Grade 10

CULTURAL, SOCIAL, PERSONAL PERSPECTIVES & SCIENCE

HISTORY & NATURE OF SCIENCE

SCIENCE & TECHNOLOGY

E-1, F-1, G-1

Based on the Alaska Science Standards
SE 1.1, SF 2.1, SG 3.1

FOR THE

Juneau-Douglas High School

Sealaska Heritage Institute

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Integrating Culturally Responsive, Place-Based Content with Language Skills Development for Curriculum Enrichment

DEVELOPED BY
Ben Carney
Steve Morley
Wayne Woodgate
Jim MacDiarmid

Unit Assessments
Bev Williams

LINGUISTIC & CULTURAL DEVELOPERS
David Katzeek
Linda Belarde

LAYOUT & FORMATTING
Matt Knutson

PRINTERS
Capital Copy, Juneau, Alaska

Project Assistants
Megan Gregory
Tiffany LaRue

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INTRODUCTION

Over the years, much has been written about the successes and failures of students in schools. There is no end to the solutions offered, particularly for those students who are struggling with academics. There have been efforts to bring local cultures into the classroom, thus providing the students with familiar points of departure for learning. However, most often such instruction has been limited to segregated activities such as arts and crafts or Native dancing rather than integrating Native culture into the overall learning process. Two core cultural values, *Haa Aaní,* the reference for and usage of the land, and *Haa Shagóon,* the tying of the present with the past and future, are known by both students and parents, and can be included in a curriculum that simultaneously provides a basis for self-identity and cultural pride, within the educational setting. This will provide a valuable foundation for improved academic achievement.

While the inclusion of Native concepts, values, and traditions into a curriculum provides a valuable foundation for self-identity and cultural pride, it may not, on its own, fully address improved *academic* achievement.

This program is designed to meet the academic realities, faced by high school students every day, using a developmental process that integrates *culture* with *skills* development. The values of *Haa Aaní* and *Haa Shagóon* are reinforced through the various activities in the program.

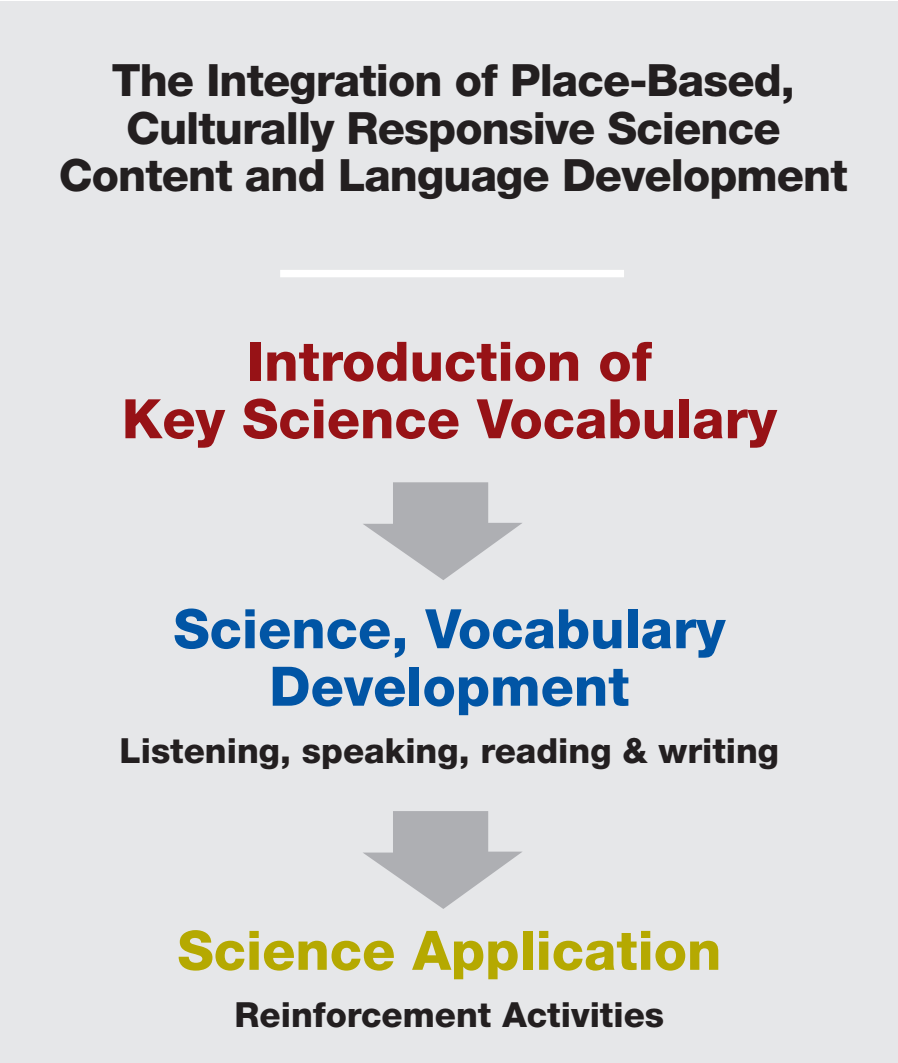
During science lessons, the students are exposed to new information and to key vocabulary that represent that information. While the students may acquire, through various processes, the scientific information, the vocabulary is often left at an exposure level and not internalized by them. Over time, this leads to *language-delay* that impacts negatively on a student's on-going academic achievement.

Due to *language delay*, many Native Alaskan high school students struggle with texts that are beyond their comprehension levels and writing assignments that call for language they do not have.

To this end, in this resource program, each key vocabulary word in science is viewed as a *concept*. The words are introduced concretely, using place-based information and contexts. Whenever possible, the concepts are viewed through the Native heritage cultural perspectives, thus reinforcing the value of *Haa Shagóon* and *Haa Aaní.* Using this approach, the students have the opportunity to acquire new information in manageable chunks; the sum total of which, represent the body of information to be learned in the science program.

When the key vocabulary/concepts have been introduced, the students are then taken through a sequence of listening, speaking, reading, and writing activities, designed to instill the vocabulary into their long term memories.

Finally, at the end of each unit, the students will participate in enrichment activities based on recognized and research-based *best practices*. By this time, the science information and vocabulary will be familiar, adding to the students' feelings of confidence and success. These activities will include *place-based* and *heritage culture* perspectives of the information learned.



The Developmental Language Process

The Developmental Language Process is designed to instill language into long term memory. The origin of the Process is rooted in the struggles faced by language-delayed students, particularly when they first enter school.

