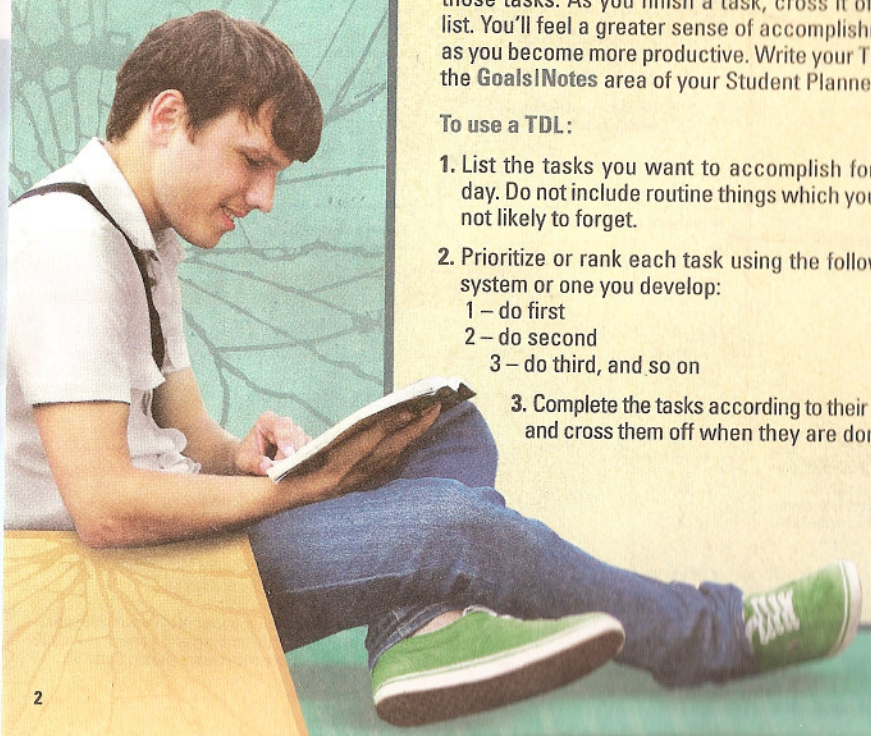
TIME MANAGEMENT

HIP TIP

Good times to read, review notes, or study include:

- study halls or library time.
- at the end of class, if you have no other assignments.
- waiting in a doctor's or dentist's office.
- waiting for the bus or a ride.



STEPS TO TIME MANAGEMENT

Careful planning can help eliminate forgotten events and assignments. It's simply a matter of keeping track of what you need to do and when you need to do it. Learning to manage your time now will help you accomplish more throughout your life.

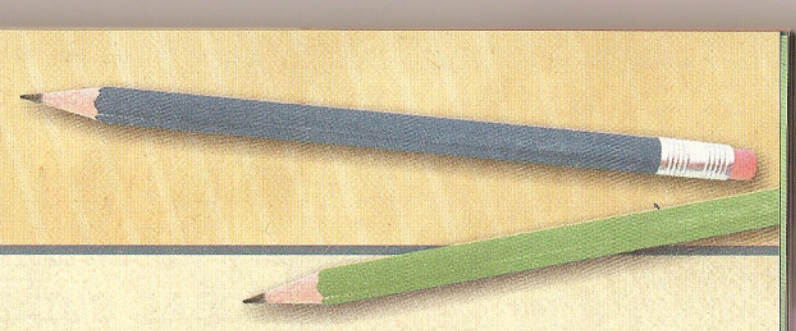
How you spend your time is a habit developed over years. Changing habits isn't easy, but it's worth the effort if it will increase your productivity and give you more time to do the things you really enjoy. Your Student Planner is an excellent tool for tracking your activities. Include everything you *need* to do, then add the things you *want* to do. Three basic techniques will help you manage your time.

1) MAKE A "TO DO LIST" (TDL)

By making and prioritizing a list of things you need to do, you will be able to set aside time to complete those tasks. As you finish a task, cross it off the list. You'll feel a greater sense of accomplishment as you become more productive. Write your TDL in the **Goals/Notes** area of your Student Planner.

To use a TDL:

1. List the tasks you want to accomplish for the day. Do not include routine things which you are not likely to forget.
2. Prioritize or rank each task using the following system or one you develop:
   1 – do first
   2 – do second
   3 – do third, and so on
3. Complete the tasks according to their rank and cross them off when they are done.



2) USE YOUR TIME WISELY

While at home:

1. Establish a routine. Set aside a specific time each night to do homework.
2. Schedule one-hour blocks of time. Study for 50 minutes and break for 10 minutes.
3. Estimate how long each assignment will take and plan accordingly. Do your hardest assignments first. Your work will become easier as you go.
4. Get to work right away. Do not waste time talking on the phone, e-mailing, texting, snacking, or watching TV.
5. Spend extra time studying subjects you find more challenging. Review what you have already studied or read ahead.
6. Do not let watching TV or chatting online consume all of your free time. Use it to study, hang out with friends or family, read and write, or exercise.
7. Continually work on long-term assignments to avoid having to rush later. Break them into smaller tasks to make the job easier and reduce stress.

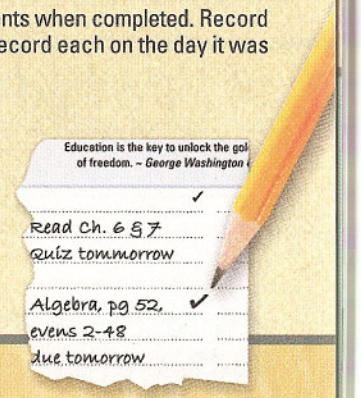
While at school or elsewhere:

1. Use "idle time" when you have nothing specific planned. Use time efficiently to ensure you get everything done. Take a book or notepad wherever you go.
2. Begin working on assignments right away. This gives you a head start and the opportunity to ask questions.
3. Get to class on time. Having to catch up wastes valuable time.
4. Use study halls wisely. If you don't have a particular assignment to work on, review notes or read ahead.
5. Start working on long-term assignments far in advance. Avoid having to read a 200-page book the night before it's due simply because you didn't plan ahead.
6. Use your Student Planner to record your assignments and other activities.
7. Avoid missing school if possible. Stay home only if you really are sick. You miss all discussions and assignments and still have work to do when you return.

3) USE YOUR STUDENT PLANNER

Your Student Planner is an excellent tool for keeping track of all your activities and assignments.

1. Record assignments and due dates and check off assignments when completed. Record long-term projects on the monthly calendar pages. Also, record each on the day it was given, the day it is due, and in-between as reminders.
2. Record dates and times of meetings, practices, games, and other appointments in the After-School spaces.
3. Use the **Goals/Notes** section for your TDL or reminders.
4. Use the monthly calendar to record personal events, such as birthdays, anniversaries, and vacation days.



SETTING GOALS

FALL 2013

- [ ]

WINTER 2013–2014

- [ ]

SPRING 2014

- [ ]

SUMMER 2014

- [ ]

LIST YEARLY GOALS

GOAL GUIDELINES

MAKE GOALS REALISTIC

- Unrealistic: I will not watch TV.
- Realistic: I will not watch TV until my homework is done.

MAKE GOALS SPECIFIC

- Vague: I will exercise more.
- Specific: I will walk for 30 minutes each day.

SET A TIMELINE

- When should I accomplish my goals?
- What steps must I take to achieve my goals and stay on track?

SET SHORT-TERM GOALS

- earn a "B" or better on my math test
- join a school organization
- clean my room

SET LONG-TERM GOALS

- look at college brochures
- list interests and career possibilities
- graduate with honors

Make a list of what's important to you.

