ACT Workbook
Student Edition 2011-2012

Dear Reader,

You're probably looking through this book as you sit in a classroom, and saying to yourself, "What am doing here?" Don't worry, every student is thinking the same thing.

At some point, you're also going to ask yourself why you have to take the ACT. You probably think that you take enough tests during the course of your schooling as you sit here wondering why that isn't enough.

The answer is that the ACT has been around for a long time as an instrument of torture. It exists to test your will and see where your breaking point is. In fact, the ACT is given to terrorists in CIA-operated prisons around the world to get them to confess their secrets.

Just kidding. The ACT actually exists to supposedly show colleges how the grades you got at your high school compare to the grades that other kids get. Colleges want to know what an "A" in geometry class means. The better you do on ACT math, the more highly the schools will look upon your "A's" in high school math classes.

Since we are going to be spending a lot of time tackling multiple choice questions throughout this class, let's start with one right now:

Which of the following facts is true about the ACT?

(A) The ACT measures with certainty how well you will do in life. It perfectly predicts your ability to succeed in high school and college classes as well as your activities outside the classroom.

(B) The "A" in ACT stands for Aptitude because it measures your "intellectual aptitude" otherwise known as your intelligence.

(C) The "A" in ACT stands for "Achievement" because it measures how much you have "achieved" or learned during your life as a student to this point.

(D) The ACT tests your knowledge of the ACT.

Answer:
Only (D) is true. The folks who write the ACT cannot find any proof that the ACT measures your abilities, achievements, or aptitude. So far, the only thing they can say with certainty about your ACT score is that it will provide a "predictor of your grades during your freshman year in college."

In essence, don't take your ACT score to mean more than it does. The ACT simply tests your knowledge of how well you understand the ACT. Nothing more.

Ok…so if all that is true, why should I bother taking and preparing for the ACT?

Good question. Like we mentioned before, the ACT is one of many factors that colleges use to determine who to admit. Although there are certainly other factors, the ACT is undeniably one of the most important.

The ACT is one of the few aspects of a student's application that can be compared across states, cities, schools, and even countries. The ACT is one of the few STANDARD means for comparing today's high school students.

Because the ACT is a "standardized" test, we know exactly what we will be tested and how the questions will be asked. The ACT doesn't change much from year to year, and the people who write it aren't all that creative. That means we can predict and prepare for every question type and trap that can be thrown at you.

WITHOUT FURTHER ADO….

LET'S GET STARTED!

ACT Mini Lesson #1-Setting Goals

ACT Course Goal Sheet

Colleges that I want to apply to:

1. _____ **Average 2009 Freshman ACT Score:** _____

Math_____Reading_____English_____Science_____

2. _____ Average **2009 Freshman ACT Score:** _____

Math_____Reading_____English_____Science_____

3. _____ Average **2009 Freshman ACT Score:** _____

Math_____Reading_____English_____Science_____

4. _____ Average **2009 Freshman ACT Score:** _____

Math_____Reading_____English_____Science_____

5. _____ Average **2009 Freshman ACT Score:** _____

Math_____Reading_____English_____Science_____

Math Raw Score Target:_____

Reading Raw Score Target:_____

English Raw Score Target:_____

Science Raw Score Target:_____

Why are you preparing for the ACT?

_____

_____

Goals for ACT Prep

1._____

2._____

3. _____

Scaled vs. Raw

The following table outlines how the ACT converts from "raw scores" in each section to scaled scores (out of 36). Take note of the scaled scores in each section that you need to receive to achieve your goals and then work backwards to figure out the "Raw Score" equivalents. *Circle the approximate Raw Score that you will be striving to achieve in each section.*

Scaled Score	***English***	***Math***	***Reading***	***Science***
36	75	60	40	40
35	73-74	59	39	39
34	71-72	58	38	-
33	70	56-57	37	38
32	69	55	36	37
31	67-68	54	35	-
30	66	52-53	34	36
29	65	50-51	32-33	35
28	63-64	48-49	31	33-34
27	62	45-47	30	32
26	60-61	42-44	29	30-31
25	58-59	40-41	27-28	28-29
24	56-57	37-39	26	26-27
23	54-55	35-36	24-25	25
22	52-53	33-34	23	23-24
21	49-51	31-32	22	21-22
20	46-48	29-30	20-21	19-20
19	43-45	26-28	19	18
18	41-42	24-25	18	16-17
17	39-40	21-23	16-17	15
16	36-38	17-20	15	14
15	33-35	14-16	14	13
14	30-32	11-13	12-13	12
13	28-29	9-10	11	11
12	26-27	7-8	9-10	10
11	24-25	6	8	9
10	22-23	5	6-7	7-8
9	20-21	4	-	6
8	17-19	3	5	5
7	14-16	-	4	4
6	11-13	2	3	3
5	8-10	-	-	-
4	6-7	1	2	2
3	4-5	-	-	1
2	3	-	1	-
1	0-2	0	0	0

ACT Mini Lesson #2-ACT Introduction:

Before we get into any specifics on how to prepare for the ACT, it's important to understand exactly what the ACT is, what material will be tested and so on. Take a few minutes and try to digest these facts about the ACT, because some of them may be surprising.

Definition of Raw Scores:

The ACT is scored in the same way as most tests. For every question you answer correctly you will **receive 1 raw point**. Then, those raw points are converted to scale the exam from 1-36 in each section.

What does the ACT measure?

The ACT features many types of questions including math, writing and vocabulary. However, you could be the best writer in the world or have received A+'s on all of your high school math tests and not do well on the ACT. The ACT claims to measure your reasoning ability in these subject areas, but really the ACT simply measures your knowledge of the ACT itself. Sound silly? It is!

How is the ACT scored?

Each subject area of the test-- math, reading, English, and science-- is scored on a scale between 1 and 36. The ACT is graded on a curve and each section is scaled so that the average score is **approximately 21.**

When Can I Take the ACT?

The ACT is offered six times per school year. The ACT is offered in the following months…

1._____

2. _____

3. _____

4. _____

5. _____

6. _____

What's on the ACT?
The ACT will be divided into four "tests" and will take a total of 3 hours and 20 minutes. The four tests on the ACT will always have the same number of questions, and will be given in the same order. The "optional" 30-minute essay question will always come last.

Section	Number of questions	Time (minutes)	Average score	College Readiness Benchmark	Content
English	75	45	20.6	18	Grammar/usage/mechanics and rhetorical skills
Mathematics	60	60	21.0	22	pre-algebra, elementary algebra, intermediate algebra, coordinate geometry, geometry, and elementary trigonometry
Reading	40	35	21.4	21	reading comprehension
Science	40	35	20.9	24	interpretation, data analysis, evaluation, reasoning, and problem-solving
Optional Writing Test	1 essay prompt	30	7.7		Writing
Composite			21.1		

College Readiness Benchmarks

The ACT defines the College Readiness Benchmarks as "the minimum ACT test scores required for students to have a high probability of success in credit-bearing college courses—English Composition, social sciences courses, College Algebra, or Biology."

What Does the ACT Mean by "Success" in those Courses?

According to the ACT, "Students who meet a Benchmark on the ACT or COMPASS have approximately a 50 percent chance of earning a B or better and approximately a 75 percent chance of earning a C or better in the corresponding college course or courses."

ACT Mini Lesson #3-Facts about the Four ACT "Tests" + the Essay

Facts about the Four ACT "Tests" + the Essay

English Test

1. _____

2. _____

3. _____

Math Test

1. _____

2. _____

3. _____

Reading Test

1. _____

2. _____

3. _____

Science Test (35 Min 40 Q)

1. _____

2. _____

3. _____

Writing Test (Optional) (30 Min)

1. _____

2. _____

Test-Taking Tips

How to think about the ACT:

Here's the big secret to learn for standardized tests. They are standardized! This means that they are basically the same each year and that they always test certain concepts in the same way. If you can learn and begin to understand the way that the ACT expects you to think, you can begin to outsmart them and spot the traps that will be laid for you.

The Test Booklet:

Your answer sheet will be the only thing that will be graded. Make sure to mark up your test booklet. Physically cross out wrong answers, draw diagrams, and don't be afraid to show your work. On the reading sections, underline key parts of the passages and make notes in the margins as you go.

Process of Elimination:

Every multiple choice question on the ACT has either three or four wrong answers-depending on the section-- and only one correct answer. By looking for the wrong answers instead of the correct ones, you will often be left with just a few answer choices from which you can make an educated guess.

Try to use process of elimination to solve the following question. Don't worry, there won't be any questions like this on the actual ACT.

What is the capital of North Dakota?

A. Billings
B. Dallas
C. Bismarck
D. Fargo

Which answers can you eliminate?

Be quick but don't hurry:

Famous UCLA basketball coach John Wooden told this to his players on the basketball court, but it applies to the ACT as well. The ACT isn't scored like a typical test where the hard questions are worth more points than the easy ones. **On the ACT, every question is worth the same amount.**

How does this help you? Since all the questions are worth the same amount, don't rush through the easy and medium questions to get to the hard ones. Concentrate on the easy and medium questions so that you won't lose points on questions that you know the answer to.

ACT Mini Lesson #4-ACT Strategy

Do the questions follow order of difficulty?

Strictly speaking, ACT questions do not fall in a specific order of difficulty. However, there is a general truth to the statement that math questions become harder as the section progresses, and reading and science passages become more difficult as the section progresses.

Despite this, we still want to find and solve easy questions first!

Easy vs. Medium vs. Hard

What type of student does the ACT want to get easy questions correct?

Answer:_____

What type of student does the ACT want to get medium questions correct?

Answer:_____

What type of student does the ACT want to get difficult questions correct?

Answer:_____

Example:

Here is a difficult math question, are there "easy" answers you can eliminate?

> *25. Cindy walked to work at an average speed of 6 miles an hour and biked back along the same route at 10 miles per hour. If her total traveling time was 2 hours, how many miles is it from her house to work?*
>
> A. 6
> B. 6.25
> C. 7.5
> D. 8
> E. 10

Because you know that this is a hard question, why can't (D) be the answer?

_____

By the same principle, what other answers are not correct?

_____

Three Types of Questions

1. _____

2. _____

3. _____

Guessing and Process of Elimination

The ACT differs from the SAT in that there is NO GUESSING PENALTY! This means that you must fill in an answer on all 215 questions on the ACT!

Remember, each question contains only 1 correct answer and 3 or 4 incorrect ones. Use POE to spot wrong answers. You won't know the exact correct answer on every question, so use your POE skills to make educated guesses.

Guessing Blindly

There will be a few questions in each section that you will probably have absolutely no clue how to solve. When this happens, you want to make sure to make a guess, you have a ¼ or 1/5 chance of getting the question right. What letter should you choose? Is (C) the most common answer?

Why Pick a Letter of the Day?

A. _____

B. _____

C. _____

ACT Intro Summary

Key Intro Section Notes:

My goals for ACT prep

_____
_____

What's on the ACT?

_____
_____

Guessing

_____
_____

ACT Math

ACT Math Mini Lesson #1-ACT Math Intro

ACT Math Section Quick Facts

1. _____
   _____
2. _____
   _____
3. _____
   _____
4. _____
   _____

ACT Math Section breakdown:

The ACT is very direct and straight-forward in letting you know what information will be tested. That means you have no excuses for being surprised by any question.

Inspirational Quote…

"Winners find reasons, losers find excuses!"

33 Algebra Questions

- 14 Pre-Algebra (integers, prime numbers, etc) questions based on basic number theory, and manipulation of fractions and decimals
- 10 Algebra I questions based on linear equations, ratios, percents, etc
- 9 Algebra II questions based on exponents, roots, quadratics, etc

23 Geometry Questions

- 14 Plane Geometry questions based on angles, shapes, etc
- 9 Coordinate Geometry questions based on slope, graphing, midpoint, etc

4 Trigonometry Questions

- 4 Trig questions based on sine, cosine, tangent, trig identities, trig functions, etc

ACT Math Tips

1. _____
    a. _____
    _____
    b. _____
    _____
2. _____
    _____
3. _____
4. _____
5. _____
    _____

Calculator Quick Facts:

- Make sure to bring a calculator to the test!
- Your calculator doesn't need to be fancy. Just make sure that it doesn't beep or have a keyboard.
- Be careful when putting numbers in the calculator. Check each number as you input it. Always clear your work after you finish a problem or a step.
- Your calculator only does what you tell it. Use the calculator as a tool, not a crutch.
- **Set up the problem on paper first. By doing this, you will prevent confusion and careless errors.**
- Don't rely on the memory function on your calculator. Scratch paper is here for a reason!
- Make sure you are performing equations in the proper order, whether you are using pencil and paper or a calculator.
- Make sure your calculator has fresh batteries. It's always a good idea to bring extras, just in case.

ACT Math Mini Lesson #2-Math Vocab

Key Terms in Math

Key Term	Definition	Examples
Integer		
Real number		
Rational number		
Prime number		
Remainder		
Absolute Value		
Product		
Quotient		
Sum		
Difference		
Consecutive		
Distinct		
Union		
Intersection		
Rules of zero		

ACT Math Fundamentals:

1. Be sure to be familiar with math terminology. Many trap answers rely on you misunderstanding what the question asks you to do.
2. Let your calculator help you avoid math errors, but don't rely on it as a crutch.
3. Know the rules of multiplying and dividing exponents, raising a power to a power and expressing fractional and negative exponents.
4. For the purposes of the ACT, square roots must be positive, but exponents can have both positive and negative roots.

ACT Arithmetic:

1. Arithmetic calculations must be performed in the correct order of operations (PEMDAS)
2. Use the distributive property whenever possible
3. Understand how to perform all arithmetic operations with fractions. Let your calculator help you whenever possible.
4. Understand the difference between ratios and proportions
5. Use the ratio box to solve ratio questions
6. Use the average pizza to solve average questions
7. Use the chair method to solve permutation and combination questions

ACT Math Mini Lesson #3-Ratios

Ratios

A ratio is simply a comparison between two parts of a whole. Ratios can be written in a few different ways.

- a/b
- the ratio of a to b
- a:b

Fractions vs. Ratios

- Ratio: Part/Part
- Fraction: Part/Whole

Whenever you see a ratio problem, you will always make a RATIO BOX!

	PART	PART	WHOLE
RATIO			
MULTIPLIER			
ACTUAL #			

10. A jar contains cardinal and gold jelly beans,
The ratio of gold jelly beans to cardinal jelly beans
Is 5:3. If the jar contains a total of 160 jelly beans,
How many of them are cardinal colored?

A. 30
B. 53
C. 60
D. 100
E. 160

Step 1- Set up a Ratio Box

RATIO			
MULTIPLIER			
ACTUAL #			

Step 2: Enter what you know (Ratio and Actual)

Step 3: Use what you know to find what you don't know (Multiplier). Add it to your box

Step 4:Use the box to find what the problem is asking. (Actual # of Cardinal)

Ratios Practice

10. A candy jar has yellow, blue, and green candies in a ratio of 3:2:1 respectively. If the mixture contains 9 yellow candies, how many total candies are in the bowl?

A. 18
B. 16
C. 15
D. 12
E. 9

ACT Math Mini Lesson #4-Proportions

Direct Variation is simply a fancy term for a proportion. As one quantity goes up, so does the other.

The formula for direct variation is simple: $X_1/Y_1 = X_2/Y_2$

5. If two packages hold a total of 12 bagels, how many bagels are in five packages?

A. 12
B. 24
C. 30
D. 36
E. 60

Set up a **Proportion** and **Cross Multiply**:

Indirect Variation is the exact opposite of direct variation. As one quantity goes up, the one other goes down.

The formula is the exact opposite of direct variation… $X_1Y_1 = X_2Y_2$

15. The amount of time it takes to consume a buffalo is inversely proportional to the number of coyotes. If it takes 12 coyotes 3 days to consume a buffalo, how many fewer hours will it take if there are 4 more coyotes?

A. ¼
B. ¾
C. 18
D. 24
E. 54

Step 1- Make sure all terms are in the same units. If they aren't, convert them.

Step 2- Plug numbers into indirect variation formula and solve for x.

Step 3- Is x the answer?

Proportions Practice

14. A sports agent's commission varies directly as the size of the contract the agent's player receives. If the player signs for $200,000, the agent receives $14,000. What is the agent's commission if the player signs for $150,000?

A. $7,000
B. $10,500
C. $14,000
D. $15,000
E. $21,000

11. If y varies directly as z^2, and y=4 and z=3, then what is the value of y when z=12?

A. 8
B. 16
C. 36
D. 48
E. 64

ACT Math Mini Lesson #5-Exponents

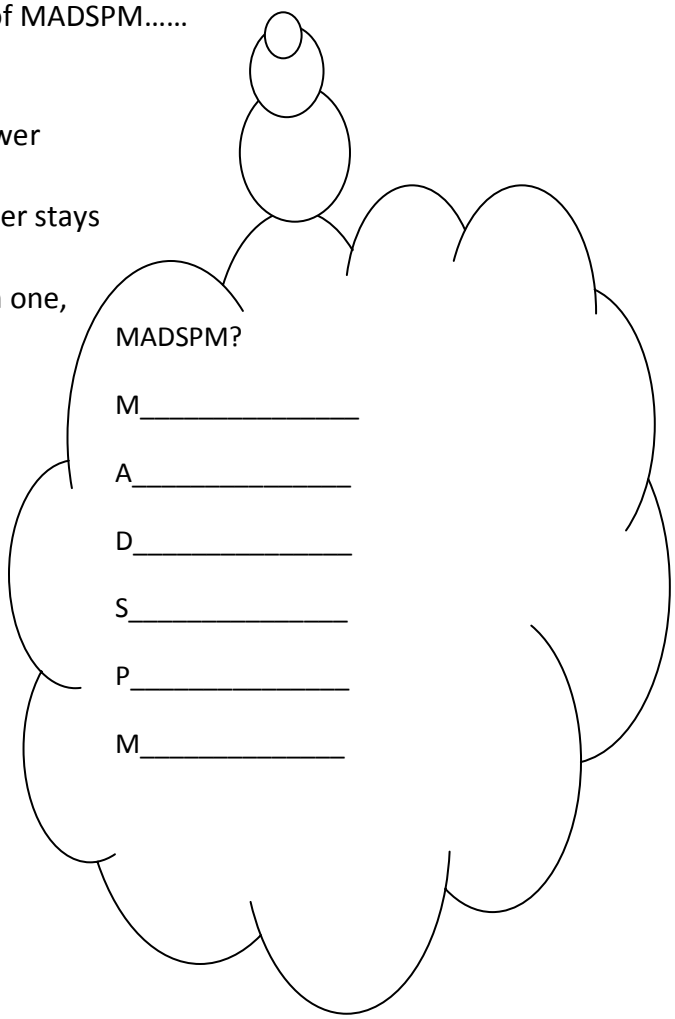
Exponents

Exponents are just a simple way of writing multiplication.

When in doubt about exponents, use the rules of MADSPM……

Remember

- A negative number raised to an even power
- becomes positive
- A negative number raised to an odd power stays
- negative
- If you square a positive fraction less than one, it gets smaller



Try a few….

$2^2 \times 2^5 =$

$r^6 / r^2 =$

$(y^7)^4 =$

Example:

15. If $J^6 < J^3$, which of the following could be a value of J?

A. 6
B. 1
C. 0
D. 1/3
E. -1/3

Exponents Practice

4. If the yth term in a sequence is $3x2^y$, what is the 10^{th} term in the sequence?

A. 60
B. 1,024
C. 1,536
D. 3,072
E. 6,144

18. If $64^{12} = 4^x$, x=?

A. 4
B. 24
C. 36
D. 72
E. 192

ACT Math Mini Lesson #6-Percents

Percents:

Solve percent problems the same way that you solve fraction problems. Percent simply means, "per 100" or "out of 100."

To convert a percentage to a decimal, move the decimal point two places to the left. To convert the other way, just move the decimal two places to the right.

What Percent of What?

The easy way to solve questions like the one below is to remember this simple trick:

$$\frac{\text{Is}}{\text{Of}} = \frac{\text{what \%}}{100}$$

8. If 3/7 of z is 42, what is 5/7 of z?

A. 10
B. 18
C. 45
D. 70
E. 98

Step 1- What is the first thing we need to solve for?

Step 2- What is the value of Z?

Step 3- How should we proceed?

Percents Practice

1. ***The regular price for a certain bicycle is $125.00. If that price is reduced by 20%, what is the new price?***

    A. ***$100.00***
    B. ***$105.00***
    C. ***$112.50***
    D. ***$120.00***
    E. ***$122.50***

2. ***In a group of 25 students, 16 are female. What percentage of the group is female?***

    A. ***16%***
    B. ***40%***
    C. ***60%***
    D. ***64%***
    E. ***75%***

3. ***If 115% of a number is 460, what is 75% of the number?***

    A. ***280***
    B. ***300***
    C. ***320***
    D. ***345***
    E. ***400***

More Percents Practice

11. Jody is picking a movie to watch this evening. Of the movies in her cabinet, 9 are romantic comedies. She will pick one movie at random. If the probability of the selected movie being a romantic comedy is 25%, how many movies are on the shelf?