The Process takes the students/children through developmental steps that reflect the natural acquisition of language in the home and community. Initially, once key language items have been introduced concretely to the students, the vocabulary are used in the first of the language skills, Basic Listening. This stage in the process represents *input* and is a critical venue for language acquisition and retention. A baby hears many different things in the home, gradually the baby begins to *listen* to what he/she hears. As a result of the *input* provided through Basic Listening, the baby tries to repeat some of the language heard – this is represented by the second phase of the Process, Basic Speaking - the oral *output* stage of language acquisition.

As more language goes into a child's long-term memory, he/she begins to understand simple commands and phrases. This is a higher level of listening represented by the stage, Listening Comprehension. With the increase in vocabulary and sentence development, the child begins to explore the use of language through the next stage in the Process, Creative Speaking. All of these steps in the Process reflect the natural sequence of language development.

The listening and speaking skill areas represent *true* language skills; most cultures, including Alaska Native cultures, never went beyond them to develop written forms. Oral traditions are inherent in the listening and speaking skills.

However, English does have abstract forms of language in reading and writing. Many Native children entering kindergarten come from homes where language is used differently than in classic Western homes. This is not a value judgment of child rearing practices but a definite cross-cultural reality. Therefore, it is critical that the Native child be introduced to the concepts of reading and writing before ever dealing with them as skills areas. It is vital for the children to understand that reading and writing are *talk in print*.

The Developmental Language Process integrates the *real* language skills of listening and speaking with the related skills of reading and writing. At this stage in the Process, the students are introduced to the printed words for the first time. These abstract representations are now familiar, through the listening and speaking activities, and the relationship is formed between the words and language, beginning with Basic Reading.

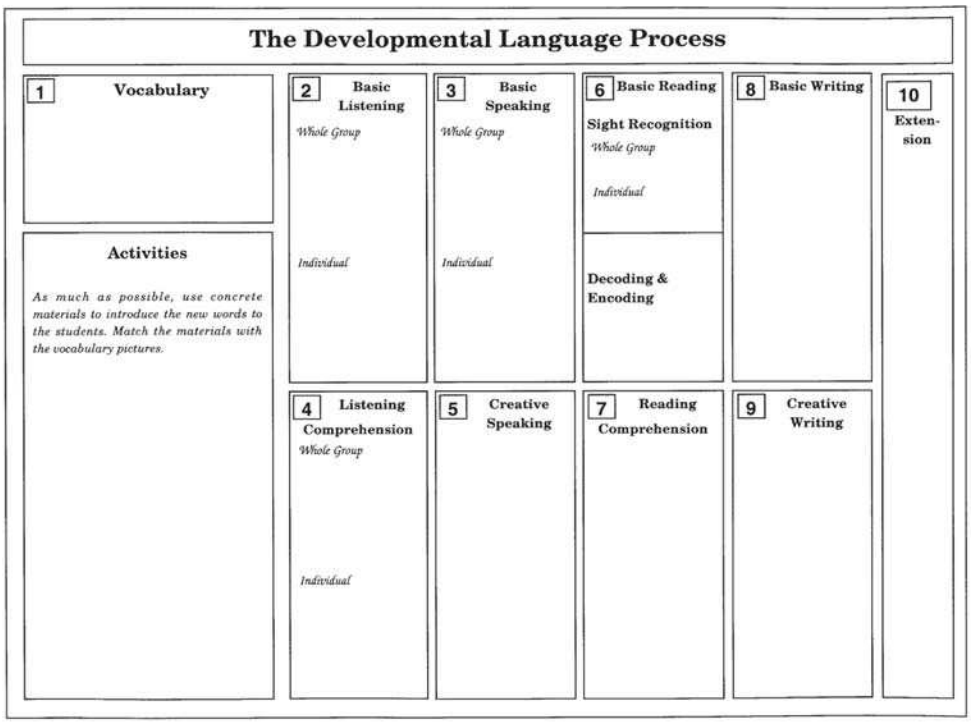
As more language goes into the children's long-term memories, they begin to comprehend more of what they read, in Reading Comprehension.

Many Alaskan school attics are filled with reading programs that didn't work – in reality, any of the programs would have worked had they been implemented through a language development process. For many Native children, the printed word creates angst, particularly if they are struggling with the reading process. Often, children are asked to read language they have never heard.

Next in the Process is Basic Writing, where the students are asked to write the key words. Finally, the most difficult of all the language skills, Creative Writing, asks the students to write sentences of their own, using the key words and language from their long-term memories. This high level skill area calls upon the students to not only retrieve language, but to put the words in their correct order within the sentences, to spell the words correctly and to sequence their thoughts in the narrative.

A student's ability to comprehend well in listening and reading, and to be creatively expressive in speaking and writing, is dependent upon how much language he/she has in long-term memory.

The Developmental Language Process is represented in this chart:



It should be understood that these materials are not a *curriculum* - rather, they are resource materials designed to encourage academic achievement through intensive language development in the content areas.

These resource materials are *culturally responsive* in that they utilize teaching and learning styles effective with Native students. As the students progress through the steps of the Process, they move from a concrete introduction of the key vocabulary, to a symbolic representation of the vocabulary, and finally, to their abstract forms - reading and writing. This provides a format for the students to develop language and skills that ultimately lead to improved academic performance.

Alaska Content Standards for Science

A. Science as Inquiry and Process

A student should understand and be able to apply the processes and applications of scientific inquiry. A student who meets the content standard should:

1. develop an understanding of the processes of science used to investigate problems, design and conduct repeatable scientific investigations, and defend scientific arguments;
2. develop an understanding that the processes of science require integrity, logical reasoning, skepticism, openness, communication, and peer review; and
3. develop an understanding that culture, local knowledge, history, and interaction with the environment contribute to the development of scientific knowledge, and local applications provide opportunity for understanding scientific concepts and global issues.

B. Concepts of Physical Science

A student should understand and be able to apply the concepts, models, theories, universal principals, and facts that explain the physical world. A student who meets the content standard should:

1. develop an understanding of the characteristic properties of matter and the relationship of these properties to their structure and behavior;
2. develop an understanding that energy appears in different forms, can be transformed from one form to another, can be transferred or moved from one place or system to another, may be unavailable for use, and is ultimately conserved;
3. develop an understanding of the interactions between matter and energy, including physical, chemical, and nuclear changes, and the effects of these interactions on physical systems; and
4. develop an understanding of motions, forces, their characteristics and relationships, and natural forces and their effects.