1. Get good grades
2. Become more involved in theater
3. Spend more time with family

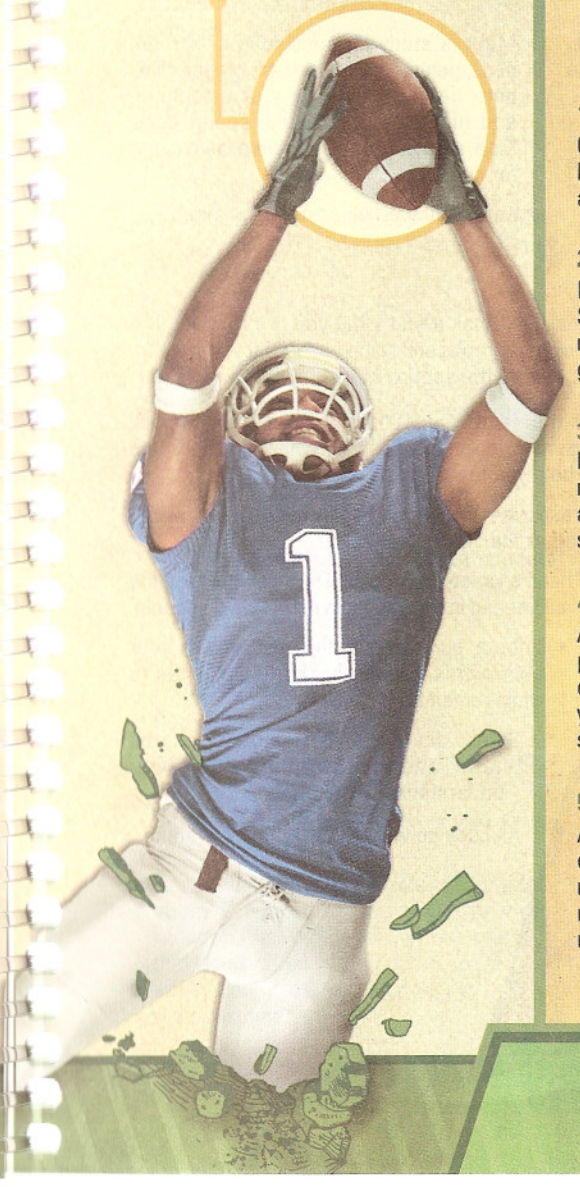
Write long-term goals in the Monthly Goals space of the monthly calendar pages.

Monthly Goals
Look at college brochures
Visit one college this month

Write short-term goals in the Goals!Notes space of the weekly calendar pages.

Goals Notes
Get an "A" on English test.
Study 20 minutes each night.
Spend more time with family.

NO GOAL IS OUT OF REACH



5 FIVE STEPS TO ACHIEVING YOUR GOALS

1) DECIDE WHAT'S IMPORTANT

Goals are based on what's important to you. Make a list of things, such as good grades, athletics, or spending time with family.

2) SET YOUR GOALS

Based on what's important, set goals. In your Student Planner, write long-term goals on the monthly calendar pages. Write short-term goals on the weekly calendar pages.

3) PLAN HOW TO ACHIEVE

Review your goals every day. Decide what needs to be done each week in order to achieve them. Write this in the **Goals!Notes** space on each weekly calendar page.

4) FOLLOW THROUGH

Achieving a goal is an important step in your personal growth and in raising your self-esteem. Review the steps you took to reach your goal. If something didn't work, revise the steps to better suit your purposes.

5) CONTINUE SETTING GOALS

After achieving one goal, plan for the next one. If your goals seem too easy, make them more challenging. If they are too difficult, revise your goals to make them more realistic for you.

STUDY SKILLS

WHERE & HOW TO STUDY

Before you study, prioritize assignments on your weekly calendar pages using the system you most prefer. (Refer to the Time Management section on pages 2–3.) Once an assignment is completed, cross it off. The next time you study reprioritize your list to include new assignments. Use the following tips to get more out of your classes, accomplish more in less time, and have extra free time.

- Find a quiet place to help you focus. Listening to music or sitting in front of the TV may only distract you.
- Always study in the same place. Sit in a straight-backed chair. A well-lit area will make it easier to read and keep you alert. Open a window for fresh air.
- Make a study kit consisting of a ruler, pens, pencils, paper, erasers, paper clips, note cards, a dictionary, a calculator, and highlighters. You will spend more time studying and less time searching for supplies.
- Keep your workplace neat and clean.

READING TO LEARN

To get as much out of your reading as possible, think about what you are reading. If a section is hard to understand, stop after a few paragraphs and summarize what you've read, either aloud or in writing. If this is difficult, reread the section more slowly.



- Read the review questions before the textbook assignment, looking for answers while you read. This will help you focus.
- Grasp what you're reading from groups of words rather than individual words.
- Read a variety of material. The more you read the easier and more enjoyable reading will become.
- Write a summary of the material in your own words. Glance back at your notes to help remember.
- Study accompanying photos, charts, maps, and illustrations to help you understand the material.
- Look up words you don't understand.

LISTENING & NOTE TAKING

Use abbreviations and symbols to write faster. Keep your system simple so you can quickly understand your notes.

Listen for cues. Your teachers will often indicate which information you should record and concentrate on.

Listen for these phrases:

- "This is important."
- "Listen to what I am saying."
- "Because of this…"
- "Let's go over this again."
- "Don't forget this."
- "This will be on the test." When you hear this, write a "T" in the margin of your notes and circle it.

Listen intently. Focus on the subject that is being discussed.

- Stay alert and ask questions.
- If you don't understand, ask the teacher to explain the material differently.

Tips for taking notes:

- Use a pen or pencil that won't smudge.
- Take notes on a full sheet of paper marked with a page number, subject, and date.
- Keep same-subject notes together.
- Use highlighters or colored pencils to mark different topics.
- Record vocabulary definitions.
- Evaluate what you read or hear before writing anything.
- Keep up. If you fall behind, catch up as soon as possible.
- Draw a line down the left side of your paper about 2" from the margin. On the right, record notes. On the left, write a question that is answered by your notes. To study for a test, cover your notes and try to answer the questions.

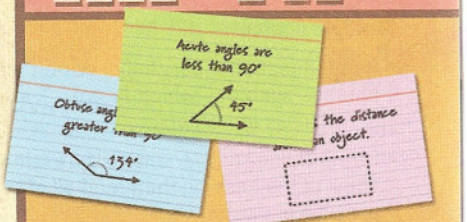
MEMORIZATION

Word Tricks. Here are several fun ideas for retaining information:

- **Ideas with the same first letter** – For example, Famous authors: Twain, Tennyson, Thoreau, Tolstoy, Tolkien,…
- **Alphabetical** – South American Countries: Argentina, Bolivia, Brazil, Chile, Colombia…
- **Word hooks** – The first letters of the Great Lakes spell **HOMES**: **H**uron, **O**ntario, **M**ichigan, **E**rie, and **S**uperior.
- **Sentence hooks** – The more creative the phrase, the easier to recall. For example, to remember when Columbus landed in the Americas, we say, "In fourteen hundred ninety-two, Columbus sailed the ocean blue."

Flashcards. Using 3"x5" index cards, print vocabulary words, formulas, dates, etc. on the front and an explanation on the back. Study the cards several times, including between classes and during your study sessions. Test your memory and score yourself. Keep practicing and watch your grades improve.

HIP TIP



Flashcards work well for:
vocabulary lists, foreign words, dates and events in history, famous people, math and science formulas, capitols, countries, etc.

TEST TAKING

General Strategies

- Get a good night's sleep.
- Eat a healthy breakfast.
- Listen to the teacher's directions.
- Read all directions carefully.
- Budget time to answer all questions.
- Answer easier questions first.
- If you are unsure about a question, mark it and return to answer it later.
- Change answers only if you are sure they are wrong.
- Guess if you don't know.
- Look for answers within the test. One question might include the answer to another question.
- Use all the time allowed. Check answers and reread directions.

Matching

- Read the answer list first to know all the possibilities.
- Do both columns have the same number of items? You might use an item twice or not at all.
- If items will be used only once, check them off to eliminate confusion.

Multiple Choice

- Read questions carefully. Watch for phrases such as "which is *not*..." and "...which is *incorrect*."
- Read through the entire question. Think of the answer, then read all of the possible answers.
- Cross out answers you know are wrong. Make a logical guess if you don't know.

Essay Tests

- Read all questions. Number them in the order you plan to answer them. Save the hardest for last.
- *Explain, define, compare, contrast, list, describe,* and *give the reasons* are clues on how to answer a question.
- Quickly outline your answer. Restate the question in the first sentence and write a simple introduction listing the points you will cover. Use transitions and explain each point using examples. Finally, restate your main points in a concluding paragraph. Try to keep your answer simple and concise.
- While writing, reread the question. Are you addressing the question and answering it thoroughly?
- Allow more time for harder questions and those worth the most points. Pace yourself so you can complete all the questions.
- Be as neat as possible. If you make a mistake, draw a line through the incorrect word(s), then continue.

True/False

- Read the statement carefully. If any part of it is untrue, the answer is false.
- Statements which include the words *all, never, no one,* and *always* are often false.



