a question involving subtracting matrices.

Guided ACT Matrix Practice Question

$$\begin{bmatrix} 16 & 3 \end{bmatrix} - \begin{bmatrix} 2 & -4 \end{bmatrix} = \begin{bmatrix} x & y \end{bmatrix}$$

What is the sum of x and y?

To answer this, we will set up two equations to solve for x and y independently.

16 – 2 = x and 3 – (-4) = y

14 = x and 7 = y

Their sum is 14 + 7 = 21.

Sometimes a variable will be introduced to stand for an entire matrix. Let's look at an example:

$$\text{If } A = \begin{bmatrix} 4 & 3 & 1 \\ -11 & 2 & -6 \end{bmatrix} \text{ and } B = \begin{bmatrix} -1 & -3 & -7 \\ -3 & 8 & 5 \end{bmatrix} \text{ then A-B?}$$

Carefully subtract each corresponding element.

The Answer

$$\begin{bmatrix} 5 & 6 & 8 \\ -8 & -6 & -11 \end{bmatrix}$$

Now try a practice question on your own!

Matrix Practice Question

$$\begin{bmatrix} -6 & 5 & 0 \\ 2 & 3 & -1 \end{bmatrix} - \begin{bmatrix} 3 & -2 & 0 \\ 1 & -1 & 8 \end{bmatrix}$$

What is the solution to the matrices?

(A) $\begin{bmatrix} -9 & 7 & 0 \\ 1 & 4 & -9 \end{bmatrix}$

(B) $\begin{bmatrix} -9 & 3 & 0 \\ 1 & 4 & -9 \end{bmatrix}$

(C) $\begin{bmatrix} 1 & 4 & -9 \\ -9 & 7 & 0 \end{bmatrix}$

(D) $\begin{bmatrix} -9 & 7 & 0 \\ 1 & 2 & -9 \end{bmatrix}$

The Answer & Explanation

The correct answer is (A).

$$\begin{bmatrix} -6-3 & 5--2 & 0-0 \\ 2-1 & 3--1 & -1-8 \end{bmatrix}$$

To subtract matrices, subtract each corresponding element, as shown above. Remember that subtracting a negative number becomes addition.

With practice, you'll see that the math involved in ACT matrix questions is rarely challenging – just keep the rows and columns lined up and you can't help but get them right!

Remember, a complex number is very similar to a binomial. We're dealing with imaginary and real numbers at the same time. We already took a look at addition and subtraction, so let's move on to multiplication and division. These are a little trickier, but only division involves a skill you may not have used yet. Take a look!

Multiplication

Do you remember having to learn how to FOIL? You multiply the terms of a binomial or complex number in this order: First, Outer, Inner, Last. Let's take a look at how to do it with a complex number.

$$(5 + 3i) \times (4 + 5i)$$

First: $5 \times 4 = 20$
Outer: $5 \times 5i = 25i$
Inner: $3i \times 4 = 12i$
Last: $3i \times 5i = 15i^2$

That leaves us with this:

$$20 + 25i + 12i + 15i^2$$

Now remember, $i^2 = -1$, as we already covered. So we get this:

$$20 + 25i + 12i + (-1) \times (15)$$

$$20 + 25i + 12i - 15$$

$$5 + 25i + 12i$$

$$5 + 37i$$

Division

All right, here's where things get a little tricky, but stick with us. We promise, we'll come out on the other side (mostly) unscathed.

Let's say you had to divide 5 + 2*i* by 6 + 3*i*.

$$\frac{5 + 2i}{6 + 3i}$$

Now, remember, *i* is just another way of writing √-1. And, according to the ancient laws of math, we can't have a radical in the denominator (or bottom part) of a fraction. So, it looks like we have to simplify in order to solve this problem.

Step One: Conjugate

In order to divide complex numbers, what you have to do is multiply by the complex conjugate of the denominator. We heard about half of you get sudden migraines there, but we promise, that's not as complicated as it sounds. The complex conjugate is just *the same exact denominator* with one tiny change. Instead of 6 + 3*i*, we take 6 – 3*i*.

So our problem now looks like this:

$$\frac{5 + 2i}{6 + 3i}\left(\frac{6 - 3i}{6 - 3i}\right)$$

Really, all we're doing is multiplying by a fancy form of 1, so we're not actually *changing* the problem; we're just simplifying it.

Step Two: Multiply

It looks like we're out of plastic wrap, which is okay, because all we need is FOIL. Yes, the good old First-Outer-Inner-Last method of multiplying binomials and complex numbers is back again. *And this time, it's personal.*

Okay, not really. But let's FOIL anyway. We'll do the numerator first.

$$(5 + 2i)(6 - 3i)$$

First: $5 \times 6 = 30$
Outer: $5 \times -3i = -15i$
Inner: $2i \times 6 = 12i$
Last: $2i \times -3i = -6i^2$

That leaves us with this:

$$30 - 15i + 12i - 6i^2$$

And now, do the denominator the same way:

$$(6 + 3i)(6 - 3i)$$

First: $6 \times 6 = 36$
Outer: $6 \times -3i = -18i$
Inner: $3i \times 6 = 18i$
Last: $3i \times -3i = -9i^2$

$$36 - 18i + 18i - 9i^2$$

Step Three: Simplify

Here's our problem so far:

$$\frac{30 - 15i + 12i - 6i^2}{36 - 18i + 18i - 9i^2}$$

We already know that $i^2 = -1$, so let's change that in both the numerator and the denominator.

$$\frac{30 - 15i + 12i + 6}{36 - 18i + 18i + 9}$$

And now, combine like terms! *Watch the magic!*

$$\frac{36 - 15i + 12i}{45 - 18i + 18i}$$

$$\frac{36 - 3i}{45}$$

$$\frac{12 - i}{15}$$

Notice how the denominator suddenly doesn't have any more *i* in it. We've fully simplified this problem! Woo-hoo! Take a nice deep breath! You've earned it.

Trigonometry

Ah, ACT Trigonometry. We can hear your reactions from here. "Oh, wow, trigonometry is tested on the ACT? Let me do my best cheerleader cheer! *Cosine, secant, tangent, sine, 3.14159! Goooo Trig!* Woo-hoo!"

Okay, we know *most* of you aren't reacting that way (...yet), but we promise you'll quake in fear

just a little less when this is all over.

The Basics

To reiterate what we're all going on about, we'll need to review the basics of trigonometry, as far as the ACT is concerned. ACT Trig is pretty much concerned with right triangles and little else. If you like right triangles, you're going to do well here.
To help illustrate our next point, let us tell you a brief story.

Once upon a time, there was a young man. He wanted to practice his baseball skills, so he started with throwing and catching. First he threw golf balls high into the air to see how high he could throw them without missing a catch. After a while, he got quite good at throwing golf balls, so he moved on to tennis balls. Once he felt confident enough with tennis balls, he moved to actual baseballs. Again, he became quite skilled at throwing baseballs, and decided to practice with bowling balls to keep improving his arm.

Of course, throwing bowling balls straight up into the air is not, generally speaking, standard practice for an aspiring baseball player, and he dropped the bowling ball directly onto the big toe of his right foot. He went to the hospital and met a lovely German doctor who told him that, luckily, his toe wasn't broken, but he would have to take care of himself until he healed completely. He asked the doctor what he should do to take care of his foot. The doctor replied, "You must SOHCAHTOA."

We know, we know, that was terrible. We hang our heads in shame for the awfulness of that joke. But seriously, SOHCAHTOA is the answer to your trigonometry fears. It is an acronym that tells you everything you need to know to figure out basic trigonometry problems. It means:

Sine = Opposite / Hypotenuse (SOH)

Cosine = Adjacent / Hypotenuse (CAH)

Tangent = Opposite / Adjacent (TOA)

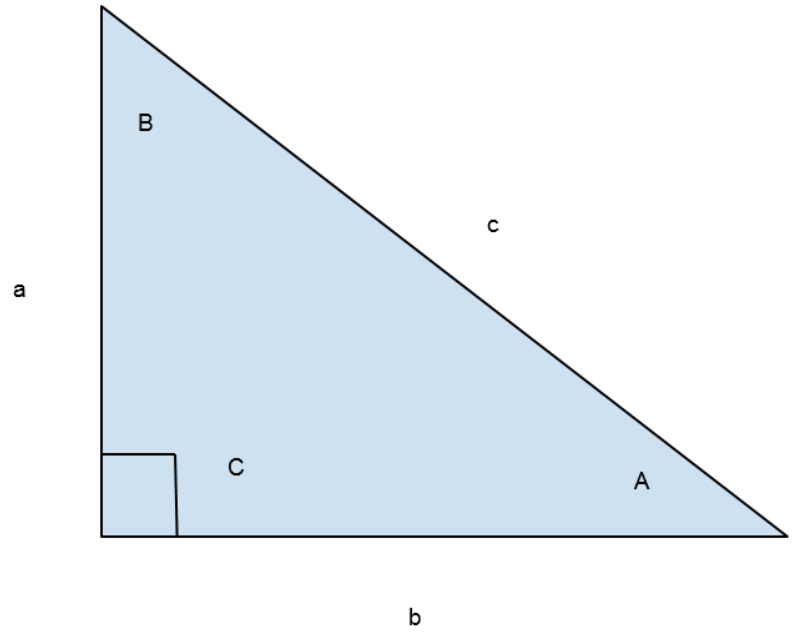
So, if you were looking for the cosine of a particular angle, you would take the value of the *adjacent side to the angle and divide it into the value of the hypotenuse*. Remember to keep things from the right point of view. Opposite always means "opposite to the angle you're being asked about" and adjacent always means "next to the angle you're being asked about."
You might also have to deal with reciprocal trig identities. Again, the above link details this very well, but for ease of reading, I'll explain here, too. Basically, these are the flipped-around versions of SOHCAHTOA.

Cosecant = Hypotenuse / Opposite

Secant = Hypotenuse / Adjacent

Cotangent = Adjacent / Opposite

I don't know why sine and cosecant are reciprocals (or why cosine and secant are paired up), but I've found it's always best not to pry too deeply into other people's relationships.
To illustrate, take a look at this lovely little triangle:



So if we were looking for it would be $\frac{a}{c}$. Make sense? Let's list out our SOHCAHTOA, to make it easier to see.

$$\sin A = \frac{a}{c} \quad \sin B = \frac{b}{c}$$
$$\cos A = \frac{b}{c} \quad \cos B = \frac{a}{c}$$
$$\tan A = \frac{a}{b} \quad \tan B = \frac{b}{a}$$

"But wait!" we hear you cry, *"What about C?"*

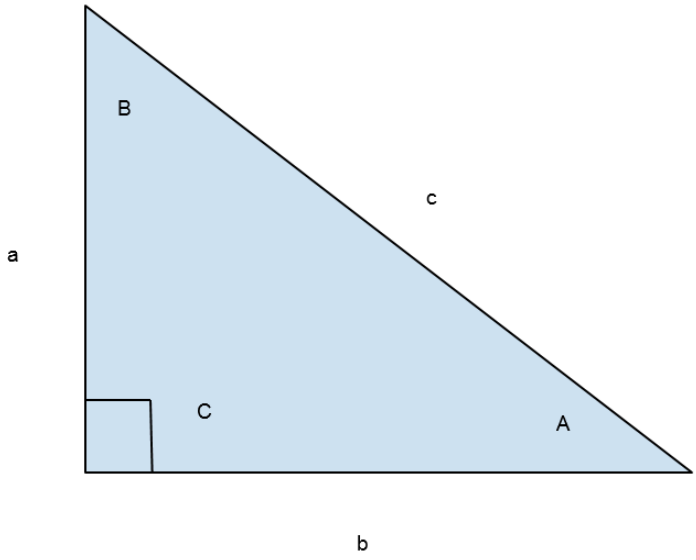
We're glad you asked. C, as we already know, is a right angle. In other words, it's 90°. Right angles follow special rules, as do a few others. [ACT Spoiler Warning] These angles are tested frequently, so memorizing these values is *probably* a really good idea.

Here's a "cheat sheet" to help you out:

Angle	Sine	Cosine	Tangent
0°	0	1	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$
45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
90°	1	0	undefined

Some Helpful Hints

Let's revisit our lovely little triangle:



You should know that you can do this:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

This is what's called the law of sines. Usually, if you have to use this formula, the question will give it to you, but it's a handy tool to have in your pocket.

Next up is a nifty little equation that you can use on any angle. We'll follow mathematical convention here and use the symbol θ (pronounced "theta") to stand in for the value of the angle.

$$\sin^2\theta + \cos^2\theta = 1$$

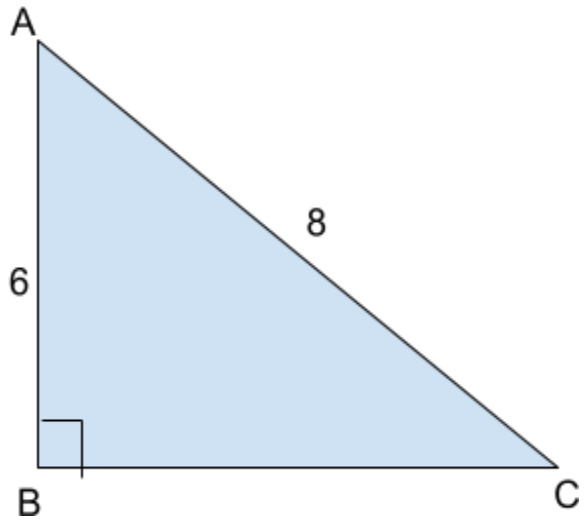
To translate from math back into English, the sine of any angle, squared, plus the cosine of any angle, squared, equals 1. Could be useful if you're trying to figure out a tough problem on test day, no? If you see this equation anywhere on your math test, just remember that it's equal to 1.