C. Concepts of Life Science

A student should understand and be able to apply the concepts, models, theories, facts, evidence, systems, and processes of life science. A student who meets the content standard should:

1. develop an understanding of how science explains changes in life forms over time, including genetics, heredity, the process of natural selection, and biological evolution;
2. develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms; and
3. develop an understanding that all organisms are linked to each other and their physical environments through the transfer and transformation of matter and energy.

D. Concepts of Earth Science
A student should understand and be able to apply the concepts, processes, theories, models, evidence, and systems of earth and space sciences. A student who meets the content standard should:

1. develop an understanding of Earth's geochemical cycles;
2. develop an understanding of the origins, ongoing processes, and forces that shape the structure, composition, and physical history of the Earth;
3. develop an understanding of the cyclical changes controlled by energy from the sun and by Earth's position and motion in our solar system; and
4. develop an understanding of the theories regarding the origin and evolution of the universe.

E. Science and Technology
A student should understand the relationships among science, technology, and society. A student who meets the content standard should:

1. develop an understanding of how scientific knowledge and technology are used in making decisions about issues, innovations, and responses to problems and everyday events;
2. develop an understanding that solving problems involves different ways of thinking, perspectives, and curiosity that lead to the exploration of multiple paths that are analyzed using scientific, technological, and social merits; and
3. develop an understanding of how scientific discoveries and technological innovations affect and are affected by our lives and cultures.

F. Cultural, Social, Personal Perspectives and Sciences
A student should understand the dynamic relationships among scientific, cultural, social, and personal perspectives. A student who meets the content standard should:

1. develop an understanding of the interrelationships among individuals, cultures, societies, science, and technology;
2. develop an understanding that some individuals, cultures, and societies use other beliefs and methods in addition to scientific methods to describe and understand the world; and
3. develop an understanding of the importance of recording and validating cultural knowledge.

G. History and Nature of Science
A student should understand the history and nature of science. A student who meets the content standard should:

1. develop an understanding that historical perspectives of scientific explanations demonstrate that scientific knowledge changes over time, building on prior knowledge;
2. develop an understanding that the advancement of scientific knowledge embraces innovation and requires empirical evidence, repeatable investigations, logical arguments, and critical review in striving for the best possible explanations of the natural world;
3. develop an understanding that scientific knowledge is ongoing and subject to change as new evidence becomes available through experimental and/or observational confirmation(s); and
4. develop an understanding that advancements in science depend on curiosity, creativity, imagination, and a broad knowledge base.

http://www.educ.state.ak.us/ContentStandards/Science.html


UNIT 1
Sealaska Heritage Institute

INTRODUCTION OF

Key Vocabulary

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Account

PLACE-BASED PERSPECTIVE

Show the students a book, DVD, etc. that represents an *account* of an event.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Totem poles provide an *account* of the history of the clan and the land.

Current

PLACE-BASED PERSPECTIVE

Draw a picture of a dam with water behind it and demonstrate to students that electric *current* is similar to a hole in the dam. The larger the hole, the more water (or electrons for this example) can go through. In the case of current, the amount of electrons are measured in amperes.
Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Native peoples have always known about the electrical *current* of lightning and its impact on the land. For example, when lightning strikes the earth, it will either start a fire or kill the plants in the area where it struck.

The green color seen in Chilkat blankets represents the color of lightning.

Evaluate

PLACE-BASED PERSPECTIVE

Discuss how Consumer Reports *evaluates* products so that buyers can make informed decisions prior to purchasing products.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditional life consisted of various dimensions of *evaluating*. Native people evaluated furs, art forms, foods, weather, and the performing arts.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Event

PLACE-BASED PERSPECTIVE

Discuss the major *event* of the comet that slammed into the Earth and caused widespread extinction, including the extinction of the dinosaurs.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditionally, there were various ceremonial *events,* for example the construction of a tribal house, the raising of a totem, funerals, and the greeting of visitors. Community meetings were also held to deal with local issues.

Factors

PLACE-BASED PERSPECTIVE

Discuss with students how the last major ice age created *factors* that allowed for the re-distribution of species, including humans. There is an emerging scientific theory that the first peoples in Southeast Alaska arrived at the end of the ice age by water; some areas of Southeast were not covered in ice at that time, as scientists previously thought.

HERITAGE CULTURAL PERSPECTIVE

A natural *factor* that affected all people was a "great flood," as documented in Native oral traditions. The movement of glaciers has been a major factor in the settlement of Native communities in Southeast Alaska.

Historically Significant

PLACE-BASED PERSPECTIVE

Discuss how the 1964 earthquake in Alaska was *historically significant* for not only the destruction caused by the earthquake, but also for the tsunamis that affected Southeast Alaska.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The battles in Sitka between the Tlingits and the Russians were an *historically significant* event in Southeast Alaska. The Alaska Native Claims Settlement Act is another major, historically-significant event for the state of Alaska.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Hypothesis

PLACE-BASED PERSPECTIVE

Ask students to make observations of three modern inventions that they see in the classroom. Have them create questions based on their observations of one of the objects. Reward the student who can then come up with more logical guesses to answer their own questions. This logical guess is a *hypothesis*.
Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditionally, the Native peoples of Southeast Alaska had a *hypothesis* that the salmon migrated to the ocean then returned to the same streams in which they were born.

Impact

PLACE-BASED PERSPECTIVE

Show a picture of Charles Darwin. Discuss his impact on the modern world.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

There have been many major *impacts* on the lives of Native peoples in Southeast Alaska. This includes the introduction of sporting events, such as basketball. To this day, inter-community competitions occur annually. In addtion, Native values of working together helped to increase their participation in the sports activities.

Interrelated

PLACE-BASED PERSPECTIVE

Ask students to list their parents, grandparents, brothers, sisters, and cousins. Discuss with them how each member of their families are interrelated to differing degrees.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Today the various Native peoples of Southeast Alaska are all *interrelated*. This is evidenced in the lineage, art work, songs, and stories.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Invent

PLACE-BASED PERSPECTIVE

Bring in a cell phone and discuss with students how the technologies used for cell phones have been *invented* and developed in recent times.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditionally, Native peoples *invented* a variety of items necessary for survival and everyday life. This included the gaff hook, the halibut hook, and fish traps.