ENGLISH SKILLS

PUNCTUATION GUIDELINES

Consult a grammar book for comprehensive coverage of all punctuation rules.

Period (.)

- Used at the end of a statement, request, or indirect question.
  Examples: I ate the pizza. Speak more slowly. I wonder who will win.
- Used in abbreviations for titles, degrees, and expressions of time.
  Examples: Sue Clark, M.D.; The play begins at 7:30 p.m.

Comma (,)

- Used to set off elements that interrupt a sentence.
  Example: That boy, in fact, worked very hard this summer.
- Used to separate items in a list.
  Example: I like hot dogs, cake, and tacos.
- Used to set off non-essential clauses and non-essential participial phrases.
  Example: Ashley, who is in my brother's grade, broke the school record for the 100-meter dash.
- Used after introductory dependent clauses.
  Example: If you study, you will pass.
- Used to set off an appositive.
  Example: William Shakespeare, a famous English playwright, wrote *Romeo and Juliet.*
- **Warning!** Commas tend to be overused. If you are unsure, consult your instructor or a grammar book. **When in doubt, leave the comma out; it's better to have too few than too many.**

Quotation Marks (" ")

- Used around the exact words of a speaker.
  Example: Laura asked, "Have you been to the movie?"
- **Warning!** Do not be fooled by a sentence like the one below. It is not a direct quote and does not require quotation marks.
  Example: Laura asked if I had been to the movie.

Apostrophe (')

- Used in place of the omitted letters of a contraction.
  Example: does not = doesn't
- Used to form possessive nouns.
  Examples: baby's rattle, students' books, dog's collar.

Colon (:)

- Used to show a list of items that follows it.
  Example: He participates in three sports: football, basketball, and track.
- Do not use a colon directly following a form of the verb **be** or a preposition.
  Example: His four favorite writers are Bradbury, King, Donne, and Thoreau.

Semicolon (;)

- Used between the clauses of a compound sentence that are not joined by *and, or, but,* or *nor.* It can be regarded as a weak period.
  Example: I reserved the room for the party; Sally took care of the music.



ENGLISH SKILLS

PARTS OF SPEECH

Noun – Names a person, place, thing, or idea.

Examples: actor, library, desk, freedom

Pronoun – Takes the place of a noun.

Examples: voters…they; elephant…it; aunt…she; Scott…he

Adjective – Describes a noun or a pronoun. It usually answers one of these questions: which one? how many? what kind? whose?

Examples: She wore the blue dress. The dress was beautiful.

Verb – Expresses physical action, mental action, or a state of being.

Examples: Matthew threw the ball. The scientist thought about her experiment. He was happy to be home.

Adverb – Explains how, when, where, or how often about a verb. It also qualifies adjectives and other adverbs. Many end in *ly*.

Examples: The train left the station yesterday. The train left the station noisily. The train leaves the station daily. The view is quite pretty. The fox moved very quietly.

Preposition – Shows how pronouns or nouns relate to other words in the sentence.

Examples: The child hid near the bush. The swimmer jumped off the board.

Interjection – Expresses strong emotion. It is often followed by an exclamation mark.

Example: Wow! This pie tastes great!

Conjunction – Connects words, phrases, or clauses in a sentence. There are three common types of conjunctions:

1. **Coordinating** – Joins words or word groups that do the same work in a sentence. They are *and*, *but*, *or*, *yet*, *for*, *nor*.

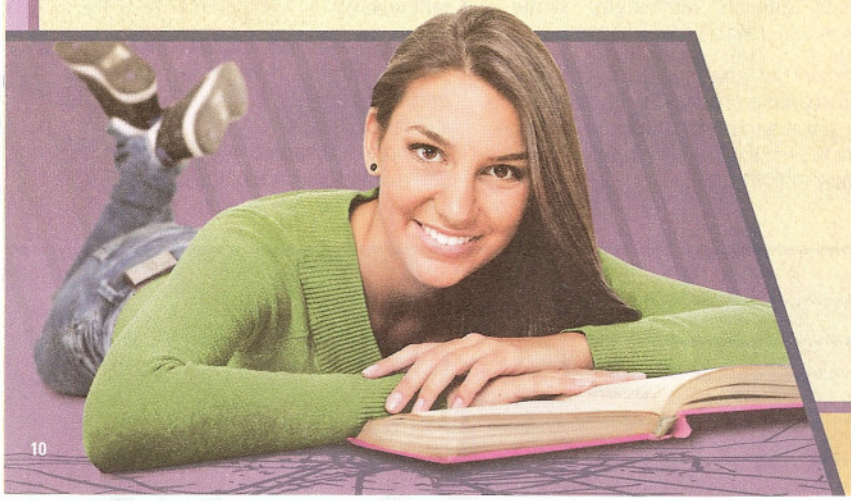
   Example: I ate pizza, pie, and cake.

2. **Correlative** – Used in pairs. They include *both/and*, *not only/but also*, *either/or*, *neither/nor*.

   Example: Neither the dog nor the cat would obey.

3. **Subordinating** – Introduces or connects subordinate (dependent) clauses to the rest of the sentence. Words include *as*, *since*, *because*, *so*, *unless*, etc.

   Example: I can't go to the tournament because I have to study.





GRAMMAR USAGE & GUIDELINES

Possessive Nouns – Nouns that show ownership, possession, or connection.

Examples: Mary's lamb; the girl's dress; Mom's sister

To form the possessive of singular common nouns and plural common nouns which do not end in *s*, add *'s*.

Examples: student becomes student's; children becomes children's.

To form the possessive of plural common nouns which end in *s*, add an apostrophe.

Example: ladies becomes ladies'

When forming the possessive of singular common or proper nouns which end in *s*, the form you should use most often is the addition of *'s* as in James's or class's. The only universal exceptions are the names Jesus, Moses, and Greek names which contain more than one syllable.

Examples: Jesus' life, Moses' writings, Pericles' helmet

Sentence Fragment – A group of words which does not give a complete message when standing alone.

Example: Because of the bad weather.
To Fix: Because of the bad weather, the picnic was canceled.

Run-On Sentence – Two or more sentences written as one with a comma or no punctuation mark between them.

Example: The blizzard came suddenly it caught us by surprise.
To Fix: The blizzard came suddenly. It caught us by surprise.

Should have / Should of – Only *should have* is correct.

Example: He should of gone.
To Fix: He should have gone.

Parallel Structure – Use the same form to express equal ideas.

Example: By studying hard, Sara earned respect, made good grades, and to be self-confident.
To Fix: By studying hard, Sara earned respect, made good grades, and gained self-confidence.

Misplaced Modifier – Word or word group placed so it seems to describe a word it cannot describe sensibly.

Example: I saw the new car walking through the parking lot.
To Fix: Walking through the parking lot, I saw the new car.

Active Voice – In active voice the subject of a sentence *performs* the action.

Example: He sees all the old cars.

Passive Voice – In passive voice the subject *receives* the action.

Example: All the old cars are seen by him.

Use the active voice more often than the passive. It sounds more natural and direct.

Tense Shift – Do not carelessly shift verb tense in sentences or paragraphs.

Example: Reese took a piece of cake and eats it with a fork.
To Fix: Reese took a piece of cake and ate it with a fork.

Titles – *Always capitalize* a title's first word and last word. *Never capitalize* prepositions of four letters or fewer, articles (a, an, the), or short conjunctions. *Underline or italicize* pamphlets, titles of books, magazines, newspapers, movies, radio and TV programs, and plays or poems that are published as separate volumes. *Place title types not listed above in quotation marks.*

GUIDELINES FOR CREATING AN ESSAY

Have a clear understanding of the type of essay your teacher wants you to write. A more creative type, such as the narrative (storytelling) essay, may not have as many restrictions as the expository (information providing) essay, which is more formal.

Plan your essay carefully before writing the rough draft. Use an outline, especially with formal essays, because it keeps you focused and on track as you write.

An essay should discuss only one major topic which has been limited to a manageable size. Divide this topic into several subtopics which will become the discussions for each of the body paragraphs.

The essay's main idea, the thesis, is usually placed at the end of the introductory paragraph. However, check with your instructor for his or her preference.

Make sure sentences and paragraphs follow one another in a clear, logical fashion. Use chronological order (time order) when relating a personal experience, explaining how to do something, or describing how something works. Use strong support when giving reasons for an opinion and place the strongest support last.