A. 9
B. 24
C. 25
D. 36
E. 48

16. A store owner raises the price of a $50 item 20%. After it does not sell, he reduces the price by 20%. What is the final price of the item?

A. $48
B. $49
C. $50
D. $60
E. $100

18. In 1950, the populations of town X and town Y were equal. From 1950-1960, the population of town X increased by 60% and the population of town Y decreased by 60%. In 1960, the population of town Y was what % of the population of town X?

A. 25%
B. 36%
C. 40%
D. 60%
E. 120%

ACT Math Mini Lesson #7-Scientific Notation

Scientific notation was created as a way to express very large or very small numbers without using a long sequence of zeros.

Example:

$2.56 \times 10^{2} = 256$

$2.56 \times 10^{3} = 2{,}560$

$2.56 \times 10^{-2} = .0256$

$2.56 \times 10^{-1} = .256$

ACT Example:

4. $(8x10^{-3}) - (2x10^{-2})$

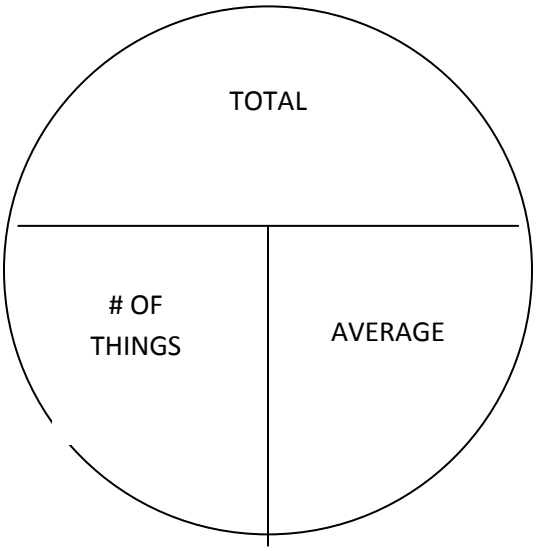
A. -.0012
B. -.012
C. .006
D. .028
E. .07

ACT Math Mini Lesson #8-Averages

For the ACT, the average, also called the arithmetic mean, is simply the sum of a set of *n* numbers divided by *n.*

However, just like with many other things, the ACT makes average problems tricky. Thankfully, you will know the easy way to solve any average problem that they could possibly give you.

THE AVERGE PIZZA:

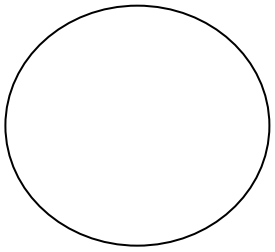


Take a look at a very difficult problem that can be solved with a few pieces of pizza!

20. If the average (arithmetic mean) of eight numbers is 20 and the average of five of those numbers is 14, what is the average of the other three numbers?

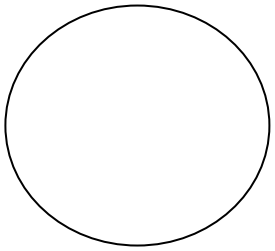
A. 14
B. 17
C. 20
D. 30
E. 3

Step 1: Start by making an average pizza for all eight numbers.



What is the total of those numbers? _____

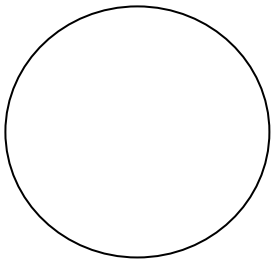
Step 2-Draw another average pizza for the other five numbers.



What is the total of those 5 numbers? _____

What else do you need to solve the problem? How do you find it?

Step 3- Draw an average pizza for the final 3 numbers



The average is ____ and the answer is ____.

Averages Practice

10. Xena earns $600 every month except for June and February, when she vacations and earns nothing. What is her average monthly income for the entire year?

A. 275
B. 300
C. 500
D. 600
E. 720

10. The average speed (arithmetic mean) of 10 drivers on the 405 freeway at 6:00pm is 64 miles per hour. What would the 11^{th} driver's speed have to be to bring the average of all 11 drivers to 65 miles per hour?

A. 66
B. 75
C. 85
D. 90
E. 100

More Averages Practice

14. ***A certain type of notebook costs $2.50 before sales tax is added. When you buy 9 of these notebooks you receive 1 additional notebook free. What is the average cost per notebook for the 10 notebooks before sales tax is added?***

    A. $2.78
    B. $2.50
    C. $2.30
    D. $2.25
    E. $2.15

15. ***In a town of 500 people, the 300 males have an average age of 45 and the 200 females have an average age of 35. To the nearest year, what is the average age of the town's entire population?***

    A. 40
    B. 41
    C. 42
    D. 43
    E. 44

16. ***The starting team of a baseball club has 9 members who have an average of 12 home runs apiece for the season. The second-string team for the baseball club has 7 members who have an average of 8 home runs apiece for the season. What is the average number of home runs for the starting team and the second-string team combined?***

    A. 7.5
    B. 8
    C. 10
    D. 10.25
    E. ***14.2***

17. ***The average of a set of 6 integers is 65. If a seventh number is added to the set, the average of the set increases to 66. What is the seventh number?***

    A. 66
    B. 67
    C. 70
    D. 72
    E. 78

ACT Math Mini Lesson #9-Median and Mode

There will probably be only one question on the ACT that tests your knowledge of median and mode, but because it's an easy concept, it's a question that you should get right.

The ***MODE*** of a group of numbers is even easier to find. It's simply the number that appears the most. If two numbers tie for the most appearances, that set of data has two modes.

The median of a group of numbers is the middle number, just as on the highway, the median is the divider at the center.

Steps to finding the median:

1. *Put the numbers in order from smallest to largest*
2. *If there is an ODD number of numbers, the middle number is the median*
3. *If there is an even number of numbers, take the average of the two middle numbers.*

Take a look at the following example:

10. If the students in Ms. Prater's chemistry class scored 90, 91, 83, 85, and 84 on their midterm exams, what is the Median of her class on this test?

A. 90
B. 88
C. 86
D. 84
E. 83

4. What is the median of the first 5 positive odd integers?

A. 3
B. 5
C. 7
D. 9
E.30

ACT Math Mini Lesson #10-Probability

Probability is the chance that an event will occur. To express the probability of an event you would just count the number of "successes" and count the number of total outcomes and express this as a fraction.

Probability of *x* = _____

12. A bag holds 6 baseballs and 12 other toys. If one item is drawn from the bag at random, what is the probability that the item is a baseball?

A. 1/7
B. 1/3
C. 1/2
D. 2/3
E. 3/7

Step 1- What is a success in this problem? How many successes are there?

Step 2- What is the total number of possible outcomes?

Step 3- What is the probability of a success? (Hint: set up a fraction)

p = _____

Probability Practice

17. A basket contains 6 chocolate and 4 mint candies. If two candies are drawn at random, what is the probability that both candies will be chocolate?

A. 2/3
B. 3/5
C. 5/9
D. 1/3
E. 2/15

3. A basket contains 58 red eggs, 78 green eggs, and the rest are blue. if the probability of choosing a blue egg from this basket at random is 1/5, how many blue eggs are in the basket?

A. 34
B. 56
C. 78
D. 102
E. 152

ACT Math Mini Lesson #11-Permutations/Combinations

Permutations describe the different ways that items can be arranged in a definite order. For example, they may ask how many different five-letter combinations of the word ROCKY can be made or the way six people can be sat at a dinner party.

All permutation questions can be solved quickly using one simple technique. Just make a "seat" for each spot that you have to fill. a sketch might look something like this.

In each seat, write how many different "people" can sit down. Remember that people put into previous seats are unavailable.

17. Kimberly wrote 9 papers for her psychology class. She wants to put 7 papers in her portfolio and is deciding on what order to put them in. How many different ways can Kimberly arrange her papers?

A. 420
B. 5,040
C. 25,920
D. 51,840
E.181,440

Step 1- Set up and Fill in Permutation Seats

__ x ___ x __ x __ x __ x __ x __

Hint: How many papers can go first? How many papers can go second?...Think about this for each 'seat'

Permutations/Combinations Practice

19. In a three digit number, all of the digits are different and the units and hundreds digits are prime. How many possible numbers can be made?

A. 64
B. 96
C. 128
D. 240
E. 504

15. There are 5 swimmers in a race. If the first place finisher wins a gold medal, the second place finisher wins a silver medal and the third place finisher wins a bronze medal, how many different permutations are possible for the medal winners?

A. 5
B. 12
C. 20
D. 50
E. 60

ACT Math Fundamentals Notes:

How can the number of the problem help me find the type of answer that the ACT is looking for?

_____
_____

What are the toughest "fundamentals problems for me to solve?

_____
_____

How do I use the ratio box and average pizza?

_____
_____

What types of problems can the "chair method" help me solve?

_____
_____

ACT Math Mini Lesson #12-Avoiding Algebra on the ACT (Part I)

THE BEST MATH TACTICS IN THE HISTORY OF HUMAN CIVILIZATION!

Best Math Tactics #1

- Plug In Your Own Number (Plugging In)

What's So Great about this tactic anyway?

Plugging-In our own number allows us to avoid using **ALGEBRA** to solve ACT math problems. Algebra works great when you are in math class and you have to solve each problem by showing work for each step in order to get full credit.

On the ACT, the only thing Algebra is good for is for confusing us and causing us to make stupid mistakes! Remember, you DON'T get extra points on the ACT for doing the problem "the right way." As long as you find the answer, the ACT NEVER asks HOW!!

BEST MATH TACTIC EVER #1

PLUGGING IN YOUR OWN NUMBER!
Plugging-In allows us to take complicated Algebra problems and convert them to simple arithmetic problems.

When do I Plug-In My Number?
Whenever possible! Look for **VARIABLES in the PROBLEM and the ANSWER choices**. Look for words such as "**In terms of**"

Steps to Plugging In your own number:

Step 1-

_____
_____
_____

Step 2-

_____
_____
_____

Step 3-

_____
_____
_____

Step 4-

_____
_____
_____

Plugging-In Tips:

1. **Watch out for Zero and One**:
   These numbers often lead to more than one answer seeming correct—we don't recommend plugging in either

2. **Don't use the same number for multiple variables**
   Again, this leads to multiple answers seeming to be correct

3. **Remember to check all your answers before moving on**
   Because certain numbers can result in multiple correct answers, make sure to check all answers before moving on. If you find more than one correct answer, don't worry. Choose new numbers and plug in again!

4. **Pick "Good" Numbers**
   Choose numbers that make the problem as easy as possible. For example, if the problem deals with percents or money, 100 is probably the easiest number to start with. However if the problem has to do with time, numbers such as 60 (seconds to minutes or minutes to hours)

5. **Mark your test book with the numbers you choose**
   For example, if you choose 10 for z and 100 for s, cross out the variables and reread the problem with those numbers. When you find the answer (your Target), circle it so you don't forget it!

Here's a moderately difficult problem that becomes very easy when you Plug in:

12. ***If a store sells a shirt for h dollars, how much would that shirt cost if it was marked down by q%***

A. hq
B. 1/4hq
C. h(1-(q/100)
D. q(1-(h/100)
E. 2hq

Step 1- Plug your own numbers in for h and q
h=
q-

Step 2- Solve the problem using your numbers.

Step 3-Target:_____

Step 4- Plug your numbers back into the answer choices and find the choice that matches your target.

Try another:

13*. If w hats cost z dollars, then how many hats could you buy with $100?*

A. 100/w
B. 100wz
C. 100w/z
D. 100z/w
E. wz

Follow the same steps that you used on the first problem. What do you do if more than one answer choice works? Read the next section to find out!

More Practice with Plugging-In:

16. ***If the sum of three consecutive odd integers is p, then in terms of p, what is the greatest of the three integers?***

A. (p-6)/3
B. (p-3)/3
C. p/3
D. (p+3)/3
E. (p+6)/3

Think about choosing easy numbers so that the math will work out as quickly as possible!

Step 1- Plug your own number in for p
Hint: find three consecutive odd integers first

Step 2- Solve the problem using your numbers.

Step 3-Target:_____

Step 4- Plug your numbers back into the answer choices and find the choice that matches your target.

ACT Math Mini Lesson #13-Plugging In Our Own Numbers Practice

Again, think about numbers that will make the math on this problem easy…

12. ***Andrew flies 40 miles in x hours. If he must fly y miles at the same speed, in terms of x and y, how many hours will the trip take?***

A. x/(40y)
B. 40/(xy)
C. 40xy
D. (40y)/x
E. (xy)/40

16. ***If g ≠ 0, which of the following must be true?***

I. $g^2 > g$
II. 5g > g
III. g + 2 >g

A. I only
B. II only
C. III only
D. I & III only
E. I, II, III

18. At a large bakery, sacks of flour are filled by a machine that weighs each sack to be sure that it holds between 29.75 and 30.25 pounds of flour. Only then is the pack sealed and shipped. If a sack holding j pounds of flour is shipped, which of the following describes all possible values of j?

A. $|j - 30| > 1/4$
B. $|j + 30| = 1/4$
C. $|j - 30| = 1/4$
D. $|j + 30| < 1/4$
E. $|j - 30| < 1/4$

Hint: *What is the easiest number to plug in on this problem*?

ACT Math Mini Lesson #14-Avoiding Algebra on the ACT (Part II)

PLUG IN THE ANSWER Choices!

This tactic allows us to work the problem backwards to solve easy questions quickly and to turn difficult questions into easy ones!

When do I use the Answer Choices to solve the problem backwards?

When there are numbers in the answer choices or you feel the strong urge to write out a long algebraic expression! (Ex: age problems)

Step 1-

_____
_____
_____

Step 2-

_____
_____
_____

Step 3-

_____
_____
_____

Step 4-

_____
_____
_____

Practice With Plugging in the Answer Choices:

Note: *If a question asks for a specific amount, Plug In the Answer Choices**!***

11. Marc is half as old as Tony and three times as old as Ben. If the sum of their ages is 40, how old is Marc?

A.3
B.6
C.12
D. 18
E. 24

Step 1-Label the answer choices: What are the answers telling us?

Step 2-How many columns will we need to label?

Step 3-Where should we start? With (C) of course!

Marc's Age (answers)	Tony's Age (Marc * __)	Ben's Age (Marc / ___)	Sum
A. 3			
B. 6			
Start here! C. 12			
D. 18			
E. 24			

Unlike when Plugging-In your own numbers, when we use PITA we DO NOT need to test all the answers after we have found one that satisfies all the conditions.

Remember, when you find the CORRECT ANSWER, then STOP and move on!

17. Chef Emeril has equal amounts flour, sugar and salt. He made pretzels by mixing 1/3 of the flour, ½ of the sugar and ¼ of the salt. If he made 52 pounds of pretzels, how many pounds of sugar did he have to start?

A. 45
B. 48
C. 50
D. 52
E. 56

Step 1- Are there any trap answers?

Step 2- Label the remaining answer choices

Answers represent: _____

A. 45
B. 48
C. 50

E. 56

Step 3: Start with (C) and work the steps backwards:

ACT Math Mini Lesson #15-More Practice with Plugging in the Answer Choices

6. Serena gives her butler a satin suit and her driver a diamond necklace. If the suit is worth one-fifth of what the necklace is worth, and if the two items together are worth $4800, how much is the necklace worth?

A. $800
B. $960
C. $3840
D. $4000
E. $4250

7. Jason has twice as many baseballs as Matt. If Jason gives Matt three baseballs, Jason would have one baseball less than Matt. How many baseballs does Jason currently have?

A. 4
B. 5
C. 7
D. 8
E. 10

12. A private plane pilot flies her plane for two days. The distance she flew on the first day was 150 km less than twice the distance she flew on the second day. If she flew a total of 600 km, what was the distance she flew, in km on the second day?

A. 250
B. 275
C. 350
D. 375
E. 450

13. If (q-6)(q-6) = 169, then one Possible value of q is?

A. √7
B. √13
C. 7
D. 19
E. 49

ACT Math Mini Lesson #16- Mixed Avoiding SAT Algebra Practice

8. If the average (arithmetic mean) of g an q is 20, then the average of (g+7) and (q+17) is?

A. 21
B. 22
C. 30
D. 32
E. 37

9. A number h, is increased by 5 and the result is multiplied by 5. The result is decreased by 5. Finally, that number is divided by 5. In terms of h, what is the final result?

A. h-5
B. h-1
C. h
D. h+4
E. 5(h+5)

9. If it costs w dollars to buy v tacos, how much will it cost, in dollars, to buy g tacos at the same rate?

A. (wg)/v
B. g/(wv)
C. (vg)/w
D. (wv)/g
E. wvg

14. A group of travelers are equally sharing the $30 cost of a taxi to dinner. If an additional person joins the party, each person will owe $1 less. How many people are currently in the group?

A. 15
B. 12
C. 10
D. 6
E. 5

7. Let c be an integer greater than 1, let f= the average (arithmetic mean) of the integers from 1 to c. Let g = the average (arithmetic mean) of the integers from o to c. which of the following can be true?
I. f = g II. f<g III. f>g

A. I only
B. II only
C. III only
D. II & III only
E. I, II & III

12. 160 students went on a trip to Washington D.C. If there were 28 more girls than boys on the trip, how many boys went on the trip?

A. 52
B. 66
C. 80
D. 94
E. 132

ACT Math Mini Lesson #17- More Mixed Avoiding SAT Algebra Practice

16. Which of the following calculations will yield an odd integer for any integer x?

- ***A.*** x^2
- ***B.*** $3x^2$
- ***C.*** $2x^2 + 1$
- ***D.*** $3x^2 + 1$
- ***E.*** $5x^2$

20. If $a < -1$, which of the following best describes a general relationship between a^3 and a^2?

- ***A.*** $a^3 > a^2$
- ***B.*** $a^3 < a^2$
- ***C.*** $a^3 = a^2$
- ***D.*** $a^3 = -a^2$
- ***E.*** $a^3 = \frac{1}{a^2}$

24. What is the product of n and m^2, where n is an odd number and m is an even number?

- ***A. An odd number***
- ***B. A multiple of four***
- ***C. A non-integer***
- ***D. An irrational number***
- ***E. The square of an integer***

30. If the sum of five consecutive even integers is equal to their product, what is the greatest of the five integers?

- ***A. 4***
- ***B. 10***
- ***C. 14***
- ***D. 16***
- ***E. 20***

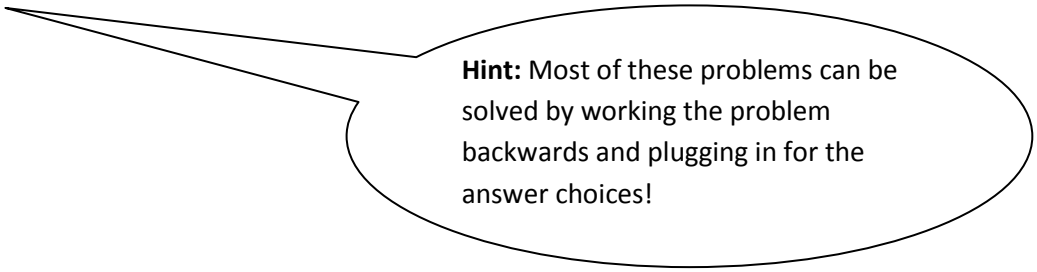
ACT Math Mini Lesson #18-ACT Quadratics

The ACT loves to test students on three specific quadratic equations. Make sure you can spot them, so that you can save time in factoring and such.

1.

2.

3.



ACT Math Mini Lesson #19-Functions

Treat functions like you're reading directions on a map. Follow them, and you'll end up at your destination.

Most function questions will give you a specific value to plug in for x or a given variable, and ask you the value of the function for the given variable.

6. If $f(x) = x^2 + 2x - 3$ f(5)=

A. 12
B. 17
C. 32
D. 35
E. 38

12. Leonard's band charges by performance. Leonard's share H, in dollars, for performance y is given by the function H(y) =12y-6. If Leonard earned $42 playing for the band during the month of October, how many performances did the band give?

A. 3
B. 4
C. 5
D. 6
E. 7

Avoiding Algebra Summary

Avoiding Algebra Notes:

Why does algebra suck on the ACT?

_____
_____

What in the problem tells me I can plug in my own number?

_____
_____

What in the problem tells me I can plug in the answer choices?

_____
_____

ACT Math Mini Lesson #20-Logarithms

Logarithm questions are not super common on ACT, but it wouldn't be out of the question for one to appear.