Progress

PLACE-BASED PERSPECTIVE

Show a picture of a fish finder and discuss the impact of sonar on the *progress* of commercial fishing.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Life in Southeast Alaska reflects many apects of *progress*, from transportation, to clothing, to communications.

Resources

PLACE-BASED PERSPECTIVE

Discuss with students how salmon are a *resource* that may be preserved, conserved, or exploited with different results for different management strategies.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Southeast Alaska is rich in natural *resources*.

Culturally Responsive & Place-based Perspective Introduction of Science Vocabulary

Solutions

PLACE-BASED PERSPECTIVE

Show a picture of a glass window. Discuss how glass windows were *solutions* to stretched animal hides. Discuss the advantages to this solution.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

The fire pit in a tribal house was an innovative *solution* in that it was designed to prevent smoke from filling the house while, at the same time, providing heat and light.

User Groups

PLACE-BASED PERSPECTIVE

Discuss with students how commercial-use, personal-use, and subsistence fishermen are different *user groups* for the annual salmon harvest.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Traditionally, peoples in Native communities were assigned areas in which they fished, hunted, or trapped. These were traditional *user groups*.

Various

PLACE-BASED PERSPECTIVE

Discuss with the students how clams, cockles, and gumboots are *various* types of foods that may be harvested during low tides.

Show the students the vocabulary picture for this word. Have the students suggest how the picture relates to the word.

HERITAGE CULTURAL PERSPECTIVE

Southeast Alaska contains *various* berries, and other vegetation.

Language Skills

Language & Skills Development

LISTENING

Use the activity pages from the Student Support Materials.

Flashlight Find

Mount the vocabulary illustrations on the walls, chalkboard, windows, etc. Have a student stand in the center of the classroom with a flashlight. Say one of the vocabulary words and the student must find the illustration for the vocabulary word you said using the light of the flashlight. This activity may also be conducted in team form. In this case, have two flashlights available. Have a player from each team stand in the center of the classroom. When you say the vocabulary

SPEAKING

Illustration Bingo

Mount the vocabulary illustrations on the chalkboard. Place a number of blue Before the activity begins, prepare a page that contains a small version of each vocabulary illustration. Provide each student with a copy of the small illustrations. Each student should cut out the illustrations from his/her copy. When the students' illustrations are cut out, each student should place them on his/her desk, face down. Then, have each student turn one illustration face up. Say a vocabulary word. Any student or students who have the illustration for that word face up must say a complete sentence, using that vocabulary word. Those illustrations should then be put to the side and other illustrations turned over. Continue in this way until a student or students have no illustrations left on their desks.

READING

Use the activity pages from the Student Support Materials.

Find the Parts

Before the activity begins, prepare a page that contains the sight words. Provide each student with a copy of the page. Each student should then cut out the letter/syllables of the sight words. When a student has cut out all of the letter/syllables, he/she should lay them on his/her desk, in a scattered form. Say one of the sight words. The students should then find the necessary letters/syllables to create the sight word you said. Continue until all of the sight words have been developed in this way. Later, the students can glue their encoded sight words on blank sheets of paper.