And to round out our helpful hints, here's one last equation for you:

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

Translation: The tangent of any angle equals the sine of the angle divided by the cosine. So if a problem ever asks you to divide the sine by the cosine, you can just plug the tangent right in! (And you can figure out the value of the tangent by using SOHCAHTOA!) Easy!

With all of this in mind, let's do a sample problem!



What is the sine of ∠A in △ABC above?

A $2\sqrt{7}$

B $\frac{\sqrt{28}}{8}$

C $\sqrt{28}$

D $\frac{\sqrt{7}}{4}$

The correct answer is... D! Let's walk through it.

To find the sine of ∠A, you need to know the values of the opposite side (line BC) and the hypotenuse (line AC). You know the hypotenuse is 8, but the problem didn't give you a value for line BC. It *did* give you line AB, though, which is 6. So we can use the Pythagorean Theorem to figure out line BC!

$a^2+b^2=c^2$ is the Pythagorean Theorem, as you might recall from the review on triangles. Substitute in the values we know, and it becomes:

$AB^2 + BC^2 = AC^2$

$$6^2 + x^2 = 8^2$$
$$36 + x^2 = 64$$
$$x^2 = 28$$
$$x = \sqrt{28}$$
$$x = \sqrt{4} \times \sqrt{7}$$
$$x = 2\sqrt{7}$$

Now that we know the value of line BC, we can figure out the sine of $\angle A$.

$$\frac{2\sqrt{7}}{8} = \frac{\sqrt{7}}{4}$$

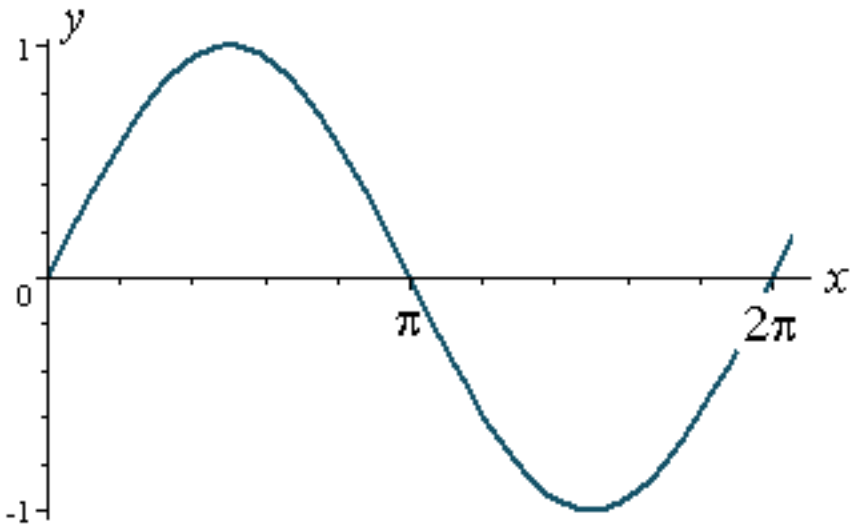
And we have our answer!

How to Graph Sine and Cosine

Sine, cosine, and tangent are the three main trig identities you might remember from Math class. You'll only see them on the toughest ACT Math Test questions, but getting them correct can really raise your score!

These graphs are usually graphed and expressed in degrees, but you may also see them expressed in radians. There are 2π radians in one circle. Each point on a circle corresponds to a certain number of radians. To convert degrees to radians, simply multiply by π/180.

Sine and cosine both have standard graphs that you need to memorize for the ACT Math Test. The standard equation for sine looks like this: y = sin x. The "period" of the wave is how long it takes the curve to reach its beginning point again. The coefficient in front of "sin" (here 1) is called the amplitude. It affects how high and how low the wave reaches vertically. If that coefficient changes, then the height changes. For example, y = 5 sin x, would show a curve that reaches +5 on the y-axis and extends down to -5 on the y-axis.



Cosine also has a standard equation. It looks like: y = cos x. For the graph of cosine, notice how it begins at its highest y-value and descends, whereas sine begins at the origin. Cosine and sine have the same period of 2π. Questions involving trig graphs will likely require you to match given equations with graphs, or interpret the meaning of certain graphs, such as in a question like this: What is the smallest positive value for x where y = cos 2x ?

The difference between y = cos x and y = cos 2x is that the coefficient in front of x is halving the period, so it will now take just one pi to complete its cycle. The smallest x-value for cosine usually occurs at π/2. For the new graph, it will occur at π/4, which is ½ of π/2.

How will the graph of the function f(x) = 4sin x + 0.2 differ from the graph of f(x) = sin x?

A) The graph's period will be 4 times as much and the graph will shift 0.2 units down.

B) The graph's period will be 4 times as much and the graph will shift 0.2 units up.

C) The graph's amplitude will be 4 times as much and the graph will shift 0.2 units down.

D) The graph's amplitude will be 4 times as much and the graph will shift 0.2 units up.

We know that the coefficient in front of sine changes the amplitude, so (A) and (B) can quickly be eliminated, since 4 multiplies the amplitude by 4. Just like a linear equation, adding to the end of an equation shifts a graph upwards. For example, the only difference between y = 8x and y = 8x + 7 is that the latter is 7 places higher on the y-axis. The answer is (C).

How to Use Your Calculator Wisely

Here are some tips to help you get the most out of your calculator on test day.

- You can use a calculator on the ACT Math Test. You cannot use a calculator on the Science Test. (Or the English and Reading Tests... not that you'd want to.)
- Make sure the calculator you want to use will be allowed by the ACT proctors. You can use any four-function, scientific, or graphing calculator, unless it has prohibited algebra software on it. For full details on which calculators are not allowed, please look here.
- Make sure to use a calculator you're familiar with. Don't go out and buy a new calculator the night before the test. You need to know how to use it, and you need to be comfortable with all of the functions you might need.
- Replace your batteries the night before the test, even if they're not that old; the last thing you want is a dead calculator in the middle of your math section.
- Please don't use the calculator for checking extremely basic arithmetic (e.g., double-checking that 10 – 2 = 8). It wastes your time.
- Please don't use the calculator when the answer choices all have fractions or radicals in them. The calculator isn't going to help you get to those answers anyway, so you're wasting your time.
- Pick up your calculator *only* when you're sure of how to solve the problem and how the calculator will help you do so. Using it any other way is a waste of time.
- Remember that ACT problems are meant to be solved quickly. If you're picking up your calculator to try to solve $\sqrt{597}$, you've probably made a mistake somewhere. Double-check your work up to that point.
- Just remember, you are the one taking the ACT. Your calculator is not. The ACT Math section is testing your math skills, not how well you can use a calculator.

Now, there's one final thing we want you to do. If you have the calculator you want to use for the ACT, I'd like you to enter this problem into your calculator:

$$1 + 2 \times 3$$

If you get the answer of 7, congratulations! Your calculator follows the standard order of operations. You probably learned this as PEMDAS, or "Please Excuse My Dear Aunt Sally." It's the order that you're supposed to follow when solving an equation: Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction. All of the math problems you'll be dealing with on the ACT will follow this order, and your calculator already takes that into consideration automatically. That makes things easier for you.

If you entered the problem into your calculator and it came back with 9, then your calculator does not follow the order of operations. This means a little more work for you; you will have to separate problems out into the proper order yourself *before* entering anything into your calculator. So, to get the right answer, you would *have to* enter the above problem into your calculator like this:

$$2 \times 3 = 6$$

$$6 + 1 = 7$$

ACT Math Formulas

Must Know Formulas:

Average:

S/T (Average = Sum/Number of things)

Lines:

Slope intercept form:

y = mx + b (where m is the slope and b is the y-intercept)

Slope:

$$\frac{y_2 - y_1}{x_2 - x_1}$$

Quadrilaterals:

Perimeter of a rectangle:

2l + 2w (where l is the length and w is the width)

Area of a rectangle:

lw (length x width)

Volume of a box:

lwh (length x width x height)

Surface area of a rectangle:

2lw + 2wh + 2lh

Diagonal in a rectangle:

Apply the Pythagorean theorem twice or

$$l^2 + w^2 + h^2 = d^2$$

Triangles:

Area of a triangle:

1/2bh (1/2 base x height)

Circles and Spheres:

Area of a circle:

πr^2

Circumference of a circle:

$2\pi r$

Volume of a sphere:

$4/3\pi r^3$

Cylinders:

Volume of a cylinder:

$\pi r^2 h$

Pythagorean Theorem:

$a^2 + b^2 = c^2$

Trigonometry:

SOHCAHTOA:

sin x = opposite/hypotenuse

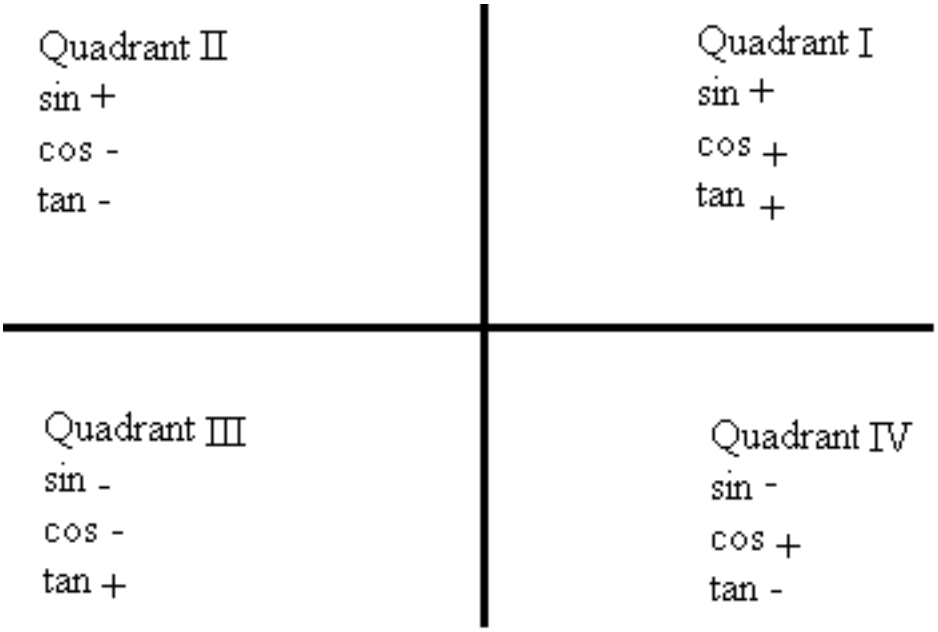
cos x = adjacent/hypotenuse

tan x = opposite/adjacent

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\sin^2\theta + \cos^2\theta = 1$$

You should also know your quadrants and where sine, cosine, and tangent are positive or negative:



Probability:

Probability ➔ Number of desired outcomes / number of total outcomes

Factorials (e.g. 8!):

To find the factorial of any integer, multiple it by every positive integer below it, e.g.:

8 x 7 x 6 x 5 x 4 x 3 x 2 x 1

Formulas that are Good to Know

Equation of a circle:

$(x-h)^2+(y-k)^2=r^2$(where center of the circle is (h,k))

Volume of a cone:

$V=1/3\pi r^2h$

Volume of a pyramid:

$V=\frac{1}{3}Bh$ (where B = base area and h = height)

Arithmetic sequences:

$t_n=t_1+d(n-1)$

Geometric sequences:

$t_n=t_1 \text{ x } r^{n-1}$

Logarithms

Definition:

If $log_a b=c$, then $a^c=b$

Change of base rule:

$$log_a b=\frac{\log b}{\log a}$$

Trapezoids

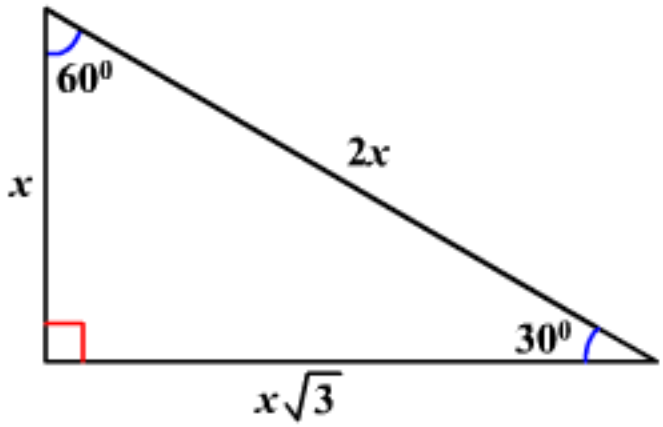
Area of a trapezoid:

$$\frac{b_1 + b_2}{2} h$$

(Add the bases, divide by two, then multiply by the height.)

