

# **SAT/ACT MANUAL**

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## FOREWORD

### TWO TESTS

The first thing you might notice about this manual is that it deals with BOTH the SAT and the ACT.

There are a couple of very good reasons for that.

First, the two tests overlap BIG time: something like 90%.

Second, students around the country are figuring out that they can take both tests, and use either one for admissions and scholarships.

So it makes sense to get the “skinny” on both tests.

You can take either test or both: it doesn't matter. All colleges and universities, with literally a handful of exceptions, will take either one. Pick the one you like better and work hard on it. If you want to work on both, fine, but you'll probably prefer one, and if you're not a hotshot test taker, you'll probably not want to burden yourself with 2 tests if you only need one.

You also probably noticed the “Coach” in the title of this program. That's our metaphor for teaching the tests. It could be a football or basketball coach.

But it could just as easily be a golf or a gymnastics or a dance coach—or a speech, or debate, or drama coach.

That's because the challenge of the SAT and ACT is that of any performance based activity.

In school, you take tests that ask you to memorize a lot of detail about one topic you learned about last week or last month.

The SAT and ACT test you on basic intellectual skills you've learned over many years: that's more like sports or dance and drama than anything—including tests in school. You learn the basic moves, you learn a strategy, you practice, you peak, and you perform.

So, that's how we approach the tests. If your game is football or basketball, fine. If it's golf, fine. If it's track and field or tennis, fine. If it's dance or drama or music, or whatever, it's all the same: learn the basics, practice, peak and perform!

## CHAPTER 1

### OVERVIEW

You know, if you're playing a game or a sport, you better know which one you're playing.

The problem with most kids taking the SAT or ACT is that they think they're taking a normal test.

They're not!

The SAT and ACT are very carefully put together to LOOK like regular tests, but they're in fact very different. In fact, the closer you look, the more different they are from regular tests in school.

So, the first thing to get in the game is: know what the SAT and ACT are--and what they're not!

The ACT has 4 sections: English, Math, Reading, and Science, plus an optional essay.

The SAT has 10 sections, divided among Math, Reading, Writing, and an essay.

90% of this stuff boils down to 3 things: Grammar, Arithmetic & Elementary Geometry, and Reading. The other 10% consists of a few vocabulary questions on the SAT and the science section on the ACT, which has nothing to do with science!

Hard to believe, but true!

### GRAMMAR

The ACT English and SAT Writing Sections test grammar. Not just grammar, but the basic, everyday grammar you use automatically without even thinking about it! Nothing fancy. Just the obvious, everyday stuff. So obvious, in fact, that if it sounds right, or looks right, it IS right! 90% of the time. You can trust your ear on the Grammar sections 90% of the time.

By the way, you're great at basic grammar. You've been doing it all your life.

We'll show you that there are only 2 basic things you have to do on the grammar sections:

First, because good grammar is not wordy, pick shorter answers!

Second, because grammar comes down to details, be careful!

If you follow these 2 rules, you'll do great!

Remember: the ACT English and SAT Writing sections are basic grammar.

## **MATH**

What people don't realize is that this is elementary school math, not high school or even college math! It's 80% arithmetic, and 20% elementary geometry. Even the stuff that looks like algebra, isn't! It's just arithmetic. There's no calculus, pre-calculus, analytic geometry, algebra II. There's absolutely no trigonometry on the SAT and only 4 questions on the ACT that test the 3 basic trig ratios—sine, cosine, and tangent—which are, despite the fancy names, just ratios or fractions, a concept you learned in 3<sup>rd</sup> grade!

You probably are thinking: no algebra?? Give me a break! OK, look at this:

$$2X + 3 = 7$$

This is a typical math problem on both tests. It's an easy one, but it illustrates the point, and harder problems are similar, with just more steps.

First, what kind of problem is it? You want to say algebra, right? Why? Because it has an X in it, right? That's what most people say.

Fine, if that's the definition of algebra, then this would be algebra, also:

$$X + X = 2X$$

That's not algebra, is it? One apple plus one apple is 2 apples. Last we checked, that was arithmetic.

So let's solve the problem.

$$2X + 3 = 7$$

First step: what do you do? Subtract 3, right?

Then, divide by 2

Voila! So, subtract and divide! That's arithmetic, not algebra!

What it's called is PRE-algebra. Sure, there's tons of pre-algebra on these tests, but PRE means BEFORE. BEFORE algebra was--arithmetic! Pre-algebra is just a fancy word meaning arithmetic applied to unknowns like X and Y or apples and oranges—same difference.

But there's no REAL algebra on these tests. What's a real algebra question?

Train A leaves at 10 am going 80 mph. Train B leaves at noon going 100 mph.

Are you groaning yet? You recognize this, don't you? The hated word problems from algebra class that no one except the math nerds understood, right?

The rest of the problem goes (as if you didn't remember!):

What time does Train B catch Train A and how far down the track?

Now, THAT's a real algebra problem. But it's not on the tests. Why? Because it's just too hard.

If you went to a typical high school and lined up all the seniors who've gotten straight A's for 4 years of math, you'd have about 10% of the class, right? Only about 10% of them thoroughly understand algebra, let alone calculus. That's about 1% of the whole school. There's no point in putting questions on the SAT and ACT that only 1% of kids understand.

Remember: there are a lot of word problems on these tests, but they're just ARITHMETIC word problems, not algebra!

Here's a classic example:

The local high school is holding its election for student council president. There are 500 students in the school. The election rules require that a candidate receive at least 40% of the vote to avoid a run-off election. If Jane fell 12 votes short of this requirement, how many votes did she receive?

Many people would think this is an algebra word problem. Why? Because everyone assumes, for some reason, that any WORD problem is an ALGEBRA word problem. That's probably because they're scared of algebra, and we always expect the worst, right?

But let's do this problem:

First, we need 40% of 500, right? That's .4 times 500 which is 200. Didn't even need the calculator for that, but you're welcome to use yours.

Alright, she needed 200, but she got 12 less. So that's  $200 - 12$ , which is 188. Again, no calculator, but hey, be our guest. Two simple arithmetic steps. That's it. Done.



There's no algebra? Yep, there's no algebra!

## **READING**

That brings us to Reading. No mystery there. You've been reading since first grade.

You read some passages, you answer some questions. Simple enough.

That leaves only a few vocab questions on the SAT and the science section of the ACT that has nothing to do with science. We'll get to those in a minute.

So far, we have GRAMMAR, MOSTLY ARITHMETIC, AND READING.

A question for you: why this stuff? Why not literature? Why not calculus? Why not history? Economics? Philosophy? Art? Real science, like physics, chemistry, or bio?

If you think about it, you might come up with the answer on your own. Grammar, arithmetic, and reading are basic, aren't they? The most basic stuff you need to know, in fact.

That's exactly why they're tested on the SAT and ACT. It's the stuff you need to know to survive in life.

Grammar: Do you need to speak and write properly? Of course. You can't write a business letter full of grammar errors. No one would take you seriously.

Do you need arithmetic in life? It's the only math you DO need! You know when you or your friends complain to your math teacher that you're never going to use pre-cal or calculus in life? The teachers probably get a bit annoyed. But you're absolutely right! You're never going to use that stuff unless you become an engineer or physicist or an actuarial scientist (that's an insurance person who uses a lot of math) or an econometrician (that's an economist who uses a lot of math.)

What do you do when you bake a cake? If you've never baked a cake, hang on: this isn't rocket science. When you bake a cake, you use proportions. One cup of sugar is good for 2 cakes, how many cups do you need for 3 cakes? If you're Bill Gates, you do the same to figure out how to make more money for Microsoft:

If we made 12 billion dollars in net profit last year and we invested 1.2 billion in research and development, how much do we have to spend on R&D if we want to make 15 billion next year?

$$\frac{1.2 \text{ billion}}{12 \text{ billion}} = \frac{X}{15 \text{ billion}}$$

By the way, you know how to finish from here, right? Cross-multiply and solve. 5<sup>th</sup> or 6<sup>th</sup> grade. You got it!

The world runs on arithmetic, not calculus. By the way, the tests are full of proportions.

So, obviously we need grammar and arithmetic in life. How about Reading: do you need to read in life? Duh! In fact, it's the most important skill in life, since you learn just about everything else, at least academic stuff, through reading, right?

Reading, grammar, arithmetic. Sound familiar? Remember the 3 R's? Reading Writing Arithmetic. The basics. That's what our public school education was based on 100 years ago when it was set up. That's what you need in life. And that's what these tests are about.

Okay, that leaves a few vocab questions on the SAT and the science section on the ACT. Well, the vocab on the SAT has gone the way of the dinosaurs, or almost. Back in the day, before 1997, they called the reading section Verbal, and it was 80% vocab and 20% reading.

In 1997, they took off a vocab question type, and that made it about 50-50 vocab and reading. In 2005 they took off another vocab question type, and now it's pretty much 20% vocab and 80% reading. If you're happy about that, you should be: the vocab on the SAT has always been tough, but now there's very little of it, so there's really no need to worry about it.

Later, we'll talk about a great tip to get a lot of these questions right even if you don't know the words, just by looking at them! So stay tuned.

As for the science on the ACT, never was there a more mis-named beast. A lot like calling a 98 Dodge Neon a sports car. Actually: it's worse than that: at least the Dodge Neon is a car!

The science section on the ACT does not test ANY knowledge of science AT ALL! Not a single fact? You don't have to know that H<sub>2</sub>O is water! You don't have to have ANY understanding of science! You don't even have to know how to set up a basic experiment.

So what IS it and why is it called Science?

It's just a test of reading charts and graphs. Can you find information in a chart or graph? That's it! You're done!

And why is it called Science? Probably just because it sounds like science stuff. You know: rock formations, hoarding habits of rodents, radio frequencies. But if you can read the TV guide, you can read these charts and graphs. No kidding, it's exactly like that. The charts and graphs could just as well be full of cooking recipes or baseball stats or TV shows. No kidding!

We'll show you how to blow this section away when we get to it in detail.

## **DIFFERENCES BETWEEN THE SAT AND ACT**

What's the difference between the SAT and ACT and which should you take?

Let's start with which you should take.

There are a lot of myths about these tests, and one of the big ones is that you need the SAT for certain schools and the ACT for other schools.

Nonsense!

You can use either test for virtually any college or university in the country.

And the same goes for scholarships: either test will do for virtually all of them.

The SAT has traditionally been more popular on the East Coast and West Coast. The ACT has been more popular in the mid-West and the Southeast.

But you can use the ACT for the Ivy League and Stanford and UCLA—and you can use the SAT for the University of Arkansas to the University of Georgia. In fact, the Southeast is where competitive students tend to take both tests.

Increasingly, students everywhere are figuring out they can use either test, and they are experimenting to see which one they're better at.

That's what you should do.

You may well find that the ACT makes more sense to you. It was designed to feel that way. It tests you on what you learned in school the way you learned it. The SAT tests you on what you learned and tricks it up. Not with hard tricks--but with silly little gotcha tricks.

Still, even that has changed a lot with the new SAT. The new SAT was forced to change to become a lot more like the ACT. That's

because the University of California System decided they preferred the ACT, forcing the SAT to change. That was front page news a few years ago.

But if you're a very strong test taker, you'll probably find both pretty easy. For most students, picking one and working hard on it makes the most sense. If you're an average test taker from the Northeast or on the West Coast, take a close look at the ACT. You may very well prefer it and do significantly better on it. Again, a lot of students in the North and elsewhere are beginning to figure this out.

People often ask: which is harder: the SAT or the ACT?

The answer is another question: What's harder: English or Japanese?

The correct answer, of course, is: it depends. It depends on whether you're an American or a Japanese student.

It depends on what you're used to.

The ACT was designed to test what you learned the way you learned it. The SAT tricks it up. So, for most people, the ACT feels easier. Notice we said "feels". The ACT actually tests more stuff and in greater depth than the SAT. The science section, for example. And the few trigonometry questions on the math.

Probably the favorite trap of the SAT is to ask:

**Which is bigger:  $X$  or  $X^2$ ?**

The obvious answer is  $X^2$ . For example, 2 squared is 4.

But  $X^2$  is not always bigger. One squared is one. Zero squared is zero. And if you square  $1/2$ , you get  $1/4$ , which is actually smaller.

That's not difficult; everyone knows that. But even the smartest student could forget it long enough to get the question wrong.

The SAT has ten sections; the ACT has four (five if you include the optional essay).

The SAT is somewhat longer; but the ACT has more questions, so it's more time pressured.

The SAT has a guessing penalty, which we'll discuss more later (see Appendix for details); the ACT does not.