Think of log questions as simply another way to deal with exponents, and the way that they could be tested on the ACT is not very difficult.

The Logarithm Formula

$$\log_x y = z \text{ simply means } x^z = y$$

For example:

$4^2 = 16$ means $\log_4 16 = 2$

ACT Example:

33. If $\log_x 64 = 6$, what is the value of x?

A. 2
B. 3
C. 4
D. 5
E. 6

Logarithms Practice

1. ***What is the value of $log_3 27$?***

   A. 3
   B. 9
   C. $\frac{1}{3}$
   D. $\frac{1}{9}$
   E. 24

2. ***What is the value of $log_2 \frac{1}{8}$?***

   A. $\frac{1}{3}$
   B. $\frac{-1}{3}$
   C. $\frac{1}{4}$
   D. -3
   E. 3

3. ***Which of the following is a value of x that satisfies $log_x 36 = 2$?***

   A. 4
   B. 6
   C. 8
   D. 16
   E. 18

4. ***If $log_x 32 = 5$, what is the value of x ?***

   A. 1
   B. 2
   C. 5
   D. 6.4
   E. 27

5. ***If $log_x 64 = 2$, then $x =$?***

   A. 2
   B. 4
   C. 8
   D. 16
   E. 64^2

ACT Math Mini Lesson #21-Plane Geometry Introduction

Geometry Facts Revealed:

- When you find a geometry problem, see if you can solve it with a logical guess before you actually try to figure it out
- Be familiar with the size of common angles
- ***Most shapes will be drawn to scale - use your eyes to eliminate illogical answers***
- When a diagram is not given or is not drawn to scale, redraw it
- ***Fill in any missing info in the figure before solving the problem***

Plane Geometry Formulas

Area of a triangle =

Pythagorean theorem =

30-60-90 Triangles =

45-45-90 Triangles =

Area of a circle=

Circumference of a circle=

Area of square/rectangle=

Area of a trapezoid =

Types of Plane Geometry Problems Include:

Types of Geometry Problems Include:

1. _____
2. _____
3. _____
4. _____

Steps to solve ANY GEOMETRY PROBLEM

Step 1-

_____
_____

Step 2-

_____
_____

Step 3-

_____
_____

Step 4-

_____
_____

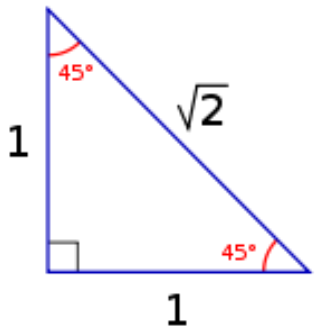
ACT Math Mini Lesson #21-Plane Geometry Introduction

- All Triangles are _____ degrees.
- The area of any triangle is equal to 1/2 (_____)(_____)
- The height must always form a right angle with the base
- An equilateral triangle has 3 equal sides and three equal angles. The angles all equal _____ degrees.
- An isosceles triangle has two equal sides and two opposite equal angles.
- Right triangles contain one ninety degree "right angle"
- The Pythagorean Theorem states that in any right triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides.
- Remember popular Pythagorean "triples" such as 3-4-5 or 5-12-13.
- You need to remember the formulas for "special right triangles."
- The length of a side of any triangle must be less than the sum of the other two sides and greater than their difference

Third Side Rule

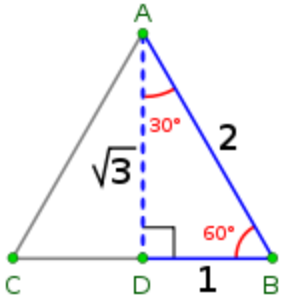
Special Right Triangle #1

The "45-45-90"



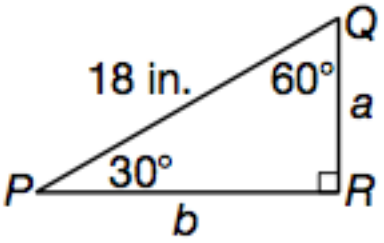
Special Right Triangle #2

The "30-60-90"



Examples with Special Right Triangles

Example 1:

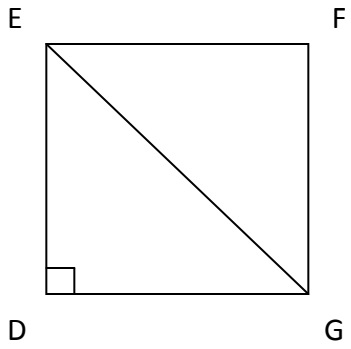


Find the length of the side PR.

Example 2:

Find the lengths of the other two sides of a right triangle if the length of the hypotenuse is $4\sqrt{2}$ inches and one of the angles is 45°.

ACT Math Mini Lesson #23-Using your "logic-brain" to solve Triangle Problems



13. Figure DEFG is a square. If EG= 4, what is the area of the square?

A. 4
B. 4√2
C. 8
D. 16
E. 32

1. *What do you know about the hypotenuse?*

2. *Are the sides of the square bigger or smaller than the length of EG?*

3. *What is a reasonable whole-number guess for the sides of the square*

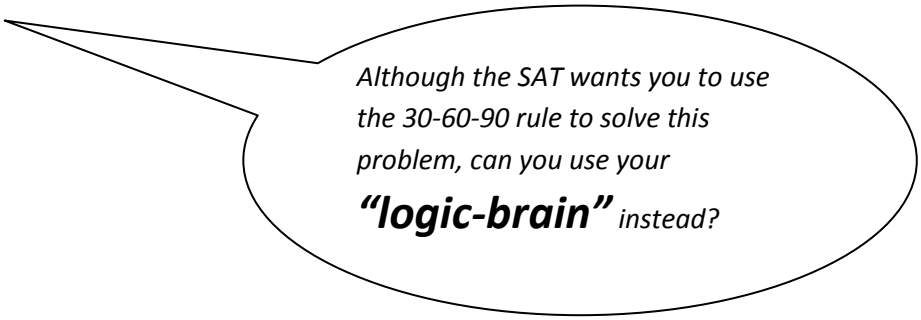
4. *What is the approximate area of the square?*

5. *What is the only answer that is possible?*

Triangles Logic Practice

16. An equilateral triangle has a side with a length of 10. What is the area of the triangle?

A. 5√2
B. 25
C. 25√3
D. 50√3
E. 100√2



1. *Draw your triangle and label the three sides*

2. *Draw your height (makes a right angle with the base)*

3. *What is a reasonable whole-number guess for the length of the height?*

4. *What is the approximate area of the triangle?*

5. *What is the only answer that is possible?*

ACT math Mini Lesson #24-Triangles Practice

1. Points A(1,0), B(8,0), and C(3,4) are the vertices of a triangle. What is the area of this triangle?

A. 5
B. 10.5
C. 14
D. 16
E. 28

2. A boat travels to a small island. The island is located 9 miles east and 12 miles north of the boat's departure point. About how many miles is the island from the departure point?

A. 3
B. 15
C. 21
D. 225
E. $\sqrt{63}$

3. A triangle has sides of length 4 inches and 7.5 inches. Which of the following CANNOT be the length of the third side?

A. 3.0 inches
B. 4.0 inches
C. 5.0 inches
D. 5.5 inches
E. 9.5 inches

1. What is the perimeter of a 30°-60°-90° triangle with a long leg of 12 inches?

A. $6\sqrt{3} + 12$
B. $4\sqrt{3} + 18$
C. $6\sqrt{3} + 18$
D. $12\sqrt{3} + 12$
E. $12\sqrt{3} + 18$

ACT Math Mini Lesson #25-Circles

Circles: Formulas You Should Know

- The circumference of a circle is equal to ____ or _____.
- The area of a circle is equal to ____, where __ is the radius.
- tangent lines touch a circle at exactly one point and form a ninety degree angle.
- Circles have 360 degrees.

You should also know these:

1. **Arc Length**= $C_{\text{whole Circle}}$ (Degrees of arc/360)
2. **Arc Area**= $A_{\text{whole Circle}}$ (Degrees shaded/360)

The ACT feels students can "logic" their way to figuring out these formulas by simply understanding proportions.

Remember, if the question is talking about arc length, that means that it wants to know about the distance on the outside of the circle, meaning you need to start with the circumference formula.

If the problem asks about arc area, that means it wants to know about the size of the inside of the circle, meaning you need to start with the area formula.

10. Points Y and Z lie on the circle (not pictured) with center O such that YOZ is equilateral. What is the probability that a randomly selected point in the circle lies on minor arc YZ?

A. 1/360
B. 1/60
C. 1/6
D. 6/10
E. It cannot be determined from the information given.

Circles Practice

7. Two spheres, one with radius 14 and one with radius 8, are tangent to each other. If T is any point on one sphere and W is any point on the other sphere, what is the maximum possible length of TW?

A. 14
B. 22
C. 28
D. 36
E. 44

10. If the length of a minor arc formed by two radii in a circle is 1/40 of the circumference, what is the arc's measurement in degrees?

A. 3
B. 6
C. 9
D. 12
E.15

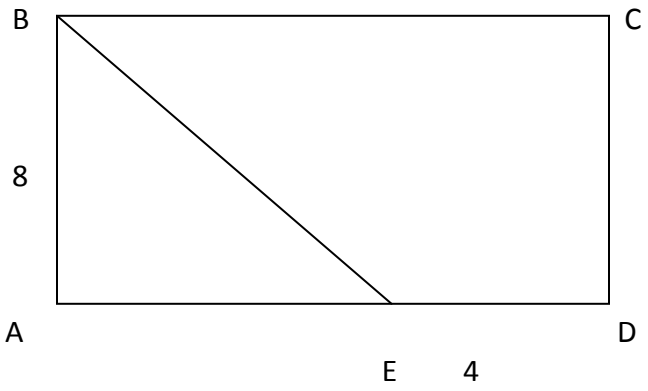
16. If the point (8,6) lies on a circle with a center at (0,0) what is the area of the circle?

A. 18 π
B. 36 π
C. 48 π
D. 64 π
E. 100 π

ACT Math Mini Lesson #26-4-Sided Figures

Four-Sided Shapes

- A square is a rectangle whose sides are equal
- The perimeter of any quadrilateral is simply the sum of its sides.
- The area of a rectangle is equal to the base (x) height
- Remember that any polygon can be divided into triangles
- The volume of a rectangular solid is equal to the length x width x height
- Remember how to plot and locate points on a coordinate plane



14. In the figure above, ABCD is a rectangle. If the area of triangle ABE is 40, what is the area of the rectangle?

A. 20
B. 28
C. 40
D. 80
E. 112

This is another problem that you should be able to solve in about 5 seconds-if you use your ***"logic-brain"***

14. In square ABCD (not pictured) CD=3, what is the length of diagonal BD?

A. 3√2
B. 3√3
C. 6
D. 6√2
E. 9

ACT Math Mini Lesson #27-Plane Geometry Practice:

12. Two lines, q and l, which never intersect, are both tangent to circle T. If the smallest distance between any point on q and any point on l is four less than triple that distance, what is the area of circle T?

A. π
B. π/4
C. 2π
D. 4π
E. 9π

Step 1- Draw the Figure!

Step 2- Write all other information given:

Step 3- What formulas will I need?

d = ?

r = ?

A = ?

ACT Math Mini Lesson #28-Avoiding Algebra Tactics to Solve Geometry Problems

Just because problems include geometry doesn't mean that our two avoiding algebra tactics don't work. Both plugging in our own numbers and plugging in the answer choices work well on problems with triangles, circles, angles, etc.

Take a look at the following problems and see what avoiding algebra tactic can be used…

20. The base of triangle G is 40% less than the length of rectangle W. The height of triangle G is 50% greater than the width of rectangle W. The area of triangle G is what percent of the area of rectangle W?

A. 10
B. 45
C. 90
D. 100
E. 125

What strategy can you use to solve this difficult problem?
(Hint: you can use this strategy for any problem that uses percents)

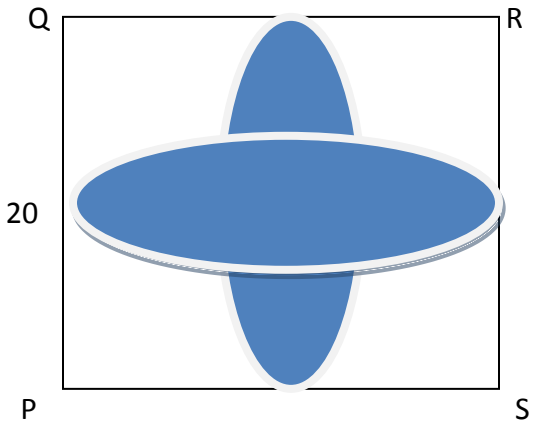
16. If a circle has an area that is half the circumference, what is its radius?

A. 1/2
B. 1
C. 4
D. π
E. 2π

ACT Math Mini Lesson #29-Using Logic to Solve Weird Geometry Problems

Has anyone ever tried to setup a geometry problem, written down your formulas, and labeled your figure, and then gotten stuck?

Use the logic side of your brain to eliminate answers that don't meet your "eyeball test."



Hint: About how much of the figure looks shaded?

20. If the figure PQRS above is a square, what is the area of the shaded region?

A. 20 π
B. 40(π -2)
C. 200 (π -2)
D. 100 π
E. 400 π

ACT Math Mini Lesson #30-Coordinate Geometry

There will be 9 coordinate geometry questions on the ACT.

- The equation for a line is y=*m*x+*b.* M is the slope and b is the y-intercept
- Parallel lines always have the same slope, perpendicular lines always have negative reciprocal slopes
- Every line is a 180 degree angle
- Four angles are formed when two lines cross. The sum of these four angles measures 360 degrees.
- ***When third line cuts across two parallel lines, the small angles are all equal and the large angles are all equal. The sum of a small angle and a big angle is equal to 180 degrees.***

1. ***The equation*** $y = 10x + 3$ ***can be graphed in the standard*** (x, y) ***coordinate plane. What is the value of the*** x***-coordinate at the point where*** $y = \frac{1}{2}$?
   - ***A.*** -4
   - ***B.*** $-\frac{5}{2}$
   - ***C.*** $-\frac{1}{4}$
   - ***D.*** $\frac{1}{4}$
   - ***E.*** 8

Slope Formula = _____

2. ***In the standard*** (x, y) ***coordinate plane, line*** m ***is perpendicular to the line containing the points*** $(5, 6)$ ***and*** $(6, 10)$. ***What is the slope of line?***
   - **A.** -4
   - **B.** $-\frac{1}{4}$
   - **C.** $\frac{1}{4}$
   - **D.** 4
   - **E.** 8

3. ***Line t in the standard*** (x, y) ***coordinate plane has a*** y***-intercept of -3 and is parallel to the line having the equation*** $3x - 5y = 4$. ***Which of the following is an equation for line*** t?
   - ***A.*** $y = -\frac{3}{5}x + 3$
   - ***B.*** $y = -\frac{5}{3}x - 3$
   - ***C.*** $y = \frac{3}{5}x + 3$
   - ***D.*** $y = \frac{5}{3}x + 3$
   - ***E.*** $y = \frac{3}{5}x - 3$

Midpoint Formula= _____

1. ***Point B $(4, 3)$ is the midpoint of line segment AC. If point A has coordinates $(0, 1)$, then what are the coordinates of point C?***

   A. $(-4, -1)$ ***answer: set up midpoint formula for x and y separately, then solve***
   B. $(4, 1)$ $\frac{(0+x)}{2} = 4$ ***x = 8***
   C. $(4, 4)$ $\frac{1+y}{2} = 3$ ***6 = 1 + y*** ***y = 5***
   D. $(8, 5)$ ***so the ordered pair (8,5) is the answer → D***
   E. $(8, 9)$

Distance Formula= _____

1. ***What is the distance, in coordinate units, between the points $(-3, 5)$ and $(4, -1)$ in the standard (x, y) coordinate plane?***

   A. $\sqrt{13}$
   B. $\sqrt{17}$
   C. $\sqrt{85}$ $\sqrt{36 + 49} = \sqrt{85}$ ***→ C***
   D. 13
   E. 85

Graphing Circles, Ellipses and Parabolas

You won't likely see many questions that ask you to graph these shapes, but it will help to be familiar with the formulas.

When in doubt, use your graphing calculator and plug in points!

The Equation for a Circle = _____

(h, k) = _____

r= _____

The Equation for an Ellipse = _____

(h, k) = _____

2a = _____

2b = _____

The Equation for a Parabola = _____

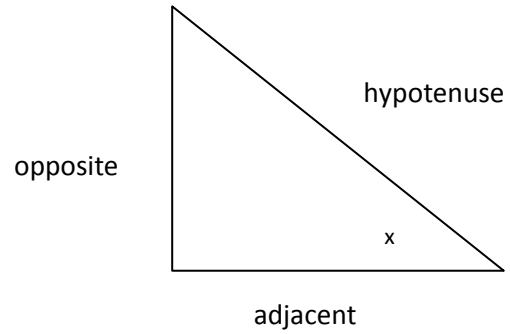
Example:

When you graph the equation $y^2 = 1 - x^2$ on a standard coordinate plane, the graph would represent which of the following geometric figures?

A. Parabola
B. Circle
C. Ellipse
D. Square
E. Straight line

ACT Math Mini Lesson #31-ACT Trigonometry

There are only 4 trig questions on the ACT. At least 2 will deal with right triangles.



SOHCAHTOA will help you remember most of the formulas

The sine of an angle = _____

The cosine of an angle = _____

The tangent of an angle = _____

Reciprocals

A. **cosecant**=_____

B. **secant**=_____

C. **cotangent**=_____

Trig Identities that will Help on the ACT

1. _____

2. _____

ACT Trig Practice

1. ***For all*** θ, $\frac{\cos\theta}{\sin^2\theta + \cos^2\theta} =$

   A. $\sin\theta$
   B. $\csc\theta$
   C. $\cot\theta$
   D. $\cos\theta$
   E. $\tan\theta$

2. ***If*** $(\sin\theta + \cos\theta)^2 = \frac{5}{2}$, ***then*** $\sin\theta\cos\theta = ?$

   A. 1
   B. $\frac{1}{2}$
   C. $\frac{1}{4}$
   D. $\frac{3}{2}$
   E. $\frac{3}{4}$

3. ***Which of the following is identically equal to*** $\sin 2A$***?***

   A. $1 - \cos^2 2A$
   B. $2\sin A\ \cos A$
   C. $2\sin A$
   D. $\frac{1}{\sec 2a}$
   E. ***None of these***

Geometry and Trig Summary

Geometry and Trigonometry Notes:

What is the first thing I should do when I look at geometry problems?

_____
_____

How can my "logic brain" help me solve geometry problems?

_____
_____

Do I need to memorize formulas? If so, which ones?

_____
_____

What does "drawn to scale" mean? Are ACT problems always "to scale?"

_____
_____

Are avoiding algebra tactics useless on geometry problems?

_____
_____

What coordinate geometry do I need to know?

_____
_____

How will the ACT test me on trigonometry?

_____
_____

ACT English

ACT English Mini Lesson #1-ACT English Intro

You will have 45 minutes to answer 75 questions that will come from 5 passages. Questions will measure your abilities in grammar, organization and style, as well as your ability to strengthen or revise parts of each passage.

The Big 5 ACT English Topics:

1. _____
2. _____
3. _____
4. _____
5. _____

ACT English Section Tips:

1. _____
2. _____
3. _____

Two Little Tricks

1. _____
   _____
2. _____
   _____

What if you don't spot the error right away or if you don't know what is being tested?

Unlike Error ID questions where you actually have to recognize what grammatical error is being tested, improving sentences questions tell you exactly what concept they test!

Use the answer choices as clues!

Sometimes, you will not spot the error or errors immediately, or you won't be sure exactly what error they might be testing. If this happens, do not panic, because this happens to everyone.

How do the answer choices tell me what is being tested?

Look down the list of answer choices from (A) to (E) and see where the differences lie. For example, if the verb tense is different in three of the answers, then that's probably what they are testing.

A…has….

B….are…
C…has had…
D…is having…

If you look at the sentence and then look at these answer choices, you can probably guess that they are testing verb tense and subject verb agreement. To find the correct form of the verb, go back to the sentence and look for the subject to see what verb is correct.

Using the Answers as Clues Drill:

Remember, if you don't know what grammar issue the question is testing, simply look down the answers to see where the choices differ. On the following sentences, use the answer choice differences to ascertain what error(s) are being tested on each question and what part of the underlined portion you will need to correct to eliminate answer choices that repeat the errors.

1.
(A) finishing
(B) finished
(C) has finished
(D) having finished

What error(s) are being tested?

2.
(A) meeting as it
(B) meeting as they
(C) meeting, it
(D) meeting will

What error(s) are being tested?

3.
(A) Joe, because he
(B) Joe, therefore he
(C) Joe, and he
(D) Joe; however he

What error(s) are being tested?