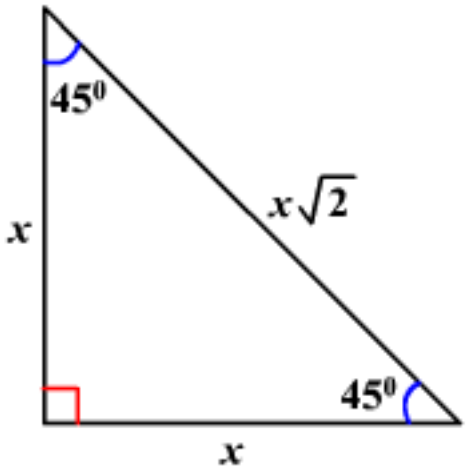
30-60-90 Triangle Ratio:

$1 : 2 : \sqrt{3}$



45-45-90 Triangle Ratio:

$1 : 1 : \sqrt{2}$



Exponential Growth Formula:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

Where P = principal (starting value), r = rate of growth, n = number of months, t = time in years, and A = new amount.

Bonus Things to Know

Quadratic Equation:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Often, you will be better off applying a strategy such as backsolving to solve a complicated algebra problem, but if you are comfortable with the quadratic equation, keep it in the back of your mind.

Permutations:

$$\frac{n!}{(n-r)!}$$

Combinations:

$$\frac{n!}{r!(n-r)!}$$

ACT Reading Test

Introduction to the ACT Reading Test

The ACT Reading Test assesses your ability to understand what you read. It will ask you to find information that is directly stated in a passage as well as understand and interpret it on a basic level.

What to Know:

- Reading is the third section of the ACT
- You have a 40-minute time limit
- You will read 4 passages (one fiction, one social science, one humanities, and one natural science)
- You will see 36 multiple choice questions (9 for each passage)
- There will be one longer passage and one set of shorter, paired passages on a common subject

What to Study:

- If you aren't reading regularly, start now. Read high-quality fiction and nonfiction, such as newspapers and news magazines covering a variety of topics.
- Active reading. Whenever you read something new, practice:
    - Determining the main idea of the entire piece as well as individual paragraphs
    - Finding cause-effect relationships
    - Figuring out the sequence of events
    - Understanding the author's tone and purpose

    - *The ACT will test you on all of the above!*
- Vocabulary, *only* if it is a real weakness of yours. The ACT will not test you on very difficult words, but you will see a few "word-in-context" vocabulary questions and you will need a decent high school-level vocabulary to fully understand the passages.

What Not to Study:

- Outside knowledge (although we at Magoosh are fans of knowledge in general, everything you need to answer the reading questions are contained within the passages, whether you are familiar with the topic or not)
- Difficult vocabulary words

Ten Tips to Quickly Improve Your Reading Score

The keys to the ACT Reading test are strategy and pacing. You'll need to have a plan for HOW you will read each passage, tackle the questions, and finish in the allotted time; otherwise it'll be hard to achieve your desired score. 🙂

Ready for some specific tips for ACT Reading success? Let's get to it.

1. Find the author's point of view as you read

Do you find yourself getting lost in the details, or reading too quickly and missing some of the important information? For the ACT Reading Test, you've got to strike a balance between reading for the author's point of view and for the function of each paragraph, while also noting the location of important details in case you need to come back later. How do you do all of this at the same time?

2. Make sure you underline anything that seems significant to you

Look for words and phrases that reveal the author's opinion, or give the main idea of each paragraph. The test booklet is basically one large piece of scratch paper, so it doesn't matter if you write all over it. In fact, it's better if you do! Underline, circle, write 3-5 word summaries of each paragraph...whatever works for you. Just don't get so carried away with the note taking that you run out of time...

3. Time yourself as you practice

If you are spending more than 3 minutes reading and marking passages, you are risking not being able to finish all of the questions on test day. As you become more and more confident with your accuracy, try to get as precise as possible with the timing of your note taking.

4. Do at least ten ACT Reading practice tests

Full-length practice tests are available in ACT practice books at local bookstores, at your local library, and are even downloadable online. Find a quiet place where you can take the practice ACT, and clear off the table or desk. Try to eliminate any distractions and do the best you can to mimic your test-day environment. Keep a clock or timer in front of you so you can periodically check and see how you are doing. You may want to set the timer to go off every 9-10 minutes. Don't rush, but make sure you can move confidently from one passage to the next and answer ALL questions in the time allotted.

5. For Vocabulary in Context questions, go back to the passage

A commonly used vocab word often takes on a secondary definition within ACT passages. Do not assume that the common meaning is the correct answer; there may be several meanings you do not know. Go back to the passage and see how the word is being used in context.

6. Pre-phrase an answer

Before you look at the answer choices, use the passage to predict your own answer. Then match your prediction to the answer choices. This will save you time. Don't get stuck weighing answer choices. Cross out all answer choices that don't match your prediction, pick the best available answer, and move on!

7. Dumb down complicated questions

If you read a question and it is confusing or unclear to you, rephrase it in simpler terms. Think of it as though you were going to explain the question to a small child. What is it really asking?

8. After 9 minutes, move on to the next passage

The ACT Reading Test is 40 minutes long and contains 36 questions (9 questions on each passage). This means you'll have around 10 minutes to spend on each of the 4 passages, so pacing yourself is essential.

9. Do the passages in any order

You will always see 4 passages and you must always answer all 36 questions. But that doesn't mean you have to approach the passages in the order in which they are presented on the test. As you practice, you will start to realize which passages are easier and which are more challenging for you. For example, if Literary Narrative is your strong point but Natural Science passages make you nervous, it may make sense for you to do the Literary Narrative passage first and save the Natural Science passage for last. Just make sure you're bubbling in the right question number on your answer sheet...

10. Paper-Test takers, bubble your answer carefully

If you do decide to skip around, make sure you are still bubbling your answers into the corresponding numbers on the answer grid. You don't want to lose points because you bubbled incorrectly! And if you're taking the digital exam, doublecheck that you've selected the answer you intended to select.

Passage Types

The ACT Reading test is very predictable: Four passages in four different "genres," always in the same order.

First, you will see a Literary Narrative passage (the fiction passage), followed by three non-fiction passages: one on a social science topic, one on a humanities topic, and one on a natural science topic. Each passage is around 700 to 850 words long and has 9 questions following the passage.

Here's what to specifically hone in on as you read each one:

Literary Narrative passages generally include a narration of events and revelation of character. You should be particularly looking for the passage's mood or tone, the relationship of the characters, and the emotions and perspective implied by what the characters say and how they say it. Fiction passages often ask questions about how an author uses dialogue to both explain a situation to a reader and reveal character.

Social Science passages present information gathered by research. As you are reading, focus on names, dates, and concepts. You should pay close attention to which name goes with which

concept in a discussion and keep track of who said what. You should also particularly watch for cause-effect relationships, comparisons, and sequences of events.

Humanities passages describe or analyze ideas or works of art. Some humanities passages that are from memoirs or personal essays may seem a bit like fiction passages, but they are treated as fact here. You should pay close attention to the author and point of view. Sometimes a question will ask students to predict the author's likely response to a hypothetical argument or situation. In these passages, the kinds of relationships students are asked to infer or identify are those between events, ideas, people, trends or modes of thought.

Natural Science passages usually present a science topic and an explanation of the topic's significance. In a natural sciences passage, the author is typically concerned with the relationships between natural phenomena. As with social science passages, you should pay special attention to cause-effect relationships, comparisons, and sequences of events. You always need to keep track of any specific laws, rules and theories--so underline them as you go!

Many of the nonfiction passages, especially natural science passages, will include some specialized or technical language. But don't worry, the passage should provide clues to the word's meaning (if it doesn't, you'll often find a footnote with a definition; the ACT Reading test does not explicitly test difficult vocabulary).

As with every subject on the ACT, remember you can do the passages in any order. Some students are not fans of fiction and prefer to leave the literary narrative passage for last. Work with your preferences and strengths and complete the four passages in that order!

Question Types on the ACT Reading Test

Out of all the sections on the ACT, the Reading test is the one students tend to approach with the least rhyme or reason: read the passage, answer the questions, there's not much more to it than that, right?

Wrong.

In addition to learning how to read strategically, getting familiar with the question types on the ACT Reading test can help you learn how to approach certain questions, which questions you might want to skip or save for last, or which questions have certain tricks or traps. By understanding how the test works, you'll be able to get more questions right.

Hopefully that's enough to convince you. Now. let's break it down.

There are 8 basic question types on the ACT Reading test:

- Detail
- Main Idea
- Comparative Relationships
- Cause-Effect Relationships and Sequence of Events
- Inferences/Generalizations
- Meaning of Words
- Author's Voice
- Author's Method/Purpose

Here's what you need to know about each of them:

Detail Questions

Detail questions ask you to (go figure) find details in the passage. Most of the time, they involve nothing more than simply locating a word or phrase in the text. These are the easiest questions out of the bunch. The trick, though, is that ACT Reading passages are long, and detail questions often don't give line numbers or paragraph references, so don't get caught up in a three-minute long fruitless search of the passage as you attempt to find out whether the girl's coat is yellow or blue. If you can't find the answer within 30 seconds or so, take a guess and move on to the other questions. Often, you might find the answer you are seeking as you search the passage for other answers.

> *Example*: The passage states that, on average, students in 2015 applied to how many more colleges than students in 2005?

Main Idea Questions

Main idea questions ask you to determine the primary message of a paragraph, section, or an entire passage. You will see a main idea question on just about every single ACT Reading passage so you should always be prepared to answer it. After you finish reading the passage, summarize for yourself the main idea of the passage so you have it straight in your mind and won't be tempted by distracting answer choices that misstate what the passage says or pick up on only one part of the passage. For questions that ask you about a specific paragraph or section, remember that the first and last sentences of paragraphs are often key.

> *Example:* The main purpose of the third paragraph is to demonstrate the author's:

Comparative Relationships

Comparative relationship questions ask you to evaluate how two or more people, viewpoints, events, theories, or so on compare. They are certainly higher level than detail questions, but they aren't too scary. To get these questions right, you just need to understand the gist of two things.

> *Examples:* According to the author, the significant difference between the director's opinion and the star actor's opinion was:
>
> According to the passage, high school students today are different from teenagers in the past because:

Cause-Effect Relationships and Sequence of Events

Cause-effect and sequence of event questions are categorized separately by the ACT, but we're grouping them together because they are fairly similar. Basically, they both require you to understand what happened before something else or what happened to cause something else. These questions are like detail questions in that the answer will be directly stated in the passage. The only thing you need to be careful about is realizing that the order of events discussed in the passage is not necessarily the order in which they happened.

> *Example:* The narrator conveys that her dismissal from her first job directly resulted in:

Inferences/Generalizations

Inference and generalization questions are typically the hardest questions on the ACT because the answer won't be directly stated in the passage but will require you to take a lot of information and boil it down. The most important thing to remember with these question types

is never to infer TOO much. You will only ever have to make a teeny, tiny leap beyond what the passage states. So if you find yourself rationalizing how an answer choice *could* be true, STOP, you are going too far.

> *Example*: It would be reasonable to infer that the boy was not surprised by the arrival of his mother because:

Meaning of Words

Meaning of words questions are also known as word-in-context questions. Typically, you are not being quizzed on difficult vocabulary here. Most of the time, the passage will pick a word that might have multiple meanings depending on the context and ask you to pick out the right one. There are two main strategies to approach these types of questions. The first is to put a blank where the word is in the passage and then fill it in with your own word. Then go to the answer choices and see which one best matches up with what you chose. The other strategy is to read each of the answer choices back into the passage and see which one makes the most sense in the context of the passage (even if it doesn't grammatically make sense).

> *Example*: As it is used in line 58, *combed* most nearly means:

Author's Voice

Author's voice questions ask you to draw a conclusion about how an author (or narrator) feels about his or her subject. These can be difficult questions, but you should know that about half of ACT Reading passages are going to ask you a question like this, so you should prepare for them as you are reading. It can be really difficult to go back and determine tone without rereading (which you likely don't have time for). As you are reading, look for clues that indicate how an author or narrator feels about something: often these are strong choices in adjectives,

adverbs, or verbs. Tone or voice questions are often particularly important on the fiction passage.

> *Example*: The narrator recalls her childhood in a remote area of Canada with a feeling of:

Author's Method/Purpose

Author's method or author's purpose questions ask you to draw conclusions about what an author is trying to achieve with a passage or why he or she developed the passage in a certain way. These are not incredibly common questions, but you should be prepared for them. The best way to prepare for these question types is to pay close attention to the structure of the passage as you read and how each paragraph builds on the previous one.

> *Example:* In the context of the whole passage, the author most likely chose to include the examples of the extinction of certain bird species in order to:

Comparison Passages

Comparison passages (or dual passages) are relatively new on the ACT Reading test (they only popped up in the last couple of years). But they are now customary, and you can expect to see one as one of the four sections on the ACT Reading test. These passages tend to intimidate students, but they aren't nearly as scary as you might think they are. Most of the questions you will encounter will only apply to one of the two passages in the set and you'll only see 2 to 4 questions that have to do with both.

Here's how to strategically tackle these comparison passages:

1. Know in advance that there are going to be certain obvious ways in which these two passages compare or contrast.

This is why they were chosen, after all! So read the first passage as you would any other passage–looking for main ideas and key points. Then, when you read the second passage, look specifically for the ways in which it is similar to and different from the first one in how it approaches its topic. Make note of these similarities and differences; we guarantee the questions will ask about them.