The SAT's questions go from easier to harder; the ACT's do not--except for the math section, where the first half are easier than the second half.

**There are other differences, but these are the big ones. You can summarize the difference pretty well by saying the SAT is trickier, while the ACT is more time pressured. In the end, the tests are more alike than they are different. But you will still probably feel a preference for one over the other, and do better on it. As you go through this program and do some practice, you will decide that for yourself.**

## **APPROACHING THE TESTS**

The problem with most students' approach to these tests is that they go about them all wrong.

They think the tests are complex college or at least high school tests. They're not: they're simple elementary level tests.

The most advanced formula that is regularly tested on both tests is the Pythagorean Theorem. You learned that in 7<sup>th</sup> or 8<sup>th</sup> grade, or 9<sup>th</sup> at the latest. That's it!

And, as we mentioned before, you've been doing basic Grammar and Reading all your lives, since the age of 5 or 6. Remember: it's all about Reading Writing and Arithmetic: the Basics.

But simple is not the same as easy.

There are a lot of very simple things in life that aren't easy.

Take the marathon.

There's nothing simpler than a marathon: just put one foot in front of the other for 26 miles. Pretty simple.

But it isn't easy.

Now, thankfully, the tests aren't as hard as a marathon.

But they ARE long: 3 ½ to 4 hours of testing, plus the time sitting around—pretty much from 8 am to 1 pm.

They test a lot of different things at once that you've learned over many years, some of which you've forgotten. You're used to being tested in detail on one topic you learned about last week or last month.

You've got a weird format you don't see every day.

You have time pressure, and the pressure to do well to get into college.

You add these things up and you have a pretty challenging test.

But all of these things are things you get better on naturally with coaching and practice. You get tougher, so you can concentrate longer and better, you get faster, and of course you learn to answer the questions more accurately and with more confidence.

So there's nothing complex about these tests. You just have to approach them in the right way.

The RIGHT WAY is to understand that there are basically 2 types of questions:

**Easy questions that look *easy***

and

**Easy questions that look *hard***

But there are--altogether now ...

**NO HARD QUESTIONS!**

There's not a single question on the tests that the average person wouldn't understand once we explained it to him or her. The trick is to learn to do it by yourself in the time limit.

On both tests, you have to review the basic elementary level math you need.

You need to practice the grammar questions mostly to avoid careless mistakes.

You need to come up with a faster way to get through the Reading.

And you need to approach the science on the ACT and the vocab questions on the SAT in the most efficient way. We're going to show you how to do all this.



But it's all SIMPLE, SIMPLE, SIMPLE. In math, the term they use for solving is SIMPLIFY, right?

Solving means exactly that: make it simpler.

That's our approach.



## CHAPTER 2

### GRAMMAR / READING

As we said in the Intro, the English section on the ACT and the Writing section on the SAT are all about basic everyday grammar. You're already virtually perfect at it. You just have to approach it correctly on the tests.

And, as we said about Reading, obviously you already know how to read. The trick is to do it better and faster on the tests.

Let's start with Grammar.

### GRAMMAR

On the ACT English, you have 5 text passages with 15 questions each, with parts of each passage underlined. You're asked to fix the underlined parts, if necessary. If not, you pick the first choice: no change. You have 45 minutes for the whole section, that's 9 minutes per passage.

On the SAT Writing, you're given 3 questions types: 2 involve stand-alone sentences with underlined parts. In the first, you fix any errors. In the second, you identify any errors. The 3<sup>rd</sup> is a passage very much like the ACT passages. You have about 1 minute per question.

In both tests, it turns out that the biggest thing tested is not any rule of grammar, it's the idea that good English is short and to the point—not wordy or verbose or repetitive or redundant or saying the same thing over and over....as we're doing right now!

It turns out that the correct answer 80% of the on both tests is the shortest or next shortest answer choice.

So, the Golden Rule is:

<b>Shortest is best!</b>
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Now, we don't mean automatically pick the shortest one, that's silly: but be on the lookout for wordiness: you'll be amazed how many of the wrong answers are wrong just because they're wordy.

There are a few non-grammar questions in each ACT English passage (and even fewer on the SAT's passage-based portion) to which this doesn't apply—but they're easy to recognize, because they're longer and they ask about meaning or organization. (The ACT calls them rhetorical questions.) On those, you just apply Rule #2:

**Be careful!**

This applies to all questions on the Grammar sections: in fact, it applies to all questions on the tests! This stuff isn't complex, it's basic, basic, basic--but you DO have to read and understand the questions properly.

So, again, the KEYS to the grammar are:

**1. Shortest is Best**

**2. Be careful! Read the entire question  
and read carefully**

Now, one little thing that turns out to be pretty big on these tests is:

COMMAS

They look harmless enough, but there are dozens of rules about commas; who's got the time to deal with that?

So you apply one simple rule:

**A comma is a PAUSE**

Read the part with the comma, and try to do it without pausing. If there's any way you can read it without pausing and it sounds OK--

NO COMMA. Only if you're forced to pause, put the comma in. Remember: shortest is best, so when in doubt, leave it out! (Remember before you learned about commas, you never used any? Then you learned about them in 2<sup>nd</sup> grade, and now you use too many? There you go.)

Believe it or not, you now have all you need to do great on the grammar sections. So let's do some questions.

Take about 10 minutes and fix these sentences. They demonstrate the grammar you need on the tests. (The 5 before the last one are tricky: we'll explain later.)

TOM AND JOE WHEN TO THE STORE, AND HE BOUGHT AN ICE CREAM.

TOM AND JANE WENT TO THE STORE AND THEY BOUGHT AN ICE CREAM AND THEN THEY WENT TO THE MOVIES.

TOM AND JANE WENT TO THE STORE; AND BOUGHT ICE CREAM.

TOM, AND JANE, WENT TO THE STORE, BOUGHT ICE CREAM.

TOM AND JANE WENT TO THE STORE, BUYING ICE CREAM.

ITS A NICE DAY.

ITS' A NICE DAY.

GIVE THE DOG IT'S BONE.

WHOM IS CALLING?

WHO'S IS IT?

WHOSE THERE?

WHO SHOULD I GIVE THIS TO?

BEING AS THE SITUATION IS THAT YOU'RE MY FRIEND, I'LL TELL YOU.

THIS IS AN ISSUE WHERE WE DISAGREE.

LET'S WALK AND HIKE TO THE TOP OF THE SUMMIT OF THE MOUNTAIN.

WALKING DOWN THE ROAD, IT BEGAN TO RAIN ON ME.

NEITHER HE NOR YOU ARE READY.

EITHER JOE OR JANE ARE AT THE PARTY.

HE PUNCHED ME IN THE NOSE, AND I BEGAN TO BLEED.

HE PUNCHED ME IN THE NOSE; THEREFORE, I BEGAN TO BLEED.

HE PUNCHED ME IN THE NOSE; I BEGAN TO BLEED.

HE PUNCHED ME IN THE NOSE—I BEGAN TO BLEED.

HE PUNCHED ME IN THE NOSE: I BEGAN TO BLEED.

I LIKE YOU, AND NOW I'M GOING TO HURT YOU.

Alright, you done? Let's review.

**TOM AND JOE WENT TO THE STORE, AND THEY BOUGHT AN ICE CREAM.**

Plural nouns, plural pronouns. Simple. Don't worry about the rule; just use your ear. Tom and Joe: They. Simple.

**TOM AND JANE WENT TO THE STORE, (comma) AND THEY BOUGHT AN ICE CREAM, (comma!) AND THEN THEY WENT TO THE MOVIES.**

Alright, these are 3 independent clauses, so you need to connect them with commas and conjunctions. Again, the rule isn't necessary really--just use your ear: Tom and Jane went to the store...pause...and they bought an ice cream...pause...and then they went to the movies. Easy.

**TOM AND JANE WENT TO THE STORE AND BOUGHT ICE CREAM.**

This is just one clause with a double verb, so no comma is needed. But again just use your ear. You hear no pause, so no comma. A semi-colon, by the way, is a full stop, just like a period. You remember that, probably.

**TOM AND JANE WENT TO THE STORE AND BOUGHT ICE CREAM.**

No pauses, no commas.

**TOM AND JANE WENT TO THE STORE AND BOUGHT ICE CREAM.**

"Tom and Jane went to the store, buying ice cream" doesn't sound terrible, but it doesn't make a lot of sense, does it?

**ITS A NICE DAY.**

Wrong its. So: **It's a nice day.**

**ITS' A NICE DAY.**

No such word as its'. The plural of it is they. The possessive of they is their. So, again: **It's a nice day.**

**GIVE THE DOG IT'S BONE.**

Wrong "its". So: **Give the dog its bone.**

**WHOM IS CALLING?**

When you have trouble with who and whom, change them to he and him and it will be immediately clear. Him is calling? No, he is calling. So: **Who is calling?**

**WHO'S IS IT?**

Wrong who's. So: **Whose is it?**

**WHOSE THERE?**

Wrong whose. So: **Who is there? or Who's there?**



**WHO SHOULD I GIVE THIS TO?**

Give it to HIM. So: **Whom should I give this to?**

**BEING AS THE SITUATION IS THAT YOU'RE MY FRIEND, I'LL TELL YOU.**

Way too wordy. So: **BECAUSE you're my friend, I'll tell you.**  
Shortest is best.

**THIS IS AN ISSUE WHERE WE DISAGREE.**

An issue is not a place. "Where" can describe only places. Chicago is where I was born. Home is where I hang my hat. So: **This is an issue about which we disagree.**

**LET'S WALK AND HIKE TO THE TOP OF THE SUMMIT OF THE MOUNTAIN.**

Wordy, repetitive. So: **Let's hike to the top of the mountain.**  
Shortest is best.

**WALKING DOWN THE ROAD, THE RAIN BEGAN TO FALL ON ME.**

Oops. Sounds like the rain was walking down the road. So: **AS I WALKED DOWN THE ROAD, THE RAIN BEGAN TO FALL ON ME. OR: WALKING DOWN THE ROAD, I FELT THE RAIN BEGINNING TO FALL ON ME.** This is particularly tricky, especially on the SAT.

**NEITHER HE NOR YOU ARE READY.**

Neither is singular. So: **Neither he nor you is ready.**

**EITHER JOE OR JANE ARE AT THE PARTY.**

Either is singular, also. So: **Either Joe or Jane is at the party.**

The next five are kind of tricky—because they are all correct! That's actually the point. There's more than one way to write a correct sentence, in fact there are MANY ways.

And that's especially true when you're connecting independent clauses, like: "He punched me in the nose" and "I began to bleed".

So:

**HE PUNCHED ME IN THE NOSE, AND I BEGAN TO BLEED.**

Perfect. You can use a comma and a conjunction to connect two independent clauses. But, again, your ear probably worked just fine.

**HE PUNCHED ME IN THE NOSE; THEREFORE, I BEGAN TO BLEED.**

Perfect. You probably remember that a semi-colon is a full stop—it acts just like a period, right?

**HE PUNCHED ME IN THE NOSE; I BEGAN TO BLEED.**

Perfect. Same thing as before, plus you can add an interjection--e.g., therefore, accordingly, moreover, however--with a comma.

**HE PUNCHED ME IN THE NOSE—I BEGAN TO BLEED.**

Perfect. Dashes are fine. A lot of English teachers don't like them, but there's nothing wrong with them and the SAT and ACT like them.

**HE PUNCHED ME IN THE NOSE: I BEGAN TO BLEED.**

Very tricky. But perfect. Very few students (probably about 1 percent) know that a colon isn't limited to just lists of things—it can be used to introduce any kind of explanation. The ACT generally tests this twice on each English section: now you'll be one of the 1% who gets them right!

Finally:

**I LIKE YOU, AND NOW I'M GOING TO HURT YOU.**

Excuse the weird sentence. But the weirdness might help you recognize the point. The point is: the sentence doesn't make sense, does it? But it's grammatically correct! How can that be?

Well, it happens a lot on the tests. Just because a sentence is grammatically correct doesn't mean it makes sense. In this case, you have 2 independent clauses connected by a comma and a conjunction. Perfect. Except it's the WRONG conjunction. So: **I LIKE YOU, BUT NOW I'M GOING TO HURT YOU.** Both tests like to trick you with this. Not all the time, but enough that you should pay close attention to meaning.

A few other points on the Grammar sections:

On the ACT, you'll occasionally see a choice called "OMIT" or "DELETE". That means get rid of the underlined part entirely. You can't get any shorter than that, so OMIT or DELETE has a very high chance of being right. So look at it first. If it seems right, pick it. If not, pick something else. It's not always right, but it's right about 3 out of 5 times.