4.
(A) night, it was moving
(B) night by moving
(C) night, and it moves
(D) night, for it moves

What error(s) are being tested?

ACT English Mini Lesson #2-Sentence Construction

These questions will test your knowledge of whether or not sentences are put together correctly. They will test you on…

1. Fragments
2. Run-ons
3. Comma Splices
4. Misplaced Modifiers
5. Nonparallel Structure

ACT English Trap

Many students use the "*sounds good method*" to solve ACT grammar sections. The ACT knows this and will try to trick you! They will make things that sound wrong correct and make things that sound fine to you and me incorrect. Because we often do not speak using proper grammar, these are easy traps to fall for.

Think about tricks

Best Grammar Tip #1: Cut out the Fat!

Many sentences will often contain unnecessary words or phrases that are meant to confuse and distract you and cause you to not see the error. As you read the sentence, cross out any "fatty" or unneeded phrases. These include prepositional phrases, comma phrases, appositive phrases and anything between two commas. These will allow you to not make careless errors see the important parts of the sentence more clearly.

For instance, a **prepositional phrase** is anything that goes in the phrase:

The bird flew____the cloud.

For instance: over, under, across, through, before, of, after, etc…

A **comma phrase**:

Dr. Phil, an English scholar and author of many books,
went for a run with his new puppy.

The entire phrase between the commas should be crossed out, and should read:

Dr. Phil, an English scholar and author of many books,
went for a run with his new puppy.

Sentence Structure:

Sentence structure questions test your knowledge of how sentences and ideas should be joined, separated, or put together. These errors will typically be tested through *clauses.*

Clauses

There are two types of clauses that will be tested on the Grammar Section of the ACT:

Independent Clauses (main) - Can stand on their own as sentences, every sentence must have at least one.

Dependent Clauses (Subordinate) – cannot stand alone, needs to be joined to an independent clause

Independent Clause will be tested in two ways:

1. The run-on sentence

The run-on is usually pretty easy to spot because it will be immediately clear that the sentence is long and confusing. The run-on sentence occurs when independent clauses are joined without any punctuation.

Tim wanted to go to the mall he wanted to see a movie.

2. The Comma Splice.

The comma splice error is incredibly common and also often difficult for students to spot because it "sounds" fine.

EX: Tim wanted to go to the mall, he wanted to see a movie.

This is NOT CORRECT. Independent clauses cannot be separated by using a comma.

The corrections:

Tim wanted to go to the mall, and he wanted to see a movie

or

Tim wanted to go to the mall; he wanted to see a movie.

Independent clauses must be joined by a **semicolon** or a **comma with a conjunction**.

Commas and Clauses Practice

1. Pollack's most intriguing impressionist works have been

produced at his garden in Madrid, he moved there from

his native France in the 1890s.

A. Madrid, he moved there
B. Madrid; he moved there
C. Madrid, but he moved there
D. Madrid and he moved there

2. There is not much difference between the decision to

enter a presidential race and the decision to walk into

a lion's den, in reality, the lion's den seems more fun.

A. NO CHANGE
B. a lion's den. In reality,
C. a lion's den in reality,
D. a lion's den, in reality

3. The YMCA's expansion plans include a new gym

and a new lunch room if the fundraising drive is

successful there will be enough funds for both.

F. NO CHANGE
G. room, if
H. room; if,
I. room. If

Subordinate (Dependent) Clauses:
Subordinate clauses cannot stand on their own because they do not contain both a subject and verb. Every sentence must have an independent clause, but only some sentences will have dependent clauses.

Subordinate Clauses will be tested in one way:

The Fragment:

Ex: When the customers entered the store, much to their confusion, and following the sale.

Fragment errors are usually easy to spot because they usually sound wrong and confusing. This is a fragment because three subordinate clauses are joined together without an independent clause.

Watch out for fragments on questions which hold a dependent clause by itself, and/or punctuation changes in the answer choices.

Examples

The bride and groom drove away in their car.

As the guests ran behind it, screaming and laughing.

A. No change
B. While the
C. During which the
D. The

Although it will be forever associated with Shakespeare's

Hamlet. The castle at Elsinore was never actually Hamlet's home.

F. No Change
G. Hamlet; the
H. Hamlet. A
J. Hamlet, the

ACT English Mini Lesson #3-Verbs

Verbs are action words that describe what the subject of a sentence is doing at a given time. THE ACT will test you on three issues concerning verbs.

1. ***Subject-Verb Agreement***
2. ***Parallelism***
3. ***Tense***

Subject-Verb Agreement:
Singular subjects must take singular verbs and plural subjects must take plural verbs. This sounds pretty easy, but the ACT makes this difficult by attempting to hide the subject and verbs in the sentence.

Singular or Plural:

Sometimes, the ACT will try to confuse you about whether a subject should have a singular or plural verb. These tricky ones are called collective nouns and are always singular.

Collective Nouns
The team *is*
The family *is*
The group *is*
The country *is*
The jury *is*
The audience *is*

Collective Pronouns:
Everyone *is*
Anyone *is*
Each *is*
None *is*
Either *is*
Neither *is*
No one *is*
None *is*

And vs. Or:

Subjects joined by *and* are plural: Joe *and* Mary are going to dinner. However, nouns that are joined by *or* can be either singular or plural. If the last noun is singular, it takes a singular verb. If the last noun is plural, it takes a plural verb.

And/Or Drill:

Which of the following is correct?

1. The cheerleaders or the football team ***is/are*** getting off the bus.

2. The football team or the cheerleaders ***is/are*** getting off the bus.

Parallelism:

Parallelism simply means that all the verbs in a given sentence must be in the same form. For example, Chris will attend the university, major in biology and to become a doctor. This is an incorrect sentence because all the verbs are not in the same form. "To become" is not the same form

Tense:

Verbs come in many different tenses. Fortunately, you will not have to find and identify the name of the tense that is being used in the sentence. You will simply have to ensure that the correct tense is being used throughout the sentence.

Often, you will be given clues as to what the proper tense for the sentence should be. Take a look at some common clues that will tell you the time frame of the sentence.

Example:

20. By next month Ms. Jones will be Mayor of Tallahassee for two years.

A. will be Mayor of Tallahassee
B. will have been Mayor of Tallahassee
C. will be mayor of Tallahassee
D. could have been mayor of Tallahassee

19. Valarie claims that cats made the best pets.

A. made the best pets.
B. could be the best pets.
C. are the best pets.
D. make the best pets

ACT English Mini Lesson #4-Nouns

When it comes to nouns, the only thing that you really have to worry about is noun agreement. Nouns must agree with other nouns and pronouns must agree with the nouns that they modify. When you see an underlined noun in the error ID section, check to make sure it agrees with the other nouns in the sentence.

7. Many students suffer from a guilty conscience

immediately after cheating on a difficult final exam.

A. suffer from a guilty conscience
B. suffer from a guilty conscience
C. suffer from guilty conscience's
D. suffer from guilty consciences

ACT English Mini Lesson #5-Pronouns

Pronouns are words like he, she, and them that are used to take the place of nouns. The ACT usually tests three things when it comes to pronouns:

1. Agreement
2. Ambiguity
3. Case

Pronoun Agreement:

As with many other parts of speech, pronouns must agree with the nouns that they stand for. Singular subjects must be replaced by singular pronouns and plural subjects must be replaced by plural pronouns.

A sports book earns most of their money from the

commission taken on each bet, not on the bets themselves.

11. A. earn most of their money
B. earn most of it's money
C. earns most of its money
D. are earning most of their money

When you first taste halva, a bread made from sesame,

one may think one is eating a completely new food group.

12. A. one may think one is
B. people may think they are
C. you may think you are
D. one may be thinking of

Ambiguity:

When it comes to pronouns, ambiguity refers to cases when you are unsure of who or what a pronoun refers to. On the ACT, if you are ever confused about who or what the pronoun is referring to, it's wrong!

Example: After looking over the paint samples, Jim agreed with Cody that his truck should be painted white.

Whose truck are we talking about? Could it be Jim's truck? Could it be Cody's truck? Because the truck could belong to either of them, the pronoun is ambiguous.

Case

Pronouns come in two cases, subject pronouns and object pronouns. Subject pronouns refer to subjects that perform the action of the sentence. Object pronouns refer to the person or thing that receives the action. Mostly, you will be able to spot errors in case because the sentence will appear funny. When in doubt, cut the fat and follow the guidelines below.

Simply use this guideline to remember which pronouns go where…

Subject Pronouns **Object Pronouns**

_____ **laughed at** _____

Take a Look at the Subject and Object pronouns below

Subject Pronouns:	Object Pronouns
Singular	**Singular**
He	Him
She	Her
It	Whom
Plural	**Plural**
We	You
They	Us
You	Them
Who	Whom

I vs. Me

If you are having trouble remembering when to use *I* (subject pronoun) or *me* (object pronoun) it often helps to cut the fat. In many cases this means removing the other person from the sentence.

I vs. Me Drill:

The apartment belongs to Lauren and me

The apartment belongs to Lauren and I

Lauren is the fat, get rid of her…

The apartment belongs to (I or me)

Me is the object and apartment is the subject, therefore the correct answer is *me*.

Try another:

Angie is more athletic than me

Angie is more athletic than I

What are you actually saying in this sentence? You are actually saying that Angie is more athletic than I *am.* However, the *am* is implied. If you in doubt about I or me, add *am* to the end to see which is correct.

ACT English Mini Lesson #6-Pronoun Usage Drill

Circle the correct Pronoun in each sentence; refer back to the previous page if necessary.

1. Alice gave (he/him) advice on what to wear to his big date.

2. To (who/whom) should Jeremy give the leftovers?

3. Together you and (I/me) will rule the school with an iron fist.

4. (We/Us) football players are planning to burn our jerseys if we don't win a game soon.

5. Between you and (I/me), the ACT is really boring

6. If Andrew built the website (himself/him), the company could save lots of money.

7. (Our/we) son is (who/whom) we would like to inherit the family business.

8. Helen likes chocolate much more than (me/I)

9. Mariah told (us/we) that her next album will be her best yet.

10. (He/Him) easily solved the mystery of (who/whom) failed to flush the toilet.

11. You can have that disgusting liver and onions; (she/her) doesn't want it!

12. Posh is going to find (her/herself) a new hairstyle.

13. Don't worry, it's (me/I).

14. You can count on LeAnn and (I/me) to save the concert.

15. To (whom/who) should I address the letter?

16. Michael can break-dance better than (he/him)

17. It was (he/him) who tagged the bridge and the overpass with graffiti.

18. Kobe bought the necklace for (him/himself)

ACT English Mini Lesson #7 Preposition Use

We talked briefly about prepositions earlier in this text. Remember that prepositions are any word that fits in the phrase

The bird flew_____the cloud.

Sometimes the ACT will trick you and use the wrong preposition. Preposition use is often dictated by idioms. Most of them you will spot because they will sound wrong, but a few of them will be more difficult to spot.

Preposition Usage Drill: circle the correct preposition(s)

I am resentful (of/to/for) her

I am happy (about/for) Joe

I am jealous (of/from) my sister

I am worried (for/about) my daughter

The couple had an argument (over/about) the election

You have a responsibility (to/for) take care of your younger brother

My life is not so different (from/of) your life

She is indebted (to/about/for) her husband

I am grateful (of/for/to) you

ACT English Mini Lesson #8-Grammar Drill

Yesterday was one of those mornings when you learned looking back that it would have been better if one had[1] simply stayed in bed. The batteries in my alarm clock had died[2] so the alarm didn't go off. When I finally was ready for school, I went to the car to find that my sister took the car and I[3] couldn't get a ride until later in the day. I then called some friends, but each of them were[4] too far away to pick me up. My mom, who finally gave[5] me a ride was[6] not too happy to hear that I was not at school. Of all the bad mornings I had this year, this one was the worse.[7]

1. A. NO CHANGE
   B. if had
   C. if you has
   D. if one

2. A. NO CHANGE
   B. have died
   C. died
   D. having died

3. A. NO CHANGE
   B. car, and I
   C. car, I
   D. car, but I

4. A. NO CHANGE
   B. was
   C. has
   D. are

5. A. NO CHANGE
   B. whom finally gave
   C. whom gave finally
   D. who gave finally

6. A. NO CHANGE
   B. ride-was
   C. ride, was
   D. ride. Was

7. A. NO CHANGE
   B. were the worse
   C. was the worse
   D. was the worst

ACT English Mini Lesson #9-Other Grammar Errors

- Diction Errors
- Faulty Comparisons
- Modifiers
- Adjectives and Adverbs

Diction Errors:

The ACT will occasionally throw a diction error at you just to throw you off. Diction means word choice, and diction errors are often difficult to spot because the incorrect word and the correct word sound exactly the same.

Common Diction Errors

- To/too/two
- They're/there/their
- Your/you're
- principal/principle
- Accept/except
- Affect/effect

Diction Drill:

Irritated-	Aggravated-
Stationary-	Stationery-
Illicit-	Elicit-
Proscribe-	Prescribe-
Imminent-	Eminent-
Allusion-	Illusion-
Perspective-	Prospective-
Conscious-	Conscience-
Elude-	Allude-
Compliment-	Complement-
Veracious	Voracious-

Diction Examples:

9. The setting of a story effects the story's plot.

A. effects the story's plot
B. effects the stories plot
C. affect the story's plot
D. affects the story's plot

4. In studying an assignment it is wise to read it over quickly at first, than see the major points, and finally outline the material.

A. first, than
B. first: then
C. first-then
D. first, then

The Faulty Comparison:

When you are comparing things, make sure that they can actually be compared. This seems pretty obvious but in conversation this is a very common mistake.

Ex: *Marc goes to Quiznos because the sandwiches are better than Subway.*

This sounds fine and we know exactly what Marc means. However, this sentence is incorrect. Take a look at what is actually being compared. This sentence compares sandwiches to a store. That is a faulty comparison. Sandwiches must be compared to sandwiches and stores must be compared to stores.

Correctly Written: *Marc goes to Quiznos because the sandwiches are better than the sandwiches at Subway.*

Kelly was overjoyed because her chili was

far better than Joe.

A. NO CHANGE
B. was far better than Joe's chili
C. was far better than the chili of Joe
D. did seem better to Joe

Comparing Groups:

When you are comparing a number of people or things, the comparison word differs depending on how many people or things you are talking about.

Many vs. Much and Less vs. Fewer:

The ACT will occasionally throw errors at you that misuse *many, much, less* and *fewer*. Just remember, if it CAN BE COUNTED you need to use *many* or *fewer*. If the amount CANNOT BE COUNTED, you need to use *much* or *less*.

Ex: With *many* people working, there is *much less* work.

Two People or Things	Three People or Things
Between *Between* you and me, Mom is a bad cook.	**Among** Alice is the *best* athlete among the three of us.
More I like chicken *more* than I like steak	**Most** Of all the dogs I know, Spike is the *most* smelly
Less I am less likely to *lose* than you are	**Least** Of all the people at the table, Sarah is the *least* intelligent.
Better I am a *better* skateboarder than Kimberly	**Best** Tony is the *best* skateboarder that I know.

Example:

If you eat fewer buffalo wings, you will use less ranch dressing.

Example:

8. After comparing my air conditioner with the one on sale, I decided that mine <u>was the most efficient.</u>

A. was the most efficient.
B. was the more efficient.
C. was, by far the most efficient
D. should be considered the most efficient.

ACT English Mini Lesson #10-Adjectives and Adverbs

The ACT will try to trick you by using adjectives when adverbs should be used and vice versa. Adjectives modify nouns, while adverbs modify verbs, adjectives and other adverbs. Adverbs are typically easy to spot because they often end in –ly.

4. We spent Sunday afternoon wandering aimless in the park.

A. wandering aimless
B. wandering aimlessly
C. wandering in an aimless manner
D. wandering almost aimlessly

Misplaced and Dangling Modifiers

Modifiers are descriptive words or phrases that are used to add depth or dimension to the phrase that they modify. Modifiers are misplaced if they do not actually refer to what they are modifying. Modifiers are dangling if you are unsure of what they modify.

Ex: *Because he was tall*, Carmelo was a great basketball player.

Because he was tall is the modifying phrase in the sentence. It gives dimension to the sentence and tells you why Carmelo was a great basketball player. Modifying phrases generally must be placed directly next to the phrase it is modifying.

Every time he urinates on the lawn, Alec praises his new dog by giving him a cookie.

In this sentence, who is urinating on the lawn? Alec is. Of course, we are trying to say that the dog is urinating on the lawn. This modifying phrase needs to be placed near the dog in order for the sentence to say what it means.

Example:

Walking into the jewelry store, Maritza's necklace

dropped into the gutter.

6. A. NO CHANGE
B. Maritza's necklace dropped in the gutter
C. Maritza dropped her necklace in the water
D. Maritza's dropped necklace in the water

ACT English Mini Lesson #11-Shifts In Construction

These errors are similar to misplaced modifiers, but are slightly different. In these errors, the modifier will be in the wrong place, but no words will need to be changed. In these errors, the modifying phrase simply needs to be moved slightly.

Example:

Attempting to avoid the mud, I carefully lost

my balance and fell.

Use your common sense to help you solve these problems!

7.
A. NO CHANGE
B. (Place before *attempting)*
C. (place after *and*)
D. (place after *fell)*

ACT English Mini Lesson #12-Other Punctuation errors

1. Semicolons
2. Dashes
3. Apostrophes
4. Colons

Semicolons
For the purposes of the ACT, semicolons should be used almost the exact same way as a period.

Use a semicolon instead of a period when you are connecting independent clauses with a similar subject.

How do you spot a semicolon error on the ACT?
If any of the answer choices contains a semicolon, ask yourself whether the sentence contains two related independent clauses that are not joined by a conjunction.

Dashes
Dashes (--) separate a word or group of words from the rest of the sentence. Use dashes to indicate an abrupt break in thought, or to introduce an explanation.

Take a look at the example below, and decide which words should be separated from the rest of the sentence.

> I tried to express my gratitude not that any words could be adequate but she just nodded and walked away.

When the group of words that needs isolating is in the middle of the sentence, dashes function in pairs. However, when the phrase that needs isolating is at the end of the sentence, then only one dash is used.

How do you Spot a Dash Error on the ACT?

If the underlined portion of any of the answer choices contains a dash, compare the dash to the other punctuation marks. Check the non-underlined portion of the passage for dashes that need to be paired. Think about whether the sentence contains a sudden break in thought, an explanation, or an afterthought.

Apostrophes
An apostrophe is used to indicate possession or to mark the missing letters in a word. When used to indicate possession, the apostrophe appears either directly before or directly after the *s* at the end of a possessive noun.

Margie's plastic surgery will be extremely expensive.
Women's issues will be important in the next Presidential race
The boys' room will be renovated this weekend.

If the noun is possession is singular, the apostrophe falls before the "s."
Its/It's/Its'

The most common apostrophe error on the ACT concerns the misuse of the three words listed above.

*It's-*_____

It's been great talking with you
It's really important to me

*Its-*_____

The baby crawled around looking for its mother

*Its'-*_____

Colons
Use a colon after a complete statement to introduce a list of related details. The list can have many items or only one.

Ex: Joel just bought all the hiking supplies needed for our adventure: a sleeping bag, a backpack, and a pair of new boots.

How do you Spot Colon Errors on the ACT?

If the underlined phrase or any of the answer choices contains a colon, ask yourself the following questions:

1. Is the list introduced by an independent clause?
2. If so, the colon is correct. If not, the colon is probably wrong.

The ACT will try to trick you by using a colon to introduce a list, but do so without the independent clause that must precede it.

Colons can also be used to separate independent clauses when one represents a general thought and the other explains or expands upon the first.

Ex: Alfred didn't know what to do: he could either go to the movies, or go to the library to study for the ACT.

ACT English Mini Lesson #13- Punctuation Drill

Punctuation Drill

My most memorable class trip as a kid was the trip I took to Yosemite with my 7th grade class. I was only 13 at that point; and[1] I'd never been camping before. Our school's principal, a real explorer,[2] decided it would be great for our class to discover the joys of the outdoors. My image of Yosemite full of flora and fauna[3] was not exactly accurate, yet the true scenery was more amazing than I imagined. On our first morning our[4] counselor for the week took us up one of the longest trails. As I followed along behind my classmates lead[5], I noticed each of the rocks displayed a unique color formation; violet[6] and charcoal in some places, greenish brown in others. By the time we reached our destination, I was tired, hot and thirsty.[7] The trip to Yosemite was truly life-changing. As I looked back on the view from Half Dome, it's beauty[8] still amazes me ten years later.