The body paragraphs should be clear and interesting. To ensure this, do the following:

- Consider the audience for whom you are writing. Try not to write above or below their level of understanding and interest.
- Write a strong concluding paragraph to summarize your essay in a meaningful way. It creates the final impression of your message.
- Vary your sentence structure and length.

HIP TIP

Paragraph Techniques

Develop an essay's paragraphs by using one or more of the following techniques:

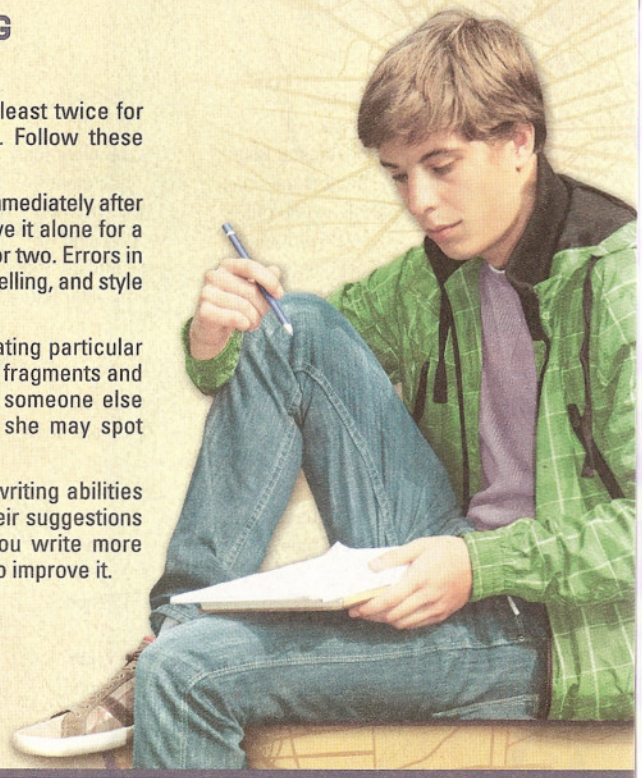
- vivid details
- facts
- logical reason
- examples
- comparisons or contrasts
- definitions

ENGLISH SKILLS

PROOFREADING AN ESSAY

Proofread your writing at least twice for improvements and errors. Follow these helpful guidelines:

- DO NOT read for errors immediately after finishing your piece. Leave it alone for a few hours or even a day or two. Errors in grammar, punctuation, spelling, and style will be easier to find.
- If you have difficulty locating particular errors, such as sentence fragments and run-on sentences, have someone else read your paper. He or she may spot errors you overlooked.
- Ask people with strong writing abilities to review your paper. Their suggestions and insights will help you write more objectively as you work to improve it.



CONNECTING WORDS

Use connecting words (transitions) to tie your ideas together so their relationships are clear to the reader. Here are some examples:

- accordingly
- again
- and
- at the same time
- besides
- but
- consequently
- conversely
- eventually
- finally
- first
- for example
- for instance
- furthermore
- however
- in addition
- in conclusion
- in fact
- in other words
- in the same way
- indeed
- likewise
- meanwhile
- moreover
- nevertheless
- next
- otherwise
- similarly
- so
- still
- therefore
- thus
- yet

MATH SKILLS

EQUIVALENCIES

Metric System

	Length	Volume	Weight
Basic Unit	meter (m)	liter (l)	gram (g)
x10	decameter (dam)	decaliter (dal)	decagram (dag)
x100	hectometer (hm)	hectoliter (hl)	hectogram (hg)
x1,000	kilometer (km)	kiloliter (kl)	kilogram (kg)*
÷10	decimeter (dm)	deciliter (dl)	decigram (dg)
÷100	centimeter (cm)	centiliter (cl)	centigram (cg)
÷1,000	millimeter (mm)	milliliter (ml)	milligram (mg)

*a metric ton is 1,000 kilograms

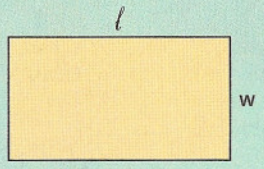
English System

Length/Distance		Volume	
1 foot	= 12 inches	1 tablespoon	= 3 teaspoons
1 yard	= 3 feet	1 cup	= 16 tablespoons
1 mile	= 1,760 yards	1 cup	= 8 fluid ounces
1.15 miles	= 1 nautical mile	1 pint	= 2 cups
3 miles	= 1 league	1 quart	= 2 pints
		2 pints	= 32 fluid ounces
Area		1 gallon	= 4 quarts
1 acre	= 4,840 sq. yards		
1 sq. mile	= 640 acres	**Weight**	
1 sq. foot	= 144 sq. inches	1 pound	= 16 ounces
1 sq. yard	= 9 sq. feet	1 ton	= 2,000 pounds

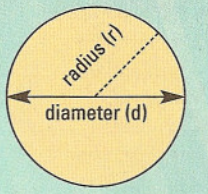
PERIMETER & CIRCUMFERENCE

Perimeter is the distance around an object.
Circumference refers to the distance around a circle.

Rectangle: $2(\ell + w)$



Circle: πd or $2\pi r$



CALCULATING THE AREA

ℓ = length s = side
w = width b = base
h = height r = radius

Square: s^2

Triangle: $\frac{1}{2}\, b \cdot h$

Rectangle: $\ell \cdot w$

Parallelogram: $b \cdot h$

Circle: πr^2

Trapezoid: $\frac{1}{2}\,(b_1 + b_2)\, h$



SURFACE & VOLUME

Surface Area: Find the area of each face and add together.

Volume of Prisms: Find the area of the base (B) and multiply by the height (h).

Cube: volume (V) = s^3

Rectangular Prism: $V = \ell \cdot w \cdot h$

Triangular Prism: V = Bh

Cylinder: $V = \pi r 2h$
surface area (SA) = $2\pi r 2 + 2\pi rh$

Volume of Pyramids: Find the area of the base (B), multiply by height (h), and divide by 3.

Triangular Pyramid: $V = \frac{1}{3}\,Bh$

Rectangular Pyramid: $V = \frac{1}{3}\,Bh$

Square Pyramid: $V = \frac{1}{3}\,Bh$

Cone: $V = \frac{1}{3}\,\pi r^2 h$

Sphere: $V = \frac{4}{3}\,\pi r^3$
$SA = 4\pi r^2$

HIP TIP

Remember: The answers to surface area problems are labeled as square units (units^2). The answers to volume problems are labeled as cubic units (units^3).

MATH SKILLS

ALGEBRA

Quadratic Equation: If $ax^2 + bx + c = 0$, then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Equations of a Line: (m = slope; b = y intercept)

Slope - Intercept Form:
$y = mx + b$

Slope of a Line:
$m = \frac{y_2 - y_1}{x_2 - x_1}$

Point - Slope Form:
$(y_2 - y_1) = m(x_2 - x_1)$

Variation Models:
For variables x, y, and z, where k is a positive constant called the constant of variation:

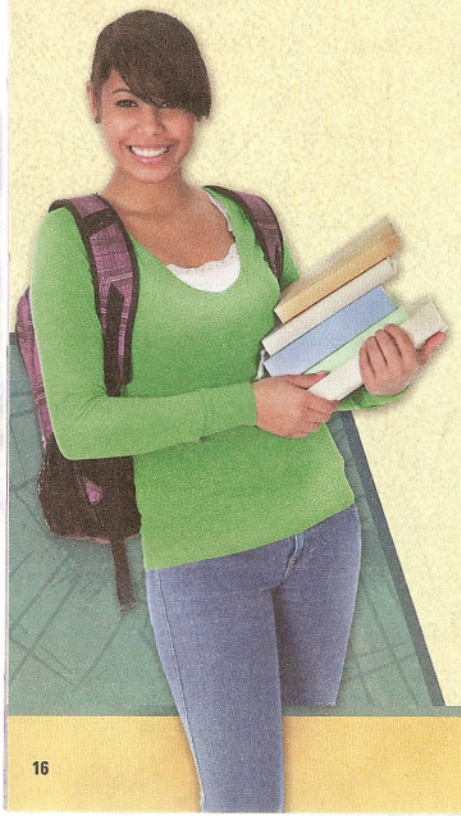
Direct Variation: $y = kx$ or $y/x = k$
Inverse Variation: $y = k/x$ or $xy = k$
Joint Variation: $z = kxy$

Law of Exponents:
If $a, b \in R$, $a, b \geq 0$, and p, q, r, s are $\in Q$, then:

1. $a^r a^s = a^{r+s}$
2. $a^r / a^s = a^{r-s}$
3. $(a^r)^s = a^{rs}$
4. $(ab)^r = a^r b^r$
5. $(a/b)^r = a^r / b^r$ $(b \neq 0)$
6. $a^0 = 1$ $(a \neq 0)$
7. $a^{-r} = 1/a^r$ $(a \neq 0)$
8. $a^{r/s} = \sqrt[s]{a^r} = (\sqrt[s]{a})^r$ $a^{1/2} = \sqrt{a}$ $a^{1/3} = \sqrt[3]{a}$

Logarithms:
$\text{Log } x^r = r \text{ Log } x$
$\text{Log } (xy) = \text{Log } x + \text{Log } y$
$\text{Log } (x/y) = \text{Log } x - \text{Log } y$
$\text{Log } x = n \leftrightarrow x = 10^n$ (Common log)
$\text{Log}_a x = n \leftrightarrow x = a^n$ (Log to the base a)
$\text{Ln } x = n \leftrightarrow x = e^n$ (Natural log)
$\pi \approx 3.14159265$
$e \approx 2.71828183$

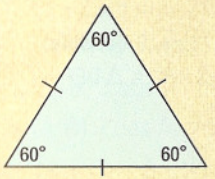
Special Products:
$(a - b)^2 = a^2 - 2ab + b^2$
$(a + b)^2 = a^2 + 2ab + b^2$
$(a - b)(a + b) = a^2 - b^2$
$a(b + c) = ab + ac$
$(a + b)(c + d) = ac + ad + bc + bd$
$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$
$(a + b)(a + c) = a^2 + ac + ab + bc$
$(a - b)^3 = a^3 - 3a^2b + 3ab^2 - b^3$



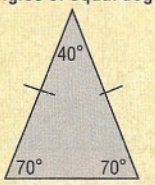
GEOMETRY

Triangles & Angles: The three angles of a triangle add up to 180°.

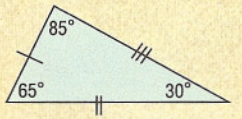
Equilateral triangle: all sides of equal length; all angles of equal degrees



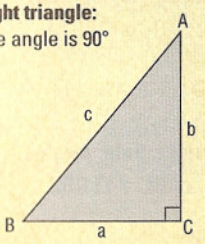
Isosceles triangle: two sides of equal length; two angles of equal degrees



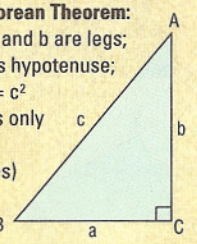
Scalene triangle: no sides equal; no angles equal



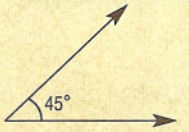
Right triangle: one angle is 90°



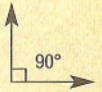
Pythagorean Theorem: sides a and b are legs; side c is hypotenuse; $a^2 + b^2 = c^2$ (applies only to right triangles)



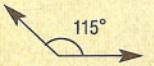
Acute angle: less than 90°



Right angle: equals 90°



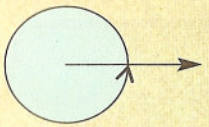
Obtuse angle: greater than 90° but less than 180°



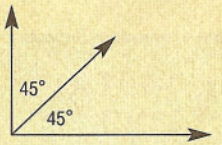
Straight angle: equals 180°



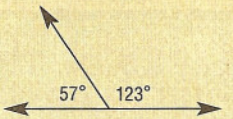
Complete angle rotation: equals 360°



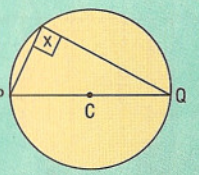
Complementary angles: two angles add up to 90°



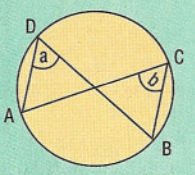
Supplementary angles: two angles add up to 180°



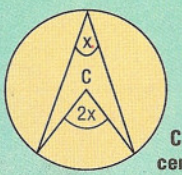
CIRCLE THEOREMS



$\angle x = 90°$ PQ is a diameter



$\angle a = \angle b$ angles subtended on the same arc AB

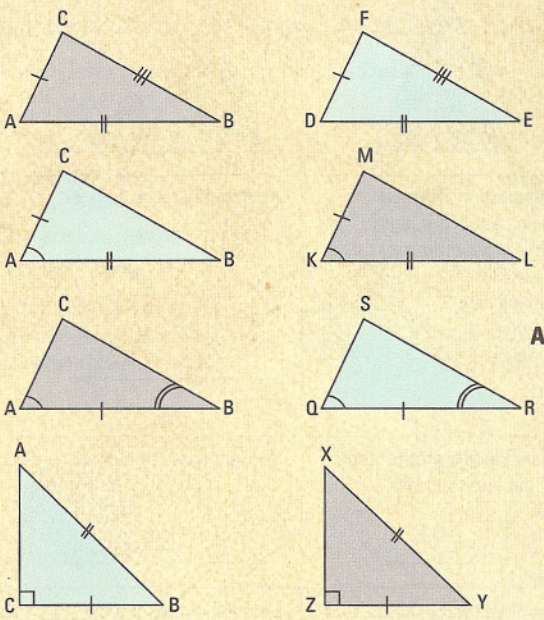


C is the center of the circle

MATH SKILLS

GEOMETRY

Congruency Cases:



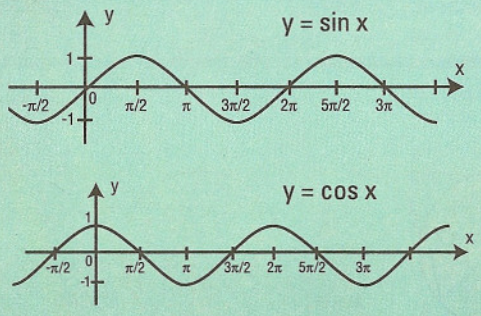
S.S.S. (Side, Side, Side)
$\Delta ABC \cong \Delta DEF$

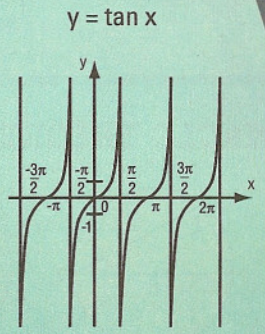
S.A.S. (Side, Angle, Side)
$\Delta ABC \cong \Delta KLM$

A.S.A. (Angle, Side, Angle)
$\Delta ABC \cong \Delta QRS$

H.S. (Hypotenuse, Side)
$\Delta ABC \cong \Delta XYZ$

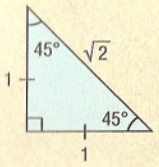
GRAPHS OF TRIGONOMETRIC & CIRCULAR FUNCTIONS





TRIGONOMETRY

$\sin(A+B) = \sin A \cos B + \cos A \sin B$
$\sin(A-B) = \sin A \cos B - \cos A \sin B$
$\sin 2A = 2 \sin A \cos A$
$\sin \frac{1}{2} A = \pm\sqrt{(1 - \cos A)/2}$
$\cos(A+B) = \cos A \cos B - \sin A \sin B$
$\cos(A-B) = \cos A \cos B + \sin A \sin B$
$\cos 2A = \cos^2 A - \sin^2 A = 2\cos^2 A - 1 = 1 - 2\sin^2 A$
$\cos \frac{1}{2} A = \pm\sqrt{(1 + \cos A)/2}$
$\tan(A+B) = \tan A + \tan B/(1 - \tan A \tan B)$
$\tan(A-B) = \tan A - \tan B/(1 + \tan A \tan B)$
$\tan 2A = 2 \tan A/(1 - \tan^2 A)$
$\tan \frac{1}{2} A = \pm\sqrt{(1 - \cos A)/(1 + \cos A)} = 1 - \cos A/\sin A = \sin A/1 + \cos A$



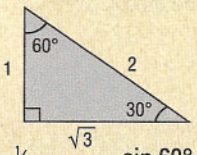
$\sin 45° = 1/\sqrt{2}$
$\cos 45° = 1/\sqrt{2}$
$\tan 45° = 1$

$1 + \tan^2\theta = \sec^2\theta$
$1 + \cot^2\theta = \csc^2\theta$
$\cos^2 - \sin^2 = \cos^2$ (only if sin=0)