2. **Read the first passage and then answer the questions on it, then read the second passage and answer the questions on it, and then answer the questions on both.**

The upside to the dual passage section is that you can break up your reading into smaller chunks. There will be a clearly marked list of questions that pertain only to the first passage, so you will have all the information you need to answer those questions after you have read the first one. So take a break at this point and do those first. This also helps you avoid any

distractor answer choices that appear in the second passage because you won't even have read it yet. Follow the same procedure for the second passage and then answer the questions that are about both passages.

3. Know that almost all of the questions on both passages will have to do with big ideas, namely main idea, tone, and purpose.

You might see questions that compare details, but most of the questions that are on both passages have to do with big ideas. So you want to be extra sure on these passages that you have the main idea, tone/attitude, and purpose of each passage straight. Jot them down after you finish reading. So, for example, on a natural sciences passage examining the connections between meditation and heart rate, you might jot down something like "New studies show meditation increases heart rate (main idea); skeptical (tone); to inform (purpose)." Do this for both passages, and it will become MUCH easier to answer those questions on both passages. Promise.

4. If timing is an issue for you or comparison passages are not your thing, leave this one for last and strategically use the time you have left.

If you are prone to running out of time on the ACT Reading test, the dual passage is a great one to leave for last. Check the list of questions before you begin to see which passage has the most questions on it and do that passage first (they might have the same number, in which case read the shorter passage first). Then do the other passage and questions. This will help you make the most of the precious dwindling minutes at the end of the Reading test.

Pacing for ACT Reading

Don't let this be you on game day!

Procrastination: We've all been there. Whether we get easily distracted, put off work we find too overwhelming or intimidating, or, hey, we just have better things to do, sometimes we start a task behind schedule–and then it's too late. As much as we can all relate to this, though, it's a risky game to play on the ACT, and sometimes test-takers don't even know they're doing it. With even the best of our intentions, it is difficult to give the maximum number of questions the maximum amount of attention to get that maximum number of points.
It is time to come up with a game PLAN. These strategies will keep you moving through ruts and progressing at the right pace, so that time will be on your side:

1) Once you start on a passage, commit to it. Going in test order may not be so important, but not wasting time jumping back and forth is. Valuable time will be lost confusing yourself, and even those precious page-turning seconds should not be wasted.

2) Don't pore over the passage. Since ACT writers only include questions that should respond to your understanding of the passage after a few minutes of reading, spending that extra time

won't help you answer the questions. Be attentive, but also quick: you don't want to do all that careful reading to not be able to get the correct answers to show for it.

3) Take the Guesswork out of Guessing. There is no penalty for guessing on the ACT. If you have only a matter of seconds to finish a question without even taking the time to read it, you should–and your chances of getting it right expand greatly with each answer choice you are able to eliminate. Unless you are aiming for a 30+, some guesswork won't kill your score. Of course, with effective time management, you should only need to resort to guessing on a handful of the more challenging questions.

Why You Might Need to Skip A Passage to Get a Higher Score

In an ideal world, we can do all 36 questions on the ACT Reading Test in 40 minutes, but many students find that they're either rushing through them with low accuracy, or only able to do 2 or 3 passages.

One of the things we hear a lot from frustrated students is that there isn't enough time on the test to take notes or follow the recommended ACT Reading strategies. Let's look at two students and their scores and see how slowing down and taking notes, even at the expense of leaving an entire passage blank, can actually increase your score on the ACT Reading Test!

Student 1: Marion

Let's say Marion does not take any notes. She skims the passage and reads the questions quickly, then scans back to the passage hoping to locate the correct answer. Her goal is to try to complete all 36 questions, which she is able to do by spending approximately 9-10 minutes on each passage. But because she rushed without really understanding any of the passage, she only gets 4/9 questions correct on each Reading passage, or 16 correct answers total.

Scaled Score for Marion = 15

Student 2: Steven

Now let's look at another student. Steven reads each passage, carefully taking notes and breaking the passage down. He practices active reading and asks himself questions about the author's main idea and point of view as he reads. This means that he only has time to do 3 out of 4 passages. For the last passage, he quickly guesses on the 9 questions since he knows there is no wrong answer penalty on the ACT. He spent about 11-12 minutes on each of the

three passages.

Because he really understood the passages, he gets 8/9 questions right on the first three passages he completed. His accuracy is much higher because of the time he spent thinking critically and analyzing the passage. For the last passage, he gets 2 questions correct out of the 9 guessed questions. This makes his total correct a 26.

Scaled Score for Steven = 22

The Outcome

It's pretty amazing how Steven took three more minutes on each passage, did not even read the 4th passage, and yet received a scaled score that was a full 7 points higher than Marion's!

The Lesson: If you're struggling with pacing and accuracy on the ACT Reading Test, try the "3 out of 4" method that Steven used!

ACT Science Test

Introduction to the Optional ACT Science Test

The ACT Science Test assesses your skills of interpretation, analysis, evaluation, and problem-solving using scientific experiments and situations. While the Science Test includes passages from the content areas of biology, chemistry, earth/space sciences, and physics, only a basic knowledge of these fields is necessary.

What to Know:

- Science is an optional multiple-choice section of the ACT
- It is scored separately from the Core (English, Math, and Reading) tests and will not count towards the Composite Score.
- You have a 40-minute time limit
- You will most likely face 6 or 7 passages (3 Data Representation passages, 2 or 3 Research Summaries, and 1 Conflicting Viewpoints passage)
- You will see 40 multiple choice questions
- You will encounter a few, but not many, questions that will ask you to use some outside science knowledge.
- Students who are interested in pursuing STEM in college, will likely want to take this section.
- It's a good idea to check the policy at the colleges and universities to which you are applying. Some might require Science scores.

What to Study:

- Basic scientific concepts
- Practice reading scientific charts and graphs (your high school science textbooks and *The Real ACT Prep Guide* are good sources).
- You can read science articles for the general population, such as from *Popular Science*, to get more comfortable with the topics. If you are really motivated, check out the academic science articles from the Public Library of Science.
- Learn how to work fast! ACT Science is a notoriously time-pressed test that overwhelms students with information. Doing practice tests under timed conditions can help you learn what you need to read and what you don't.

What Not to Study:

- Science! (Well, for the most part. Very few questions ask students to use outside science knowledge, and you likely will have learned it in school already. Maybe even in middle school.)

Top 3 Tips to Improve Your ACT Science Score

ACT Science tests are a little like olives; either you love them or you hate them. Yes, skeptical readers, there are some students out there who love the ACT Science test. The nice thing, though, is that no matter where you fall on this love/hate spectrum, you absolutely can learn to at least like the ACT Science test a little more; you just have to get used to it. And this only comes with practice.

So here are some of the top strategies that will help you get more cozy with the ACT Science test and be fully prepared for it.

Take Practice ACT Science Tests

The ACT Science test is unique. Unlike the English or Math sections, you can't do effective preparation for it simply by studying, say, grammar rules or geometry formulas. Heck, you can't even really prepare for it by studying science. This sounds rather ironic, but it is true. The ACT Science test is far more a test of scientific reasoning and data analysis than a test of science content. So the most effective preparation for the ACT is to do lots of ACT Science questions. We have passages for you to practice with on Magoosh. Also check out the options on act.org.

Take Timed Practice Tests

Once you develop a familiarity with the ACT Science test, it is crucial that you practice doing tests under timed conditions. There are 6-7 passages on the Science test and a 40-minute time limit, meaning you have about 5-6 minutes per passage. Some passages will take you more or less time than others, but time yourself to see if you are able to work at this approximate pace. If you are not, don't get discouraged; this may just mean you need to focus on doing fewer passages to get your best score (and plan to entirely skip 1 or even 2 passages). But it's really important that you figure this out in practice and not on the real thing.

Read Scientific Writing

The more you read about science, the more comfortable you will be with the lingo, terminology, and strange units on the ACT Science test. The Public Library of Science has some good free sources for you to read, but be forewarned that these articles are written for scientists and are more complex than what you will see on the ACT. Therefore, I only recommend this for students who are VERY serious about their science score. If you aren't ready to get that intense about your ACT Science study, you can devote a little more attention to your school's science textbooks and lab experiments. Focus particularly on understanding the hypothesis, the control, the variables, and the results of the experiments you encounter.

Review Fundamental Scientific Concepts

Every ACT Science test will have a few questions that require you to bring in outside science knowledge. There won't be many of these, and any outside knowledge required will be on a pretty basic level. The ACT doesn't provide a list of what could be tested, but we've taken our best guess at what is fair game: study the following list of concepts, and you should be in pretty good shape for whatever the ACT throws at you!

Science Knowledge on the ACT

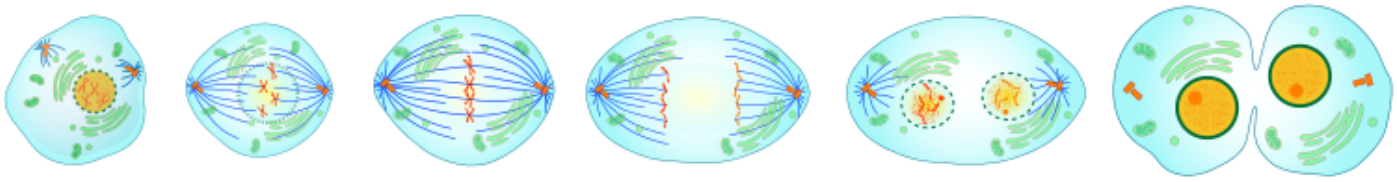
The ACT Science section will occasionally include questions in which the answer requires science knowledge that is not provided in the passage.

Here is a list of basic scientific topics that the ACT might test. But don't panic! Anything tested will be on a very basic level (something you might have learned in an introductory class or even remember from middle school), and you will only see a few questions per test that require any outside knowledge at all.

Biology

- classifications: genus, species (e.g. knowing that lizards are mammals, reptiles or amphibians)
- human anatomical systems (circulatory, digestive, respiratory)
- eukaryotic and prokaryotic organisms
- photosynthesis
- pollination
- metamorphosis

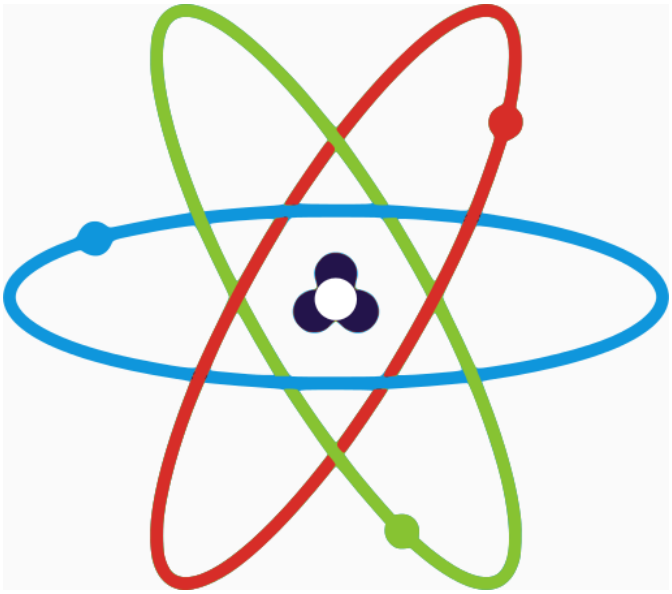
- genetics (allele, genes, chromosomes, X and Y chromosomes)
- proteins
- DNA
- RNA
- ribosomes
- mitochondria
- chromosome
- genotype
- osmosis
- phenotype
- dominant and recessive traits
- crossing over of dominant and recessive alleles
- mitosis
- meiosis
- cellular division phases (interphase, etc.)