Another thing: don't be afraid to pick NO CHANGE on the ACT or NO ERROR on the SAT. These are right as often as any other choice. If you think there's no error, that's fine. Also, don't worry if you think there's no error on 2 questions in a row, or 3, or 4. It happens. In fact, NEVER worry about patterns of answers. The test makers are smart: they make sure there are funny or odd patterns just to make you think twice. Also, there's NO WAY to guess the pattern of correct answers. The test makers are too smart for that. So don't worry about it. Just answer the questions as best you can, and watch your time. Do that, and you'll score your best.

## READING

Alright, let's start with a typical reading passage. Here it is.

*Is Golf a Game, a pastime, a sport, or a hobby? Numerous debates have been had over this question, but on one thing most people agree. Whatever else golf is, it is challenging.*

*Think about it: you have to direct a ping pong sized ball over dozens, even hundreds of yards, of terrain, with the use of an oddly shaped stick, into a hole in the ground the size of an average coffee mug. Not to mention the trees, the water, and the sand pits strategically placed to gobble up any errant shot.*

*But perhaps the greatest challenge of golf is psychological. The ball is so small--the average person so much bigger. And it sits still, not like a pitched baseball. It's almost as if the little critter is mocking you, daring you to try to take a swing at it. And then the landscape: beautiful, but treacherous. And you think: this thing could go anywhere; I'm supposed to make it go one certain way, to one certain point, but it could go ANYWHERE....*

*No wonder golf has reduced even the most stalwart spirits to tears. Winston Churchill, the great English statesman, observed: "Golf is a game whose purpose is to hit a little ball with implements ill designed for the purpose." And Mark Twain, the great American writer, opined: "Golf is a good walk spoiled."*

*And yet millions valiantly persist. Golf grows ever more popular, with all sorts of people. Arnold Palmer probably*

*did more than anyone to popularize golf in America in the 50's and 60's. In recent years, Tiger Woods has made golf attractive to young people, including minorities, who would otherwise have spurned it in favor of basketball and football.*

*It is a tribute to the difficulty of the game that some of the greatest athletes of all time struggle with the sport. The great Michael Jordan, who loves the game and plays regularly, is at best a mediocre golfer. And Charles Barkley's golf swing is the subject of a humorous commercial.*

*As people have flocked to this elusive game in ever greater numbers, the sporting goods industry has developed a bonanza of game improving equipment. The design and construction of golf clubs and balls have undergone a veritable revolution in the last twenty years. Twenty years ago, one might have bought a full set of golf clubs (14), along with a carrying bag, for \$300. Today, it is not unusual to find a single club, an oversized driver or a super-technological putter, retailing for that amount, or more.*

*So, if you get hooked on this beguiling game, you may never master it, and you may hurt your wallet trying. But, not to worry, at least you won't be alone!*

We're going to repeat the text of this essay, but this time, we're going to show it the way the average student might read it, the way they might hear it in their head as they read the text:

Is Golf a game, a pastime (**What's a pastime?**) or a hobby?

**Oh, God, a passage about golf....how boring...OK, OK, concentrate...**

Is golf a game, a pastime, a sport, or a hobby?

Numerous debates have been had over this question,  
*(What's with debates? How's that connected with golf?)*  
**Alright...numerous debates. *blah,blah, blah...***

***Alright:***

Think about it, you have to direct a ping pong--***What?***

***Now it's ping pong?***

***Blah, blah, blah...***hundreds of  
yards...terrain...***blah..blah...***oddly shaped stick...

***Man...what is this stuff?***

***Let's jump ahead...hmmm...***Winston Churchill...Mark  
Twain...***Oh God!***

***Hmmm...***Arnold Palmer...***Who's he?***

Tiger Woods! ***Cool, I know that guy...Maybe I can get a  
question about him right....***

Alright, so maybe we exaggerate a little. But not a lot. Did you recognize anyone you know in that? Don't worry, it happens to the best of us. The hardest thing to do on these tests is concentrate. Remember, it's simple, simple, simple stuff. The key is knowing how to approach it and then focusing. The good news is you only have to focus a bit better, and that comes with practice. And even better news: we'll show you how to make it easier to focus, especially on reading.

But first, did you notice how the average reader spent a lot of time struggling with the passage? And did you notice how much he got out of it? Basically nothing. He never got the basic point that golf is challenging. He never understood that Churchill and Twain were underlining that point. He never got that Palmer and Woods were examples of another supporting point.

Have you ever started reading something, then got confused, started again, lost your train of thought, started again, then got frustrated or panicked and rushed through the thing, and basically got nothing out of it?

Or even found yourself looking out the window, thinking about the prom or last night's party, or what's up with the boyfriend or girlfriend?

That's human nature. The key is to make it easier on yourself to focus.

That's what we're going to do.

First, notice that there's quite a bit of information in this passage. You could probably ask 20 substantive questions about it. But the SAT and ACT will only ask you about 10. So trying to remember every detail about the passage as you read it isn't a good idea.

Better to get a BASIC idea of what the passage is about, get to the questions, find out what they want, then go find it in the passage.

Especially when you have time pressure. On the ACT, the time pressure on the Reading section is huge. On the SAT, it is pretty harsh, also.

The average student can't read everything and answer all the questions accurately in the amount of time available. You have to find a way to go faster.

The easiest way to read faster is to read LESS.

So, what you should do is:

**Read the first paragraph of the passage, then the first sentence of every paragraph after that, and the last sentence of the passage.**

Got that? That's: first paragraph, first sentence of every paragraph after, and last sentence.

So let's try it on this passage.

Below we'll re-write the passage the way you should read it.

First Paragraph:

*Is Golf a Game, a pastime, a sport, or a hobby?*

*Numerous debates have been had over this question, but on one thing most people agree. Whatever else golf is, it is challenging.*

Next paragraph, first sentence:

*Think about it: you have to direct a ping pong sized ball over dozens, even hundreds of yards, of terrain, with the use of an oddly shaped stick, into a hole in the ground the size of an average coffee mug.*

Next paragraph, first sentence:

*But perhaps the greatest challenge of golf is psychological.*

Next paragraph, first sentence:

*No wonder golf has reduced even the most stalwart spirits to tears.*

Next paragraph, first sentence:

*And yet millions valiantly persist.*

Next paragraph, first sentence:

*It is a tribute to the difficulty of the game that some of the greatest athletes of all time struggle with the sport.*

Next paragraph, first sentence:

*As people have flocked to this elusive game in ever greater numbers, the sporting goods industry has developed a bonanza of game improving equipment.*

Next paragraph, first sentence:

*So, if you get hooked on this beguiling game, you may never master it, and you may hurt your wallet trying.*



Final sentence of the whole passage:  
*But, not to worry, at least you won't be alone!*

So, what's the main point of this passage?

### **Golf is hard.**

Other supporting points:

**It's become very popular,  
and it can be very expensive.**

That's it. The rest is details. We can always go back for details.

Now let's go to the questions. Here are the questions:

**1. According to the passage, most people agree that golf is:**

- A. a pastime
- B. a hobby
- C. a sport
- D. challenging
- E. expensive

**The answer, D, is in the first paragraph.**

**2. According to the passage, the greatest challenge of golf is:**

- A. the cost to play it
- B. physical
- C. physiological
- D. mental
- E. to put the ball in the hole.

**The first sentence of the 3rd paragraph tells us that the greatest challenge is psychological. Mental is the closest choice. Physiological (a fancy word for physical) is a trap.**

**3. The passage suggests that Mark Twain and Winston Churchill both thought that golf is:**

- A. an entertaining pastime
- B. a difficult game to master
- C. too expensive
- D. a bonanza of equipment
- E. the favorite sport of Michael Jordan and Charles Barkeley

**The answer, B, is the main point of the passage and is repeated in the first sentence of the 4<sup>th</sup> paragraph, which goes on to use Twain and Churchill as evidence of this.**

**4. The author believes that Arnold Palmer and Tiger Woods:**

- A. were rivals in professional golf
- B. are stalwart spirits
- C. are friends of Michael Jordan and Charles Barkeley
- D. are responsible for the bonanza of golf equipment in recent years
- E. helped increase the popularity of golf

**The answer, E, is in the 5<sup>th</sup> paragraph. You'd find it by scanning for the names Arnold Palmer and Tiger Woods. Common sense.**

**5. The author would most likely agree that golf is:**

- A. played by stalwart spirits
- B. a game with ill-designed implements
- C. a ruined walk
- D. a lot like ping pong
- E. expensive

**The answer, E, is in the first sentence of the last paragraph.**

We could do a few more questions, but you get the idea.

That wasn't so bad, was it? We still had to read a little, and we still had to think a little. But not so much. We made it a lot easier. That's the key.

Basically we focused on the main ideas and worried about details when we had to: when the questions asked for them, and we went back to find them.

Now, this approach works better on some passages, not quite as well on others--but it's the best approach for all of them, and you can use it flexibly.

Notice what the title of the test section is: Reading. But do you get points for reading? Obviously not. You get points for answering questions.

The average person spends way too much time reading or trying to read, then rushes through the questions, gets confused, and messes up.

Get through the passage quickly with the main points, then spend your time reading the questions and answers carefully, then hunting for answers in the passage. That's how you get your best score.

And, if you're really a lousy reader, and we mean really lousy, don't read anything--go directly to the Q's and hunt for answers in the passage. If you're not good at it, don't do it!



## CHAPTER 3

### MATH

As we noted in the Intro, the math is grade school math. It focuses on the stuff you learned from 1<sup>st</sup> through 8<sup>th</sup> or 9<sup>th</sup> grade. The most advanced formula tested is the Pythagorean or the Dead Greek Guy's Theorem.

The math is 80% arithmetic on both tests. That's hard to believe, but it's true. The rest is elementary geometry. All stuff you learned in grade school.

Remember  $2X + 3 = 7$ ?

You subtract three...and divide by 2. That's it. Pure arithmetic. And just 2 steps.

Would you believe they ask you to count on these tests? Check this out:

Suppose you're a mailperson delivering mail to mailboxes numbered 25 through 100. How many did you fill?

75, right? Wrong! 76.

100 minus 25 is 75, sure. The world has not gone off its axis.

But when you do that, you count the 100, but not the 25. Think about it. If we asked you to show that  $100 - 25$  is 75 by counting on your fingers, instinctively you'd start with ...26, 27, 28...right?

Obviously, when you fill in the mailboxes, you're filling BOTH the 25<sup>th</sup> and the 100<sup>th</sup>, so that's 76.

But we're not done yet. Suppose we asked you how many mail boxes are BETWEEN the 25<sup>th</sup> and the 100<sup>th</sup>? 74, right? Because you're not including either the 25<sup>th</sup> or the 100<sup>th</sup>.

So, depending on how you ask the same simple counting problem, there are 3 different answers. Who knew counting was so complicated?

But that's why the tests don't have to mess around with algebra, let alone calculus: because they can get you with simple counting problems.

Plus the SAT likes to play dumb little gotcha tricks, and the ACT isn't above trying a few.

Remember when we asked you in the intro: What's bigger,  $X$  or  $X$  squared? The average person says  $X$  squared, but not always. Zero squared is zero, 1 squared is 1, and  $\frac{1}{2}$  squared is actually smaller,  $\frac{1}{4}$ !

That's probably the SAT's favorite trick. Another favorite is what we call the 2 changes to a number trick. Check it out:

Let's say you're thinking about buying a sweater at Christmas. It's on sale for a 20% discount. But you decide to wait till New Year's because you think you'll get an even better deal, and sure enough, it's on sale for an additional 10% off the new price. What's the total percent discount on the sweater?

Here are the choices:

- A. 10
- B. 20
- C. 28
- D. 30
- E. 70

You're thinking 30, aren't you? Or maybe you're thinking; No, it SOUNDS like 30, but obviously they're trying to trick me.

Right you are! In fact, it's NOT 30. How strange!

Well, maybe you listened carefully and heard that the 2<sup>nd</sup> discount was on the NEW price. That makes all the difference!

So, say the sweater costs originally 100 dollars. 20% off is 80 dollars. 10% of the NEW price is 10% off of 80, which is 8! Aha! That's 80 minus 8, which is 72! Not 70. So, the difference between 100 and 72 is 28. Voila! 28%!

Sneaky, huh?

Now, here's a harder one:

A teacher goes to work in the morning at an average speed of 50 mph. She comes home from work at an average speed of 40 mph. What's her average speed for the round trip?