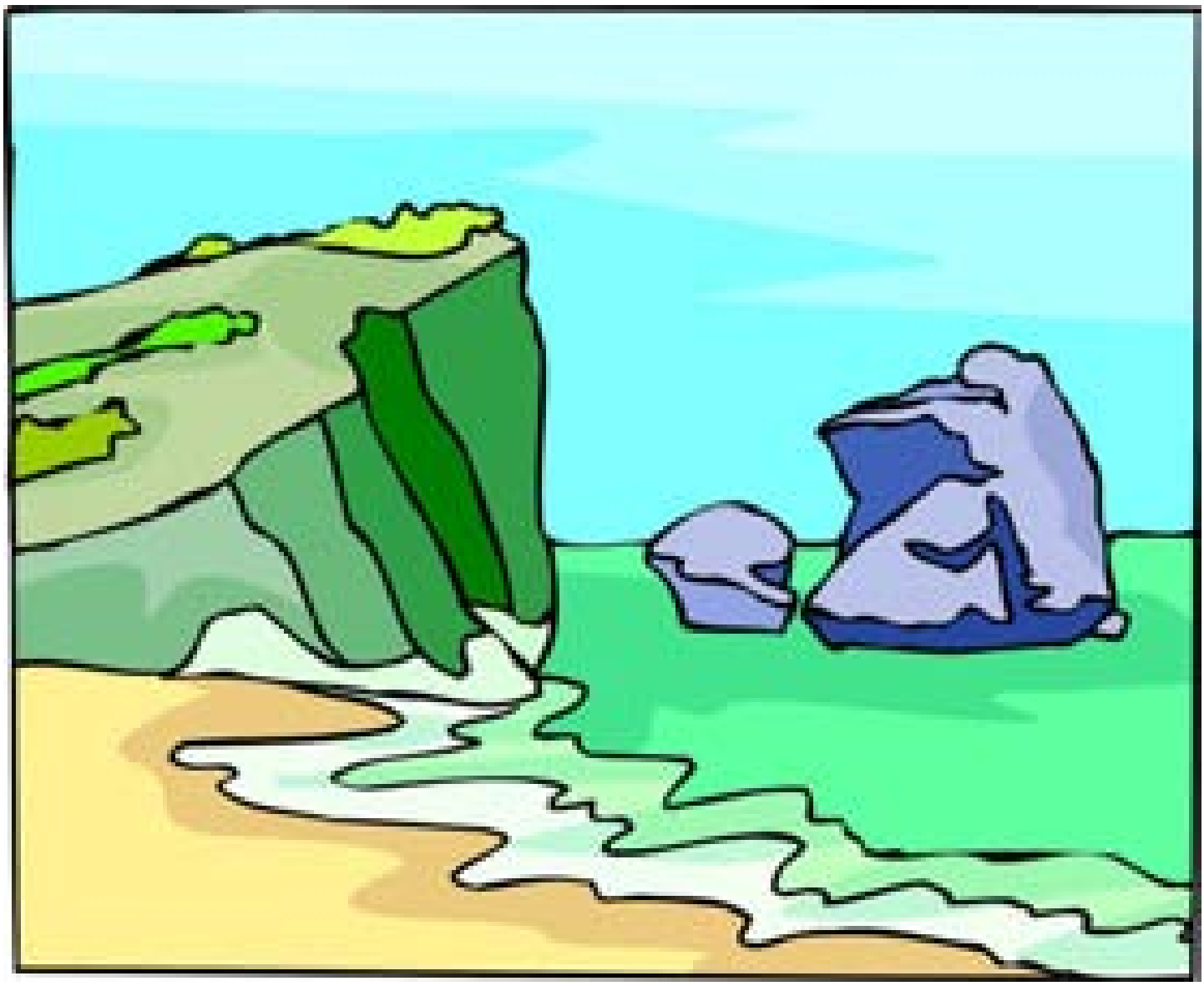
WRITING

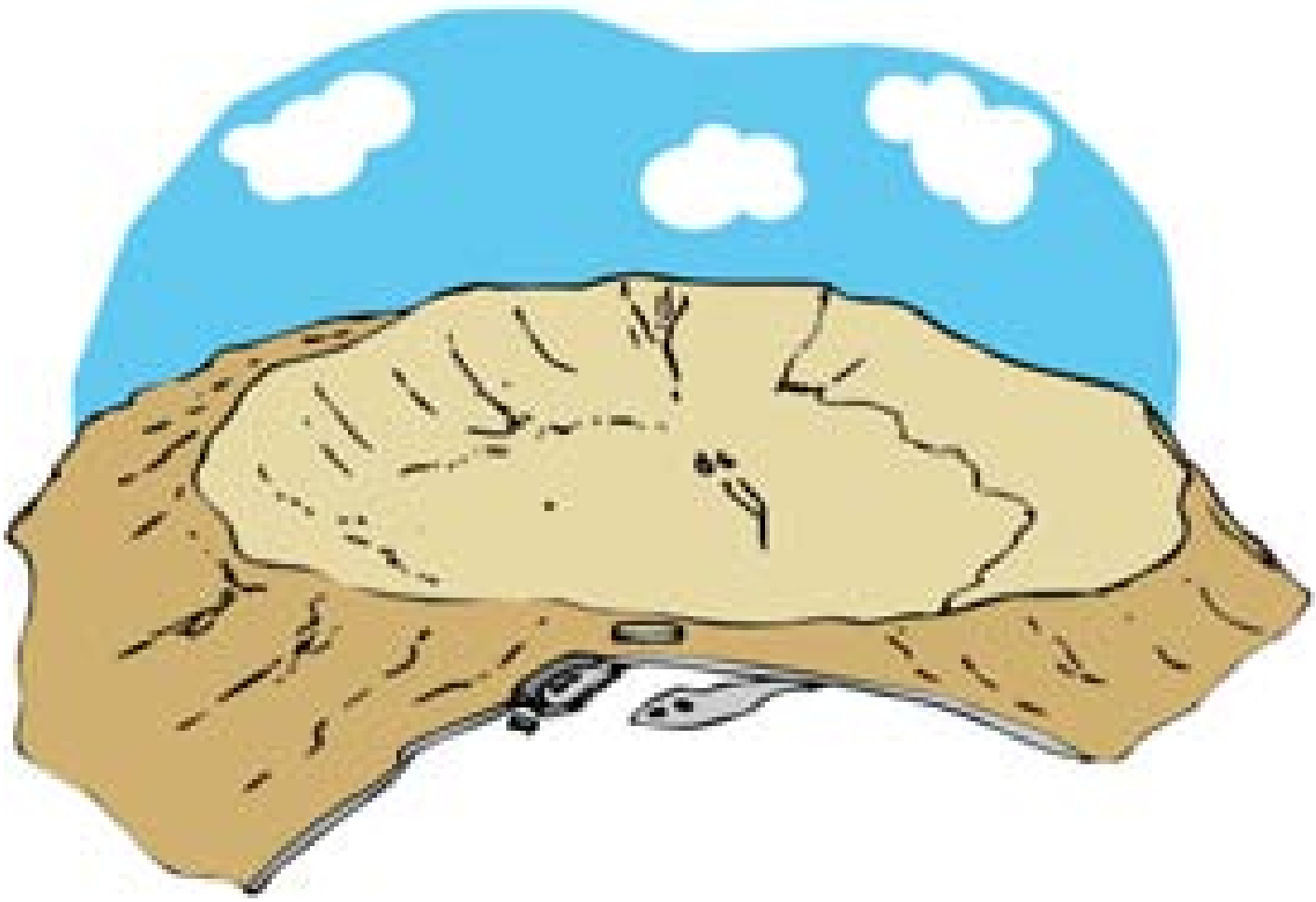
Use the activity pages from the Student Support Materials.