$\tan\theta = \sin\theta/\cos\theta$
$\sin^2\theta + \cos^2\theta = 1$

CAST

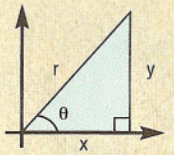
S	Quad II sin +	Quad I all ratios +	A
T	Quad III tan +	Quad IV cos +	C



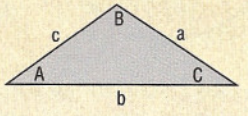
$\sin 30° = 1/2$
$\cos 30° = \sqrt{3}/2$
$\tan 30° = 1/\sqrt{3}$

$\sin 60° = \sqrt{3}/2$
$\cos 60° = 1/2$
$\tan 60° = \sqrt{3}$

$\sin\theta = y/r$ (opposite/hypotenuse) $= 1/\csc\theta$
$\cos\theta = x/r$ (adjacent/hypotenuse) $= 1/\sec\theta$
$\tan\theta = y/x$ (opposite/adjacent) $= 1/\cot\theta$



Law of Sines: $a/\sin A = b/\sin B = c/\sin C$
Law of Cosines: $a^2 = b^2 + c^2 - 2bc \cos A$
$b^2 = a^2 + c^2 - 2ac \cos B$
$c^2 = a^2 + b^2 - 2ab \cos C$



SCIENCE SKILLS

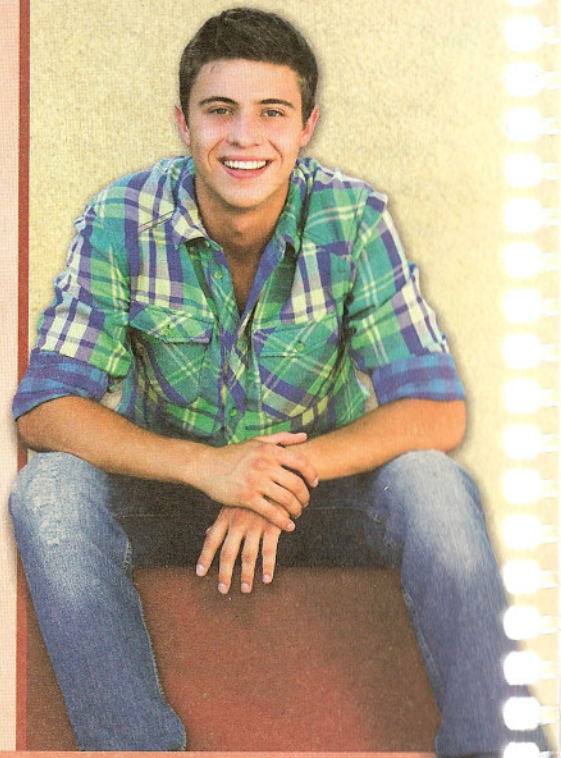
THE HUMAN BODY

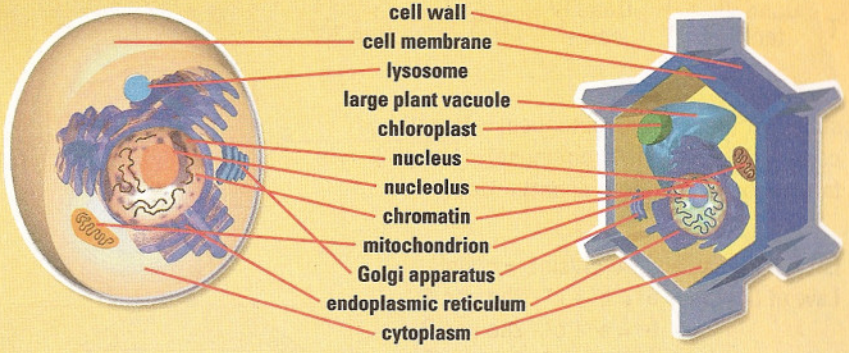
Systems – The body consists of 10 systems: skeletal, digestive, circulatory, muscular, integumentary, endocrine, respiratory, lymphatic, nervous, and reproductive.

Organs – Each system is made up of organs. An organ is a part of the body that has a specific purpose. Some organs, such as the liver or the skin, have more than one function.

Tissues – Organs are made from tissues. A tissue is a part of the organ made from similar cells and, in some cases, extracellular material. For example, bone tissue consists of bone cells and extracellular minerals.

Cells – Cells are the fundamental components of all organisms, and they are composed of several different parts: the nucleus, the cytoplasm, the cell membrane, and various smaller parts with different functions.





Shown is a comparison of an animal cell and a plant cell. Some structures found in these cells are listed above.

PHYSICS EQUATIONS

Density $D = \frac{m}{V}$
m is mass; V is volume

Distance $d = v \cdot t$
v is velocity; t is time

Acceleration $a = \frac{(v_f - v_i)}{t}$
v_f is final velocity;
v_i is initial velocity;
t is time

Distance $d = v_i \cdot t + \frac{1}{2} \cdot a \cdot t^2$
v_i is initial velocity;
t is time;
a is acceleration

Net Force $F = m \cdot a$
m is mass;
a is acceleration

Kinetic Energy $K.E. = \frac{1}{2} \cdot m \cdot v^2$
m is mass;
v is velocity

Force of Gravity $Fg = \frac{(G \cdot m_1 \cdot m_2)}{d^2}$
G is universal gravitational constant;
m_1, m_2 are masses of the two objects;
d is separation distance

Work $W = F \cdot d$
F is force;
d is distance

Power $P = \frac{W}{t}$
W is work;
t is time

Momentum $p = m \cdot v$
m is mass;
v is velocity

Electrical Force $Fe = \frac{(k \cdot Q_1 \cdot Q_2)}{d^2}$
Q_1, Q_2 are electrical charges;
d is separation distance;
k is Coulomb's constant
$k = 9.0 \cdot 10^9 \ \frac{N \cdot m^2}{c^2}$

Electrical Potential Difference $V = \frac{W}{Q}$
V is volts;
W is work done;
Q is electric charge moving

Electric Current $I = \frac{Q}{t}$
Q is electric charge flowing;
t is time

Electrical Energy $W = V \cdot I \cdot t$
V is voltage;
I is current;
t is time

Power $P = V \cdot I$
V is voltage;
I is current

Heat Energy $H = c \cdot m \cdot \Delta T$
c is specific heat;
m is mass;
ΔT is change in temperature

MEASUREMENTS OF ASTRONOMY

Measurement	Earth	Sun	Moon
Mass (m)	5.98×10^{24} kg	1.99×10^{30} kg	7.35×10^{22} kg
Radius (r)	6.37×10^{3} km	6.96×10^{5} km	1.74×10^{3} km
Average density	5.52 g/cm^3	1.42 g/cm^3	3.34 g/cm^3

SPECIFIC HEATS OF COMMON MATERIALS IN $\frac{J}{kg \cdot K}$

Water = 4180	Steam = 2020	Glass = 664	Brass = 376
Alcohol = 2450	Aluminum = 903	Iron = 450	Silver = 235
Ice = 2060	Carbon = 710	Copper = 385	Lead = 130