1. A. NO CHANGE
B. at that point and
C. at that point, and
D. at that point. And

2. A. NO CHANGE
B. principal, a real, explorer
C. principle, a real explorer,
D. principal, a true explorer

3. A. NO CHANGE
B. Yosemite-full of flora and fauna-
C. Yosemite-full of flora and fauna
D. Yosemite-full of flora and fauna,

4. A. NO CHANGE
B. On our first morning, our
C. On our first morning our,
D. On, our first morning, our

5. A. NO CHANGE
B. classmates' lead
C. classmate's leads
D. classmate's lead

6. A. NO CHANGE
B. formation, Violet
C. formation: violet
D. formation, violet

7. A. NO CHANGE
B. tired, hot, and thirsty.
C. tired hot and thirsty
D. tired, hot, and, thirsty

8. A. NO CHANGE
B. its beauty
C. its' beauty
D. its beauty,

ACT English Mini Lesson #14-Rhetorical Skills

35 of the 75 English questions will test your knowledge of "rhetorical skills." These questions will test strategy, organization, style and transition. You will need to understand the author's argument and think about the most logical flow of ideas.

Strategy Questions

These often test transitions, and they are typically easy questions. Other strategy questions test your ability to improve the passage, rather than fix errors. To help you on these questions, think about the flow of ideas and how to best order the author's thoughts.

Transitions

Same Direction	Cause and Effect	Change Direction

The Three Types of Organization Questions

Question-Type #1:

_____

_____

Question-Type #2

_____

_____

Question-Type #3

_____

_____

Example

Behind me, I heard kids oohing and aahing at the wonders of the circus. I was eight, and I fell in love with the big top and everything under it right then, even down to the musty sawdust and hay that ground underfoot, so much so that I vowed that someday, I would work under its canvas wings.

12. Which of the following sentences would best continue the personal theme expressed here?

A. As I grew older, I found I had a talent for numbers, and studied accountancy.
B. Twenty years later, I had gone into engineering, and soon went to work for NASA.
C. Throughout high school, I studied acting and drama, and began working with dinner theatre after graduation.
D. It took me several years, but by the time I was 20, I had graduated from clown college and begun working with a small family-run operation.

Style Questions

Style questions test redundancy, overall tone, and suitability of words. There could also be questions that test wordiness, slang, or irrelevance. Be aware that the ACT prefers formal English to casual.

1. In the brilliant glare of the spotlight, focused on the center one of a group of rings on the dirt floor, a man in a silver suit stood proudly, top hat in hand.

A. NO CHANGE
B. center of the rings
C. center one ring
D. center ring

2. Behind the ringmaster, I could see a majestic lion, pacing back and forth between the sides in the cage and snarling at the clowns that stood off to one side.

A. NO CHANGE
B. REMOVE
C. between the sides
D. back and forth

ACT English Mini Lesson #15-Rhetorical Skills Practice

(1) I guess that fixing vintage car engines is not a very common hobby for a teenage girl, but that has never really bothered me. (2) I have been helping my dad restore old cars since I was 7 years old, and my (1) dad would let me lie under the car, hand him tools, and helped (2) change the oil. (3)

[2]

By the time I was 11, I was sifting through old car part catalogues to help my dad find spare parts. (4) A lot of it has to do with experience; how (3) you instinctively begin to know what's wrong with the engine, just by hearing an old car wheezing its way into the shop. (5) It takes quite a while to really get the hang of fixing vintage cars.

[3]

(6) Once one gains an understanding of the basic engine platforms of the Big Three car makers, you can begin to have the ability to diagnose the problem in any car. (7) I will readily admit that I have had some spectacular failures, like attempting to fit some Ford Mustang parts into a Dodge Charger. [4]

[4]

(8) Some skills have been easier to acquire than others. (9) However, my father has been very supportive through the ups and downs of my learning to fix and restore vintage cars. (10) He has bravely taken (5) the progress with the setbacks. (11) My friends may laugh at my hobby now, but some day when I open up my own car shop, they'll all wish they knew their way around a car's engine like I do.

1. A. NO CHANGE
   B. old, when
   C. old, my
   D. old, since

2. A. NO CHANGE
   B. help
   C. to help
   D. helping

3. A. NO CHANGE
   B. experience, how
   C. experience. How
   D. experience: how

4. Which two sentences, if the order was reversed, would best improve the organization of the paper?

A. 1 and 2
B. 2 and 3
C. 3 and 4
D. 4 and 5

5. A. NO CHANGE
   B. brave taken
   C. taken bravely
   D. bravely took

6. Which sentence could be taken out of the passage most easily without changing the meaning?

A. 8
B. 4
C. 9
D. 5

7. Which of the following sequences of paragraphs gives the passage the most logical progression?

A. NO CHANGE
B. 1,3,2,4
C. 1,4,2,3
D. 3,1,2,4

ACT Reading

ACT Reading Mini Lesson #1-ACT Reading vs. English Class

ACT Reading Comprehension…the part everybody hates!

Reading passages are almost always the most boring and dreaded part of the ACT. However, with a few simple strategies, you can save lots of time and avoid key errors.

The first key to understanding ACT reading passages is to know how reading on the ACT differs from reading for your English class at school.

How long do you need to remember things you read?

English Class _____

ACT _____

What's being graded and how?

English Class_____

ACT _____

What happens on a Multiple Choice Test if a student objects to a correct answer?

English Class _____

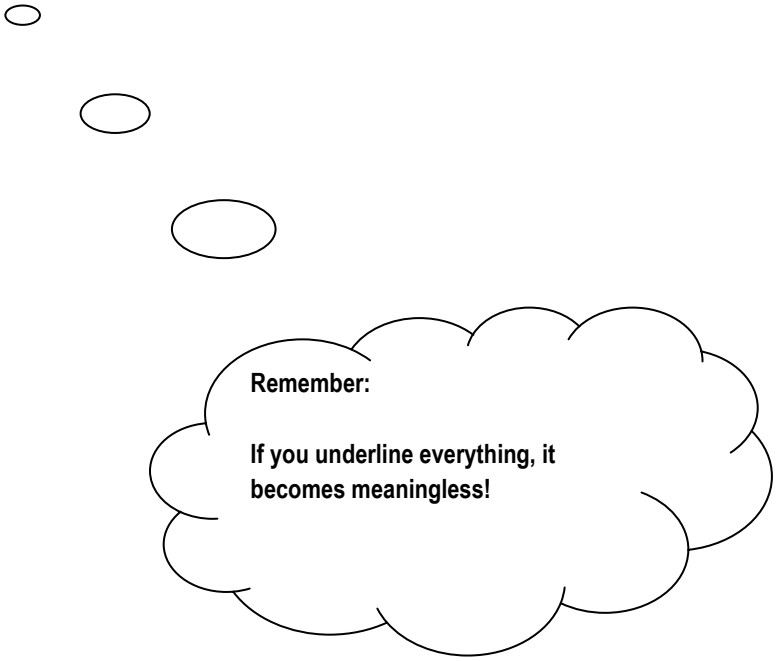
ACT _____

ACT Reading vs. English Class

How to read ACT passages:

Essentially, there are two ways to read. One of them is how the ACT wants you to read, the other is how you SHOULD be reading ACT passages. Take a look at the following chart:

ACTIVE READING	**PASSIVE READING**
You *turn your brain on* before reading	Brain is off during reading
Great for: School reading, research, the SAT/ACT/PSAT/AP Tests	Great for: Magazines, Harry Potter books, brochures, etc
You *think critically* about the author/characters while reading	You simply read/skim to understand the main point
You *underline key aspects* and make notes as you read	You simply lie on the couch and flip the pages



ACT Reading Mini Lesson #2-ACT Reading Tips

Reading Test Format

You will read 4 passages and answer 40 questions in 35 minutes. This means, you have approximately 9 minutes per passage.

The Reading Test Passages

The four reading test passages will come from the following fields. As you practice, take a look at each type of passage, and decide which you find easiest. Then do the passages from easiest to hardest. Many people run out of time during the reading test. If you answer the passages from easiest to hardest and you run out of time, then you will have left the hardest ones to guess and actually answer the easy ones.

1. _____
2. _____
3. _____
4. _____

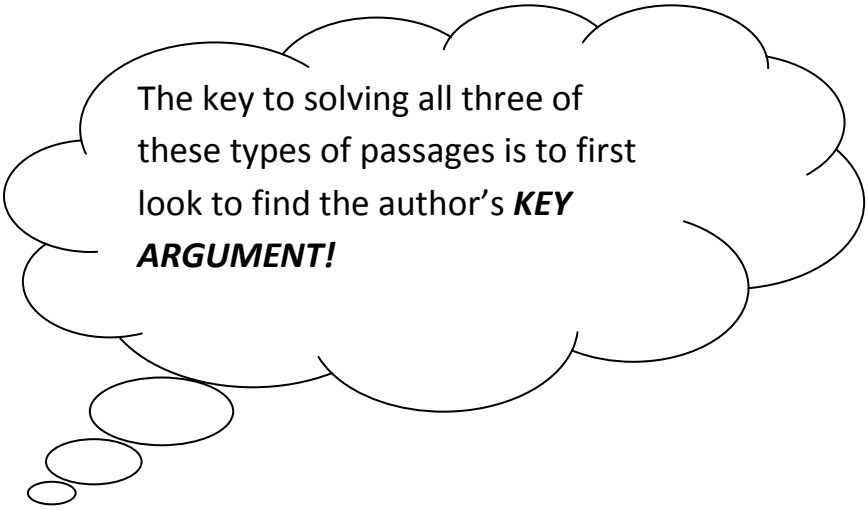
ACT Reading Passages Basic Strategy:

1. _____
2. _____
3. _____
4. _____
5. _____

Natural Science, Social Science, and Humanities Passages

Natural Science Passages
These passages are often filled with many details and complex descriptions. Be sure to go back to the passage to find the answers to each question.

Social Science and Humanities Passages
These passages are a sort of hybrid between natural science passages and prose fiction passages. Typically, the author will be making an argument of some kind about the subject of the passage, from which you will make logical conclusions.



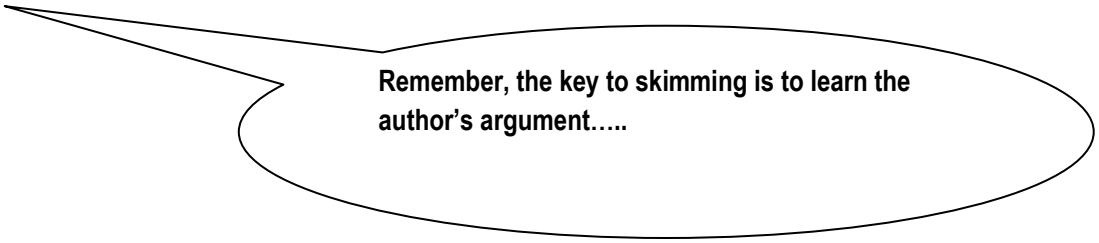
ACT Reading Mini Lesson #3- Understand Key Arguments

Step 1. _____

Each long passage will be preceded by an italicized blurb about the passage. Read it! This will give you a general idea about what you are about to read.

Step 2. _____

This doesn't mean read the whole thing! Read the first paragraph and skim the passage from there. Remember, you get no points for understanding the passage as a whole.



"The Blurb"

The following passage was adapted from an article published in the New York Herald around 1870. The article discusses the sport of baseball, which was just becoming popular at the time.

Some few years ago there was no manly outdoor sport in which the youth of the country could indulge and which could be claimed as national. The game baseball in a crude form was practiced among others, and by a few gentlemen was being systematized and perfected. The Herald, observing that in the game were all the elements which could commend it as a favorite pastime, styled it the National Game, and from that time to the present the young men—and many of the old men—of the country have adopted it as a means of recreation, amusement, and physical development.

That the game possesses the requisites for affording recreation and relaxation from daily labor is plainly shown by the thousands who flock to witness contests between any of the leading organizations. That it promotes the physical development is attested beyond a doubt by the improved physiques of those who practice with the bat and ball. Every portion of the physical system is brought into action, while the mind is subjected, at the same time, to a recreative course of treatment. The eye is

system is brought into action, while the mind is subjected, at

the same time, to a recreative course of treatment. The eye is trained to take in at once the entire situation; the hearing is quickened, to enable the players to note the slightest click of "tip" and to understand the call of the umpire or the order of the captains when the other faculties are intent on some other point; the judgment is exercised so as to enable the player to decide instantly on the best course of action to benefit his party, and the muscular strength is developed by the running, throwing, pitching, and batting in which all take part during the contest.

The game has now been reduced to a science, and the objection which was formerly made to it, on the ground that, compared to cricket, it was child's play, can no longer be raised. It was considered by some as being too dangerous; fingers were broken and the players were otherwise wounded, while in cricket the men could pad themselves so that they would not be hurt. Is it an objection to swimming that people are drowned sometimes? Or to skating that people are hurt by collisions or falls? Besides, the fact that the players at baseball unflinchingly face the dangers shows the inherent bravery of the American people and their determination to obtain even amusement at the risk of danger.

Aside from these considerations, the formation of clubs and state and national associations presents an advantage to the youth of this country. In these associations the members are almost unconsciously trained in the system of legislation. Business is conducted on the same plan as the legislative and corporate bodies throughout the country, and the members of the club become fitted for the proper performance of their duties as sovereigns. There is still another advantage to be derived from the associations which may be formed in the leading amateur organizations, such as the Empire, Knickerbocker and Eagle clubs of New York, Excelsior and Star of Brooklyn, Eureka of Newark, and National of Albany; for in them gentlemen of the highest standing in business and social circles may be found, aiding by their presence and their influence the progress and permanency of the national game.

What is the author's key argument in this passage?

_____

_____

_____

What lines did you find the thesis and other key argumentative statements?

_____

_____

_____

ACT Reading Mini Lesson #4- Types of Questions and How to Answer Them

Step 3. _____
After you have skimmed the passage, head for the questions and start breaking them down. We will discuss specifically the order in which you should answer the questions.

Step 4. _____
You don't get extra points for trying to answer the question from memory. All the answers to the questions are right in front of you. Go back to the passage and find the required information.

Ordering the Questions

Comprehension Questions	**Reasoning Questions**
Ask about the passage	Ask about the author's argument

Ordering the Questions to Maximize Time

The reading passage questions will not come in a specific order of difficulty. It will be up to you to decide which questions are easy, medium or difficult. Remember, all the questions are worth the same amount of points, so spend your time to avoid making careless mistakes on easy or medium questions.

Essentially, there will be two types of questions to test your knowledge of long passages. The first type of question will ask you to literally comprehend the meaning of the passage. The second type of questions can be described as reasoning questions and will ask you to understand SLIGHTLY beyond the literal meaning of the passage.

Easy Questions	Hard Questions

Ordering the Questions Drill

Imagine you encounter the following questions. Don't worry about answering them, since you don't have either the passage or the answer choices. Instead, refer to the chart above, and make a note next to the question from 1-8, in the order that these questions should be answered.

___ *According to the passage in line 9, "spell" most nearly means*

___ *In lines 10–22, the author notes that a "hard day's work" does all of the following EXCEPT*

___ *In lines 31–33, the author mentions the loss of Alice's innocence in order to*

___ *The author's tone in lines 31–34 could most accurately be characterized as*

___ *In line 7, "harassing" most closely means*

___ *The author suggest that athletes*

___ *The "Good Walk Spoiled" (line 32) most likely refers to a*

___ *In paragraph 4, the author argues that dancing helps the elderly of America by*

Further Info of Long Passage Strategy Step 3-Types of Reading Questions

ACT Mini Lesson #5-Further Info on Types of Reading Questions

Comprehension Questions

Facts about Comprehension Questions

- Look to complete literal comprehension questions first!
- These questions will most likely be the easier of the two question types
- These questions often contain line numbers that will tell you exactly where in the passage that you need to look to find the answer.
- These questions include: line reference questions, lead word questions and vocabulary in context questions

Line Reference Questions

The best way to spot literal comprehension questions is to look for a specific line reference within the question.

Examples:

The author uses the quote from Smith's book (line 67) to demonstrate that

In lines 23-24 the main character's primary concern is

According to paragraph 2 (lines 19-24) archeologists studied the fossils in order to

Many times you will be able to solve these questions just by going to those specific lines. However, don't be fooled, **the answers to the questions often lay just a few lines away from the given lines**. These questions are often solved best by going back to the passage, finding the answer and stating it in your own words.

Vocabulary in Context Questions

Some line reference questions will be deemed vocabulary questions. For instance a question could ask you about the meaning of the word "spell" in line 45. Be careful because the words that they ask you about will always have multiple meanings. Therefore, it's important to treat these questions in the same way that you would treat sentence completions. Even if you don't know the exact meaning of the word, you should be able to use the context to get a general idea of what the word means.

*******Because Vocabulary in context questions can most always be solved quickly, you should always do these questions first!*******

Steps to Solve Vocabulary In Context Questions:

Step 1. _____

Step 2. _____

Step 3. _____

Step 4. _____

Step 5. _____

Lead Phrase Questions:
Many specific and literal reading comprehension questions do not contain a line number. However, this does not mean that these questions are more difficult or any less straightforward. For instance, if a question asks about the "Bronze Age" you would naturally go to the passage and look for the words "Bronze Age." This is the lead phrase that will help you find the answer to the question.

Circle the lead word/phrase in the following example questions:

> The author suggests that mystery writers tend to
>
> According to the passage, which of the following is unique to Russian literature of the 19th century.
>
> The author of the passage suggests that he was able to publish his first book because
>
> In the passage, the invention of the wheel is compared to

In each question above, a lead word is there to tell you where in the passage to look for the answer. The good news for you is that the questions will come in roughly chronological order. So, you can often use the line reference questions to help you find the correct place in the passage to look for the lead word.

Just like with line reference questions, you will usually need to look a few lines before and after the lead word to understand the full context. Use the same strategies to answer the question in your own words and then use process of elimination.

Reasoning Questions

Reasoning Questions

- Reasoning questions are simply two-step questions.
- They ask you to find the information in the passage and then figure out how or why the author uses that information.
- Reasoning questions test what the author says or means while literal comprehension questions test what the passage says or means.
- These questions are typically harder than literal comprehension questions so it's usually a good idea to save these until the end
- Reasoning questions typically do not ask about the passage itself, but rather the author's views and intent
- Cover the answers and write your own prediction whenever possible
- When using process of elimination, look out for trap answer choices

1. Strengthen/Weaken Questions

Most short passages that contain an argument of some kind will ask you a question about how to make the author's point better or worse. Make sure you know whether the ACT wants you to help the author by providing more evidence to support his or her point, or if they want you to provide contradictory information to attack the author's position.

Here's an example of what a question might look like.

> If true, the author's argument would be most weakened by which of the following statements?
>
> The author's argument would most likely be strengthened if it were true that…

Before answering these questions, you must know the main point of the passage and what side you need to take. Then use process of elimination to find your answer.

Inference Questions

The definition of an inference is a reasonable conclusion based upon analysis of available evidence. Police investigators, scientists and engineers all must make inferences in their jobs each day…but these are not the type of inferences the ACT wants from you.

The ACT wants you to infer something that MUST be true based on what you have read. Wrong answers will either be directly stated in the passage or go way beyond the level of inference the ACT is looking for. When you look at the answer choices, try to find the "one-step inference," something that is just a small step beyond what is directly stated.

Here is an example. Let's say the passage stated that…

Ms. Nelson came to class this morning with wet hair.

What can be inferred from the preceding statement?

A. She ran through the sprinklers
B. She was sweating from the gym
C. She showered before class
D. Her hair is not dry

According to THE ACT (D) would be the answer.

All we can infer is that sometime between when she woke up and when she came to class, Ms. Nelson's hair came into contact with liquid and is therefore not currently dry. Would a detective infer that Ms. Nelson probably took a shower before coming to work? Of course, but for the purpose of the ACT, that inference would be wrong.

Remember, these types of questions will be asking you to find the *best* answer, not the *right* answer. Unfortunately, it is often difficult to write in our own prediction on these types of questions. So be careful and <u>use process of elimination</u>.

Author Agreement/Response Questions
These questions expect you to think about how the author would respond to a certain statement. Do they expect you to read the author's mind? No, therefore the answers to these questions lie in your main idea statement. Just like inference questions, take care not to go too far with your answers.

"Except" Questions
"Except" questions are very tedious as they are basically many literal comprehension questions rolled into one. Instead of asking which of the answer choices is supported by the passage, except questions ask you which is NOT supported by the passage. Therefore, to answer these questions correctly, you have to go back to the passage and cross out the four answers that ARE mentioned or that you can find support for.

Because these questions are often very time consuming, it is never a bad idea to save these questions until the end.