- A. 40
- B.  $44 \frac{4}{9}$
- C. 45
- D.  $47 \frac{5}{9}$
- E. 50

Now on this one you DEFINITELY want to say: It HAS to be 45, right? But, again, you're thinking: No way: he's tricking me. It can't be 45. But how can it NOT be?!

Good question.

Well, you know a couple of things. You know it can't be 40, right? And it can't be 50. It has to be something in between.

Now, you're pretty sure it's not 45, and you're right. And you know that because this would be a question towards the end of the section, which means you know it's designed to be harder, which really means trickier.

So, being a smart test taker, you say, it's not 45. Now, the question is: is it LESS than 45, or MORE?

Think about that for a few seconds. You might come up with the answer, which is common sense.

The teacher goes the same distance each way, right? But she's going different speeds each way. That means she'll spend less time going at the faster speed, and more time going at the slower speed!

Get it now? That means the average of the speeds has to be a bit lower than exactly halfway in between—the average is pulled lower; it's a weighted average. It's like in school: you'd prefer to have four 100's and an 80 averaged for your final grade, rather than just one 100 and an 80, right?

So, you know it's lower than 45, and so the answer is B:  $44 \frac{4}{9}$ . The beauty of this is you got the question right, a very tricky one, just using common sense and a bit of test savvy.

You still don't know how to do this using "regular" math, do you? Don't worry: we'll show you how to use traditional math to solve this in chapter 5. But it's a guarantee that you'll like the method we just used a lot better, because it's so much easier!

These are obviously tricky, but once you've seen a couple, they're no big deal. Also, the key to doing well on the tests has much more do with knowing the basics well, not worrying about tricks.

The good news is that the ACT is NOT a very tricky test; and the SAT is not as tricky as it used to be, and the tricks are easy to catch if you're paying attention. In fact, that's really why the tricks are there: to see if you're paying attention. So: pay attention!

Other than that, you just have to know the **BASICS REALLY WELL**. Hopefully, better than you've ever known them before.

The good news is: you don't have to know a lot--just a few things out of the many you've learned in 10 to 12 years or so of school.

So, here they are.

**The things you MUST know:**



1) How many degrees are there in a rectangle or square?

2) How many degrees are there in a triangle?

3) How many degrees are there in a circle?

4) How many degrees are there in a line?

5) What is the formula for the area of a rectangle or square?

6) What is the formula for the area of a triangle?

7) What is the formula for the area of a circle?

8) What is the formula for the circumference of a circle?

9) What is the Pythagorean Theorem?

10) Factor:  $x^2 + 10x + 16$

11) Solve for x in the systems of equations:  
 $2x + 3y = 10$ ,  $5x - 6y = 14$

12) In a bag of marbles, there are 3 blue for every 4 red marbles. If there are 63 total marbles, how many are blue?

13) Given the two points (2,3) and (4,5), write the equation of the line connecting them.

14) For the ACT only: what is sine? cosine? tangent?

**Unbelievably simple, huh?**

**If you know all of these things, plus you can add, subtract, multiply, and divide, including fractions and percents and decimals, you can get a perfect or near perfect score on the SAT and the ACT.**

It's absolutely true.

Let's go over them.

1. How many degrees are there in a rectangle or square? 360.  
They have 4 corners, each a right angle or 90 degrees, so  $4 \times 90$  is 360.

2. How many degrees are there in a triangle?  
Well, isn't a triangle just half a rectangle? So, 180

3. How many degrees are there in a circle?  
360 degrees, right?

4. How many degrees are there in a line? Well, isn't a line just half a circle? So, 180.

5. What is the formula for the area of a rectangle or square?  
Length times width or base  $\times$  height. Easy. You remember that.

6. What is the formula for the area of a triangle? Well, again, a triangle is half a rectangle, so: one-half base  $\times$  height.

7. What is the formula for the area of a circle? Ok, this one and circumference are the two that students so often forget, even though you've covered it half a dozen times in grade school.  $\Pi r^2$ .

8. What is the formula for circumference of a circle?  $2\Pi r$ . [NOT  $2\Pi r^2$ !]

9 What is the Pythagorean Theorem? You know this:  $a^2 + b^2 = c^2$ . Applies ONLY to right triangles, right? Be careful with that.

10. Factor:  $x^2 + 10x + 16$ . You know this.  $(x + 2)(x + 8)$

11. Solve for  $x$  in the systems of equations:  $2x + 3y = 10$ ,  $5x - 6y = 14$ . You remember this, right? Sort of? Use substitution or elimination. Here we could eliminate  $y$  by multiplying the first equation by 2 all the way across. You end up with  $x = 34/9$ .

12 In a bag of marbles, there are 3 blue for every 4 red marbles. If there are 63 total marbles, how many are blue? This is a tricky proportion problem. If you're thinking  $3:4 = B:63$ , that's a good idea, but it's wrong. That would mean red is to blue as blue is to--total! So, instead, you need to think: 3 out of SEVEN marbles are blue, so:  $3:7 = B:63$ . You know how to finish from here. Cross multiply and solve and you get 27.

13. Given these 2 points-- $(2,3)$  and  $(4,5)$ --write the equation of the line connecting them. Very important to know this. In fact, this is the most important thing you learned in high school. It allows you to go on to calculus, not that you have to worry about calculus on these tests. Anyway: you write the basic slope/intercept form of the equation:  $y = mx + b$ . You remember that, I'm sure. Then you find the slope, which is  $m$ . How do you do that? Use the 2 points, right? Rise over run, or difference of the  $y$ 's over difference of the  $x$ 's:  $y_2 - y_1$  over  $x_2 - x_1$ . In this case you get 1 for  $m$ . Then how do you find  $b$ , the  $y$  intercept? Easy, just plug in one of the points, so:  $3 = 1 \times 2 + b$ . So  $b$  is 1. Voila. Your equation is:  $y = x + 1$ . Easy.

14. For the ACT only, because the SAT doesn't test any trig: what is sine? cosine? tangent? They're just the ratios of the sides of a right triangle. You draw a right triangle. You pick an angle, then label the sides relative to it: opposite for the side across, or opposite; adjacent for the side next to, or adjacent; and the hypotenuse, always the diagonal side across from the right angle. Remember SOHCAHTOA? "Some old horse caught another horse taking oats away." There are other rhymes, as I'm sure you know: some of them not so polite! SOH: Sine is Opposite over Hypotenuse; CAH: Cosine is Adjacent over Hypotenuse; TOA: Tangent is Opposite over Adjacent. Remember to give it the

Yiddish pronunciation though: SOCHZ/CACHZ/TOA. Otherwise you might forget the H and that would mess you up.

15. This isn't a content item, it's a format difference between the two tests. The SAT has 10 questions called Grid-Ins—the ACT doesn't. But these involve exactly the same kind of math; they're just a format difference: you don't have answer choices to choose from; you directly write down and grid in your answer. Actually, the math is slightly easier on these questions, as a way of compensating for the fact that the format is slightly harder, since you have no choices to pick from. So don't worry about the grid-ins: go after them aggressively--especially since the SAT suspends their guessing penalty for the grid-ins. But don't worry about the guessing penalty on ANY question: go for it, since you are always rewarded in the end for aggressive guessing. (See Appendix for more on guessing.)

So, again, if you know these roughly dozen things and can do arithmetic, you're golden on the Math.

**Aside from this, the key to the Math is reading and understanding the problems. People don't realize how important it is to read and understand the problems. For our money, the math sections are AT LEAST as much reading tests as they are math tests.**

There will be several proportion questions.

There will be several factoring or foiling questions.

There will be a number of long word problems that are pure arithmetic questions, not algebra, just like that one we did in the intro.

There will be several questions about the circumference or area of a circle.

There will be a bunch of simplification problems, like  $2X + 3 = 7$ .

These are all very easy questions, as long as you're familiar with them and ready to go.

In addition, there are a couple of shortcut techniques you should keep in mind:

**GUESSING AND CHECKING (OR PLUGGING IN)**

**Remember:**

**If you can solve a question by plugging in answer choices (guessing & checking), do it!**

For example, which of the following satisfies the equation:

$$3x^2 - 5x = 2$$

- A. 0
- B. 1
- C. 2
- D. 3
- E. 4

Good luck trying to solve this using traditional math. You can't factor it. So you'd have to use the quadratic formula, which is a waste of time to remember, considering it's almost NEVER tested on the ACT and absolutely NEVER on the SAT. But there are a lot of simpler versions of this problem that you WILL see.

On this one, you'd simply guess and check, as you've probably done in school sometime. That is, just plug in the answer choices and see what works. It's a good idea to start with the middle number, unless that's an awkward one, like a fraction or a negative. In this case, 2 is nice and simple. Plug it in and you get:  $2^2$  is 4, times 3 is 12; 5 times 2 is 10;  $12 - 10$  is 2! Voila! You're done.

Again, all we did there was arithmetic. Multiplying and subtracting. You made a hard quadratic problem easy.

## **ESTIMATING**

**Next, and probably our favorite math technique:**

### **Estimating or measuring**

This technique will get you lots of hard geometry questions correct quickly!

Think about that: the hardest math problems...right...quickly: that's how a genius takes the SAT and the ACT!

Here's an easy example:

**You have an isosceles right triangle; one leg has a length of 5. What is the length of the hypotenuse?**

Choices:

- A. 2
- B. 5
- C.  $5\sqrt{2}$
- D. 10
- E. 20

There are three ways to do this. You can use the Pythagorean Theorem. You can remember the ratios of the side of a 45-45-90 triangle, which are: 1-1- $\sqrt{2}$ . Remember? If not, no big deal, there are 2 other ways to do it!

You can simply LOOK at it and figure it HAS to be C. Obviously it has to be longer than 5—you can SEE that! But 10 is twice as long, that's obviously wrong. And so is 20. That leaves C. You're done. Over! No need to make it harder than it has to be. If you want to measure it more accurately, use the side of your answer sheet as a ruler and mark it with your pencil.

It looks like about 5 plus about half of it, maybe a bit less, right? Let's say 7. Plug in  $5\sqrt{2}$  into your calculator, and what does it say? Well,  $\sqrt{2}$  is 1.4 or close enough, and 5 times that is...TADA....7!

Here's a harder one:

You have a square with side 6. There's a circle inscribed in it. What's the area of the shaded leftover parts of the square?

Now, this is not that hard. If you understand the ACT is simple stuff and you're ready to go with the basics, you should be able to figure this one out using regular math.

But you can also estimate it very quickly. You know the area of the square is base times height, which is  $6 \times 6$ , 36. It looks like the circle takes up most of the square; in fact, if you imagine that the shaded parts are like oil in a can and the oil settles to the bottom, doesn't it look like it takes up about  $1/4^{\text{th}}$  or a  $1/5^{\text{th}}$  of the can? Let's say  $1/4^{\text{th}}$ . A fourth of 36 is 9. That's our answer.

But the choices are:

- A.  $\pi$
- B.  $2\pi$
- C.  $36-9\pi$
- D. 27
- E. 36

Let's see.  $\pi$  is about 3, right?

So A is about 3. No good. B is about 6. No good.

D and E are definitely out. That means C is it.

$9\pi$  is about 27, right?  $36-27$  is 9, which was our answer. There you go!

Estimating is a very powerful technique! You definitely want to use it whenever you can. Even the best math students have to find ways to go faster, especially on the ACT. In fact, the best math students love this, because it's so much faster than the regular way, especially on harder questions.

Remember, it gets the hardest questions right quickly: you gotta love it!

What else can you estimate? How about angles?

Take a moment and draw random angles—some bigger than 90, some less. Now, using just your eyes, estimate them. Go on! Don't be afraid. It's no big deal. The corner of a square LOOKS like 90 degrees, right? O.K., and if you split that in half, you have 45.

Notice how that's steeper or bigger than you might have guessed? People tend to underestimate how steep 45 degrees is—so now you know to be careful! Make that a little smaller and you have 30. Cut that in half and you have 15.

If you take the 45 you drew and add it to the 90, you have 135, right? Add a little more and you have 150. And so on.

With just a minute of practice, you can confidently estimate within 5 degrees or so, certainly within 10.

By the way, you might be thinking: can I really trust the diagrams and drawings to accurately represent what's going on? Good question! The answer is: absolutely! Everything on both tests is drawn to scale, unless they tell you otherwise, which is rare. And even when they tell you otherwise, the diagrams are usually to scale anyway! And when they're not, you can re-draw them and estimate off your own diagram!