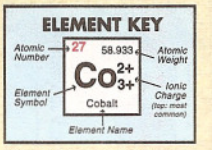
PERIODIC TABLE

PERIOD	I A	II A	III B	IV B	V B	VI B	VII B	VIII B	VIII B	VIII B	I B	II B	III A	IV A	V A	VI A	VII A	VIII A
1	1 1.0079 H+ Hydrogen																	2 4.0026 He Helium
2	3 6.941 Li+ Lithium	4 9.0122 Be2+ Beryllium											5 10.811 B Boron	6 12.011 C Carbon	7 14.007 N3- Nitrogen	8 15.999 O2- Oxygen	9 18.998 F- Fluorine	10 20.180 Ne Neon
3	11 22.990 Na+ Sodium	12 24.305 Mg2+ Magnesium											13 26.982 Al3+ Aluminum	14 28.086 Si Silicon	15 30.974 P3- Phosphorus	16 32.066 S2- Sulfur	17 35.453 Cl- Chlorine	18 39.948 Ar Argon
4	19 39.098 K+ Potassium	20 40.078 Ca2+ Calcium	21 44.956 Sc3+ Scandium	22 47.867 Ti4+ Titanium	23 50.942 V5+ Vanadium	24 51.996 Cr3+ Chromium	25 54.938 Mn2+ Manganese	26 55.845 Fe3+ Iron	27 58.933 Co2+ Cobalt	28 58.693 Ni2+ Nickel	29 63.546 Cu2+ Copper	30 65.39 Zn2+ Zinc	31 69.723 Ga3+ Gallium	32 72.61 Ge4+ Germanium	33 74.922 As3- Arsenic	34 78.96 Se2- Selenium	35 79.904 Br- Bromine	36 83.80 Kr Krypton
5	37 85.468 Rb+ Rubidium	38 87.62 Sr2+ Strontium	39 88.906 Y Yttrium	40 91.224 Zr Zirconium	41 92.906 Nb Niobium	42 95.94 Mo Molybdenum	43 (97.907) Tc Technetium	44 101.07 Ru Ruthenium	45 102.91 Rh Rhodium	46 106.42 Pd2+ 4+ Palladium	47 107.87 Ag+ Silver	48 112.41 Cd2+ Cadmium	49 114.82 In3+ Indium	50 118.71 Sn4+ 2+ Tin	51 121.76 Sb3+ 5+ Antimony	52 127.60 Te2- Tellurium	53 126.90 I- Iodine	54 131.29 Xe Xenon
6	55 132.91 Cs+ Cesium	56 137.33 Ba2+ Barium	57 138.91 La * Lanthanum	72 178.49 Hf Hafnium	73 180.95 Ta Tantalum	74 183.84 W Tungsten	75 186.21 Re Rhenium	76 190.23 Os Osmium	77 192.22 Ir Iridium	78 195.08 Pt4+ 2+ Platinum	79 196.97 Au3+ + Gold	80 200.59 Hg2+ + Mercury	81 204.38 Tl + 3+ Thallium	82 207.2 Pb2+ 4+ Lead	83 208.98 Bi3+ 5+ Bismuth	84 (206.98) Po2+ 4+ Polonium	85 (209.99) At- Astatine	86 (222.02) Rn Radon
7	87 (223.02) Fr+ Francium	88 (226.03) Ra2+ Radium	89 (227.03) Ac3+ ** Actinium	104 (263.11) Rf Rutherfordium	105 (262.11) Db Dubnium	106 (266.12) Sg Seaborgium	107 (264.12) Bh Bohrium	108 (269.13) Hs Hassium	109 (268.14) Mt Meitnerium	110 (272.15) Ds Darmstadium	111 (280) Rg Roentgenium	112 (285) Cn Copernicium	113 (284) Uut Ununtrium	114 (289) Fl Flerovium	115 (288) Uup Ununpentium	116 (293) Lv Livermorium	117 (289) Uus Ununhexium	118 (293) Uuo Ununoctium

Lanthanides *	58 140.12 Ce3+ Cerium	59 140.91 Pr3+ Praseodymium	60 144.24 Nd3+ Neodymium	61 (144.91) Pm3+ Promethium	62 150.36 Sm3+ Samarium	63 151.96 Eu3+ 2+ Europium	64 157.25 Gd3+ Gadolinium	65 158.93 Tb3+ Terbium	66 162.50 Dy3+ Dysprosium	67 164.93 Ho3+ Holmium	68 167.26 Er3+ Erbium	69 168.93 Tm3+ Thulium	70 173.04 Yb3+ Ytterbium	71 174.97 Lu3+ Lutetium
Actinides **	90 232.04 Th4+ Thorium	91 231.04 Pa5+ Protactinium	92 238.03 U6+ 4+ Uranium	93 (237.05) Np5+ Neptunium	94 (244.06) Pu4+ 6+ Plutonium	95 (243.06) Am3+ Americium	96 (247.07) Cm3+ Curium	97 (247.07) Bk3+ Berkelium	98 (251.08) Cf3+ Californium	99 (252.08) Es Einsteinium	100 (257.10) Fm Fermium	101 (258.10) Md Mendelevium	102 (259.10) No Nobelium	103 (262.11) Lr Lawrencium

Rare Earth Elements (All Transition Group 3)

ELEMENT KEY



Atomic weights appearing in parentheses are those of the most stable known isotopes. For elements 110-112, 114, 116, and 118, names, symbols, and values are temporary as elements are under review.

LEGEND Aa *Black Element Symbol = SOLID* Aa *Green Element Symbol = LIQUID* Aa *Blue Element Symbol = GAS* *Red Outline = SYNTHETICALLY PREPARED*

Non-Metal · Alkali Metal · Alkali Earth Metal · Transition Metals · Metals, Metalloids, and Nonmetals · Halogens · Noble Gases

NORTH AMERICA



CANADA
CAPITALS & PROVINCES/TERRITORIES

AB	Edmonton	Alberta	
BC	Victoria	British Columbia	
MB	Winnipeg	Manitoba	
NB	Fredericton	New Brunswick	
NL	St. John's	Newfoundland & Labrador	
NS	Halifax	Nova Scotia	
NT	Yellowknife	Northwest Territories	
NU	Iqaluit	Nunavut	
ON	Toronto	Ontario	
PE	Charlottetown	Prince Edward Island	
QC	Québec	Québec	
SK	Regina	Saskatchewan	
YT	Whitehorse	Yukon	

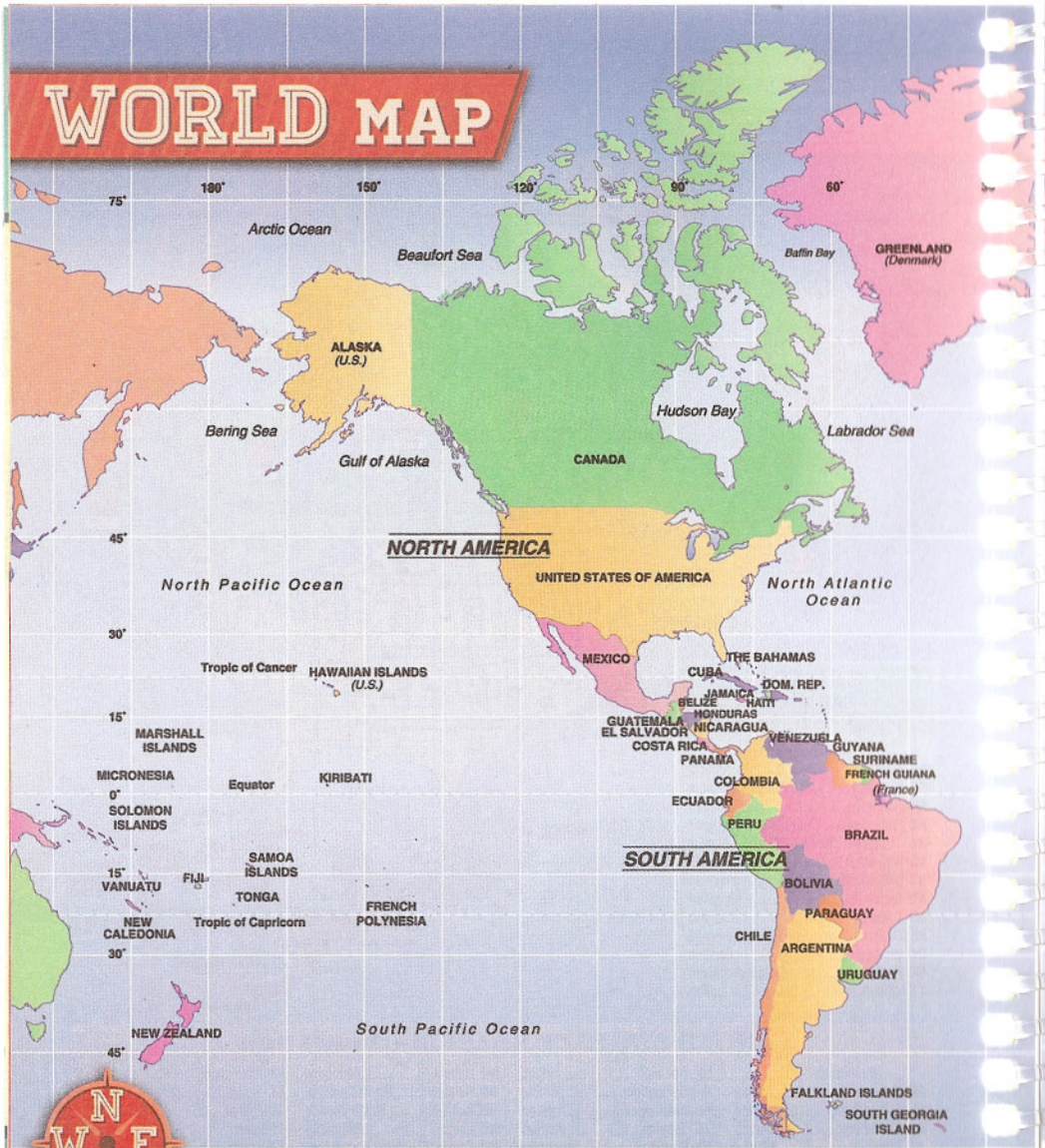
UNITED STATES OF AMERICA – CAPITALS & STATES