Big Picture Questions

- Although there are two main question types for long passage reading comprehension, a third question type also exists.
- These questions can be called general questions because they ask about the passage as a whole.
- These questions exist to make sure that you understand the gist and the primary purpose of the passage.
- Because of this, always save these questions for LAST!
- By the time you get around to answering these questions, you will have read the passage multiple times and hopefully have a very good idea about the general purpose of the passage**.**

Examples of general questions include:

"The tone of the author can best be described as…"

"The main point of the passage is that…"

The Best way to Predict on Tone Questions:

1.

_____

_____

2.

_____

_____

Reading Comprehension Question Type Drill
Take a look at some examples, which of the following are literal questions and which are reasoning?

1. In line 8, vacuous most nearly means
(L/R)

2. Which of the following best describes how the author would feel about nuclear power?
(L/R)

3. In lines 13-18, "scientist argue…facts" suggest that Nobel Prize winners
(L/R)

4. Which of the following statements best describes the author's opinion of baseball at the turn of the 20th century?
(L/R)

5. The discussion in lines 34-41 implies that the treatment of children in 19th century Russia
(L/R)

On reasoning questions, remember that THE ACT will be trying to trick you! While a question may ask about a particular point in the passage, the reason that the author uses this point could lie elsewhere in the passage.

Reasoning Question Puzzle-Fit

If you've ever practiced ACT reading comprehension passages, you've probably noticed that the questions seem repetitive. In fact, they are. The ACT uses long passages to test your ability to identify and comprehend only a FEW key sentences in the passage. Then, all of the **REASONING** questions surround these few ideas.

So What?

1. After you've finished answering all the reasoning questions, go back and look at your answers. The answer choices that you've circled should fit together - they should all agree with one another. **These correct answers should seem repetitive and fit within the author's thesis.**

2. If they don't, go back and see which ones stand out because they don't fit in your puzzle.

3. If you can't see a pattern, you've probably misunderstood or failed to identify the key points of the author's argument

ACT Reading Mini Lesson #6- Don't Let the ACT Guide Your Brain

Step 5. _____
Like they do in other sections of the test, the ACT will give you many answers that sound good to trip you up. To avoid these traps, cover the answer choices and predict in the same method as you would for sentence completions. Don't plug in the answer choices!

Step 6. _____
Trust your prediction and look for trap answers. Remember, if you can eliminate one answer it pays to guess.

Based on the passage above, answer the following questions in your OWN WORDS

In the passage, line 6, "styled" most nearly means

_____
_____
_____

In lines 10–25, the author notes that baseball serves as a venue for…

_____
_____
_____

In lines 31–33, the author mentions the dangers involved in swimming and skating so as to

_____
_____
_____

The author's tone in lines 41–44 could most accurately be characterized as

_____
_____
_____

In lines 44–51, the author suggests that the participation of important businessmen

_____
_____
_____

In paragraph 4, the author argues that playing baseball helps the youth by

_____
_____
_____

ACT Reading Mini Lesson #7-Reading Comprehension Traps

The key to answering reading comprehension questions correctly is to not fall into the ACT's traps! There are many ways to trick you on reading comprehension, but these traps are almost always easy to spot if you know what you are looking for.

1. _____
Often the ACT will make answer choices deceptive, meaning that the statement may be true or may be related to the passage but does not answer the question that is asked.

2. _____
This trap is often the easiest to spot because extreme words are difficult to miss. Absolute statements are almost always wrong. If anyone might get offended by an answer choice, it isn't correct. Words like, *best, never, must, most, worst, totally, always, only, cannot, all*…etc signal extreme language and are never correct. When you see these words, eliminate the answer.

Example:

The author mentions his visit to the store (lines 13-19) primarily to show that…

(A) California avocados are better than any other avocado in the world
(B) Markets often do not stock the best produce
(C) Smaller avocadoes are always more flavorful than larger ones

If you narrowed the answers down to these three choices, which would you choose?

3. _____
The ACT loves this one! These are statements that are true or that you could infer from the passage but are not explicitly stated. The ACT hopes these answers will trigger something you have learned and cause you to pick the wrong answer.

4. _____
Sometimes, The ACT will throw in wrong answers that are the exact opposite of what the passage says about a given subject. To spot this trap, make sure you read the entire answer choice.

5. _____
With this trap, part of the answer will be correct while another part will be wrong. The ACT hopes you will only read the first part, see that it's correct and move on. Be sure to read the entire answer before choosing it

ACT Reading Mini Lesson #8-Natural Science Passages Practice

The passage is adapted from a description of the present appearance and geological history of a particular volcano. The passage is written by the American naturalist John Muir.

Shasta is a fire-mountain, an old volcano gradually accumulated and built up into the blue deep of the sky by successive eruptions of ashes and molten lava which, shot high in the air and falling in darkening showers, and flowing from chasms and craters, grew outward and upward like the trunk of a knotty, bulging tree. Not in one grand convulsion was Shasta given birth, nor in any one special period of volcanic storm and stress, though some mountains more than a thousand feet in height have been cast up like molehills in a night.

Sections cut by the glaciers, displaying some of the internal framework of Shasta, show that comparatively long periods of quiescence intervened between many eruptions. During these periods of calm the cooling lavas ceased to flow, and took their places as permanent additions to the bulk of the growing mountain. Thus eruption succeeded eruption with alternating haste and deliberation, until Mount Shasta surpassed even its present sublime height.

Then followed a strange contrast. The glacial winter came on. The sky that so often had been darkened with storms of cinders and ashes and lighted by the glare of volcanic fires was filled with snow, which, descending upon the cooling mountain, gave birth to glaciers that eventually formed one grand conical glacier—a creeping mantle of ice upon a fountain of smoldering fire, crushing, grinding, and remodeling the entire mountain from summit to base.

How much effect the glaciers wielded we have no means of determining. The porous, crumbling rocks of Shasta are poorly adapted to provide a record of the mountain's glacial past. This much, however, is plain: the summit of the mountain was considerably lowered and the sides deeply grooved during the time when Shasta served as a center of dispersal for the glaciers of the entire region.

When at length the glacial period began to draw near its close, the ice mantle gradually melted off around the base of the mountain. In receding and breaking up into its present fragmentary condition, the once great glacier left behind it a ring of irregular heaps of moraine matter on which forests now grow. The receding glacier left behind porous gravel and sand that yields freely to the power of running water. In fact, several centuries ago when an eruption melted massive quantities of ice and snow, a flood of extraordinary magnitude washed the sand and gravel from the higher slopes to the mountain's base, creating conspicuous delta-like beds around the base. Upon these flood-beds of soil flowery chaparral now grows.

Thus, by forces seemingly antagonistic and destructive, Nature accomplishes her designs—now a flood of fire, now a flood of ice, now a flood of water. Then in the fullness of time an

outburst of organic life—Shasta the fire-mountain becomes forest and garden, with all its wealth of fruit and flowers, and the air stirred into one universal hum by rejoicing insects.

10. What can be inferred from lines 6-9?

A. All mountains form in the same way.
B. Volcanoes are all under one thousand feet in height.
C. Most mountains take a long time to form.
D. Different mountains are created in unique ways.

11. The term "deliberation" in line 16 most nearly means

A. a slow, steady pace
B. contemplation
C. disagreement
D. indecisiveness

12. Which of the following is NOT a function of the phrase "glacial winter" in line 18?

A. to dramatize the process of glaciation
B. to refer to an Ice Age
C. to suggest a marked contrast from periods of volcanic activity
D. to describe a particularly cold winter of long ago

13. From the passage, it's possible that Muir bases his version of Mount Shasta's geological history primarily on the basis of

A. the mountain's flora and fauna
B. the position and types of rock formations on the mountain
C. settler's histories
D. his knowledge of other mountains

14. Based on the passage, which of the following topics would most interest Muir?

A. New data on earthquakes around Mount Shasta
B. A history of attempts to climb Mount Shasta
C. Local legends regarding the mountain
D. An anthropological study of Native American tribes living near Shasta

15. Which of the following best expresses the theme of this passage?

A. "Time Passes"
B. "One Mountain Long Ago"
C. "Shasta's Majestic Height"
D. "Shasta: A Study in Contradictory Forces"

ACT Reading Mini Lesson #9-Prose Fiction Strategy

Prose Fiction Passages usually ask about:

1. **_____**
2. **_____**
3. **_____**
4. **_____**

Prose Fiction passages usually have three types of characters:

***The Protagonist*: _____**

***The Antagonist*: _____**

***The Foil*:_____**

***Note: ACT fiction passages often have a foil that you will need to identify**

Steps to solving questions based on a fiction passage:

Step 1. _____

Step 2. _____

Step 3. _____

Step 4. _____

Step 5. _____

Fiction passages will ask you about tone, mood and motivation rather than focusing on literal comprehension questions.

ACT Reading Mini Lesson #10-Prose Fiction Passages Practice

In the following passage, the author describes Wing Biddlebaum, a mysterious loner who lives near the town of Winesburg, Ohio.

Upon the half-decayed veranda of a small frame house that stood near the edge of a ravine near the town of Winesburg, Ohio, a fat little old man walked nervously up and down. Across a long field that had been seeded for clover but that had produced only a dense crop of yellow mustard weeds, he could see the public highway along which went a wagon filled with berry pickers returning from the fields. The berry pickers, youths and maidens, laughed and shouted boisterously. A boy clad in a blue shirt leaped from the wagon and attempted to drag after him one of the maidens, who screamed and protested shrilly. The feet of the boy in the road kicked up a cloud of dust that floated across the face of the departing sun.

Wing Biddlebaum, forever frightened and beset by a ghostly band of doubts, did not think of himself as in any way a part of the life of the town where he had lived for twenty years. Among all the people of Winesburg but one had come close to him. With George Willard, son of Tom Willard, the proprietor of the New Willard House, he had formed something like a friendship . George Willard was the reporter on the Winesburg Eagle and sometimes in the evenings he walked out along the highway to Wing Biddlebaum's house. Now as the old man walked up and down on the veranda, his hands moving nervously about, he was hoping that George Willard would come and spend the evening with him. After the wagon containing the berry pickers had passed, he went across the field through the tall mustard weeds and climbing a rail fence peered anxiously along the road to the town. For a moment he stood thus, rubbing his hands together and looking up and down the road, and then, fear overcoming him, ran back to walk again upon the porch on his own house.

Wing Biddlebaum talked much with his hands. The slender expressive fingers, forever active, striving to conceal themselves in his pockets or behind his back, came forth and became the piston rods of his machinery of expression.

The story of Wing Biddlebaum is a story of hands. Their restless activity, like unto the beating of the wings of an imprisoned bird, had given him his name. Some obscure poet of the town had thought of it. The hands alarmed their owner. He wanted to keep them hidden away and looked with at the quiet inexpressive hands of other men who worked beside him in the fields, or passed, driving sleepy teams on country roads.

The story of Wing Biddlebaum's hands is worth a book in itself. Sympathetically set forth it would tap many strange, beautiful qualities in obscure men. It is a job for a poet. In Winesburg the

hands had attracted attention merely because of their activity. With them Wing Biddlebaum had picked as high as a hundred and forty quarts of strawberries in a day. They became

his distinguishing feature, the source of his fame. Also they made more grotesque a grotesque and elusive individuality. The
(50) town was proud of the hands of Wing Biddlebaum in the same spirit in which it was proud of Banker White's new stone house and Wesley Moyer's bay stallion, Tony Tip, that had won the two-fifteen trot at the fall races in Cleveland.

Practice with Cover and Predict

1. *The first sentence of the passage introduces a sense of*

   _____
   _____

2. *The effect of the description of the berry pickers in their cart is to*

   _____
   _____

3. *The word "beset" (line 13) most nearly means*

   _____
   _____

4. *The phrase "something like a friendship" is used to tell the reader that*

   _____
   _____

5. *Why might Wing have waited for the berry pickers to pass before going out to look for George Willard?*

   _____
   _____

6. *Wing's name is a result of…*

   _____
   _____

7. *The comparison of Wing Biddlebaum to Banker White's stone house and Wesley Moyer's stallion helps support..*

   _____
   _____

8. *The first two sentences of the last paragraph imply that…*

   _____
   _____

ACT Reading Mini Lesson #11-More Fiction Practice

This passage is excerpted from the novel O! Pioneers by Willa Cather, which is set in 19th century Nebraska.

On Wednesday morning Carl got up before it was light, and stole downstairs and out of the kitchen door just as old Ivar was making his morning ablutions at the pump. Carl nodded to him and hurried up the draw, past the garden, and into the pasture where the milking cows used to be kept.

The dawn in the east looked like the light from some great fire that was burning under the edge of the world. The color was reflected in the globules of dew that sheathed the short gray pasture grass. Carl walked rapidly until he came to the crest of the second hill, where the Bergson pasture joined the one that had belonged to his father.

There he sat down and waited for the sun to rise. It was just there that he and Alexandra used to do their milking together, he on his side of the fence, she on hers. He could remember exactly how she looked when she came over the close-cropped grass, her skirts pinned up, her head bare, a bright tin pail in either hand, and the milky light of the early morning all about her. Even as a boy he used to feel, when he saw her coming with her free step, her upright head and calm shoulders, that she looked as if she had walked straight out of the morning itself. Since then, when he had happened to see the sun come up in the country or on the water, he had often remembered the young Swedish girl and her milking pails.

Carl sat musing until the sun leaped above the prairie, and in the grass about him all the small creatures of day began to tune their tiny instruments. Birds and insects without number began to chirp, to twitter, to snap and whistle, to make all manner of fresh shrill noises. The pasture was flooded with light; every clump of ironweed and snow-on-the-mountain threw a long shadow, and the golden light seemed to be rippling through the curly grass like the ocean tide sweeping in .

He crossed the fence into the pasture that was now the Shabatas' and continued his walk toward the pond. He had not gone far, however, when he discovered that he was not the only person abroad. In the draw below, his gun in his hands, was Emil, advancing cautiously, with a young woman beside him. They were moving softly, keeping close together, and Carl knew that they expected to find ducks on the pond.

At the moment when they came in sight of the bright spot of water, he heard a whirr of wings and the ducks shot up into the air. There was a sharp crack from the gun, and five of the birds fell to the ground. Emil and his companion laughed delightedly, and Emil ran to pick them up. When he came back, dangling the ducks by their feet, Marie held her apron and he dropped them into it.

As she stood looking down at them, her face changed. She took up one of the birds, a rumpled ball of feathers with the blood dripping slowly from its mouth, and looked at the live color that still burned on its plumage.

1. The word "stole" in line 2 most nearly means

A. moved stealthily
B. clambered noisily
C. did illicitly
D. stumbled clumsily

2. From the passage, it is possible to infer that Carl is which of the following?

A .a small child
B. a young man returning to his childhood home
C. an old man about to go on a journey
D. naive about the farming life

3. What is Alexandra's relationship to Carl?

A. sister
B. neighbor
C. daughter
D. cousin

4. In the third paragraph, the author uses Carl's memories to

A. explain how Carl first came to rural Nebraska
B. provide a sense of Carl's feelings for Alexandra
C. highlight the beauty of the fields
D. indicate that Carl feels lonely and isolated

5. In lines 28-31, the metaphor comparing the morning light to the tides of the ocean does all of the following EXCEPT

A. suggest that Carl has seen a lot of the world beyond the farm
B. suggest that the scene can be meaningful even to those who have not seen morning light on the prairie
C. suggest that Carl wishes he were at the ocean
D. imply the calmness of the scene

6. The reference to "the pasture that was now the Shabatas'" in lines 32-33 suggests that

A. the old neighbors were bad farmers
B. Carl is mistaken in his memories
C. significant time has passed since Carl's last visit
D. the farms are dwindling away and won't exist much longer

7. Emil's shooting of the ducks contrasts sharply with which of the following in this passage?

A. Carl's feeling of hunger
B. the pastoral depiction of farm life
C. the description of the sunset
D. the environmental dangers of farm life

8. The description of the bird as "a rumpled ball of feathers" in line 47 is an example of a

A. metaphor
B. paradox
C. conflict
D. theme

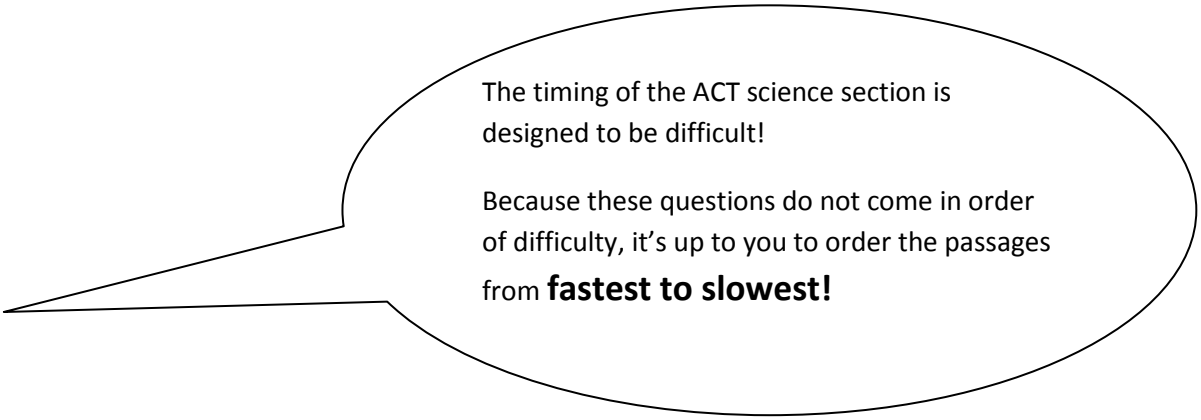
9. The tone of this passage is best described as

A. reflective, then wistful
B. cheerful, then troubled
C. distracted, then confused
D. nostalgic, then uneasy

ACT Science

ACT Science Mini Lesson #1-About ACT Science Info

The science test will consist of 7 passages that will each be followed by 5-7 questions. The passages will cover content from biology, chemistry, and physical sciences. They will vary in terms of organization and difficulty. You will have 40 minutes to answer 35 questions.



The Science Passages Fall in Three General Categories

1. _____

You will be provided with at least one chart, graph, illustration that will test your ability to understand scientific information presented. There will be Three c/g passages, and each one will have five questions.

2. _____

Several experiments and their results will be given to see how you follow and interpret procedures. There will be three experiments passages, and each will have six questions

3. _____

These passages will provide you with the viewpoints from multiple scientists regarding a scientific argument. You will be asked about the conflict and the evidence supporting each view. You could also be asked to speculate about what kind of information could potentially solve the conflict.

ACT Science Mini Lesson #2-ACT Science Vocab

Although the ACT science section is not a true science exam, you will still benefit from an understanding of some key scientific terms. That being said, **DO NOT MEMORIZE!**

Absorption	**Acid**
Atom	**Base**
Calorie	**Catalyst**
Chemical reaction	**Chlorophyll**
Chromosome	**Compound**
Control	**Constant**
Density	**Diffusion**
DNA	**Element**
Evolution	**Gas**
Kinetic	**Liquid**
Malleable	**Mass**
Molecule	**Nucleus**
Organic	**Permeability**
pH	**Photosynthesis**
Protein	**Radioactive**
Reflection	**Solid**
Solution	**Solvent**
Viscous	**Weight**

ACT Science Mini Lesson #3-Types of ACT Science Questions

1. _____

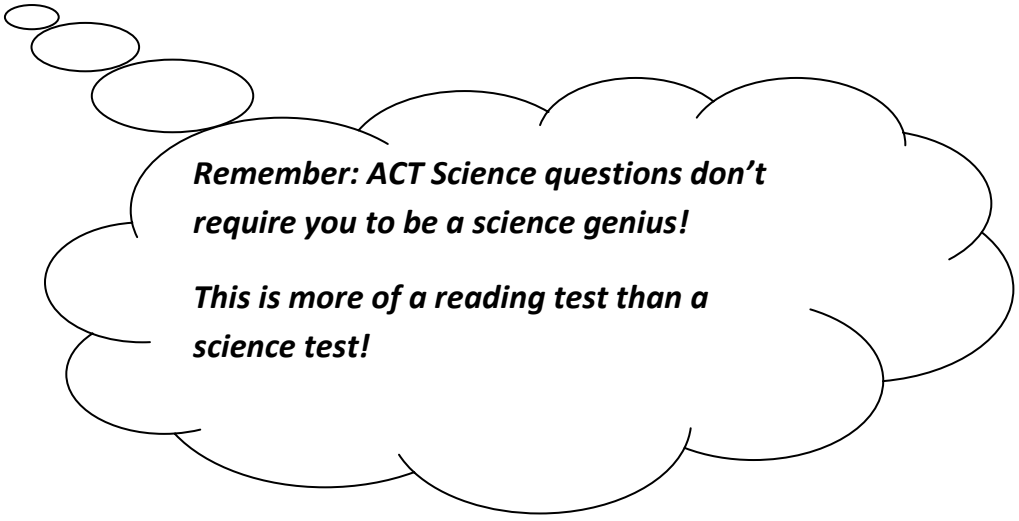
These questions will ask you to paraphrase certain parts of the passage. These are very similar to reading comprehension questions, and will usually focus on one sentence, paragraph or chart. You could be asked to consider the events of the passage and what the underlying assumptions may be. You also may have to look up a value on a chart.