By the way, both tests have directions that deliberately mislead you. The ACT, for example, says that the math diagrams are NOT NECESSARILY DRAWN TO SCALE. Think about that for a second. What does that mean? Nothing! Not necessarily drawn to scale? That's like saying: you are not necessarily reading this. But you are! Or: you are not necessarily a student. But you are!

A lawyer wrote those directions! They don't mean anything! Trust us, everything's drawn to scale, unless they say otherwise, which is rare, and even then, it usually is drawn to scale anyway, and if not, you can redraw it yourself!



So, to sum up:

- 1. The math is simple stuff, all arithmetic and elementary geometry. Know the basics we went over.**
- 2. Remember to guess and check by plugging in answer choices whenever you can. This is fast and easy.**
- 3. Remember to estimate on any geometry questions that call for areas, or angles, or lengths.**

The rest is practice! Never underestimate the value of practice!



## CHAPTER 4

### **SAT VOCAB / ACT SCIENCE / ESSAY**

Vocabulary is unique to the SAT; Science is unique to the ACT. You'll recall from the Overview that we promised to show ways to handle these sections quite handily.

It turns out that the vocab on the SAT just doesn't count that much, because there isn't that much of it; second, there's a great way to guess on these questions, so that you get more questions right and spend less time!

As for the science on the ACT, it has nothing to do with science, it's just a matter of finding answers in charts and graphs, and that turns out to be very simple, and quite easy.

### **SAT VOCAB**

Alright, let's start with Vocab. Let's face it: you're not likely to sit down and learn a thousand or even a couple hundred words. In over 20 years, we've never seen a student do this. Well, we've seen a few--but a few among thousands--and it didn't do all of those few a whole lot of good, because memorization is not the same as mastery. You have to build a great vocabulary over years of good reading and focusing on words--and let's face it, for most of us, that's not happening.

The good news today is: there are so few vocab questions on the new SAT (new since 2005) that you don't have to worry about the vocab .

The best approach is to use what you already know, get through the section quickly, and get to the Reading questions, which are the bulk of the Reading part of the test.

The vocab questions are called Sentence Completions, because you fill in blanks on sentences. The questions go from easiest to hardest. You'll find the easier questions challenging enough, and when you get to the harder ones, unless you have a great vocabulary, you'll find them very hard. No problem!

**It turns out that the right answers on the harder questions--something like 80% of the time--are the hardest/weirdest words in the answer choices!**

So when you get to the 2<sup>nd</sup> half of the questions, just narrow down the choices as best you can, then from what's left, just pick the hardest or weirdest words. You'll be amazed how often this works. And, of course, you'll save loads of time, which you can then turn around and use on the Reading part of the section. That's great, because all the answers in the Reading are in the passages, so all you need is time to find them, right? There you go!

Here are some examples:

**3. Goethe was a genius of \_\_\_\_\_ talents; he was a \_\_\_\_\_ in a multitude of extraordinary abilities.**

- A. numerous....participant
- B. a paucity of.....genius
- C. profound....neophyte
- D. grand....dilettante
- E. multifarious....virtuoso

We're sure a number of those words might be making you uncomfortable. Join the club. Very few students in the world would know all those words, probably less than one percent. Don't worry; just narrow down as best you can and guess the hardest/weirdest words. The two words that overall are the hardest, we think you would agree, are: multifarious and virtuoso, right? All the other choices have at least one pretty simple word in them.

Guess what? DING, DING, DING! That's the answer!

Here's another example:

8. The athlete made a valiant and \_\_\_\_\_ effort, but in the end, fell short, despite his exertions.

- A. long
- B. brilliant
- C. assiduous
- D. interesting
- E. long

No contest here. Assiduous is the hardest, right? DING, DING, DING! Next question!

**Take the free point quickly and spend the time you save on the Reading passages, where all the answers are there for you, as long as you have time to find them!**

The most effective way to improve your vocabulary, short of reading good literature over many years, is to review the words in as many practice SAT's as possible. The easiest way to do this is to use your *Official SAT Guide*, which we've supplied to you.

As you take the practice tests, highlight any words in the Sentence Completion sections that you don't know. Then make a list, look up the words, and study the definitions. A good trick is to write one-word definitions at the bottom of the page, in random order. Then review the questions from time to time, to see if you can remember the words before checking at the bottom of the page. This will work on two levels: it will give you another look at the word, but just as important, you'll see it again in context. Studying words IN CONTEXT is crucial.

If you want to get REALLY serious about vocab, read great old literature and look up words you don't know in a THESAURUS, not a dictionary. The thesaurus will give you a list of other words with the same meaning, many of them new to you. So instead of learning one new word at a time, you learn several. Now THAT's getting serious about vocabulary!

But, in the end, the vocab is no longer a crucial component of the SAT. There are just too few vocab questions now.

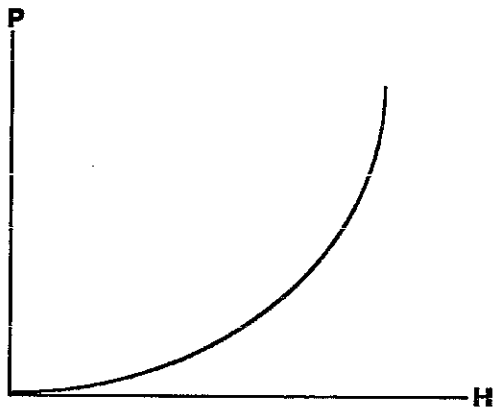
Of course, if you're going for a great score, you should have a pretty good if not great vocabulary. But if you have a real shot at a great score, you probably DO have a pretty good vocabulary. If you're closer to average, an average vocabulary isn't going to hurt you. Either way, the vocab section just doesn't make that much difference.

That doesn't mean you shouldn't take it seriously. If you have time and the energy to study words, great! But your time is limited, as it is for most of us. Your time is best spent on practice tests, so that you work on ALL parts of the test, which are the reading passages, all the math, and the grammar questions.

## **ACT SCIENCE**

One of our favorite things on these tests is the Science section of the ACT. That's because it looks so hard and turns out to be so easy. Students end up laughing out loud when we show them this.

Here's a simple but classic example:



So there's the graph--and here's the question:

## What happens to the pressure as the heat goes up?

Don't worry, it's not a trick question: it REALLY is that simple: pressure goes up!

It shows you how simple and straightforward the science really is. It's just about finding answers in the charts and graphs.

It has NOTHING to do with science. It requires no KNOWLEDGE of science whatsoever, and no UNDERSTANDING of science whatsoever! It's hard to believe, but it's true!

You don't even have to know that H<sub>2</sub>O means water! Can you believe that?

Here's another example:

A golf course superintendent is studying the effects of various fertilizers in growing various types of grass on a golf course, as well as the concentration of runoff in streams running through the course. The data collected is given below:

### GROWTH RATES FOR FERTILIZER WITH DIFFERENT GRASS TYPES

		FERTILIZER			
		A	B	C	D
G	X	.8	.9	.7	1.2
R	Y	.3	1.2	1	1.5
A	Z	.9	1.5	1.2	1.8
S	Z1	.5	.5	.5	.6
S	Z2	.2	.3	.3	.4

### RUNOFF RATES FOR FERTILIZER TYPES

X	5
Y	4
Z	5
Z1	2
Z2	1

Questions:

**1. Which Fertilizer produced the highest growth rate for all grasses?**

- A. A
- B. B
- C. C
- D. D
- E. Cannot be determined from the information given

(Let's see: go to the first chart, look under fertilizers for the highest numbers all the way down: gotta be D, right? If you missed this, you weren't being careful.)

**2. Which Grass experienced the lowest growth rate for all fertilizers?**

- A. X
- B. Y
- C. Z
- D. Z1
- E. Z2

(Same chart, look at grasses for the lowest numbers across: has to be Z2, right?)

**3. Which Grass experienced the highest growth rate for all fertilizers?**

- A. X
- B. Y
- C. Z
- D. Z1
- E. Z2

(Go to grasses, look across for highest numbers. Voila: Z is the winner!)



**4. If a growth rate of .5 is considered a moderate growth rate, which Grass experienced the most consistent moderate growth rate for all fertilizers?**

- A. X
- B. Y
- C. Z
- D. Z1
- E. Z2

(Go to grasses, read across for numbers closest to .5. No brainer: it's Z1!)

**5. According to the information provided, which of the following observations about growth rates and runoff rates is most accurate?**

- A. There was no apparent connection between growth rate and runoff rate
- B. The fertilizer that produced the highest growth rate resulted in the lowest runoff rate
- C. The fertilizer that produced the highest growth resulted in the highest runoff rate. *(Looks and sounds good!)*
- D. The fertilizer that produced the lowest growth rate resulted in the highest runoff rate.
- E. Greater growth rates always results in higher runoff rates *(Careful! This one is very tricky. You can't predict all cases just by a sample of a few. This choice goes too far. C is more moderate and reasonable. Feel free to use common sense and go with the more reasonable choice. This works like a charm on Science, and on Reading, as well.)*

(On this one, we need to look at BOTH charts, which is not as hard as it sounds. In fact, it's pretty easy. It looks like the higher the growth rate, the higher the runoff rate, so C is it! The main challenge here is not to get confused with the wording, which can get a bit dizzying after the 3<sup>rd</sup> or 4<sup>th</sup> choice. How often does that happen on both tests? How about a lot! Remember, focus and be careful, and this stuff is pretty easy, definitely very simple.)

So: Notice how we just found answers in the charts and graphs. We didn't read or analyze or understand anything!

That's exactly how you go about the science section.

**Remember, it's NOT science: it's just finding answers in charts and graphs.**

No knowledge or understanding is required, so don't try to figure anything out; just go to the charts and find the answers.

Here's an analogy to illustrate. Suppose we asked you to go to your library and find us a copy of a book: say, *Old Man and the Sea*, by Hemingway. You could do one of two things: you could go into the library, grab the first book you saw, read it, then read every book in the library until you found *Old Man and the Sea*. Silly. You'd go to the card catalog, find the call number, go to the stacks, find the book, check it out, take it out to the parking lot and hand it to us. Mission accomplished, right? You get an A for the assignment.

Did you understand anything about the book? Of course not! You didn't read it! Same with the Science on the ACT: don't try to understand anything. Just find the answers!

There are 7 passages on the science, for a total of 40 questions, in 35 minutes. 6 of them have charts and graphs, just like the examples we've done. But one of the passages has no charts and graphs. It's called *Conflicting Viewpoints*. It presents a problem or question, then gives two answers to the problem, sometimes three. Scientist 1, scientist 2, hypothesis A, hypothesis B, Physicist 1, Physicist 2, whatever.

The key to this passage is to treat it just like a reading passage. Read the first paragraph, then the first sentence of each explanation, then go to the questions, and hunt back for details.

Here's a short example:

**Two scientists discuss whether the cause of the extinction of the dinosaurs was caused by global warming or by an asteroid striking the earth. Blah, blah, blah, blah....**

**Scientist A**

**The extinction of the dinosaurs was caused by global warming. Blah, blah, blah, blah, blah....**

**Scientist B**

**The extinction of the dinosaurs was caused by an asteroid striking the earth. Blah, blah, blah, blah, blah....**

**Question Number 1:**

**The major point of difference between the 2 scientists' hypotheses is:**

- A. the approximate time of extinction of the dinosaurs
- B. the temperature of the earth at the time of the extinction
- C. the time at which the asteroid in question hit the earth
- D. the cause of the extinction of the dinosaurs

Pretty easy, huh? Now, it's not always going to be THAT easy, but this is definitely the easiest approach to all the questions.

There will often be one or two harder questions on each passage. Fine, just take a bit longer; if you get it, great. If not, guess and move on. There are plenty of easy questions coming up.

**And always remember: on the charts and graphs passages (6 out of the 7 passages):**

**Go directly to the questions, then hunt back in the charts and graphs for the answers.**

Do this, and you'll cut the ACT Science section down to size!

## THE ESSAY

Both the SAT and ACT have essays you need to write. On the SAT, it is a required part of the test. On the ACT it is optional.

In both cases, the essay is scored separately, then combined with the Grammar score. It has only a pretty slight effect, because the essay counts 1/3, while the multiple choice counts 2/3. Basically, it will either not affect your Grammar score, or increase or decrease it slightly. So, while it's not insignificant, it's not crucial; you should take it seriously, but not worry about it.

Also, the essay really isn't hard at all. Think about it: there's no right or wrong answer. You just take a position and defend it. Plus, you've probably done plenty of writing in your high school years--including the teacher telling you you've got half an hour to 45 minutes to write on some topic, pretty much what you get on the SAT and ACT. So, you're used to it. The essay on both tests came out in 2005 and if you listened to the media, you'd think the sky was falling: they thought students would have a hard time with it. Wrong! The essay is pretty easy, although a bit of a pain, for most students.