Chemistry

- understanding (and balancing) chemical equations and reactions
- atom
- nucleus
- ion
- molecule

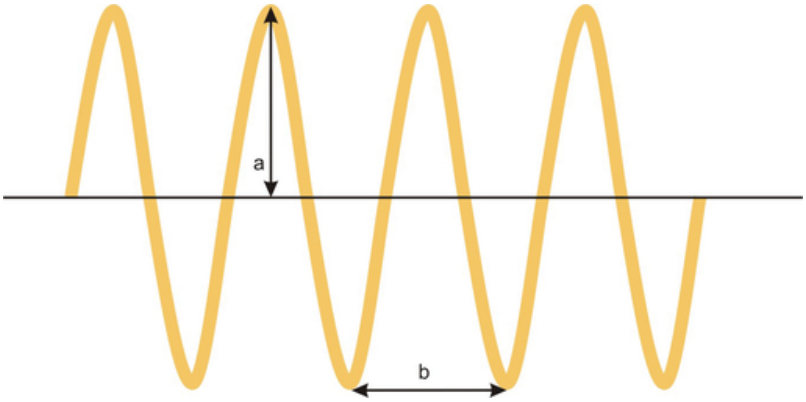
- solute
- solution
- solvent
- reactant
- product
- solubility
- atomic mass
- solid, liquid, gas
- pH
- acid
- base
- viscosity
- condensation
- evaporation
- electrons
- protons
- neutrons
- atomic number
- atomic mass
- molar mass
- isotopes
- solid, liquid, gas and melting, boiling, freezing points (very generally speaking; not specific to any particular substance, except maybe water)
- important elements (e.g. water is H20)



Physics

- velocity
- acceleration
- polarity
- buoyancy
- waves
- amplitude
- frequency
- wavelength
- charges (like charges attract; opposite charges repel)
- circuits (capacitor, resistor)
- amperes
- volts
- convection
- conduction
- radiation

- kinetic energy
- potential energy
- gravitational potential energy
- mechanical energy
- density

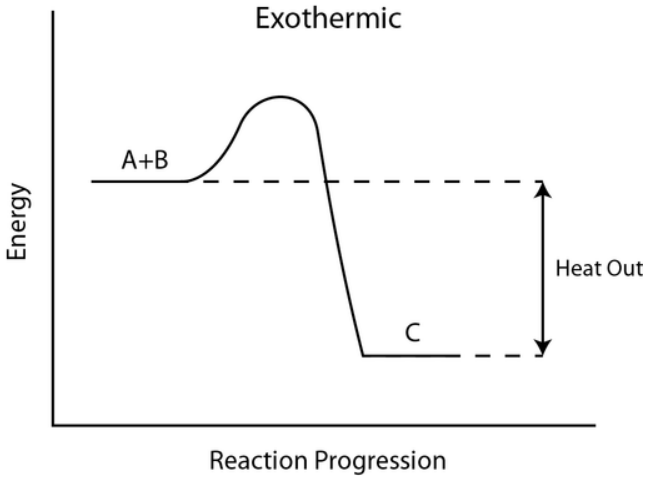


Earth and Space

- metamorphism (state change)
- layers of earth
- erosion
- altitude
- air resistance
- orbit
- terrestrial planet/gas giants

Other Science Terms

- independent variable
- dependent variable
- control
- hypothesis
- endothermic
- exothermic
- ectothermic
- matter
- mass



Passage Types

There are three distinct passage types on the ACT Science test: Data Representation, Research Summaries, and Conflicting Viewpoints. Here's how the numbers break down on most tests.

Passage Type	Number on Test
Data Representation	**3**
Research Summaries	**2 or 3**
Conflicting Viewpoints	**1**

In the past, there used to be 3 Data Representation passages, 3 Research Summaries passages, and 1 Conflicting Viewpoints passage on each test (7 passages total). However, on recent tests, there have been 3 Data Representation passages, 2 Research Summaries passages, and 1 Conflicting Viewpoint passage (6 passages total). This means that there have been more questions per passage on these more recent tests since the total number of questions on an ACT Science test is always 40.

Here's what you are going to face in each passage type:

Data Representation Passages

ACT Science Data Representation passages are typically the most straightforward of the three ACT Science passage types. Unlike the Research Summaries passages, which recreate various experiments, and Conflicting Viewpoints passages, which present alternative hypotheses on a scientific phenomenon, Data Representation passages present students with a few figures, graphs, or charts to analyze without accompanying experiment descriptions.

This doesn't mean that they are always easy, but generally speaking, most students find them to be the easiest out of the three types because they rarely ask students to do the kind of higher-level scientific reasoning that the other passage types require. As a result, students who are uncomfortable with the Science section often like to concentrate on these passages first.

You can recognize them because they won't have headers such as "Experiment 1," Study 2" or "Scientist 1," and they often have a lot less text.

Research Summaries

Research Summaries provide descriptions of one or more related experiments or studies conducted by hypothetical scientists or science students. These passages generally have more text than Data Representation passages because they detail the design and procedures of a particular study in addition to presenting the results on tables or graphs. The questions on these passages ask students to understand, evaluate, and interpret the design and procedures of the experiments and analyze the results.

You can recognize them because they will typically include one or more experiments or studies with headers such as "Experiment 1," "Trial 2," or "Study 3."

Conflicting Viewpoints

There is generally only one Conflicting Viewpoints passage on each ACT Science test. This passage typically presents two (although sometimes three) alternative viewpoints, hypotheses or theories on a specific scientific phenomenon. Some students refer to these passages as "Fighting Scientists" passages because these different viewpoints always fundamentally

disagree with one another, even though they may agree on some points. Your job is to notice all the similarities and differences between the viewpoints and answer the questions that follow. These questions might ask you to determine which scientists or theories would agree with a certain point, determine how a certain point might strengthen or weaken the different hypotheses, or how new information might affect the viewpoints.

You can recognize Conflicting Viewpoints passages because they typically have no figures or diagrams, or only one or two simple diagrams, and a lot of text. Because you have to read these passages in full and because the questions often involve a lot more critical thinking, many students like to save this passage for last.

Remember that you can do the passages in any order that you want! As you practice, notice whether or not you struggle with one passage type over another and start with the ones you find to be easier to get your feet wet (and in case you run out of time). If any passage seems too complicated or intimidating, remember you can skip it and come back to it at the end!

More on the Conflicting Viewpoints Passage

In Conflicting Viewpoints passages on the ACT Science Test, several different viewpoints or hypotheses will be presented on a specific scientific phenomenon.

The first few paragraphs will describe the phenomenon and the remaining paragraphs will outline each student or scientist's viewpoint. These passages typically contain more words than Research Summaries or Data Interpretation passages, so your reading skills will definitely be useful here!

Let's look at some tips for handling Conflicting Viewpoints passages.

1. Identify what's being studied.

This information is usually located in the very first paragraph. What is the main subject the students or scientists are studying? This paragraph will often include unfamiliar scientific terminology, but don't panic! They are trying to confuse you, but you don't have to worry because any new vocabulary will eventually be defined by the passage. Locate and underline the phenomenon before you move on to the viewpoints.

2. Figure out the opinions.

Each student or scientist will have a basic theory in regards to the phenomenon. This opinion can usually be found in the first sentence underneath the person's name. Try and put yourself in each scientist's shoes. Ask yourself, how are the basic theories different? How are they similar (if at all)? Underline this information, as well, so you can easily reference it later. You could even jot down a quick summary of each scientist's viewpoint, so you don't forget.

3. Circle any relevant data.

Once you've located and underlined the basic theories of each scientist, identify what data they are using to support their theory. Are there any graphs or figures involved? Make sure to draw on the figure exactly what is described by each theory and label it "Student 1", "Student 2," etc.

Consider whether any of the supporting data is contradictory. For example, if Student 2's theory is correct, does that make Student 3's theory incorrect? If no support is provided for a theory, make sure to write "No Support" next to the paragraph.

The main goal of the Conflicting Viewpoints passages is for you to understand what the argument or conflict is about, and determine what is different about each point of view. As you carefully read and understand the phenomenon, basic theories, and support, it is also helpful to consider the strengths and weaknesses of each argument. What needs to be true in order for each theory to be correct? What assumptions are the scientists making?

You may find yourself taking a little more time than you do on the other passage types to understand all of the viewpoints and answer the questions. Make sure you get plenty of practice with Conflicting Viewpoints passages before your test so you are comfortable and confident with the format.

You may feel more pressure on the Science test in terms of timing, but *don't skim the Conflicting Viewpoints passages* – you'll need to truly understand each viewpoint to correctly answer the questions. Otherwise, you will waste more time re-reading later as you answer the questions.

Using Key Terms

One of the most fundamental strategies for doing well on the ACT Science test is knowing how to identify the key terms in the question and find them in the passage. Because you don't have time to read and understand everything in the Science passages, it's essential to be able to quickly pull out the key pieces of data and find and use them. It's about training your brain to hone in on finding key terms rather than understanding everything that is going on in the passage, and it will allow you to increase the number of questions you can confidently get right.

So, what are "key terms"?

Key terms are the words, phrases, units, and numbers you will be looking up on the figures and in the passage or that you will be applying to answering the question.

Key terms are always:

- the name and number of the figure, table, or experiment to which the question refers
- names of substances, objects, categories, etc.
- any numbers or percentages that appear in the question
- any trial or group numbers that appear in the question
- anything that is capitalized or has a numerical value
- what the question is actually asking you to find

For every single question on the Science test, underline the key terms. This helps keep you engaged and focused on what is important.

Here's an example question:

Based on the results in Figure 1, which of the following could be the absorbance values for samples containing 4 ppm of chromium and copper, respectively?

And here it is again with the key terms underlined:

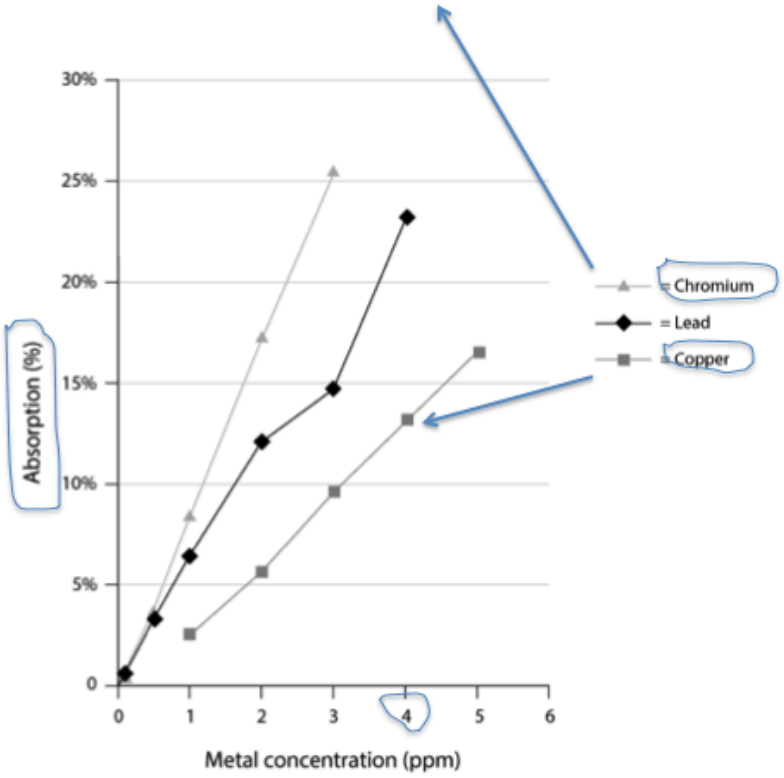
Based on the results in Figure 1, which of the following could be the absorbance values for samples containing 4 ppm of chromium and copper, respectively?

Now let's try to answer it:

Based on the results in Figure 1, which of the following could be the absorbance values for samples containing 4 ppm of chromium and copper, respectively?

A. Copper: 23%, Chromium: 25%
B. Copper: 23%, Chromium: 34%
C. Copper: 13%, Chromium: 25%
D. Copper: 13%, Chromium: 34%

Now, here is the figure you need to answer the question with the key terms circled on it. You should do this as well when you are annotating the Science test to help avoid making mistakes.



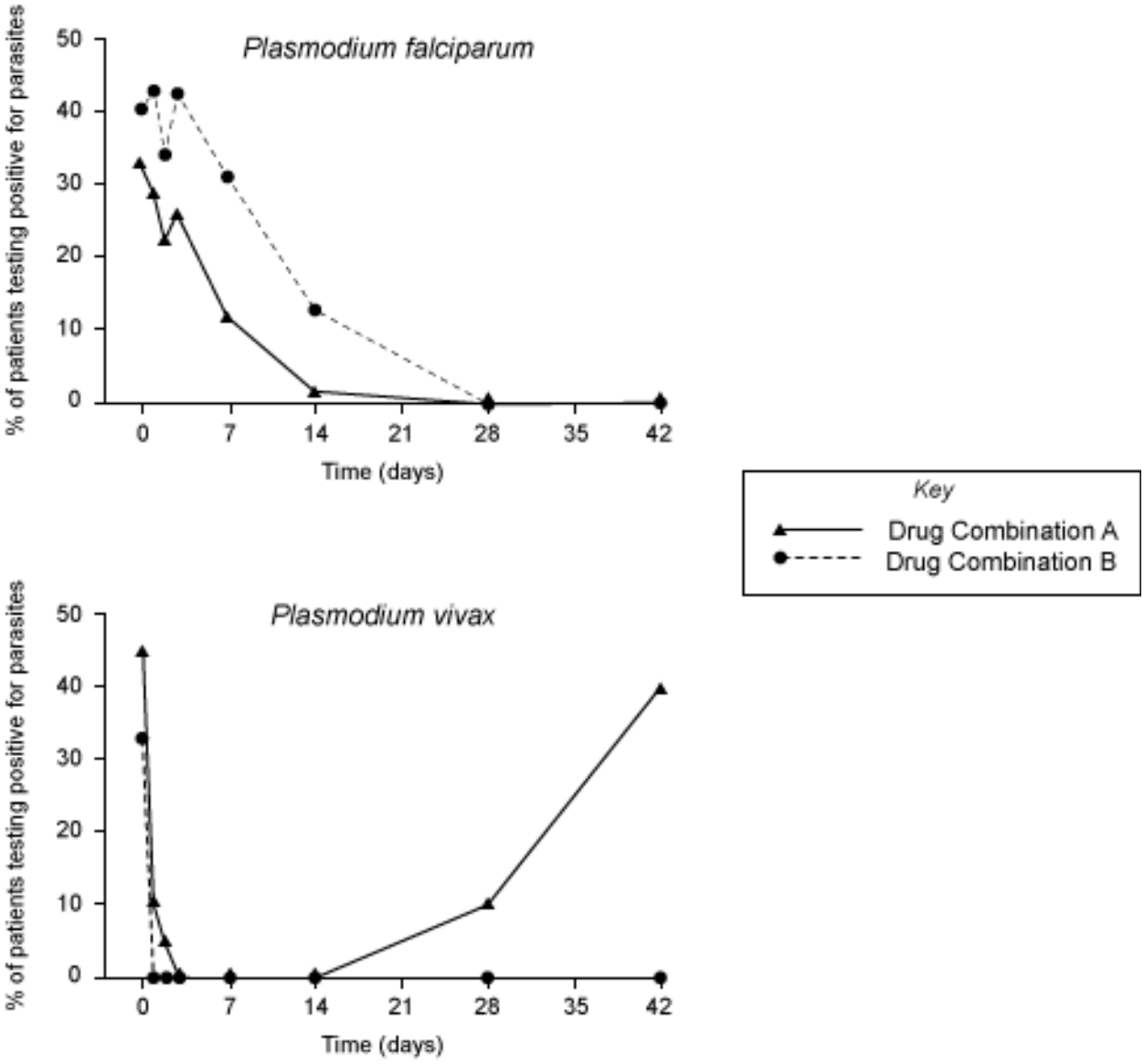
See how the key terms automatically point us to the answer? Copper at 4 ppm is at about 13%. Chromium is off the charts but if the line continued (to where the arrow I drew in is pointing) we could guess that it would be at about 34% ppm, so our answer is D. This strategy will help you out on even more complex questions as well.