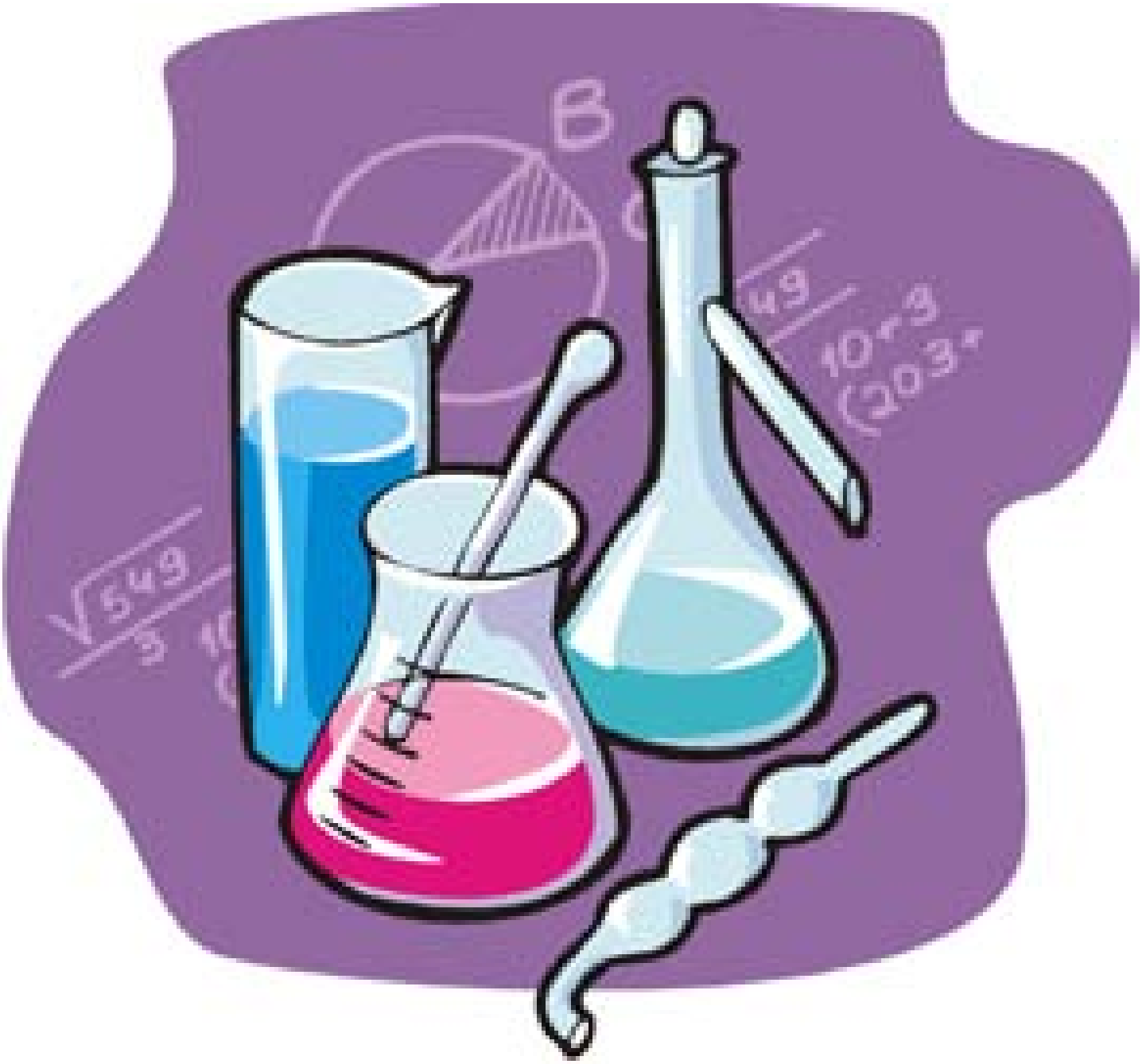
Numbered Illustrations

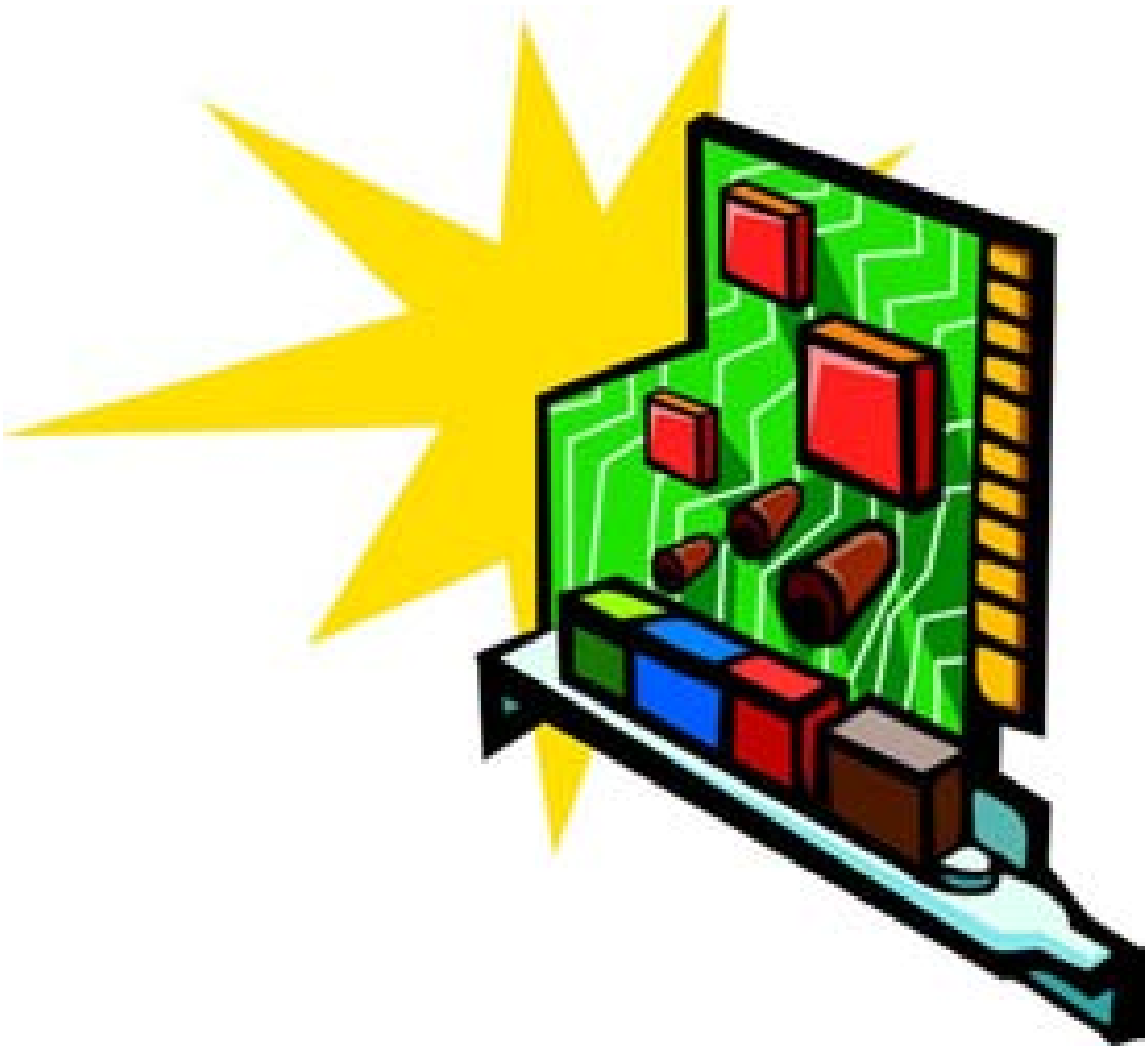
Mount the vocabulary illustrations on the chalkboard and number each illustration. Provide each student with writing paper and a pen. Call the number of an illustration. Each student should write the vocabulary word for the illustration represented by that number. Repeat until all vocabulary words for the illustrations have been written. Review the students' responses.