Keep in mind, also, you're just being graded on a rough draft, not a finished, polished product. They don't expect it to be perfect, or even close. The main thing is that the essay should follow directions, have a beginning, middle, and end, and make sense. That's it. And if you can write more, rather than less, so much the better. The easiest way to get a higher score is to write more! But don't feel you have to overdo this. 5 paragraphs are fine: intro, 3 body paragraphs, and conclusion.

You only have 25 minutes on the SAT and 30 on the ACT. That means you have no time (or very little) to sit there and think about it. You have to start writing immediately, or almost. But go with the position that seems easiest for you to defend, then start writing, and think as you go.

In the first paragraph, just state your position. In paragraphs 2, 3, and 4 just address the main points of your position. If you can point out one or two points on the other side and give them credit, while pointing out that they don't quite match your side of the

argument, so much the better. Then conclude by simply summing up what you said.

Write big, so it's easy to read and fills more space. Also, indent very clearly. Paragraphing shows the reader you're organized and logical. If you make an error, just cross it through and write above or next to it. If you have a minute or 2 left over, go back and change a few ordinary words to more interesting ones: like *diligent* instead of *hard-working* or *engrossing* instead of *interesting*. The graders like a few fancy words.

That's it: if you follow this simple recipe, the essay will go pretty smoothly, and you'll have a solid to excellent score.

On the SAT, your essay prompt will be something fairly academic in nature. By that, we mean it'll remind you of something you might be assigned in English class. Something on the nature of beauty, or honor, or competition.

On the ACT, the prompt will be something to do with school policy: like, should schools have a dress code? Should there be one-on-one tutoring in school as well as regular classes? And my personal favorite: should driving licenses be limited to students who have a GPA of C or better?

To see samples of essays that got various scores, just go to the official practice guide we supplied to you. You'll be impressed with the ones that got the highest scores, but you'll probably feel comfortable with the good but not quite great essays.

Here's a very solid essay that one of our students wrote in response to a prompt in the *Official Guide to the SAT*. We think it would earn a 9 or 10, a very nice score. If you could do as well or close, or a bit better, great.

Here it is:

The prompt asks about competition—whether it is necessary in society or not.

Competition is the driving force behind human life. Without it, man would still be struggling for survival by hunting and gathering. Entrepreneurs such as Henry Ford would be nonexistent **[sic--that means, he wrote it wrong that way; it should be "nonexistent," but we left it in because the point is: you don't have to spell perfectly; in fact, you don't have to do anything perfectly in the essay.]** Entrepreneurs such as Henry Ford would be nonexistent had they not been beholden **[nice word!]** to the competitive nature of the human race. This inherent desire to come out on top is expressed through great empires, successful athletes, and even in novels.

The 16<sup>th</sup> century was a time of mercantilism and expansion. Towards the beginning of the 17<sup>th</sup> century the Spanish dominion in the New World looked unchallengeable **[sic: it should be "unchallengeable," but who cares? The scorers probably wouldn't catch it, and if they did, they certainly wouldn't care]** but the British Empire decided to curtail **[ah, nice word!]** Spanish expansion north from Florida. This empire fought for control of the Atlantic coast and, until the American Revolution, kept it under the rule of the crown. Without the competitiveness of King George I, Spain or France would have surely dominated the continent and **[he missed a comma before the "and," but who cares?]** England would have weakened and fallen apart.

On a smaller scale, if one has a desire to become a successful athlete, competitiveness is essential. Michael Jordan, well known for his desire to win, exemplifies competition in the NBA. With 6 championships and numerous MVP awards, Jordan has become the model for all young basketball players. His accomplishments are not solely because of his skill but also his competitive drive and refuse **[oops; he meant "refusal," but no big deal,**

didn't hurt him, scorers will cut him a break, especially because they know it was just a typo and the writer knows better] and refusal to accept anything less than outstanding.

*In A Separate Peace* [way to go! One of our favorite novels and a great one to use for examples in these kinds of essays], Phinny pushes Gene, though unconsciously, to become better than he thought he could be. In the end, competition gets a hold of Gene [not the most elegant diction or wording, but that's okay: "gets hold of" would be better] and unceasingly tortures [oops, an extra "u" in there, but no harm no foul] him until Phinny winds up dead. This shows the strength of competition and, if one cannot control it, how it can take control of you.

*Competition, a simple emotion that pushes us as a society into unimaginable glory and prosperity. [technically, this is a sentence fragment, but he's taking poetic license, so he's fine.] To take it for granted is a mistake. Whether you are expanding your empire, fighting for a roster spot, or learning the strength of it, competition is a vital component to our race.*

Very good essay. Not perfect, but very good, excellent even. Great examples. A few choice words, but not so many so that it's stilted or overdone. Grammar and spelling virtually perfect. Followed directions. Answered the question. Nice length. Classic 5 paragraphs. Made sense. Flowed well. Beginning, middle, and end. What more could you ask? Not much.

If you can do this well, great. If you can use it as a model and come pretty close, also great. If writing isn't your thing, don't worry: just try your best, keep it simple, follow the basics, and use this one as a goal to strive for. You'll be fine. And if you can do better than this one, bully for you—just don't brag.

No one likes a braggart!





## CHAPTER 5

### GAME TIME

#### GETTING INTO THE ZONE ON THE SAT AND THE ACT

We now know all the stuff on the SAT and the ACT. Now let's talk about putting it together for big scores.

You now know how to approach every question type on the tests, and after following this program, you've done enough practice to go into the test in great shape.

What next? Get back in there! Take the test again. When you do, set aside a few days or a week to get ready for it. Or you can set aside two weeks to a month. You don't want to go longer than that, because you'll get stale. Just like getting ready for a competition. You want to peak and go. If you're a sophomore or junior, that's great. Because you can repeat this process several or even many times.

There's no limit to how many times you can take these tests. The more the better! So your best approach, if you're a junior or even a sophomore, is to take the tests as often as possible, while preparing for each one as much as you can without getting stale.

This is how you get your best scores. You don't try to get it all on one test, though that certainly would be nice. Realistically, you improve on every test you take, and build up a huge improvement over time. If you're a junior or even a sophomore, that should be your approach.

If you're a senior, you have to get busy and get it done NOW! That's ok, because if you follow the advice in this program, and do just a little practice, and hopefully a bit more than that, you should improve substantially! And you have a few opportunities in the fall: three SAT's and two or three ACT's, depending on where you live.

**By the way, the place to go for all info on the SAT and the ACT and to register for the tests are their official websites: [collegeboard.com](http://collegeboard.com) and [act.org](http://act.org).**

The most important thing to do is: take the advice in this program and practice it on REAL TESTS!

For more practice, use the official guides we've supplied to you.

Nothing but nothing will beat these for practice. All other prep books you find on the bookshelves in stores have mock, or fake, tests in them. Most of these are pretty good; they're certainly not bad, but they're not the REAL thing. And there's nothing like the REAL thing. That's why we haven't written tests and put them in this program--they wouldn't be as good as the real thing.

If you have just a week before the test date, take the first practice test in the official guide and thoroughly review it, seeing if you can fix your errors the second time around. Then review the tests with us in Disk 2 or 3. If you can take another test and review it, terrific.

If you have more time, say a few weeks, try to take at least two and hopefully 3 or 4 practice tests, and thoroughly review them. If you do that, you will be ready to go on the real thing. Then, remember, to turn right around and take the next administration of the test. If you keep preparing for and taking tests, you will get better and better. (When you run out of tests, go to the mock tests in the prep books in the bookstores, or go to [www.number2.com](http://www.number2.com), which gives free mock practice questions and tests.)

Now, don't be discouraged if you take a real ACT or SAT for the 2<sup>nd</sup> or 3<sup>rd</sup> or 4<sup>th</sup> time and suddenly you don't go up, or even go down a little. This is no big deal, believe us! And it happens to just about everybody. As you go higher, it gets harder, of course. And sometimes, you plateau for a bit. Don't worry: get back in there and take it again—your trend is always up! Because every time you practice for a test, you're a better test taker.

### **Test Day Tips**

The key to doing well on these tests is preparing beforehand, then focusing on the day of the test. Your focus will be better

automatically because of the preparation you've done. But you also want to set yourself up physically for success on test day.

So, try to get a bit more sleep each night the week of the test.

Most of all, **go to bed early on Thursday night!** That's the key night of rest. We operate off the sleep we can two nights before, not the night before. This is a little known fact, but now you know it.

Have you ever noticed how if you pull an all-nighter, the next day you feel surprisingly OK? Then the next day, you go to bed early and get extra sleep, but you feel groggy and out of it the next day? There you go. It's an evolutionary adaptation.

We call it the "Saber Tooth Tiger" theory:

Thousands of years ago, when we used to live in caves, the Saber Tooth Tiger would attack the clan, and we'd spend all night fighting it off. Then, when it left, if we all collapsed in exhaustion, the tiger could come back and eat us all. So we had to be able to stay up a bit longer, just in case--then we could rest later.

So, we operate on the sleep we get two nights before as a survival mechanism.

By the way, did you believe that story? We made the story up, but the point is true.

So make sure you go to bed early Thursday night. That's the single best tip we can give you for getting to the test in the best condition possible.

On the morning of the test, get up early. Go outside and get some fresh air. If you're an athlete, run around the block. If not, a brisk walk couldn't hurt.

Then eat a heavier breakfast than normal. If you usually eat nothing, eat something! If you like a good breakfast, go for an extra helping! You'll need the energy to carry you through the 2<sup>nd</sup> half of the test.

If you like coffee or coke, go for it! If not, don't start now. Basically, do more of what you normally do. Don't try anything new on test day. You wouldn't believe what some students have tried—don't go there!

Dress in layers, so you can adapt if it's too cold or hot in the room.

Bring some small water or juice bottles and some small munchies, like M&M's or raisins or raisinettes or trail mix or whatever. You can eat and drink during breaks. You can even sneak an M&M or two during the test: we won't tell!

When they say start: don't! Look around, stretch, enjoy the fact that you're better prepared than everyone else, then start when YOU'RE ready! This isn't a big ideal, and not necessary, of course, but it'll give you a sense of being in control. You're taking the test, not vice versa.

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**Bring sharp pencils to the test, but also the dulllest pencil you can. The dull pencil will help you bubble in the answer sheet in the fastest most efficient way.**

**Instead of bubbling in one answer at a time as most people do, do this:**

**Do two pages worth of questions in your test booklet and circle the answers in the booklet, using a sharp pencil. Then put down the sharp pencil, and use the dull pencil to fill in the 2 pages worth of answers. The dull pencil will fill in the ovals with one or two quick strokes, and will fill in the ovals perfectly.**

This has several benefits:

First, it's much faster. It takes an amazing amount of time to bubble in answers, so the faster you do it, the better.

Second, it will save energy and stress from swiveling back and forth from the booklet to the answer sheet and constantly refocusing your eyes.

Third, and by far the most important, it will allow you to find your place on your answer sheet a lot less often, so you'll cut down dramatically on your chances of messing up your answer sheet by doubling up on an answer line or skipping one.

This isn't a huge deal, but it makes things easier and gives you an added sense of being in control. Hey, every little advantage helps!

Now, let's talk about each test specifically.

### SAT

On the SAT, remember that all question groups go in order from easiest to hardest.

That means: make sure you get the easy questions right: check your work as you go on the Math to make sure you don't make careless errors. (Don't go back at the end; check as you go: this is much more effective.)

On the harder Math questions, remember: harder doesn't mean harder, really: it means TRICKY. Be on the lookout for tricks. They're silly gotcha tricks, nothing hard. So if you're on the lookout for them, you'll spot them.

Remember, you can get a lot wrong and do very well, so don't sweat the hardest questions. If you have any idea, take a guess and move on. If not, you can leave it blank, though it's always good to be aggressive, so you have our blessing to guess on any question. Never be afraid to guess! In the long run, you're rewarded for guessing, as long as you've read and thought about the question.

Specifically, guess the hardest weirdest words on the vocab; don't waste time; use the time you save to get every question on the reading section right: or as close to it as you can.

On the Writing section, shortest is best! And read carefully.

On the short Reading passages, read the whole passage. On the long passages, remember: read the first paragraph, the first sentence of every paragraph afterwards, and the final sentence.

Then go to the questions and hunt back in the passage for details. (When you get to the long Passage 1/Passage 2 section, do the 1st passage and its questions first, then do the 2<sup>nd</sup> passage and its questions, then do the questions about both passages last. This avoids confusion.)