It takes a little self-discipline to force yourself to underline or circle the key terms on every single question, but it will greatly reduce the number of errors you make on the ACT Science test and help your brain zoom in on what is important, and this makes it well worth it!

Finding Trends and Patterns

One of the most important skills you need to master for success on the ACT Science test is how to quickly and accurately determine trends and patterns in figures and tables.

Imagine you see the following figures on a Science passage (don't worry about understanding what they mean right now; you don't need to):



Now imagine you see a question like this:

Between days 14 and 42, the percentage of patients testing positive for *Plasmodium vivax* after being treated with Drug Combination A:

A. increased only
B. decreased only
C. increased then decreased
D. decreased then increased

What do you need to know?

Well first of all, you need to know what it means when lines slope downward or upward on a graph. We can figure this out by looking at our x-axis and y-axis. The x-axis (the horizontal axis) shows days of the study increasing from left to right, so the study is progressing in time from left to right. The y-axis (the vertical axis) shows percent of patients testing positive for parasites and the percentage values increase from bottom to top.

So this means that if a line is trending upwards as the days go on, then the percentage of patients testing positive for parasites is increasing, and if it is trending downwards, then the percentage of patients testing positive is decreasing. Note that if we look at the Drug Combination A line for *Plasmodium vivax* (the one with the triangles) over the course of all of the days, the line goes down, then levels out at the bottom, then shoots up again. So this is why you might see answer choices on the ACT such as C and D in the question above (in this case though, we are limited to what happens between days 14 and 42, which is different than the whole length of the study.)

Second of all, on these trend and pattern questions, you always need to make sure you are looking at the right figure. This is a common mistake students make on the ACT Science test. If you neglected the reference to *Plasmodium vivax* in the question and looked at the first figure for *Plasmodium falciparum*, you might select "B. decreased only" for your answer. But we need to look at the second figure. Now, if you correctly look at the second figure, but neglect to note that the question asks about days 14 to 42, you might incorrectly select "D. decreased then increased" because the line for Drug Combination A seems to do that over the course of the study. But if we look at the correct figure and the correct line and limit our scope to between days 14 and 22, we see that the percentage of patients infected increases only, so the answer is A.

Trends and patterns questions might also refer to tables of data. In this case, you don't have lines to help you and you need to look at increases and decreases in the values in the table to help you figure out the trend.

So, imagine you see this table:

	P. falciparum			*P. vivax*		
Response Measure	**Drug Combination C**	**Drug Combination D**	**Drug combination E**	**Drug Combination C**	**Drug Combination D**	**Drug combination E**
Percent of patients free of parasites						
Day 1	0	25	90	62	87	55
Day 2	30	49	95	85	90	58
Day 7	75	51	100	99	97	76
Day 14	100	51	100	100	100	99
Day 42	100	52	100	20	100	89

And this question:

As the percentage of patients infected with *P. falciparum* and treated with Drug Combination C decreased, the percentage of patients infected with *P. vivax* and treated with the same drug combination:

A. increased only
B. decreased only
C. increased then decreased
D. decreased then increased

This one might trip you up if you don't note one important detail: the chart shows "percent of patients free of parasites" NOT "percent of patients infected." This is a common way that the ACT Science test might cause you to slip up. So if we look down the column for patients infected with *P. falciparum* and treated with Drug Combo C, we see that the number of patients *free* of the parasite increases (this, therefore means, that the number of patients infected *decreases* as we go down the column.) So we are looking to read the trend going down the column, not going up the column.

I'd suggest drawing in an arrow there to keep it straight in your head:

	P. falciparum			*P. vivax*		
Response Measure	**Drug Combination C**	**Drug Combination D**	**Drug combination E**	**Drug Combination C**	**Drug Combination D**	**Drug combination E**
Percent of patients free of parasites						
Day 1	0	25	90	62	87	55
Day 2	30	49	95	85	90	58
Day 7	75	51	100	99	97	76
Day 14	100	51	100	100	100	99
Day 42	100	52	100	20	100	89

Now we need to look at what happens to the numbers in the Drug Combination C column under *P. vivax* as we follow the column in this same downward direction. We can see that the percent of patients free of parasites increases from 62 to 100 then decreases from 100 to 20. So this means that the number of patients *infected* decreases then increases, so our answer is D. This might seem a little confusing at first, but it is a good thing to get used to, as this will pop up all the time on the test.

Learning how to find patterns and trends on ACT Science tables and figures (and making sure you are following them in the right direction) is such an important skill to master to get a higher ACT Science score, so practice reading tables and figures to determine when values are increasing or decreasing, and most importantly, make sure you are looking at the right data!

Linking Tables and Graphs

While many questions on the ACT only require you to look at one figure or table, there are also many that require you to combine information gleaned from multiple figures, tables, or even information in the passage. This is not as intimidating as it might initially seem if you follow one key process. We call this “finding the link” (a really creative title, we know).

Here’s how it works:

If a question asks you to look at multiple sources, you want to find the key term that appears on both sources. This is your “link” that helps you connect the dots between the data.

Let’s look at an example question:

Considering the data in Figure 1 and Table 1, which of the following could have been the absorption level measured for lead in Sample 5?

A. 5%

B. 7%

C. 13%

D. 17%

Here are the related figures:

Figure 1

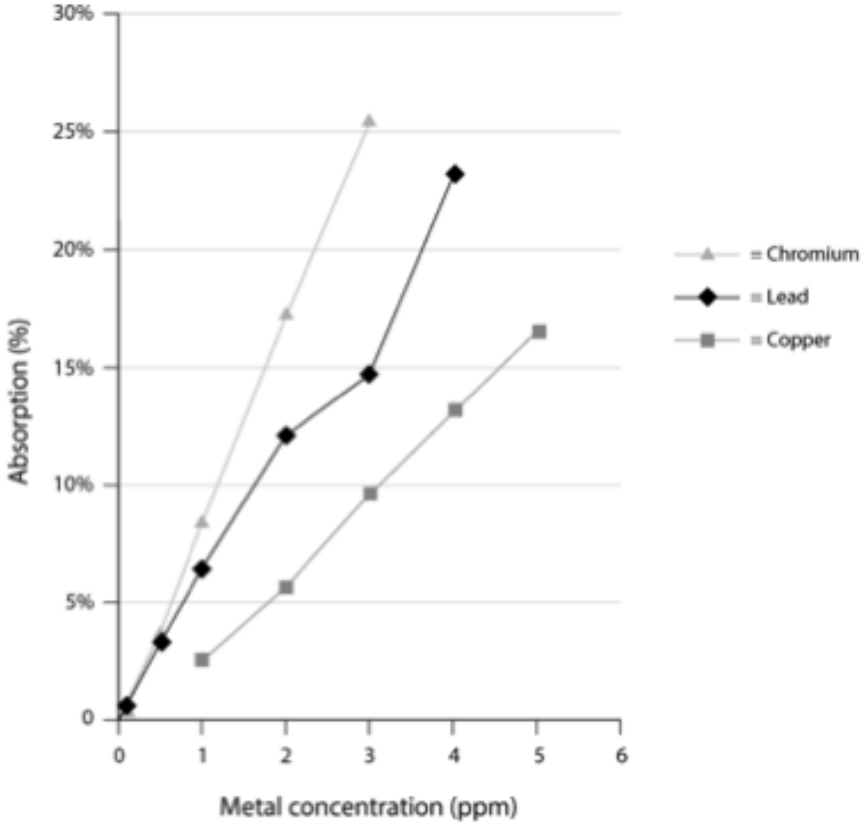


Table 1

Sample #	Site #	Lead in 100 ml (ppm)	Lead in soil sample (ppm)	Chromium in 100 ml (ppm)	Chromium in soil sample (ppm)	Copper in 100 ml (ppm)	Copper in soil sample (ppm)
1	1	0.5	50	1.1	110	2.1	210
2	1	0.8	80	0.9	90	1.9	190
3	1	1.2	120	2.8	280	2.2	220
4	2	2.2	220	0.1	10	3.3	330
5	2	2.3	230	0.1	10	3.9	390
6	2	4.8	480	0.2	20	6.2	620

The fact that there are two different sources (Figure 1 and Table 1) referenced in the question clues us into the fact that we should be looking to apply this strategy of “finding the link”.

We can see that Figure 1 contains several of the key terms from the question: “lead”, “absorption”, but not “Sample 5”. On Table 1, we find “lead”, “Sample 5”, but not “absorption”. So “lead” is the link here because it appears on both figures. But we need a little more help to actually connect the dots for this question. So what else appears on both Figure 1 and Table 1? The answer is “ppm”. And this is our key link.

If you notice, on the horizontal axis of Figure 1 we have ppm listed across the bottom, and along the top of the Table 1 we see ppm as well (ppm, if you are curious, stands for “parts per million.”) So, since the question asks about Sample 5, let’s start there in Table 1 and look at the “Lead in 100 ml” column. The value here is 2.3 ppm. So now, we can link this to Figure 1, find where 2.3 would fall along the horizontal axis of Figure 1 and follow the lead line (our other link), to see where it is at that point. Looks like it is closest to 13% and so our answer is C.

So, as a recap, the basic process for linking charts and graphs is to find the key terms in your question, figure out which terms appear in both places referred to in the question and use these key terms to connect the dots. This takes a little practice, but once you get used to it, you’ll be surprised how quickly you can answer some questions without even needing to fully understand what the question is asking!

ACT Writing Test

Introduction to the Optional ACT Writing Test

The ACT Enhanced Writing Test measures your ability to evaluate different perspectives on a debatable topic and write an essay (within a time limit!) presenting your own argument on the issue and supporting it with specific details and examples. It is an optional component of the ACT, although there are still a *very* small handful of colleges and universities that require or recommend it for admissions. It's always good to doublecheck whether your schools do or don't.

What to Know:

- You have a 40-minute time limit to plan and write your essay.
- There will be one essay prompt that will present you with a debatable topic and three different perspectives on it. The prompt will ask you to evaluate the three different perspectives, present your own perspective (which may agree in part or in full with any of the provided viewpoints), and explain the relationship between your viewpoint and the provided ones.
- The essay is scored by two graders, each of whom will assign you a score of 1 to 6 on four different writing "domains." Your total points added up between these two graders are converted to a scaled score of 1 to 36, which is the final score you will see on your score report.

What to Study:

- Practice planning and writing essays on practice ACT essay prompts. Although writing full essays is the best practice, ten-minute outlining sessions in which you plan out your essay (like you will do on the test) can go a long way in helping you learn how to quickly generate and organize your ideas.

- Share your writing with the strong writers you know and get feedback from them. Have them score your practice essays using the ACT rubric.
- Review the sample essays on acts.org so that you can get a sense of what kinds of essays get which scores. This can be incredibly helpful!
- Learn about current events and form your own opinions on them. Engage in lively debates with your friends and family so that you can practice supporting your opinions and anticipating opposing arguments!

Top Tips for the ACT Writing Test

Tip 1: Choose to agree with one of the three perspectives rather than presenting your own. You can get a perfect score by agreeing with one of the perspectives; with such a limited amount of time to write, why make your life harder (and risk going off topic) by developing a fourth perspective? (For VERY strong writers, you may be able to score a slam dunk by modifying one of the perspectives or narrowing its focus slightly but avoid the temptation to do something completely different. It's too easy to get off track.)

Tip 2: Never, ever, ever be wishy-washy. Pick a side. You have three perspectives to evaluate, but this definitely doesn't mean that you should agree with all of them. At least two of these perspectives will be in conflict with one another, and the essay asks you to develop and support one argument. And you can't possibly do that if you try to agree with all the perspectives. Decide what your stance is on the debatable issue and then agree with the perspectives that help support your argument and challenge the ones that don't.

Tip 3: On that note, when you pick your perspective, pick the one that you can more easily think of concrete, specific examples for, even if you don't necessarily agree with it.

Tip 4: Use a five-paragraph essay structure: an introduction with a clear thesis; one body paragraph on each of the perspectives (ending with the one that fits in best with your perspective) including concrete pieces of evidence; and a conclusion that ties everything together.