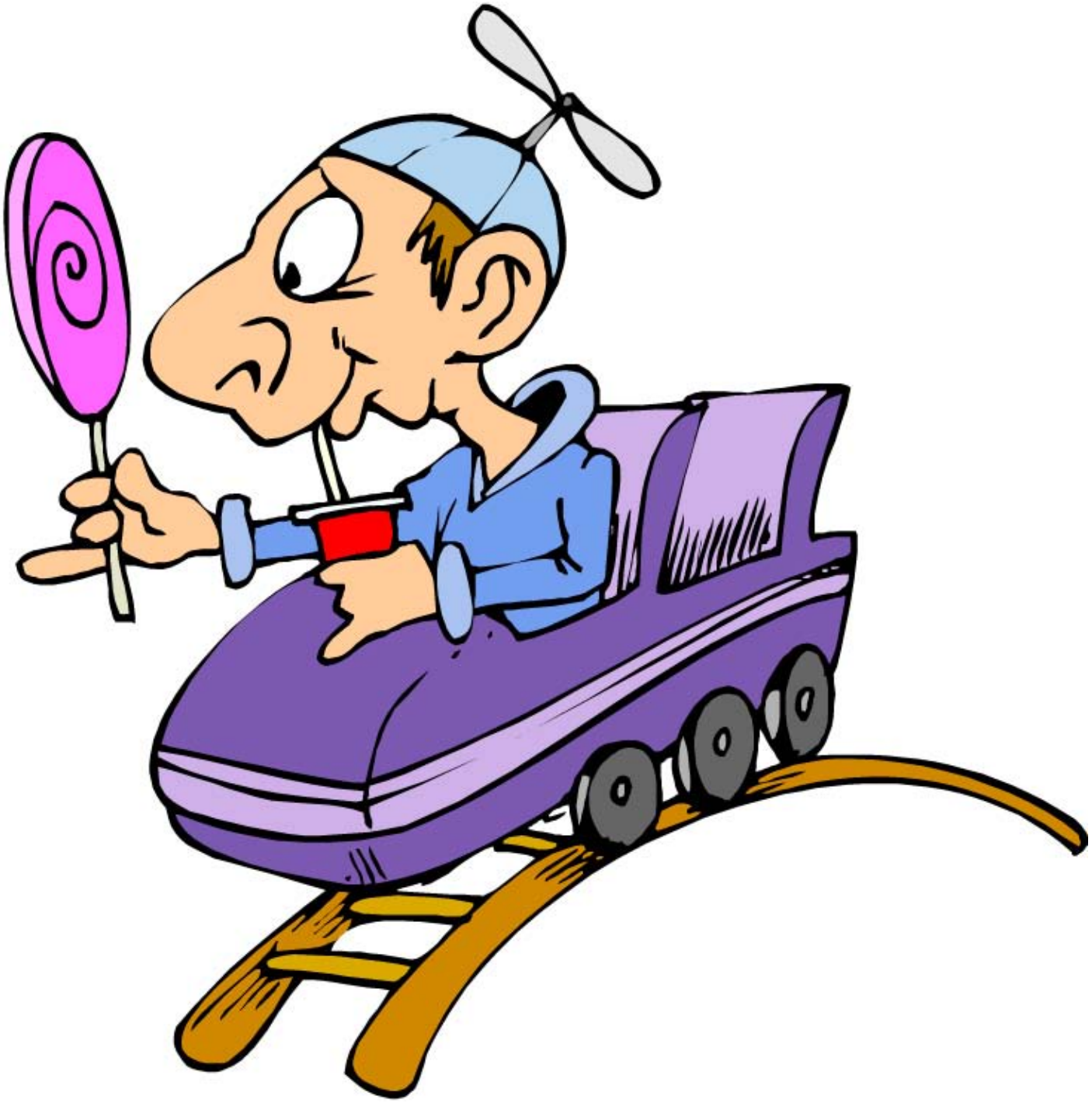
Vocabulary Images

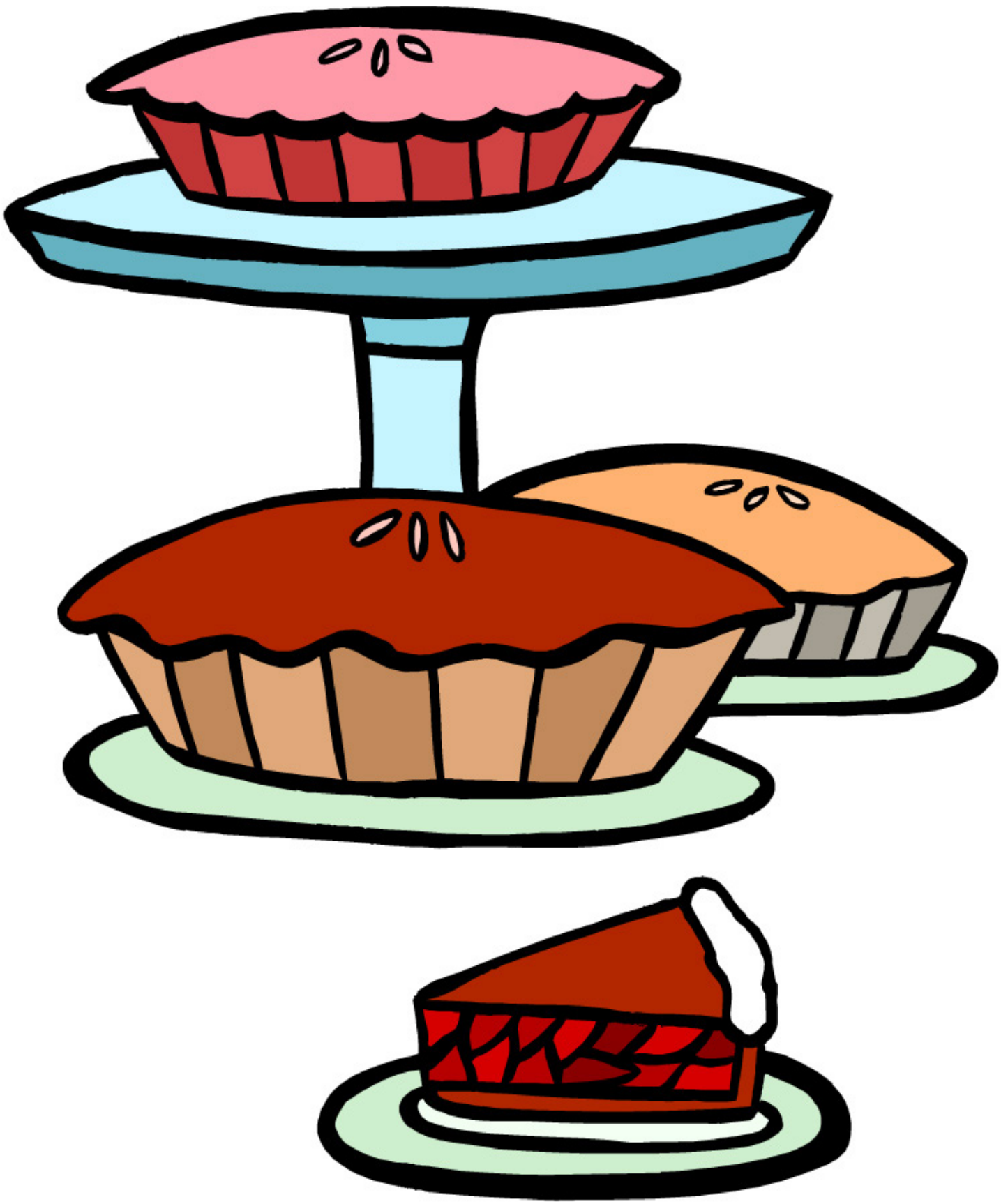








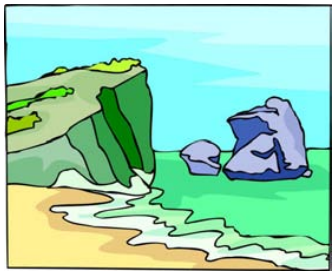


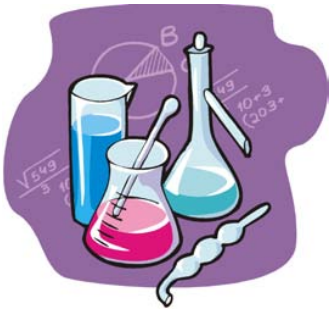


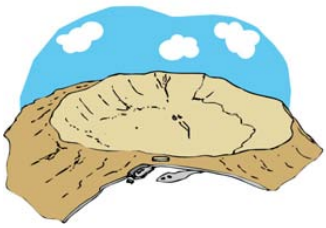
STUDENT SUPPORT MATERIALS

Listening

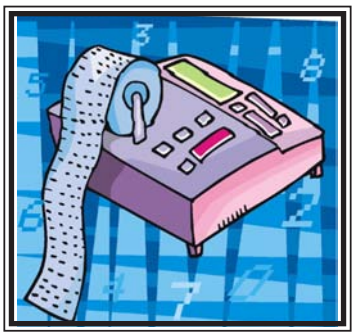
Say these words to the students - they write the numbers of the words under the pictures.
1. progress, 2. solutions, 3. interrelated, 4. factors, 5. account, 6. various, 7. invent, 8. event
9. user groups, 10. historically significant, 11. current, 12. evaluate, 13. hypothesis, 14. impact
15. resources

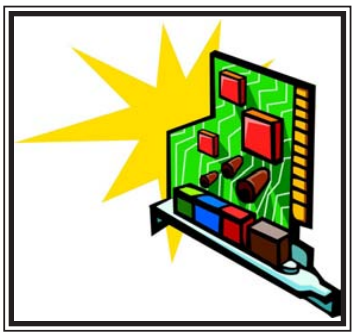






Say these words to the students - they write the numbers of the words under the pictures.
1. progress, 2. solutions, 3. interrelated, 4. factors, 5. account, 6. various, 7. invent, 8. event
9. user groups, 10. historically significant, 11. current, 12. evaluate, 13. hypothesis, 14. impact
15. resources





Fill-in The Blanks, Paragraph

Read the sentences to the students. The students should name the "missing words."

The ___1___ of science is often___2___ with the problems that societies face. In other words, scientists often seek answers to problems based on human needs. One can witness this relationship by observing how scientists are seeking a _____3_____ to our growing global energy needs. One greenhouse-gas-free method of obtaining a large amount of energy while expending very little is nuclear fission. Increasing our use of this technology would address the problem of increased ___4___ (oil, coal, wood) consumption. But in the process we create radioactive waste, which is ___5___ stored all over the world. One huge storage facility is in the mountains of Nevada. Its location irritates some ___6___including ranchers and desert enthusiasts. They argue that this waste will cause ___7___ problems, including water contamination, if not stored properly for the next several thousand years. They also argue that we have no foolproof way of ___8___ if our radioactive waste storage technology is going to work while the centuries pass. Others argue that our scientists and engineers are very capable of dealing with these wastes and built the storage facilities taking as many of the variables and significant risk ___9___ (security, earthquake, hostile military or terrorist attack, climate change, etc.) into ___10___. They argue that we need not worry that these facilities will ever be at the root of an ___11___ catastrophic ___12___.