On math, always remember to plug in and estimate.

Remember on the grid in questions: there's absolutely no guessing penalty on those, so don't be shy: always guess! And remember: those questions are actually set up to be easier, so attack them with confidence.

### ACT

On the ACT, remember: GO FAST!

There is no time to dilly dally on this test. When you're stuck, guess and move on!

The key is to get to all the questions, read them, and put your best answer down, even if that's a guess.

As long as you get to every question, and think about it, you'll do your best.

On the English section, shortest is best! And Read carefully.

On Math, remember it's simple stuff, and don't forget to guess and check by plugging in the answer choices, and remember to estimate, estimate, estimate!

On Reading, the first paragraph, first sentence, first sentence, last sentence approach works like a charm.

And on Science, go directly to the questions and hunt back for answers in the charts and graphs.

If you do this, and watch your time, and keep moving, you'll do great!

## **MINORS & MAJORS: TROUBLE SHOOTING/ADVANCED**

This section is for: A: those of you struggling and B: those of you who are hotshots. But you may as well view both sections because you never know when you might struggle, or when you might suddenly become a hotshot!

### STRUGGLERS

First, if you're struggling with any section, don't obsess about it! No matter how good you get on these tests, you'll probably always have a relative weakness. That's ok: as long as everything improves, you don't have to be perfect--or even close. So do your best, but cut yourself some slack: because if you don't, if you obsess, you'll get in your own way and do worse. Keep things in perspective.

If you're struggling with grammar, refocus on the fundamentals, because they work so well:

#### **Keep it short Read carefully**

And remember: trust your ear!

The Grammar section is probably the easiest section to improve on, so keep at it!

Don't worry about the tricky questions, there's only a few of those anyway. Just work on the basic ones, which are the majority. If you practice keeping it short and reading carefully, you will get better! No question.

In Math, remember that if you get half the questions right, you'll score around average or a little better. Don't put too much pressure on yourself to get the harder questions right. With practice, you'll get more and more of those right naturally. But that takes time. In the meantime, focus on getting the easier questions right. If you do that, you'll have a solid score--average to above average.

On Reading, if you're really having trouble getting through the passages, even with the first paragraph-first-sentence of every other paragraph technique, then drop back ten and punt!

Don't read anything! Go directly to the questions. Then go back to the passage and hunt for the answers. Your best bet here is to start with the questions that give you line references: that will tell you exactly where to go, and they will be detail questions so that you can answer them quickly. Leave the big picture or main idea questions for last. This works really well!

It's definitely a technique you'll want to use if you're running out of time and still have a full passage or two left.

On the ACT Science, stay calm! This is a bear of a section: it's last, you're tired, and it's long. So don't expect miracles of yourself. Remember: everyone's in the same boat, and these are the mothers of all curved tests. I.e., it's just as tough for everyone else, so it's not just you. Take comfort in that and relax. Just make sure you go directly to the questions and hunt back in the charts and graphs for answers. There are usually 1 or 2 harder questions on each passage, usually at the end, so be ready to punt (guess quickly) on those.

Remember: if you get half the questions right, you get a 20, which is the average score. So don't sweat the harder questions: just guess and move on!

### HOTSHOTS

Alright, hotshots: here are some questions that may blow your mind! And some tips to go along with them.

Actually, this section is for any student who wants to get to that next level in each section of the test. The basics we've talked about will take care of most of the improvement you need. This is for those who want to go that extra mile—and get that extra 5 or 10%.



## Math

We'll start with Math. Again, what we talked about before in Math will take care of most of the improvement you need. If you know your basics, and if you practice to recognize how the basics underlie even the hardest looking problems, you'll be fine.

In fact, most of these so-called hard questions we're about to show you aren't hard at all, they're just a bit tricky---sometimes very tricky. But once you've seen them, you've got them: you'll know what to do.

So we're going to try to cover as many tricky little problems as we can—so you'll have all the ammo and tools you need to squeeze every last point out of these tests.

### Adding up 1 to 1000

This is a great problem made famous by the great 19<sup>th</sup> and 20<sup>th</sup> century mathematician Carl Friedrich Gauss, who used the idea behind it when his elementary school math teacher got mad and made the class sit down and add 1 to 100 by hand. Little Gauss came up with the answer in 30 seconds, to the astonishment of the teacher. This is how he did it.

Take out the middle number—500. Take the numbers one less and one more—499 and 501. Add them. That's 1000. Now add one less and one more: 498 and 502. That's 1000 also. Do it for all the numbers down to 0 and up to 1000. That's 500 pairs of 1000, which is 500,000. Plus the middle 500 we took out: that's 500,500. Voila! Done. You can use this to add 1 to a billion in about 20 seconds. How cool is that? You're faster than a Defense Department computer!

That little Gauss was something, huh?

**Next: remember that problem we did earlier: a woman goes to work at 50 mph and returns at 40 mph--what's her average speed?**

The way we want you to do this is the way we discussed earlier. Eliminate 40, 50, and 45, and realize that the woman spend longer at the slower speed, so the answer has to be slightly less than 45, and the only choice left that's lower is:  $44 \frac{4}{9}$ .

We'll show you the "real" math way, just to show that you CAN understand it, but you'll much prefer the way we just did it. Here we go:

The distance going is the same as the distance coming back, right? And distance = rate x time, right? And the total time could be 1 unit of anything, right? So, we can say:

$$50 \times T = 40 \times (1 - T) \quad (\text{Told you you wouldn't like this!})$$

Solve for T, and you get  $\frac{4}{9}$ . That's the fraction of the total time that the woman spends going. Speed will be distance divided by time, right? So the average speed will be the total distance divided by the total time, so you get:

$$\frac{50 \times \frac{4}{9} \times 2 \text{ (distance going } \times 2 \text{ for the whole trip)}}{\text{-----}}$$

$$1 \text{ (the entire unit of time)}$$

Solve, and you get  $44 \frac{4}{9}$ . Voila!

Dizzy? Got a head ache? Don't worry, just go with the common sense approach we used first! The "real" way was probably no fun for you unless you're a math geek, but, even then, the common sense method is way faster!

### **Double function problems**

As the name implies, you just do one function, and then another. Again, this is simple arithmetic. So, for example: if  $f(x) = 3x$  and  $g(x) = x + 2$ , what is  $f(g(5))$ ? Easy, take  $g(5)$  first: that's  $5 + 2 = 7$ , right? Then take  $f$  of that, i.e.,  $f(7)$ , which is  $3 \times 7$ , or 21.

### **Hard-looking graph problems**

These are new to the SAT, although they've been on the ACT all along.

Example: There's a picture of a parabola with the equation  $y = x^2$ .

The question: what is the distance between  $f(3)$  and  $f(-2)$ ? This really has nothing to do with the parabola. Just plug 3 into  $x^2$  to get 9, and -2 to get 4. The trap answer is 5; the real answer is the distance between (3,9) and (-2,4), which is  $5\sqrt{2}$ .

### **Pattern problems: e.g., beads on a string**

If there are 253 beads on a string that repeat in a pattern of green, red, yellow, and blue, what is the color of the last bead?

You have plenty of time to do this the long way--by counting--especially if you notice you can count by 4's (or 40's or 100's, for that matter.) But the fast way is to divide 253 by 4 to get 63 with 1 left over, or a remainder of 1. Remember remainders? You learned them in 3<sup>rd</sup> grade!

You know that the last bead, therefore, will occur 1 after you've counted through the pattern 63 times, ending on the blue. One more gives you green.

### **Permutation problems**

These ask you how many ways there are to arrange one set of things in different order: books on a shelf, people in chairs, etc. So, how many ways are there to arrange 4 books on a shelf? The answer is:  $4 \times 3 \times 2 \times 1 = 24$ . This is also called "4 factorial," a function you may have heard of. You can think of this intuitively: starting with the first book, there are 4 possibilities; the 2<sup>nd</sup> now has 3 possibilities for each of those 4, etc. So, how many ways can 12 books be arranged on a shelf? Put it in your calculator and the answer will astound you!

### **Equation of a circle problem**

You never see this on the SAT, but you may see it once on the ACT. Very very rarely, probably never, would you need the equation, because you can simply guess and check, using different points on the graph and in the answer choices, and eliminating. However, the equation is:  $(x \pm a)^2 + (y \pm b)^2 = r^2$ . You also have to remember that the center of the circle has x and y coordinates that are the

opposite signs of the a and the b. Note: this applies to only 1 question on the ACT, so it doesn't make sense to memorize this unless you're going for more than a 30 on the math, especially because you can almost always guess and check on these problems.

### **Law of Cosines/Law of Sines/Perimeter of an ellipse**

You may see advanced formulas like these on the ACT, almost never or never on the SAT. The great thing is, the ACT gives you the formulas! You just plug in all the values they give you into the equation and solve for one unknown. In other words, it's a pure arithmetic question!

### **Quadratic formula**

Never on the SAT, haven't seen it in years on the ACT. You never have to know the equation: you can always just guess and check!

$$\text{Sine}^2 + \text{cosine}^2 = 1$$

Again, never on the SAT and rare on the ACT. Even if you didn't know the formula, you could plug in the info from the question and end up with the answer. This is the trigonometric equivalent of the Pythagorean Theorem: notice if you square the sine and cosine of the same angle and add them, you get the hypotenuse squared over itself. That gives you 1!

### **Secant/cosecant/cotangent**

Once again, never on the SAT and rare on the ACT. Secant is the inverse or reciprocal of cosine; cosecant is the inverse of sine; cotangent is--well, you get the idea!

### **Reading**

There will be some tougher Reading passages: skip and come back or bull your way through: either way, focus hard and don't waste time. If you feel you're losing concentration, go directly to the questions: that will get your attention back. Same with Science passages and questions on the ACT: hang in there by toughing it out, or, if you just can't get a question, guess and move on.

## **Grammar**

On the Grammar sections, stick with the fundamentals, and you'll be fine: shortest and be careful.

The trickiest questions, as a group, tend to be misplaced modifiers, which trick you because of how far they are from their referents--especially on the SAT. The example we used earlier was: Running down the street, rain fell on my head. Just remember to be careful: being CAREFUL is crucial.

## **Essays**

On essays, to squeeze out an extra point or two, remember that longer is better, as are more paragraphs; remember to address the positive points on the OTHER side of the argument; take a minute to substitute a few impressive words for ordinary ones. But, above all, follow directions and have a beginning, middle, and end.

## **In General**

The better you are, in general the more important TIME is. So never make the mistake of getting bogged down on a question because you're going for a perfect score. Your attitude should be: you're not going for PERFECT, you're taking the test in the most efficient, intelligent way to get the best score. That's the right approach that gets the best results, reducing stress that just gets in your way.

## **EXTRA INNINGS**

### **CHOOSING AND APPLYING TO YOUR COLLEGE / FINANCIAL AID**

Over the years of teaching these tests, we've been in a position to advise students informally on just about everything having to do with college.

The process of choosing and applying to colleges and scholarships is intimidating and a bit overwhelming when you first go through it.

But it's really quite a simple process. The good news is a large part of it is fairly automatic. You just have to be proactive in a few key areas; we'll help you with these.

First, of all, you're doing the most important thing right now: preparing to get the best SAT or ACT score you can. A higher score will vastly increase your options.

In thinking about colleges, don't be afraid to go after reach schools. You'd be surprised if you knew who got into certain schools, and who didn't. Every year, we're surprised in this regard, although we're so used to it, it doesn't really surprise us anymore.

If you've struggled a bit with your GPA, keep in mind that an improving trend in your grades is given a lot credit by colleges. It's almost as though improving your GPA from a 3.0 in 9<sup>th</sup> and 10<sup>th</sup> grades to 4.0 in 11<sup>th</sup> and 12<sup>th</sup> is the same as having a 4.0 for all 4 years. Of course, if you have a 2.5 for 4 years, the odds of getting into an Ivy League-level school are pretty much zero, so of course, you have to be realistic. But most students ARE realistic; if anything, they're shyer than they have to be.

We encourage you above all to consider the FIT of you with your college choice. Think about where you'd be happiest and most productive. That's more important than a brand-name school, though there's nothing wrong with a brand name if that's important to you. Keep in mind, though, that brand name doesn't necessarily mean the best education, either in general or specifically for you.

Some of the very best colleges in the country are small liberal arts schools, many of which you may never have heard of.

The media seems to be catching up with this idea. There have been recent articles in major magazines talking about how choosing the right college for yourself is so much more important than picking a prestigious school.