2. _____

These questions are typically more detailed than the fetch questions because you will be asked to understand multiple pieces of the passage, and how they relate to one another. You may be asked *why* something happened or what is *going* to happen in the future.

3. _____

These questions will test your knowledge of the "big picture." These questions could ask you to relate information in the passage to other information, or ask about how the results would apply in the "real world."



Ordering the Questions to Maximize Time

The science questions will not come in a specific order of difficulty. It will be up to you to decide which questions are easy, medium or difficult. Remember, all the questions are worth the same amount of points, so spend your time to avoid making careless mistakes on easy or medium questions.

Ordering the Questions

Fast/Easy Questions	**Slow/Hard Questions**
Ask about the passage/data	Require analysis and generalization

ACT Science Mini Lesson #4- More Types of Science Questions

Easy Questions: go grab the answer…(10 to 15 questions)

1. Look at the graph/chart/table Questions

These questions are relatively straight-forward, and should be answered first. These questions simply ask you to go back to the chart, table, or experiment, and fetch what the information says and means.

These questions ARE NOT designed to trick you, and you should always DO THESE FIRST. They are fast, easy, and points that you should make sure that you get.

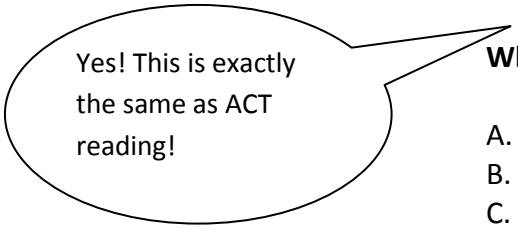
Medium Questions: analyze the information given…(15-20 questions)

1. Infer/Suggest/Imply Questions

The definition of an inference is a reasonable conclusion based upon analysis of available evidence. Police investigators, scientists and engineers all must make inferences in their jobs each day…but these are not the type of inferences the ACT wants from you.

The ACT wants you to infer something that MUST be true based on what you have read. Wrong answers will either be directly stated in the passage or go way beyond the level of inference that the ACT is looking for. When you look at the answer choices, try to find the "one-step inference," something that is just a small step beyond what is directly stated.

Here is an example. Let's say the passage stated that…



Ms. Nelson came to class this morning with wet hair.

What can be inferred from the preceding statement?

A. She ran through the sprinklers
B. She was sweating from the gym
C. She showered before class
D. Her hair is not dry.

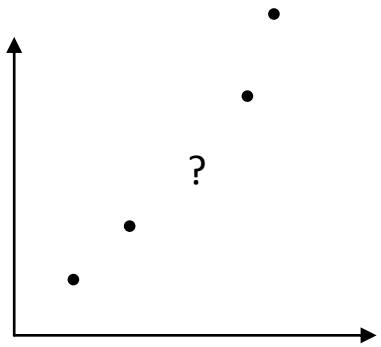
All we can infer is that sometime between when she woke up and when she came to class, Ms. Nelson's hair came into contact with liquid and is therefore not currently dry. Would a detective infer that Ms. Nelson probably took a shower before coming to work? Of course, but for the purpose of the ACT, that inference would be wrong.

Remember, these types of questions will be asking you to find the *best* answer, not the *right* answer. Unfortunately, it is often difficult to write in our own prediction on these types of questions. So be careful and use process of elimination.

3. Interpolate Questions

These questions will require you to look within the chart or graph and find the answer based on the information given. To interpolate simply means to estimate a value on a graph that is between two known data points.

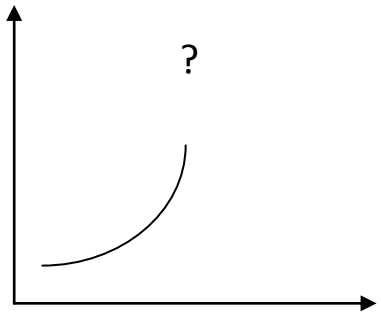
For instance...



4. Extrapolate Questions

Extrapolate questions are slightly more difficult, because they will require you to use the known data to expand into an area not tested.

These questions can be asked in terms of a graph, table, or experiments, and ask you to use the given data to support a logical and inarguable conclusion.



<u>Hard Questions-Make general conclusions (10-15 questions)</u>

5. Compare and Contrast Questions

These are mostly seen in both the "fighting scientists" and "experiments" passages. These questions will ask you to make general conclusions, and interpret the differences between the hypotheses.

Puzzle Fit of Correct Answers

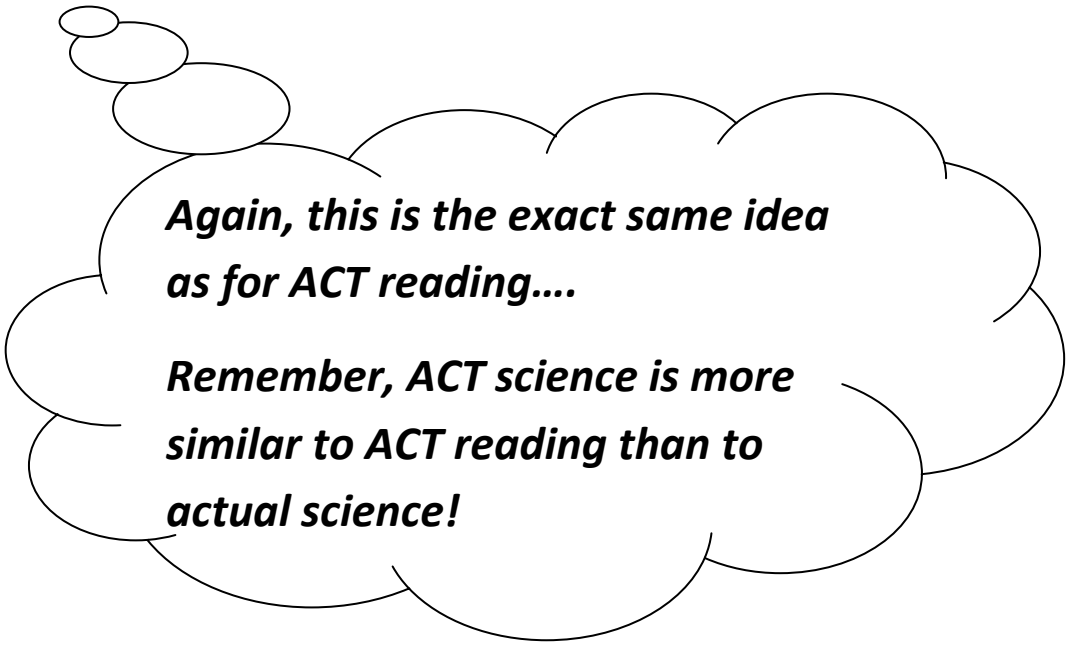
If you've ever practiced ACT questions in either reading or science, you've probably noticed that the questions seem repetitive. In fact, they are. The ACT uses these passages to test your ability to identify and comprehend only a FEW key ideas. Then, **ALL** of the questions surround these few ideas.

So What?

1. _____
   _____
   _____

2. _____
   _____
   _____

3. _____
   _____
   _____
   .



Ordering the Questions Drill

Imagine you encounter the following questions. Don't worry about answering them, since you don't have either the passage or the answer choices. Instead, refer to the chart above, and make a note next to the question from 1-4, in the order that these questions should be answered.

___ *The results of experiments 1 and 2 indicate that…*

___ *Which of the following items serves as the control in the experiment*

___ *Based on the above experiments, which of the following is the most likely conclusion…*

___ *Suppose the plant described in experiments 1-5 is cut off while in the light, and a new plant doesn't grow. What will happen to the plant?*

ACT Science Mini Lesson #5-Steps to Solving the Science Passages

Although each type of passage will require a slightly different strategy, the overall steps for maximizing time on ACT science passages are as follows.

Step 1. _____

a. Take a look at the format and identify the type of passage
b. Scan the graphs or charts
c. Jot down some notes, and underline key words

Step 2. _____

a. Look to answer fetch questions first
b. Any questions that look like they will take a long time, save for the end

Step 3. _____

a. Use mental math to make quick calculations or read graphs
b. Cover-up and Predict whenever possible

Step 4. _____

a. Eliminate incorrect answer choices
b. Spend time going back to the passage to make sure that you make the best guess possible

ACT Science Mini Lesson #6-Charts and Graphs Passages

Four Types of Graphs

1. _____
2. _____
3. _____
4. _____

When you see a graph, ask yourself three questions:

1. _____
2. _____
3. _____

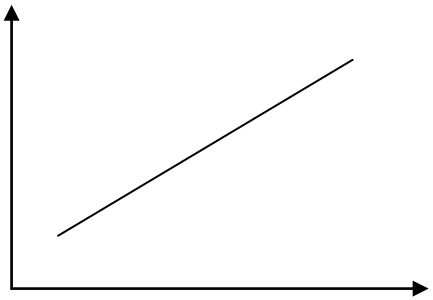
Sometimes, the ACT will try to trick you by putting the answer choices in the wrong units (Ex: meters instead of centimeters.) Make simple conversions when needed.

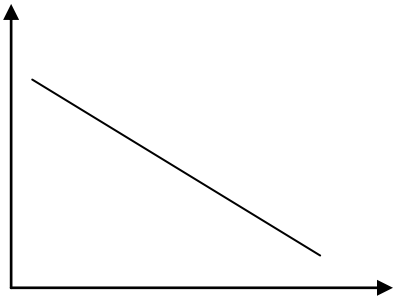
Linear Graphs

Type 1: Linear (Straight) Graphs

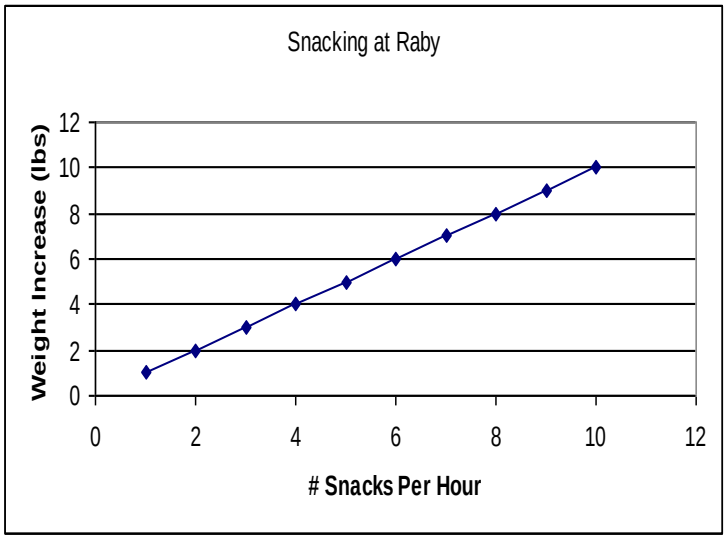
Positive Relationship = _____ Relationship = ALWAYS PUT A _____

Negative Relationship = _____ / _____ Relationship = ALWAYS PUT A _____

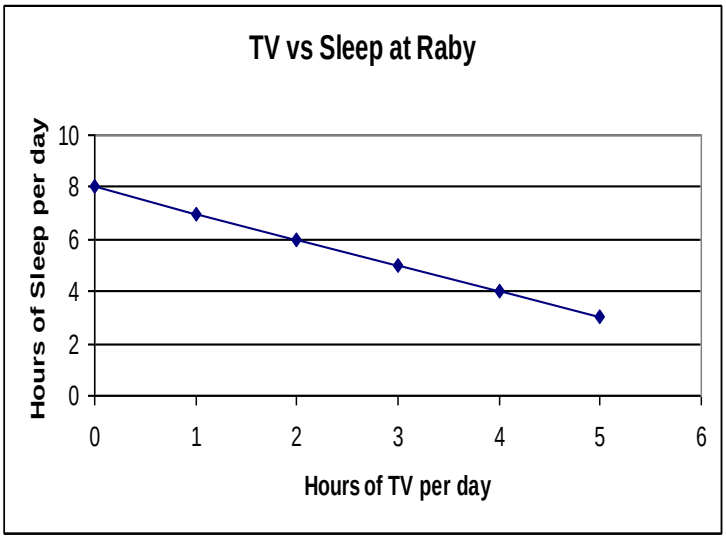




Example #1



Example # 2



For each of the graphs above, identify the following:

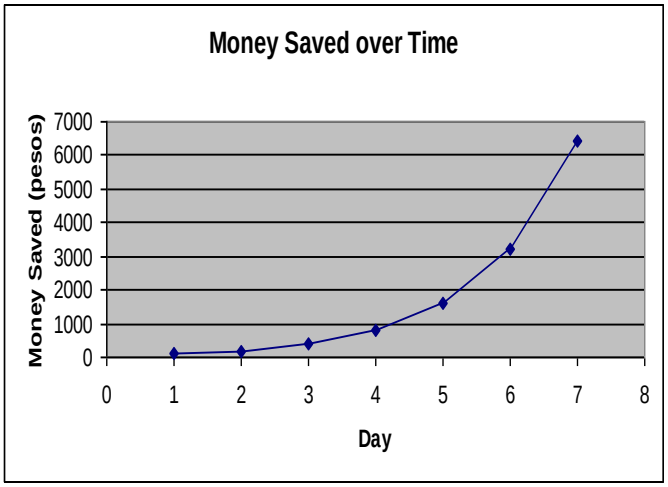
	Example 1	Example 2
What are the variables?		
How are they measured?		
How are they related/changing?		

Graphs with Curves

Type 2: Curved (Nonlinear / Non-straight) Graphs

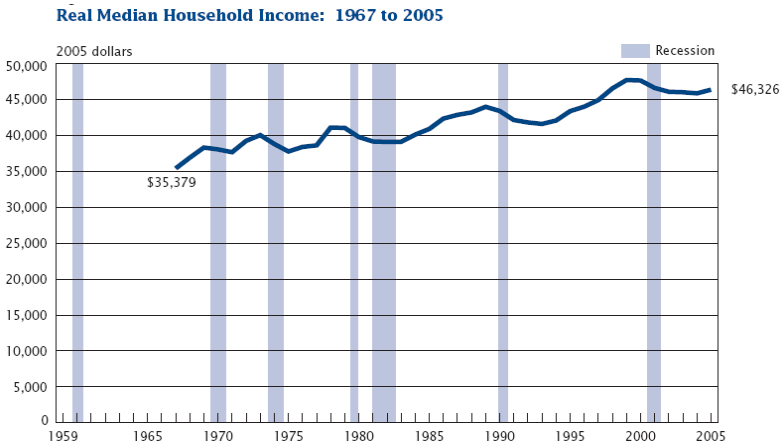
Still annotate with a + or a - Might need several +'s or –'s, or an OVERALL + & –.

Example #1



	Example #1
What are the variables?	
How are they measured?	
How are they related/changing?	

Example #2



	Example #2
What are the variables?	
How are they measured?	
How are they related/changing?	

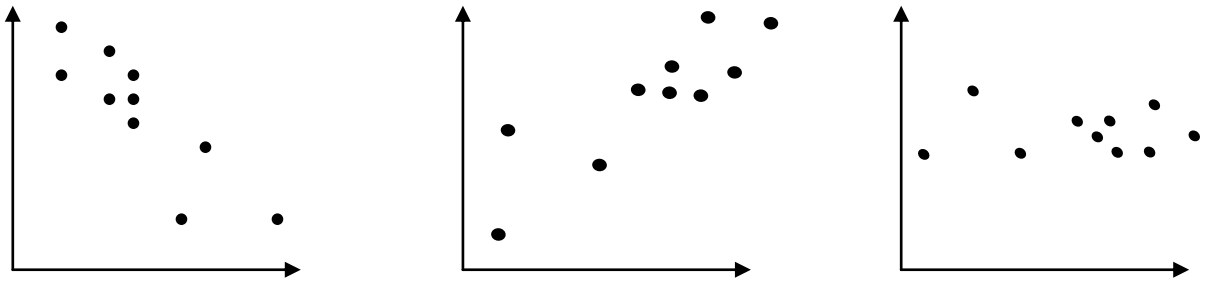
Scatter Graphs

Steps to solving Scatter Plots

1. Still annotate with a +/-/NR .
2. Draw in the ***LINE OF BEST FIT***

Drill:

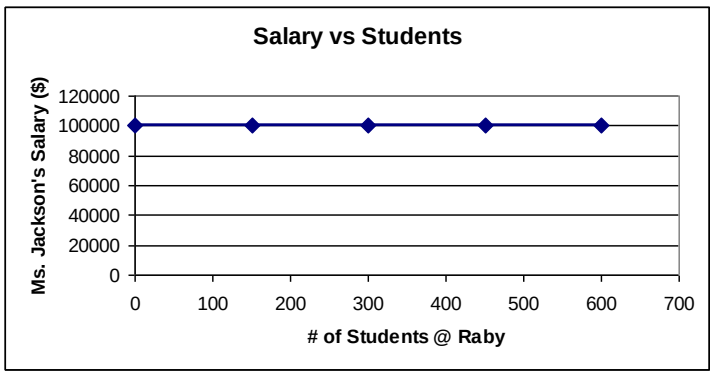
Draw a line of best fit for the following scatter graphs



Flat Graphs

These graphs will not have a +/- relationship, but that does NOT mean that these variables are not related.

Example



	Example
What are the variables?	
How are they measured?	
How are they related/changing?	

Tables

You should have the same thought process for tables as you have for graphs.

Houses Sold in US over Time

Year	# Units (in 1000s)
1970	485
1975	549
1980	545
1985	688
1990	534
1995	667
2000	877
2005	1,283

Source: US Census Bureau, 2006

Lifting Strength vs. Muscle Diameter

Lifting Strength (N)	Muscle Diameter (cm)
50	24
43	20
40	19
20	15
12	12
5	6
2	4
1	3

Human CO_2 Output vs. Forest Size

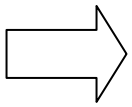
CO_2 Output (kg)	Forest Size (ha)
10	2013
20	2010
30	2111
40	1983
50	1323
60	2100
70	2000
80	2001

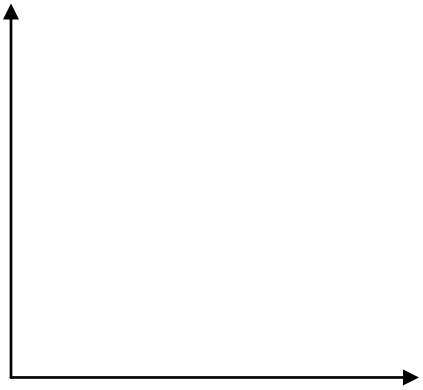
	Example 1	Example 2	Example 3
What are the variables?			
How are they measured?			
How are they related/changing?			

Translating a Graph from a Table

Chymotrypsin Acidity:
Temperature Dependence

Temp (°C)	pH Level
47	2
42	5
37	7
32	4
27	3





Don't Forget:

- Title
- Labels for variables
- Scale

ACT Science Mini Lesson #7-Experiments

Do not read the experiments in detail. Make some notes about what is changing from one experiment to another, and be sure to underline or circle key words or phrases. When you are scanning, simply look for differences in the experiments and charts. Then go straight to the questions.

Steps to Solving Experiments Passages

Step 1._____

Step 2._____

Step 3._____

Step 4._____

Step 5._____

Step 6._____

Remember, if you see two answer choices that are exact opposites, one of them is likely the correct answer.

Independent and Dependent Variables

Every experiment has two variables – or things that will change.

Independent Variable: _____

Dependent Variable: _____

Ex: Which brand of toothpaste cleans teeth the best?

Dependent variable: how clean the teeth are

Independent variable: brand of toothpaste

Independent vs. Dependent Variable Practice Drill

Identify the dependent and independent variables:

1. How does the number of vegetables children eat affect how tall they grow?

Dependent variable: _____

Independent variable: _____

2. Sam grew 3 artichokes in 3 different brands of soil. After 2 weeks, he measured their heights and determined which one grew the tallest.

Dependent variable: _____

Independent variable: _____

3. Connie swabbed 3 different places in her dorm room for bacteria – the doorknob, the tops of her desk, and her textbooks. She let the bacteria grow in dishes for 2 weeks and then she measured how big the bacteria grew.

Dependent variable: _____

Independent variable: _____

4. Summer put 1 Mentos each into 3 different brands of soda and measured how high the soda shot up.

Dependent variable: _____

Independent variable: _____

Experiments Example 1:

An investigator was interested in observing whether a chemical reaction occurs when compounds are mixed with water. Chemical reactions are known to produce heat. Three compounds were observed in order to determine whether, based on the release of heat, a reaction took place. A thermometer was placed in each test tube to record any change in temperature.