Tip 5: Consider including counter-arguments and examples where appropriate regarding the perspectives you don't agree with. (But make sure that it's a criticism someone might actually use. Making a weak counter-argument only makes you look weak!)

TIp 6: Try to vary your types of evidence among historical circumstances, personal examples, common knowledge, and objective reasoning; it makes your argument much more persuasive, which leads to a higher score!

Tip 7: Remember to keep your handwriting legible. An essay the graders can't read will be given a zero, no matter how great the content is.

Tip 8: Resist the urge to edit too much as you go. Changing a word here or there is fine, but don't worry about perfection in a forty-minute essay. The graders know you don't have a lot of time.

Tip 9: Finally, keep an eye on the time. Devote about 10-15 minutes to prewriting, 20-25 minutes to writing, and 2-3 minutes to proofreading. Wear a watch so you know for a fact how much time you have left. Your proctor may not be the greatest at reminding you how much time has passed, and on the essay, every minute really counts. (And, no, you won't be able to use your phone, even to keep time!)

ACT Essay Sample Prompt

Before you peek at the prompt on the next page, set aside some time to either do a timed outline (about 10 minutes) or an entire essay (about 40 minutes), so you can make the most of it.

Censorship

Almost since human beings began sharing ideas, the issue of censorship (officially suppressing ideas or writing) has been debated. Proponents of censorship argue, for example, that offensive material might morally corrupt children or that governments have the right to protect their national secrets. Opponents argue that censorship infringes on individual freedom and hinders progress. Censorship has long been an issue regarding books and papers; now, it has become a critical issue concerning the great amount of information on the Internet. Given the continued impact of censorship on various aspects of our lives, it is an issue worth examining.

Read and carefully consider these perspectives. Each suggests a particular way of thinking about the impact of censorship.

Perspective One

Selective censorship prevents children from being exposed to offensive material. It allows parents and caretakers to determine what material children are ready for and when they are ready based on their maturity level.

Perspective Two

Censorship intrudes upon freedom of the press and freedom of speech. Individuals have the right to learn about their world, both its positive and negative aspects, and express their ideas on it.

Perspective Three

Censorship should not be condoned because it places too much power in the hands of a few: no government or leadership system should be allowed to decide what information should reach the public.

Essay Task

Write a unified, coherent essay in which you evaluate multiple perspectives on the impact of censorship on society. In your essay, be sure to:

- analyze and evaluate the perspectives given
- state and develop your own perspective on the issue
- explain the relationship between your perspective and those given

Your perspective may be in full agreement with any of the others, in partial agreement, or wholly different. Whatever the case, support your ideas with logical reasoning and detailed, persuasive examples.

ACT Study Schedules

Making the most of your study schedule

The first challenge of studying for the ACT is finding the time and energy to get started. The second challenge? Committing to your study plan.

If you haven't already noticed, high school is a game of time management. And finding a way to complete all your homework, study for your tests, finish your projects, manage all your extracurricular activities, sleep, and maybe even have some time left over for yourself.

Then, you throw standardized tests into the mix, and your well-organized schedule falls apart at the seams. Don't be overwhelmed! There are ways to make your life easier.

Finding an ACT study plan that works for you, and sticking to that plan, can help you stay organized and self-motivated while keeping procrastination at bay. With a good study plan, you'll study a little bit every day, preventing the weekend-long cram sessions that murder your sleep pattern and social life.

Rather than create your own study guide, from scratch, check out the Magoosh ACT Study Schedules online. They list all the materials and resources you'll need to study for the ACT (many of which are even free), and then give you day-by-day assignments covering all ACT topics and test strategies.

How to Use an ACT Study Guide

There's no such thing as a one-size-fits-all study schedule. However, adapting a study schedule to your needs shouldn't take too much effort. Here's what you do:

1) Honestly assess your ACT strengths and weaknesses.

Do you always struggle with a certain ACT test (that's what they call each section), or with a certain question type? Focus extra time and energy here. For example, you could do extra

practice problems, read up on the subject, or learn specific strategies for outsmarting the ACT's questions on that subject. Is your problem time management? Practice with a timer, and always answer the easiest questions first.

2) Determine how much time you can realistically devote to your ACT prep.

If you're working, playing sports, volunteering, and maintaining your course load all at the same time, you probably can't commit to an hour of ACT prep each day. In this case, you might want to break the One Month ACT Study Schedule into smaller units, and tackle it over two or three months. It's okay if you need to reschedule your exam to give yourself more time to study. Try to set realistic goals for yourself – it's important that you have time to sleep!

3) Always check your work and understand where you are making mistakes.

Just doing practice problems won't improve your ACT score very much. You need to figure out why you miss the problems that you get wrong, and then re-do those problems until you get them right. There's no use in making the same mistakes over and over during your ACT prep – it just means that you'll get the same types of problems wrong when they show up on the ACT.

4) Set small goals and keep track of your progress.

Tell yourself – by the end of the week, I will be able to do matrix problems without consulting my notes. Or, decide to follow the One Month Schedule day by day, and reward yourself at the end of the week with a trip to a guilty pleasure food joint or an hour of TV time. Make sure you're logging your progress in a notebook, or on your computer, so you can keep track of your goals and note which topics give you the most trouble.

5) Incorporate ACT prep into the rest of your life.

Achieving your goal score on the ACT takes more than just studying. Be sure to eat right, exercise, and get enough sleep. If your body and mind are healthy, you'll be much more calm and confident heading into this challenge. So, take some meaningful study breaks! Hang out

with your friends, watch your favorite show on Netflix, go on a leisurely jog ... all in the name of test prep.

Which Strategy Will Work Best for Me?

It's ok if your ACT study plan is unique! Making the most of your ACT study schedule requires adapting it to your particular needs. Experiment with various strategies to see which ones work best for you (there's no "one size fits all" approach to the ACT). Be patient if you don't see your scores shoot up immediately. The new strategies may slow you down or mess you up at first but practicing them will give you extra tools on test day.

Once you've practiced enough problems, so that you've refreshed your knowledge and test-taking skills, schedule a time for yourself to sit down and take a full practice test. Set a timer for each section and try to find a quiet room to mimic test-taking conditions. The goal is not to get every question correct, but to get a feel for what the timing of each section is like. You may not finish each test on your first try, but you'll know what strategies you need to practice.

How Do I Know if My Study Plan Works?

Focus on your progress, and don't be upset if your first couple practice tests aren't as high-scoring as you'd like. Preparing for a test takes organization, practice and a positive mental attitude. There is no such thing as a "good" or a "bad" test-taker. Some students are just more familiar with the content areas and strategies than others. Test-taking is a learned skill, so don't be discouraged. Create a checklist of your study sessions so you can reward yourself as you get work done!

Finding and Using Great ACT Resources

A great place to begin learning about the test itself is at act.org. If you can, order an official copy of the Real ACT Prep Guide. It includes full-length practice tests as well as answers and explanations.

Here's a secret: You don't need the newest edition of the Real Guide. Even an older copy will work for your prep purposes because the content of the ACT has not changed. The only thing to be mindful of when using older materials is that they might not reflect the timing and structure changes that took place in 2025-26. But! All those old practice questions are still a great way for you to practice your test-taking skills.

Here's how to begin: Do some practice problems to get a feel for the format of the test and to learn your personal strengths and weaknesses. Don't worry if you get a lot of questions wrong at first. Create an ACT study folder or online doc. and add a "Formula Sheet" and a "Vocab Sheet," where you can write any unfamiliar math formulas and vocabulary you come across in your studies. Make flashcards if that is an easy way for you to learn!

Tip: Though the ACT exam isn't as vocab-focused as the SAT, you can definitely use the free Magoosh SAT Vocab Flashcards (available on iPhone, Android, and the web) to boost your vocabulary knowledge. They're actually kind of addicting...

Study Schedules

Whether you're giving yourself a week, a month, or a year to prep for the ACT exam, it always helps to add some structure to your ACT study plan. Using a study schedule can help you stay motivated and hold you accountable, even on days when you'd rather not study for the ACT (yes, you'll probably have many days like this).

With this in mind, we created some study plans to help you ace your ACT prep. The plans include recommended materials, as well as steps for each stage of your prep.

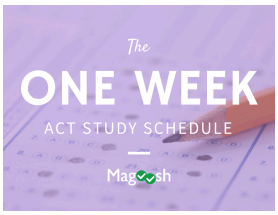
(All of our Study Schedules require Magoosh ACT Prep. If you have any questions about purchasing a plan, please email us at help@magoosh.com for more information!)

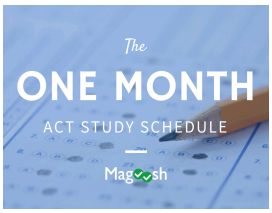
And be sure to let us know if you need help adapting a study schedule to your individual needs.

Happy Studying, Magooshers!

Magoosh ACT Study Plans

Click a link below to go to the corresponding ACT Study Schedule:





- One Week
- One Month
- Two Month
- Three Month

Test Day Tips

After all this time, ACT test day is finally looming. Here are some tips to make sure it goes as smoothly as you hope.

ACT Tip #1: Pack the day before.

The last thing you want to worry about as you shake yourself awake on test day is what you need to bring. In fact, ACT even provides a This not That List.

Here's What you Need:

- admissions ticket--it's in your MyACT account
- photo identification (crucial! You will not be admitted without it. Check acceptable forms of identification and that you have remembered to pack it the night before)
- (Paper Test) several sharpened soft lead No. 2 pencils (the old fashioned wooden kind; NOT mechanical.)
- a permitted calculator
- extra batteries
- a watch to pace yourself (you can't rely on the fact that the test room will have a clock.)
- eraser
- pencil sharpener
- healthy snacks (see below)

- a water bottle
- gum (did you know chewing gum improves accuracy and reaction times? Check out this and other test prep lifehacks on our blog – written for SAT prep but totally applicable to the ACT!)
- an outfit with layers (your test room may be too hot or too cold. It is rarely just right, Goldilocks.)

ACT Tip #2: Go to bed early.

Make sure you are giving yourself a solid night of sleep. For most teenagers, this is 8-9 hours. Figure out when you need to get up to be completely ready and at the test center stress-free and work backwards from this time to figure out when you need to go to bed. If you can't sleep, though, don't force it. Get up and do something else and try again in a half hour. Don't lie there agonizing.

ACT Tip #3: Wake up early and do some physical and mental exercise.

Go for a jog; do some jumping jacks. Waking your body and mind up is crucial. Read some articles from the newspaper and focus on finding the main idea. Try a couple math problems. Avoid the urge to do any last-minute ACT prep, but it is important that your brain is warmed up for the test.

ACT Tip #4: Eat a healthy, long-sustaining breakfast.

We like granola, fruit, eggs and veggies. Drink coffee only if you are used to it. Don't try it now if it is new– you might get crazy jitters.

ACT Tip #5: Bring a cheat sheet.

Not THAT kind of cheat sheet. But we recommend bringing an "ACT strategy cheat sheet" that you can review before the test and then tuck safely away in a bag. This should include the most important reminders you've learned from your test prep such as "Don't forget to watch out for comma splices!" and "Make sure to stick to a pace of 5 minutes per passage on the Science." Having a last-minute review list can help you remember that you are, in fact, prepared and you do, in fact, got this.

ACT Tip #6: Don't lose your cool before the test.

Libraries or cafeterias full of arriving test-takers are generally not good places. You could cut the nervous energy with a knife. So many anxious students fretting about whether or not there will be a comparison reading passage or quizzing each other on logarithms. Or even worse, the kid leaning up against the wall who looks like he could care less. Or a group of your friends pulling you into some Homecoming Dance drama that distracts you from the task at hand. Of course, eventually you need to check in, but if you get to the test center early, by all means, pull out your headphones, blast your favorite pump-me-up music and hang out outside. You've done too much preparation to let these other students shake your confidence.

ACT Tip #6: Keep your focus during the test.

A surefire way to not get the score you want is to constantly pay attention to the test-takers around you. How does that girl in front of you answer math problems so fast? Why can't that kid stop tapping his foot? Try to stay in the zone and focus on your particular strategies. Everyone is different, and what these other students are doing is irrelevant. And it should go without saying that you should avoid any temptation to peer at your neighbor's answer sheet. Cheating is not a risk you want to run here. And he's probably wrong anyway.

ACT Tip #7: Eat on your breaks even if you aren't hungry.

Your brain needs fuel just like the rest of your body, even if your nervous stomach doesn't think so. And the last thing you want is to let a perfectly good snack break go to waste only to regret it later when your stomach is howling halfway through the Science section. Fruit is great test fuel: the natural sugars help give you energy. Make sure to have something with protein too, like a handful of nuts. Many of our students swear by peanut butter and jelly sandwiches or trail mix with chocolate for the perfect combo of sugar and sustenance. Don't forget the water!

ACT Tip #8: Reward yourself.

You worked hard for this, and no matter how you think the test went, afterwards treat yourself to something you enjoy. You need the mental break and relaxation. But as important as an after-test reward is, I think that what is even more important is rewarding yourself during the exam. No, you can't whip out a cookie in the middle of the English section, but give yourself mental pats on the back when you catch yourself doing something right. So many students beat themselves up during a test for what they think they are doing wrong. Put a stop to this destructive mentality and instead congratulate yourself when you find yourself doing something right: sticking to your pacing or recognizing a grammar error you've missed before. It's a long test and a positive attitude is crucial!