Virtually everybody these days goes to visit colleges before making their choice. With the price of admission today, this just makes sense. You wouldn't buy a house without looking at it. Same with college.

We find that our students end up deciding on their colleges when they visit them. The visit seems to make them definite, one way or another. The good thing is they pick schools that are ones they have a strong chance to get into. The 2.5 GPA student does NOT fall in love with Princeton.

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So, number one: go for the right fit.

Second, when it comes to applying, the process is pretty simple. And your counselor should guide you through it. But don't count on your counselor—it's up to you to make sure everything is done, done right, and done on time. Fortunately, there really isn't that much to it, as long as you pay attention and keep after things.

During the summer before senior year, or earlier, go online to check out the websites of schools you're interested in. Ask for info and brochures.

For many schools, you can use a one-size-fits-all application called the Common Application or Common App. You can get this online at [commonapplication.com](http://commonapplication.com). This really simplifies the process.

Many schools, including many large state schools, allow you to apply online, another convenient time-saver.

As far as the personal essays on these applications are concerned, they are often not that important at less competitive and large schools. But at a small liberal arts college, the personal essay

could make the difference. So treat these essays seriously. We'll give you tips later on that.

You should be getting your applications in shape in October of senior year. Regular deadlines are January 1 or January 15, although many schools allow rolling admissions so you can apply as early as you like.

Early action is similar, usually a Nov. 15 deadline, and it's nice to get an early shot at a school. Early action is not binding, so there's no downside to using it. Early decision, though, is a big deal, because it obligates you to go if you get accepted. It also tends to reduce your chances at scholarship money, because you've given up a lot of your bargaining power.

Only if you have no doubt you want to go to a certain school, and you're not worried about the best financial aid package, should you use early decision. The "experts" are undecided as to whether E.D. helps you get in: our experience is that it usually does. For students who are dead set on a particular school, and not too worried about financial aid, we've always encouraged it. However, E.D. seems to be losing some of its shine: Harvard just recently decided to do away with it. If you're not sure, just go with regular decision. Don't worry: regular decision works just fine!

Go to your counselor to discuss your application process. Decide which teachers you want to write your letters of recommendation and tell them, so they have plenty of time. Give them a list of your accomplishments in school—like a resume. This will help them write about you.

Basically, a typical application consists of an application form, with or without a personal essay, 2 or 3 letters of recommendation, an official high school transcript, and your official SAT or ACT scores, which have to be sent directly from the test companies. Just go online and have them sent to the schools you're interested in.

The process is really not difficult, and it doesn't have to be nerve-racking. By the time you apply, you should have a short list of schools you're interested in. Your short list could be as short as 3 schools, or it could be as long as 10 schools. It's really up to you.



But always have a selection of reach schools, solid schools, and safety schools.

As for scholarships, the key thing to remember is that most money comes directly from schools. And you are usually automatically considered for it when you apply.

It's nice to find private scholarships—from the Rotary Club, or your church, or your Mom or Dad's company—these are all great.

But the big money comes from the schools directly, and it's easy to apply for. So that should set your mind at rest: you don't have to spend hundreds of hours looking for money.

Merit scholarships will be based on GPA and ACT or SAT score, but the emphasis will be on the test score. The higher you can get that score up, the more money you'll get! It's as simple as that.

## **PSAT**

The PSAT is great for bragging rights. But beyond that, it's highly overrated. You hear a lot of hoopla about it, mostly coming from your school counselor or principal. That's because PSAT scores are used to determine the quality of high schools. That might sound strange, but it's true. That, along with number of AP exams taken by the students at the school. That might sound strange too, but maybe a little less strange.

Anyway, that's why there's all the hype about the PSAT. But a PSAT score can't get you into college--you need the SAT or ACT for that. A high PSAT score might get you National Merit recognition and might help trigger a scholarship offer, but it is only the SAT or ACT that will get you the actual scholarship offers.

So, drop back ten and heave a heavy sigh of relief on the PSAT: if you're a really good test taker, then by all means, take a whack at National Merit recognition, but if you're average, or around average, don't sweat it. Treat it as a warm-up for the SAT: good practice, but that's about it.

The bottom line: don't stress about the PSAT. It just isn't worth it!

## **APPLICATION ESSAY**

Finally, a few words about the personal essay in your college application. Above all, tell a story! The college already knows about your grades, and your achievements: all that is listed in the application already. And no one is really interested in biographical information.

What people ARE interested in is: WHO are you? What are you like? WHAT do you like? What makes you tick?

And rather than make a laundry list of these things, tell a story that illustrates WHO you are. The best personal essay for college we ever read was about how a guy was getting ready to write it, and then a dog walked in. A stray dog that wouldn't go away, and the writer ended up talking about how he liked dogs and would have to take care of this one, even if it took time away from his college application. He also managed to get a quote from a great writer in there and to make a few wise observations.

Another one talked about how Batman was the greater superhero than Superman, because no one could be superman, but anyone COULD be Batman. Another compared believing in God to believing in penguins, something the author had never seen, either.

Those were unique. But others that SEEM more common are actually unique to each writer, also. Like the ones about grandma, or granddad, or a strange but inspiring neighbor, or so many other things.

Students always say: but these essays are about other things and other people, not about the writer. WRONG! By showing how the writer feels and reacts to these other things and other people, these essays are entirely about the writer!

So don't be afraid to tell a story. It's far more interesting, and it tells a lot about you. Remember, Jesus, Buddha, Confucius, and Socrates all spoke in parables, and there were no greater communicators than they. They certainly got their points across!

There are a lot of other details we could discuss with you about the college admissions process, and we're sure you'll have a lot of little questions. But what we've talked about so far are the basics and they'll serve you well.

In the meantime, good luck! Better yet: work hard, be smart, and be good, and you'll make your own luck. Practice and get your SAT or ACT scores up, keep your grades up, get your applications together, and enjoy the benefits you'll earn for yourself!

Congratulations in advance!



## **APPENDIX**

### **SAT 2's**

Only the most competitive schools will also require, in addition to the SAT OR ACT, the SAT 2's. These are content tests in high school subjects. Most students will not have to worry about these. For those who do, they are quite easy to prepare for. Samples of all the subject tests are contained in the *Official Guide to the SAT 2's*, published by the College Board, and available at your local bookstore. Take the ones you're interested in for practice and thoroughly review your errors. This will accomplish two important goals: it will help you select which tests you're better at, and you will learn from your errors and score higher on the real tests. You can also find additional mock tests in prep guides at your bookstore.

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### **When do I start taking the SAT or ACT and should I take them more than once?**

You should start at the beginning of junior year, earlier if you're very motivated. The more often you take the tests and the more you prepare for each one, the better you will do. And you have every incentive to do so, because colleges will take the best score you send them.

### **Can I take them TOO many times?**

In a word, no. Many students take the tests 5 or 6 times, even 8 or 10 times. If you took the ACT 12 or 20 times (rare and a bit odd!), the colleges would only have to see your best scores (they will see all your SAT scores, because all previous scores are printed on current score reports.) Even if they knew you took the test that often, they might think you were a bit overzealous, but probably wouldn't hold it against you. They might even be impressed with your dedication. But, in reality, 5 or 6 times should be enough to get the result you need—and colleges will think you are dedicated AND reasonable.

Remember: most students start too late and don't take the tests enough.

## **Remind me: What's the difference between the SAT and the ACT?**

They are more similar than they are different.

They both test the fundamentals you learn in elementary school, not really high school.

Both tests test grammar, reading, and elementary math. The SAT throws in a few vocabulary questions, and the the ACT throws in a so-called Science section (that tests no science: just your ability to read charts and graphs.)

Both have an essay section, in which you write an essay in about half an hour on a prompt.

However, there ARE differences:

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Although both tests are very different from tests in school (the content is the same, it's the way the content is tested that's different), the ACT is a bit closer to what you actually see in school. Both are curriculum and reasoning tests, but the ACT is a bit more curriculum based, and the SAT a bit more reasoning based.

The SAT can feel harder, because it is trickier.

The ACT is hard to finish, because it is more time-pressured.

### **So which test should I take?**

Whichever one you're better at, of course. You find that out by taking practice tests and deciding which seems easier for you. You may very well feel the ACT is easier. That's because it is less tricky. (It is more time-pressured, though. But you get faster with practice.) If you're a great test taker, feel free to take both tests multiple times. If you're closer to average, remember you only need one or the other, so focus on the one you're better at.

## **How high can I score?**

You can bet you won't score your best on the first try, even if you prepare well for it. You will get better and better as you take more tests and prepare for each one. Of course, you might have a result that stays the same or goes down, but hang in there: your trend is always up, so get back in there and keep trying. Theoretically, an average student could keep going and eventually get a perfect or near-perfect score, but that would likely take years and scores of tests—not really a reasonable option. But it's nice to know that you are always getting better as you prepare and take tests. Remember: the more you prepare and the more you take the tests, the better test taker you are.

## **I hear a lot about the guessing penalty on the SAT. I'm confused. Should I guess, or not?**

Bottom line: always guess, and always guess quickly. The SAT has a so-called guessing penalty, but it is really a guessing CORRECTIVE. It only deducts the points you got when you guessed right. It's based on a simple statistic: there are 5 choices, so you will randomly guess one right for every 4 you guess wrong. The SAT deducts a quarter point for each error you make. So, with 4 errors you lose one point, the point you got when you guessed right. Pretty simple.

It means it can't hurt you to guess, especially because you rarely guess randomly. You usually guess intelligently by eliminating clearly wrong or unlikely choices. So your odds go up, and so do your points. So you should be aggressive on the SAT and guess, but guess quickly, so you don't waste time.

On the ACT, if you guess right, it's a free point: there is no guessing penalty. So, obviously you should absolutely guess every time you're not sure of the answer, but, again, guess quickly!

## **How are the tests scored? And how do you compare their scores?**

The SAT has 3 scored multiple-choice parts, each scored from 200 to 800. The top score is 2400. An average score is 500 on each part, for a total of 1500. 1650 is a "good" score". 1800 is a "very

good" score. 1950 is an "excellent" score. 2000+ is a "great" score. 2100 is Ivy League territory. 2200 is often good enough for full scholarships for schools that offer them.

The ACT has 4 scored multiple-choice parts, each scored from 1 to 36, which are averaged for a composite score, also from 1 to 36. 20 is average. 24 is good. 26 is very good. 28 is excellent. 29+ is great. 30 is Ivy League territory. 32 is often good enough for full scholarships for schools that offer them.

Both tests have an essay section, scored from 2 to 12. This score is combined with the Writing part of the SAT and with the English part of the ACT; in both cases, the essay score counts 1/3 of the total of that combination. The ACT is offered with or without the Essay section, but most colleges will want you to take it. (Again, check with each school.)

To compare the SAT and ACT, you can use a simple rule of thumb. Beginning with 2400, deduct 60 SAT points for every point lower than 36 on the ACT. It's not exact, but it's close enough.

**A fascinating fact of the tests is that, to get the average score, you only need to get 50%--half!--the questions right! This is true on every section of both tests. Amazing, huh? In school, you need to get 75% to get the average grade: a middle C.**

It just goes to show you how different these tests are from school tests. Since the SAT & ACT test you on a set of different skills you've learned over many years (as opposed to a lot of detail in one subject you learned recently), you're given a much larger margin for error. So, be happy: you can make a lot wrong and do well! Just cut down on your errors by knowing the basics and being careful, and you'll do better. That's really your goal.

### **How do I register for the tests?**

Go to their official websites to register online: [act.org](http://act.org) for the ACT and [collegeboard.com](http://collegeboard.com) for the SAT. You can also register by mail by getting a registration packet from your guidance counselor.



## **Are you sure I don't have to worry about the PSAT?**

The PSAT is a shorter version of the SAT. It is given to sophomores and juniors, who are usually automatically signed up for them through their schools, where the test is given. It is used as the basis for National Merit Recognition. You probably hear a lot about this. The first thing you should do is: relax. The PSAT can't get you into college, and by itself can't get you a scholarship. You need the SAT and ACT for that. If you're a very good to great test taker, by all means prepare for the PSAT and go for National Merit recognition. But if you're closer to average, don't worry about it: take the PSAT in stride and treat it as a little warm-up for the SAT, which is really what it's designed for.

The reason you hear so much about the PSAT is that high schools use National Merit recognition as a key measure of their quality. Whether that is reasonable or not, it certainly doesn't have much to do with a student's college plans.

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## **Drop us a line!**

Please feel free to email us with any other questions you may have. In the meantime, we wish you the best with your test preparation. Remember: start early, take the tests often, and prepare for each one! Practice, peak, and perform!

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