Test Tubes	Δ Heat	
	Yes	No
1. Powdered bleach + H_2O	X	
2. Salt + H_2O		X
3. Sugar + H_2O		X

1. What is the objective of the experiment?

2. How is the research being conducted?

3. What were the results?

Experiments Example #2

Example 2:

A laboratory experiment was conducted to determine whether the lack of sunlight influences photosynthesis (production of glucose). Eight potted *Salvia* flowers were randomly selected and divided into two groups and labeled Group A and Group B. The plants were then subjected to differing light conditions and examined one week later.

Group A

These plants were exposed to sunlight for the duration of the study. At the end of the study, these plants were green in appearance and produced glucose.

Group B

These plants were kept in the dark. At the end of the study they were yellow in appearance and did not produce glucose.

Questions

1. What is the objective of the experiment?

2. How is the research being conducted?

3. What were the results of each test?

ACT Science Mini Lesson #8-Experiments Practice

Four test landfill sites were prepared to determine the effect of industrial wastes on water absorption, alkalinity, and metal concentrations. All four sites contained the same amount and type of municipal waste and were located within a mile of one another. Site 1 was used as a control and no additional material was added. Sewage sludge was added to Site 2, battery production waste was added to Site 3, and inorganic pigment waste was added to Site 4.Over the course of a year, measurements were taken to determine what percent of the maximum water capacity the site had maintained. Scientists measured each site's alkalinity, and its concentration of copper and nickel.

Table 1 Concentrations in mg per kg

	Alkalinity	*Nickel*	*Copper*
Site 1	2080	182	17
Site 2	5820	236	36
Site 3	3008	287	53
Site 4	4420	938	134

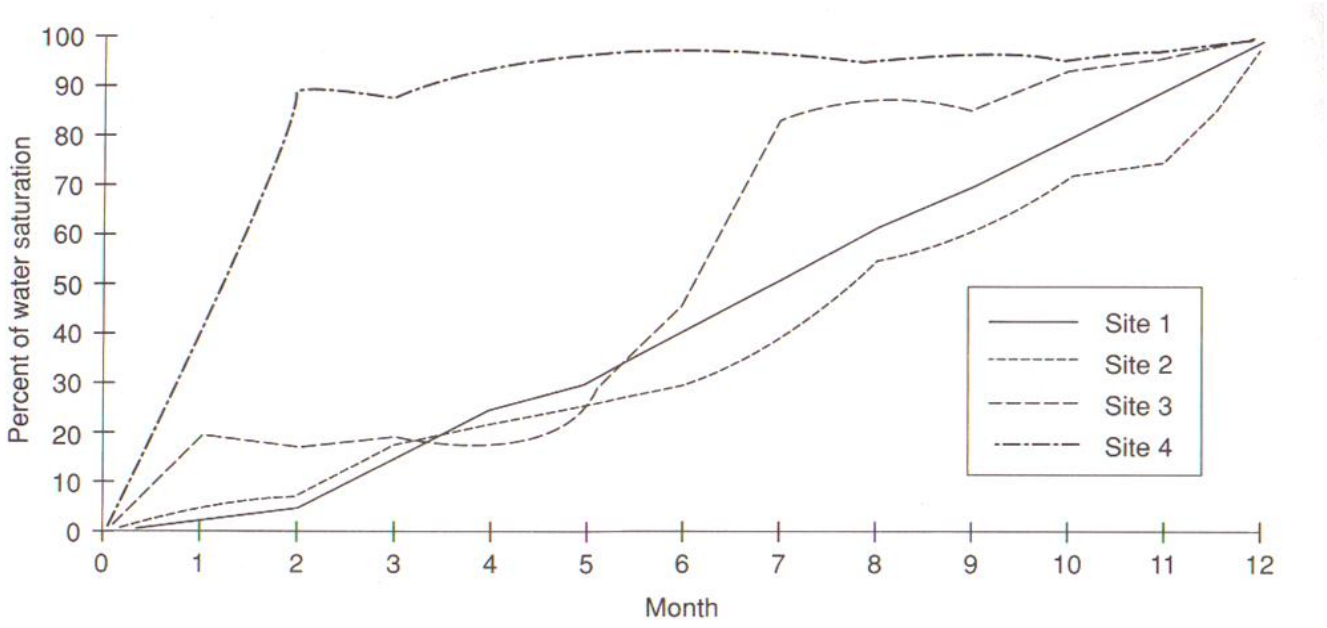


Figure 1

Questions 1-6 are based on the above passage…

1. According to the study, the best model for studying the effects of increased copper concentration in landfills would be a site that:

A. only contains municipal waste.
B. receives wastes from an inorganic pigment factory.
C. receives wastes from a battery factory.
D. is very alkaline.

2. Which of the following best describes the pattern of water saturation seen in Figure 1?

F. Site 1 was saturated with water more quickly than the other sites.
G. Site 4 was saturated with water more quickly than the other sites.
H. Site 3 was saturated with water at about the same rate as Site 2.
J. Site 2 was saturated with water at about the same rate as Site 4.

3. What conclusion can be drawn from the results in Figure 1?

A. More rain fell on Sites 3 and 4 than on Sites 1 and 2.
B. The municipal waste was more porous in Site 3 than in the other sites.
C. Adding battery waste decreases the amount of time for saturation to occur.
D. Site 3 absorbed water at about the same rate for all twelve months.

4. On the basis of these experimental results, which of the following is least likely to delay the saturation of a landfill site?

F. Increasing the amount of copper
G. Adding sewage sludge
H. Increasing alkalinity
J. Adding inorganic pigment

5. Suppose that scientists created a fifth test site and added about half the amount of battery production waste that was added to Site 3. When compared to Site 1, saturation in the new site will probably occur:

A. more quickly, because adding battery waste speeds up saturation.
B. more slowly, because adding battery waste increases the concentration of nickel.
C. more quickly, because adding battery waste greatly increases alkalinity.
U. more slowly, because adding battery waste slows down saturation.

6. The alkalinity of a site was most affected by:

F. municipal refuse.
G. sewage sludge.
H. battery production waste.
J. inorganic pigment waste.

ACT Math Mini Lesson #9-More Experiments Practice

A student conducted experiments to determine the coefficients of friction between blocks of different types of wood and a lacquered tabletop. The student determined both the static and kinetic coefficients of friction for the various wood-table pairs. Static friction is the friction inherent in stationary objects, while kinetic friction is the friction inherent in moving objects. Coefficients of friction depend only on the two materials involved: the object and the surface.

Experiment 1

The student placed a block of wood flat on the table 50 centimeters from the edge. Attached to the wood was a cord that went through a pulley mounted on the end of the table. Hanging off the table at the end of the cord was a platform. The student carefully placed weights on the platform until the block of wood began to move. The mass, m, which caused the block to begin moving, is known as the threshold mass. The results are shown in Table 1.

A student conducted experiments to determine the coefficients of friction between blocks of different types of wood and a lacquered tabletop. The student determined both the static and kinetic coefficients of friction for the various wood-table pairs. Static friction is the friction inherent in stationary objects, while kinetic friction is the friction inherent in moving objects. Coefficients of friction depend only on the two materials involved: the object and the surface.

Trial	Wood	Mass (kg)	Threshold Mass (g)	Coefficient of Friction
1	Fir	1	396	0.396
2	Fir	2	808	0.404
3	Fir	4	1608	0.402
4	Oak	2	1246	0.623
5	Oak	3	1863	0.621
6	Oak	5	3090	0.618

Experiment 2

The student used the exact same setup as in Experiment I and the information gathered from that experiment. The student placed weights greater than the threshold mass on the platform and measured how quickly the blocks were dragged over the side. The time was measured so that acceleration and the coefficient of friction could be calculated. The results are shown in Table 2.

Trial	Wood	Mass (kg)	Hanging Mass *m* (g)	Time (s)	*a* (m/s^2)	Coefficient of Friction
7	Fir	1	500	0.783	1.63	0.337
8	Fir	2	1000	0.788	1.61	0.339
9	Oak	2	1500	0.604	2.74	0.476
10	Oak	3	2000	0.733	1.86	0.481

Questions 1-6 are based on the above passage…

1. If a new block of oak with mass 4 kilograms were tested, the threshold mass would be closest to:
A. 1635 grams
B. 2420 grams
C. 3090 grams
D. 3740 grams

2. Based on the information in both experiments, which of the following statements about coefficients of friction is correct?
F. Increasing the mass of the block always increases the coefficient of friction.
G. Increasing the mass of the block always decreases the coefficient of friction.
H. Increasing the mass of the block can increase the coefficient friction for some materials.
J. There is no relationship between the mass a block and the coefficient of friction.

3. Which of the following would have the highest coefficient of friction?
A. Stationary fir
B. Moving fir
C. Stationary oak
D. Moving oak

4. If the student repeated the experiments on an inclined plane made of the same substance as the table, what quantity would not change?
F. Coefficient of friction
G. Acceleration
H. Threshold mass
J. Time

5. The purpose of each experiment was to measure the coefficient of friction. Which one measured static, and which one measured kinetic?
A. 1st: kinetic; 2nd: static
B. Both measured kinetic
C. 1st: static; 2nd: kinetic
D. Both measured static

6. If the student repeated Trial 7 with a heavier mass, how would the results differ?
F. Acceleration: increase, time: decrease, coefficient of friction: constant
G. Acceleration: constant, time: constant, coefficient of friction: constant
H. Acceleration: decrease, time: increase, coefficient of friction: increase
J. Acceleration: decrease, time: increase, coefficient of friction: decrease

ACT Science Mini Lesson #10-Conflicting Scientists

At least two views about a scientific theory will be presented, followed by 7 questions. Go over each theory briefly to understand the puzzle-fit of the arguments before answering the questions.

Step 1. _____

Step 2. **_____**

Step 3. **_____**

Remember to answer specific questions first and general questions last, just like you would if there was only one passage

Step 4. **_____**

Step 5. **_____**

Remember to answer specific questions first and general questions last, just like you would if there was only one passage

ACT Science Mini Lesson #11-Conflicting Scientists Practice

A greenish, potato-sized meteorite discovered in Antarctica is believed to have originated on Mars. Investigations of the meteorite have revealed a number of unusual features. Some scientists believe that these features are evidence of primitive life on Mars, while other scientists believe that they are more probably the result of nonbiological (nonliving) processes, such as hydrothermal synthesis.

Hydrothermal Synthesis Hypothesis

This hypothesis states that the meteorite crystallized slowly from magma (molten rock) on Mars 4.5 million years ago. About half a million years later, the rock became fractured. This was a time when Mars was much warmer and had abundant water. Deep inside the planet, in a process called hydrothermal synthesis, hot water and carbon seeped into the fractured rock and formed new complex organic compounds called polycyclic aromatic hydrocarbons (PAHs). (Organic compounds, or those that contain carbon, are formed from life processes, such as bacterial decay, as well as processes that are not associated with life, including hydrothermal synthesis and star formation.)

As the chemical environment of the planet changed over time, crystals of magnetite, iron sulfides, and carbonate formed in the rock. The crystallization of the carbonate resulted in the formation of unusual elongated and egg-shaped structures within the crystals.

Main Argument of Hypothesis #1

_____

_____

Primitive Life Hypothesis

Proponents of this theory argue that the meteorite crystallized slowly from magma (molten rock) on Mars 4.5 million years ago. About half a million years later, the rock became fractured. At this time abundant water and a warm climate created the right conditions for life. The rock was immersed in water rich in carbon dioxide, which allowed carbon to collect inside the fractured rock, along with primitive bacteria. The bacteria began to manufacture magnetite and iron sulfide crystals, just as bacteria on Earth do. As generations of bacteria died and decayed, they created PAHs inside of the meteorite's carbon molecules. Finally, some of bacteria themselves were preserved as elongated egg-shaped fossils inside the rock.

Main Argument of Hypothesis #2

_____

_____

Key Points From the Passages

What is the issue being argued about?

_____
_____

Main Point of Agreement

_____
_____

Main Point of Disagreement

_____
_____

ACT Science Section Summary

Science Section Notes:

What should I look for when analyzing charts and graphs?

_____
_____

What should I look for when analyzing experiments passages?

_____
_____

How should I tackle conflicting scientists?

_____
_____

How do I maximize time on ACT science?

_____
_____

In what order should I answer ACT science questions?

_____
_____

The "Optional" ACT Writing Section

ACT Writing Mini Lesson #1-Essay Introduction

Writing Section Introduction

You will have 30 minutes to plan and write an essay on a topic that will be given to you. Your essay will be graded on a scale of 1-6 by two graders. Each will spend only a few minutes on your essay, so be sure to concentrate only on the "big things." Like the ACT essay, the ACT essay is graded holistically, meaning that you will not receive points for specific paragraphs. The grader will simply scan the essay and come up with a score.

The ACT essay will test your ability to do the following five things:

1.

_____

a. You must have a clear thesis statement
b. Do not straddle the fence of the issue

2.

_____

a. Be sure that every sentence and paragraph relates to your thesis
b. Do not digress or counter your thesis at any point

3.

_____

a. Use examples and evidence
b. Acknowledge the counter argument

4.

_____

a. Intro, Body, Conclusion

5.

_____

b. Sound as smart as possible
c. The more formal your language you use, the more it looks like you care

How the Essay is Graded:

The ACT essay is graded "holistically" meaning that there is no rubric for the graders to follow. ACT graders do not give you points for your thesis, your examples, or your conclusion. Instead, they simply read your essay and pull a number out of thin air.

The essay is graded by two graders on a scale between 1 and 6. These two scores are added together and combine to a scaled score from 2-12.

What this means for you:

Because the ACT graders will only be spending about 150 seconds grading your essay, you don't need to focus on being perfect. Instead of worrying about every little thing, you just need to worry about the BIG THINGS that will make your essay seem great.

The Big Five Part I:

- _____
- _____
- _____
- _____
- _____

The Big Five Part II:

- _____
- _____
- _____
- _____
- _____

Address the Prompt:

This simply means answer the question that they ask you! The only to way to get a score of zero on the ACT Essay is to not answer the question.

ACT Writing Mini Lesson #2-Organizaton

There is a single **BEST** way to organize your ACT Essay.

- Introduction
- "Con" Paragraph
- "Pro" Paragraph #1
- "Pro" Paragraph #2
- Conclusion

Why did we make this page so big?
No, we did not do this by accident. If you learn nothing else but to follow this structure, you'll already have avoided some of the key ACT essay errors!

If you structure your essay in this way, the graders will think that you are well organized and that you have taken care in planning your thoughts. We will talk about each of these paragraphs in detail later, but all your essays should be structured in this fashion.

ACT Writing Mini Lesson #3-The Introductory Paragraph

The introduction to your essay should be simple and "hook" the reader into your topic. Because your essay is graded holistically, a strong first impression is very important.

The introduction should contain three simple parts

1. **Interest Creating Device** (hook) - this will draw the reader into your topic
2. **Preview of Coming Attractions**
3. **Thesis**

The three types of hooks:

1. The Rhetorical Question
2. The Anecdote
3. The Quote

Which of these three works best on the ACT Essay?

The Fake Quote:

An easy way to add depth to your examples and make your details more vivid is to employ the fake quote. The fake quote simply means to make some analytic or clichéd statement and attribute it to whomever you see fit. The fake quote can be used as a great hook and you can attribute it to your dad, your mom, or someone famous.
The fake quote can also be added to your body paragraph as either from the protagonist of the book that you are referencing or from the historical figure that you are using.

The fake quote can also be added to your body paragraph as either from the protagonist of the book that you are referencing or from the historical figure that you are using.

Practice with the Fake Quote:

Example question: "Should American high schools be more tolerant of cheating?"

Your Job: Come up with a fake quote that applies to this question that could be used as the first sentence of your essay. It should be specific to the question and tell the reader what side of the issue your essay will take.

My Fake Quote:

_____

_____

_____

The Rest of the intro Paragraph

Preview of Coming Attractions: This should be a few sentences describing your body paragraphs

Thesis: This should always be the last sentence of your introductory paragraph and in one sentence illustrate your main point. The thesis should be stated in active voice and must "take a stand" on the posed essay question.

Example Thesis:

Here is a thesis statement that will work regardless of what the question asks. Is it the greatest thesis statement ever? No. But it clearly states your position in one active voice sentence, and gives you one less thing to think about!

*Although__**(acknowledge counter argument)**___.....**_____Pro #1_____** and **_____Pro #2_____** demonstrate that….*

Your Job: Take the following question above and write a sample thesis to go with it.

The question: "Should American high schools be more tolerant of cheating?"

My thesis:

_____

_____

_____

Conclusion:

Your conclusion does not have to be long, but you must have one. The ideal concluding paragraph on the SAT essay summarizes your two examples, relates the two examples together, and adds a general analytic point.

Note: If you don't have a conclusion, the ACT graders will view you as *disorganized*. If you're running out of time, make sure to ***indent your last sentence***, and there's your conclusion!

ACT Writing Mini Lesson # 4-The "Con" Paragraph

The ACT graders will be looking for your first body paragraph to acknowledge that another side of the argument could be taken. Use this paragraph to acknowledge the counter-argument, and then destroy it!

The con paragraph should include words like "although…" to show the readers that you grasp the entire issue, not just one side. This paragraph should include one example that would help those on the "other side" of your argument.

Sample Question

"Should American high schools be more tolerant of cheating?"

Con Paragraph Structure:

If you can answer the following questions in approximately the order below, your "con" paragraph will avoid repetition and specifically answer the question being asked.

1. *Some would argue…(stating counter argument)*

_____

_____

2. *Example of counter argument….*

_____

_____

3. *Explanation of why this argument is flawed*

_____

_____

The answer to the last question is the most important aspect of your analysis, as well as the one that most students forget.

ACT Writing Mini Lesson # 5-The "Pro" Paragraphs

These two paragraphs form the bulk of your argument and should be used to prove your thesis. Each paragraph should contain only one example. Choose two examples that prove slightly different sides of your topic in order to make the most convincing argument possible.

Sample Question

"Should American high schools be more tolerant of cheating?"

1. *State your argument…*

_____

_____

2. *Specific example proving your argument….*

_____

_____

3. *Explanation of negative results if your argument was ignored*

_____

_____

4. *Explanation of positive results of your example/argument*

_____

_____

ACT Writing Mini Lesson #6 Other Things to Know

Examples:

One of the most important aspects of your essays will be the examples that you choose to support your thesis.

Grammar:

Treat the ACT essay as you would any other, use correct grammar! Just because you only have 25 minutes does not be you should get sloppy with your grammar. Incorrect grammar can make you look like you did not take time and care while writing your essay and could receive a lower grade.

Vocabulary:

For your essay, try to incorporate the fanciest vocabulary that you are COMFORTABLE using. Do not simply look up a few big words and include them randomly in your essay. The graders will know whether or not you understand the vocabulary that you use.

Vocabulary II:

An easy way to improve your vocabulary on the ACT essay without much effort is to simply memorize and include a few **analytic transitions.** Include these words between your ideas and your writing will become more analytical with a more formal tone.

These transitions often come in 2 forms depending on whether your sentences are moving in the same direction or if they are moving in opposite directions.

Same Direction	Change of Direction

The Two Most Important Words to Remember:

- **Concrete** examples- your examples must be real in that you should be talking about real books, events and people.

- **Vivid** details-your examples should include names of people and characters, places and settings, and dates of occurrence. The beauty of supplying vivid details is…THEY DO NOT HAVE TO BE TRUE! Vivid details are easy to fudge and they cannot mark you down for it. For instance, if you think that the story of Paul Revere fits perfectly into your thesis but you can't remember the year and the place that he made his famous ride. Simply make your best guess and move on. It's better for your VIVID DETAILS to be WRONG THAN NO DETAILS AT ALL!

A Note about Passive Voice:

When learning to write, many of us focus on the adjectives that we use. We often think these adjectives make us sound smarter and make our writing more advanced.

The truth of the matter is that it is the VERBS that we use determine our level of writing. Take a look at any novel lying around and notice the verbs that the author uses. Specific verbs make writing more concise and allow the reader to see a clear picture of the scene being described.

The following is a list of passive voice verbs that should be avoided at all costs. Breaking the habit of these verbs can be difficult, but it is the surest way to improve your writing.

The List:

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.
13.
14.
15.
16.
17.
18.
19.
20.
21.
22.
23.

Example ACT Essay Questions:

1. In your view, should high schools be more tolerant of cheating?
2. In your view, should school computers contain filters that prevent students from visiting certain websites?
3. In your view, should three month summer vacations from school be maintained?
4. In your opinion, should high schools adopt dress codes for students?
5. In your opinion, should students be required to maintain a "C" average before receiving a driver's license?
6. In your opinion, should high schools require students to complete a certain number of hours of community service?