	Washington, D.C.	ID	Boise	MT	Helena
AK	Juneau	IL	Springfield	NC	Raleigh
AL	Montgomery	IN	Indianapolis	ND	Bismarck
AR	Little Rock	KS	Topeka	NE	Lincoln
AZ	Phoenix	KY	Frankfort	NH	Concord
CA	Sacramento	LA	Baton Rouge	NJ	Trenton
CO	Denver	MA	Boston	NM	Santa Fe
CT	Hartford	MD	Annapolis	NV	Carson City
DE	Dover	ME	Augusta	NY	Albany
FL	Tallahassee	MI	Lansing	OH	Columbus
GA	Atlanta	MN	St. Paul	OK	Oklahoma City
HI	Honolulu	MO	Jefferson City	OR	Salem
IA	Des Moines	MS	Jackson	PA	Harrisburg
	Alaska		Illinois		Montana
	Alabama		Indiana		North Carolina
	Arkansas		Kansas		North Dakota
	Arizona		Kentucky		Nebraska
	California		Louisiana		New Jersey
	Colorado		Massachusetts		New Mexico
	Connecticut		Maryland		Nevada
	Delaware		Maine		New York
	Florida		Michigan		Ohio
	Georgia		Minnesota		Oklahoma
	Hawaii		Missouri		Oregon
	Iowa		Mississippi		Pennsylvania
		RI	Providence		Rhode Island
		SC	Columbia		South Carolina
		SD	Pierre		South Dakota
		TN	Nashville		Tennessee
		TX	Austin		Texas
		UT	Salt Lake City		Utah
		VA	Richmond		Virginia
		VT	Montpelier		Vermont
		WA	Olympia		Washington
		WI	Madison		Wisconsin
		WV	Charleston		West Virginia
		WY	Cheyenne		Wyoming

MEXICO – CAPITALS & STATES

	Mexico City, F.D.	11.	Chilpancingo	22.	Chetumal
1.	Aguascalientes	12.	Pachuca	23.	San Luis Potosí
2.	Mexicali	13.	Guadalajara	24.	Culiacán
3.	La Paz	14.	Toluca	25.	Hermosillo
4.	Campeche	15.	Morelia	26.	Villahermosa
5.	Tuxtla Gutiérrez	16.	Cuernavaca	27.	Ciudad Victoria
6.	Chihuahua	17.	Tepic	28.	Tlaxcala
7.	Saltillo	18.	Monterrey	29.	Jalapa
8.	Colima	19.	Oaxaca	30.	Mérida
9.	Durango	20.	Puebla	31.	Zacatecas
10.	Guanajuato	21.	Querétaro	32.	Mexico City
	Guerrero		Quintana Roo		
	Hidalgo		San Luis Potosí		
	Jalisco		Sinaloa		
	Mexico		Sonora		
	Michoacán		Tabasco		
	Morelos		Tamaulipas		
	Nayarit		Tlaxcala		
	Nuevo León		Veracruz		
	Oaxaca		Yucatán		
	Puebla		Zacatecas		
	Querétaro		Federal District		

WORLD MAP





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Jamaica
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Finland
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Germany
Greece
Hungary
Iceland
Ireland
Italy
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Liechtenstein
Lithuania
Luxembourg
Macedonia
Malta
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Netherlands
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Poland
Portugal
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Russia
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Slovakia
Slovenia
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Uzbekistan
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Zimbabwe

ANTARCTICA
Antarctica (not pictured)

TIPS FOR COLLEGE

FINANCIAL AID

Don't assume you won't qualify for financial aid. Many private sources don't base their awards on financial need, and most families pay less than full price. Check with your high school guidance office for assistance. To learn more about college costs and financial aid, also visit **www.collegeboard.com** and **www.fafsa.ed.gov**.

- At four-year U.S. public colleges and universities, more than 60% of full-time students receive some type of financial aid.
- At four-year U.S. private colleges and universities, more than 75% of students receive some form of financial aid.
- Aid is available from your local government, federal government, directly from colleges, and private sources, such as corporations.

Loans are borrowed monies you must repay once you complete your college education. Some loans are based on need, while others are not.

Grants are financial aid you don't have to pay back. Grants are awarded on the basis of need.

Scholarships are private aid awarded on a local, state, or national level based on academic achievement, artistic or musical talent, athletic ability, membership in an organization, or other achievements.

ARE ACT & SAT SCORES IMPORTANT?

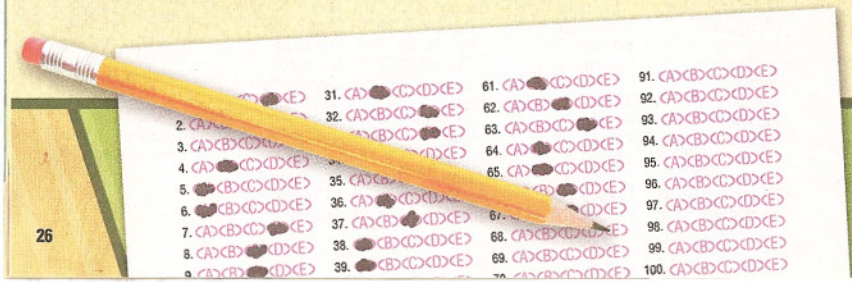
ACT and SAT scores are important in determining your admission to U.S. colleges and awarding of scholarships. Many scholarships are based on class rank, grade point average, and ACT or SAT scores. Tests are conducted up to seven times per year.

ACT – covers four areas: English, math, reading, and science. The format is multiple choice. Some schools may require the Writing Test.

If you have taken the ACT more than once, a **separate** record is maintained for each test date. If you have a report sent to a college, **only** the record(s) from the test date(s) you designate will be released. Visit **www.act.org** for more info.

SAT – assesses writing, critical reading, and math skills. SAT subject tests measure knowledge of a subject and the ability to apply that knowledge.

A cumulative report of all scores is sent to the colleges of your choice. You cannot select your latest or highest scores or separate scores for verbal, math, SAT Reasoning, or SAT Subject Tests. Visit **www.collegeboard.com** for more info.





MAKING THE TRANSITION TO COLLEGE

Getting ready for your college freshman year can be daunting because it may be the first time you've lived away from home. Managing your time will be key – from studying to doing your own laundry. Here are tips to make the transition easier.

CONQUER COLLEGE COURSES

- **Keep up with studies** – College courses are more challenging and move at a faster pace. Work on assignments early and stay on task. Begin long-term assignments right away and use time in-between classes. Conquer procrastination!
- **Take notes** – As your professors review material, summarize it in your own words so you understand the content. This will make it easier to recall information for exams.
- **Always go to class** – It may be tempting to skip and sleep in, but going to class ensures you won't miss any important information. Remember, college is critical in building a future career.
- **Find a good study place** – The chaos of dorm life, roommates, etc., may only distract you. Find a quiet, well-lit study area where you can do your best work.
- **Use available resources** – If you are struggling with a class, talk with your professor or find a good tutor. Good relationships with your professors give you a huge advantage during class and later on, when you need a letter of recommendation.

BECOME YOUR OWN PERSON

- **Learn about the campus** – Most colleges offer organized campus visits for high school seniors. Once you know the college you will be attending, study a campus map to figure out where everything is located. The same applies if you're in an unfamiliar city. Eliminate the frustration and have fun getting to know your new campus/city.
- **Read campus rules and regulations** – This includes dorm rules and those in other campus facilities. Knowing the rules will help you act appropriately and keep you safe.
- **Be positive** – One minute you love your independence, the next you're homesick. Join school clubs and activities to make new friends and create a sense of community. It's good to get out of your comfort zone with new situations and surroundings. Have a good attitude to learn, live, and mature!
- **Budget your money** – How you manage your money may set the tone for the rest of your life. Accumulating a large credit card balance will only cost you later. It's best to stick with cash. Necessities (food, class supplies, etc.) come first. Luxuries (eating out, road trips, etc.) come last. Never use grant/loan money for luxuries.