Cheers to a fantastic test day!

Free Practice Materials

Where can you find free practice ACT resources?

Released ACT Exams

Your best source for free ACT practice tests is the actual people behind the ACT. ACT, Inc. has released several past exams. You can find an official practice test in the *Preparing for the ACT*

Guide, available online, and additional practice sections on act.org. (Note: the ACT refers to each section as a "test," so when you see "Math Test" it means the math section from a complete ACT).

These are the best practice tests you can find — straight from the test creators. However, they don't release a ton of free stuff. A simple Google, or other browser, search will give you lots of additional options, but not all free ACT practice tests are created equal.

Why Are They Free?

Perhaps you've heard the expression "There's no such thing as a free lunch." Well, it's true in every arena — including test prep.

If you're taking a free practice test, you should think about why it's free. ACT.org releases free tests so that people can prep for the exam and do as well as possible. Other companies (like Magoosh!) will give away free materials in the hopes that it will lead you to purchase additional resources. Companies like us have an incentive to make sure that our materials are good — you won't buy premium service if the free stuff isn't good, after all.

But there are other companies that will give away free stuff because they're going to sell advertisements or — worse — data about you. You should be wary of these sources — they have no incentive to give you top-quality test prep materials, and moreover they may end up selling your email address to any number of random third parties. Before you know it, you're getting emails for Rogaine or Donkey Rental.

Just because practice tests are free doesn't mean they're a good use of your time. There are lots of publishers out there that produce content quickly and — let's face it — poorly. If you're

going to spend multiple hours taking a practice test, make sure that test is as close to the real ACT as possible.

If you're using something created by ACT, then you can be pretty sure it will be good. But for other materials, it will be well worth your time to do some quick evaluation before you start taking practice tests. First, use materials from sources you trust. ACT.org and Magoosh are great places to start. You can also get a good sense of a company's test quality by reading some student reviews of the other materials that are available. Finally, you can evaluate the practice test yourself by quickly scanning to make sure the passages look like what you've seen on the officially released exams.

Additional Test Prep Resources

Magoosh ACT YouTube Channel

We help you ace the ACT with short, informative videos that aren't totally boring to watch. :) Click here to check us out (or search for MagooshACT on YouTube).

SAT Prep Resources

We all know that the ACT and SAT test are pretty different from one another: different formats, different scoring, different subjects tested. However, if you're preparing for both exams, you'll start to notice that there is quite a bit of overlap when it comes to required skills.

Don't think about the two exams as the ACT vs. the SAT, but as more of an ACT/SAT venn diagram. They share a lot of content, especially at a basic level. So, with that in mind, feel free to use some of Magoosh SAT's free resources to brush up on your basic skills:

- **SAT Vocabulary Flashcards: To help your reading comprehension skills.**
- **SAT Math Formula eBook: For brushing up on your basic math skills.**
- **Best Free Vocab Resources: Because online tools make learning vocab more fun.**

Your College Search

Not sure where to begin your college search? Feeling completely lost and confused?

Well guess what? In my humble opinion, I think that means you are actually one step ahead of the game. Despite all the talk out there about a "college search," the vast majority of college applicants never truly search for a school themselves. They make a list of colleges their friends like, their parents like, their counselors like, or simply schools they've seen on t-shirts or on TV. I was one of these students. I never looked outside of my own backyard, and when I started learning about all the amazing colleges and universities that are out there later on, boy, did I have some regrets.

So, first, pat yourself on the back just for being on the mission to uncover the right college for you. Now, let's talk about how you can find it.

Step 1: Take an Inventory of Yourself

Ask yourself these questions: What do I like and dislike about my current school? How do I learn best? Do I like to study alone or with a group? Do I like to have personal interactions with my teachers? Do I like socializing in large or small groups? Does climate have a serious impact on me? Do I need to be close to home? Do I like to be involved in a lot of activities? Do I need

school spirit? sports? theatre? There are so many questions to ask and lots of resources for self-assessments out there. Here is one that we particularly like.

Step 2: Establish Your Must-Haves

Take a look at the following list of criteria and determine what your requirements are for each category. Are there any deal-breakers? Are there any you don't have particularly strong feelings about? Be careful of eliminating anything you aren't sure about at this point: If you've never seen a small liberal arts school before, how do you know you don't want to go to one? If you don't know, then make some college visits before you rule anything out.

***Curriculum*:** Have you already decided on a major to pursue? Do you want to make sure you have options? Do you want to have a core curriculum or total freedom? Do you want to double major? Do you want to design your own major?

***Location*:** Is it important for you to be close/far from home? In a certain geographical region or climate?

***Size*:** Small? Medium? Large? Mega? Don't forget to consider the size of the individual program you are looking at, not just the whole school.

***Resources*:** Do you need specific resources for learning needs or psychological, social, or medical concerns? Desire a strong cultural or ethnic group support network? Want robust internships or research opportunities?

Activities: What types of activities are you interested in participating in in college, both on and off campus? What type of leadership, service, study abroad, etc. opportunities would you like to pursue?

***Cost and Financial Aid*:** How much can you/your family afford to pay for college? What level of financial aid do you need?

Step 3: Research, Explore, and Visit

Once you've determined what you are looking for in a college experience, you can begin exploring schools that meet your criteria. College Navigator is a good tool to launch your college search based on the criteria you've established. (You can also check out our list of the best free online resources for your college search below!)

Once you've developed an exploratory list, lay out a plan for visits. If you don't have the time or means to visit colleges far away, pick a selection of different types of schools within a day's drive. Plan out a handful of weekend trips to visit 2 to 4 schools each weekend (any more and they will all start to run together in your mind).

For the schools you can't visit (and even for the ones you can), do research online, get on mailing lists, visit with the rep when they come to your school, talk to current students and alumni, and go to college fairs. Learn as much as you can!

Step 4: Refine Your List

Once you've done your exploration, refine your college list. The length of this list can vary. Some students have three or four schools, others have fifteen. Whatever you do, make sure to cover your bases. You should have a balance of good bets (schools you have more than a 75% chance of getting into), targets (schools you have a 25% to 75% chance of getting into), and reaches (schools you have less than a 25% chance of getting into).

Step 5: Express Your Interest

Now that *you* know which schools you are interested in, make sure *they* know it too! Take advantage of opportunities for interviews and meetings with representatives and alumni; get on their mailing list. Even if these contacts don't seem to lead anywhere, when it comes time

for your application, you will be able to check off all sorts of boxes that show your demonstrated interest in the school and your essays will reflect your effort. Go to each school's website and find the admissions representative who will be reading your application (sometimes this is based on the alphabet or geography, sometimes on other criteria). This person is going to be your contact throughout the admissions process. Definitely don't pester them, but don't hesitate to reach out if you have important questions or if you need to follow up with information regarding your application.

Remember, this is YOUR college search! All sorts of people–from your parents to your friends to your teachers–are going to have their own thoughts about it. Listen to them, but don't be swayed by the opinions of others. If you have a better sense of who you are and what you want in a school, you'll be much less likely to fall into this trap and far more likely to fall in love with your chosen school once you get there.

Free College Search Resources

Fortunate college applicants of the Internet age! You have so many resources at your fingertips to find the right school for you! Here are ten of our favorite free resources for an online college search.

College Confidential SuperMatch: A search tool that uses 20 criteria (attributes such as location, major, diversity, special services, and party scene) to help you find the right school for you. It uses a "fuzzy" approach to ranking schools based on your preferences, meaning it finds not only the perfect matches, but also the schools that are pretty darn close.

College Navigator: Not quite as fun as College Confidential's tool, but is an authoritative one hosted by the National Center for Education Statistics. You can search for schools by criteria, compare them side by side, and pinpoint school locations on an interactive map.

Big Future from the College Board: Another well-respected search tool. Of particular note is the ability to find schools based on test scores, those that offer academic credit for advanced high school courses, and those that meet financial aid needs.

U.S. News and World Report Best Colleges: The most famous national source of college rankings, highly anticipated each year. You will need either a website subscription or a purchase of the magazine for full details on the rankings.

Colleges that Change Lives: A non-profit organization promoting a small group of liberal arts colleges supporting a student-centered college experience. Also has numerous quality resources for a general college search.

Best Colleges: Uses compiled information from various sources to rank colleges on specific features (for example, online colleges that offer free laptops, tuition-free colleges, and colleges with lowest out-of-state tuition)

Niche (formerly College Prowler): provides the "real dirt" on colleges; students review aspects of the college experience at their respective schools, such as the sports scene or campus food. Lots of information; take individual student opinions with a grain of salt, though.

Intro to Financial Aid

For high school seniors everywhere, navigating the ins and outs of financial aid can be completely confusing. So many deadlines, so many forms, so many weird acronyms that would make interesting band names (FAFSA NATION, anyone?).

In all honesty, everything can get a bit overwhelming. In this section, we'll try to guide you through the basics of the process step-by-step.

But first of all...

Why do I need financial aid?

College is a wallet demolisher. Costs not only include tuition, but room and board, textbooks, personal and travel expenses, and well, you name it. It's expensive! More and more students these days are graduating with enormous amounts of debt — debt that would not exist in such considerable quantities if more people had known how to maximize the amount of financial aid they were eligible for.

There is a nifty calculator on finaid.org for calculating how much financial aid you could qualify for based on your EFC (Estimated Family Contribution). Even if you don't think you will qualify for much aid, you should try anyways. There really is no risk involved.

Financial aid can come in the form of institution-based financial aid, given out by the school; federal aid; and separate scholarships run by private organizations. They are all important, and

they can all save you from becoming bankrupt, becoming homeless, and living in a cardboard box crying over your framed diploma.

Image from speedbump.com

Deadlines

The FAFSA, CSS, scholarship applications, Cal grants, tax return information...there are so many forms to send in! All colleges usually have a specific deadline as to when they'd like to receive these.

Before you start any of this process, it's important to write down all of your deadlines for all of your schools. When you're mailing material in, deadlines are usually a lot more flexible — but it's still important to get all of your materials mailed in on time.

For a lot of colleges, these forms are due at the beginning of February. Other colleges have deadlines toward March or even April and May. If you can't find deadline information on one of your colleges, call the Admissions Office! It won't hurt to check!

So...what are all these forms I have to submit?

The most popular and well-known form is the infamous FAFSA.

It stands for the "Free Application for Federal Student Aid," which basically speaks for itself. It's completely free, and if you enter in all financial info and submit your application, you can receive an estimate for how much the government can give you. This application is nice because you can submit the same one to all of your schools. Within a few weeks of submitting the FAFSA, a paper Student Aid Report will be mailed to you, detailing information from your FAFSA and your Expected Family Contribution. If you also provided an email, you'll receive a link to your results after just a few days.

Overall, the FAFSA is a bit faster and easier to complete than the other major financial aid forms.

CSS

The "College Scholarship Service" is not required by every school — in fact many schools only require the FAFSA! There are about 200 colleges, however, that do require the CSS Profile. These colleges include a lot of the top schools, like the Ivy Leagues. Check with your school to see if it requires this form! Otherwise, you might be missing out on a huge portion of financial aid.

Using information provided on the CSS, they will compute how much institutional aid you are eligible for. If your Estimated Family Contribution is less than the college's tuition fees, you can qualify for need-based financial aid!

The CSS Profile is run by College Board, and because College Board hasn't milked your wallet enough already, there is an application fee and an additional fee for every school. If you are applying to 10+ schools, we sympathize with you.

Separate financial aid documents

1) Institution-specific

There are some schools like Princeton and the University of Pennsylvania that have their own separate financial aid forms as well. For Princeton, if you already submitted a CSS form, you can sync the information from CSS to Princeton's own application form to make the process quicker. These institution-specific forms can be difficult to find. Make sure you know if any of your schools require this!

2) Cal grants

If you are applying to any school in California, make sure you have this done! Cal grants offer financial aid/grants to anyone attending a California university — and according to its website, you can receive up to $12,192 in financial aid that you don't have to pay back. All you have to do is fill out the FAFSA and have your counselor fill out a GPA verification form. The deadline is normally early March.

3) Tax returns

This is a particularly annoying part of the financial aid process, but it's necessary nonetheless. Lots of schools require copies of your tax returns in order to verify your imputed information. This means the entire tax return packet: all forms and schedules included, signed by both of your parents. College Board has a nifty service called IDOC through which you can send these digitally. You can also make copies and physically send it out to your colleges, but this is very labor intensive.

Other

Merit Aid

This is another type of student aid which is awarded based on your academic, athletic, musical, etc. achievements, rather than your family situation. Unfortunately, most of the elite colleges in the U.S. do not offer academic merit aid (and only offer need-based aid), so this is considerably less common.

Private scholarships

Sometimes, you can receive an institutionally-based scholarship just by sending in your application. No extra forms needed. There are tons of other scholarships out there, however, that require a little bit more initiative on your part.

Takeaway

This article does not cover all of your financial aid options by far, but hopefully it helped out a bit with clearing up the process! It's tricky, but in the end it will definitely be worth it.

Don't let the cost of college get you down. With the right financial aid, you can do anything.

Peace. Love. Dolla billz.

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