Some would say that the progress of science is slow, too slow to solve the problems we are quickly creating for ourselves with our "progress." One might ___13___ that if society does not work to change its needs, the drive behind the progress of science, we will not be able to mitigate the consequences of scientific developments before we become victims of the technology that we ___14___.

ANSWERS
1. progress
2. interrelated
3. solution
4. resource
5. currently
6. impact
6. user groups
7. various
8. evaluating
9. factors
10. account
11. historically significant
12. event
13. hypothesize
14.invent

True Or False?

Read the following sentences to the students. The students should write "true" or "false" for each of the sentences.

1. Progress in science is accomplished by scientists dogmatically sticking to what they were taught in school.
2. To invent something is to fabricate it for the first time.
3. The problem of energy consumption, pollution, and global climate change are not interrelated.
4. Solutions to complicated social problems often please all parties involved.
5. We are still studying the impact of television and video games on the development of the human brain.
6. Some natural resources are more valuable than others because they are less common and/or more desired.
7. A synonym of the word "various" is alike or similar.
8. Hunters are not a user group of the Tongass National Forest.
9. It is cumbersome to have a written account of every minute of one's day.
10. It is not important for a scientist to be aware of everyday events because science is a process that is totally disconnected from the rest of the world.
11. Sometimes we do not know what is historically significant until years, sometimes decades or centuries, have passed.
12. One does not need to evaluate the quality of an automobile before purchasing it.
13. A hypothesis should never be stated as a question, but rather as a statement.
14. The quality of the textbooks is never a factor in the success of a student in math class.
15. If you are "staying current" you are probably not reading newspapers, listening to the radio, surfing the internet for news, or watching television.

ANSWERS
1. F, 2. T, 3. T. 4, F, 5. T, 6. F, 7. F, 8. F, 9. T, 10. F, 11. T, 12. F, 13. T, 14. F, 15. F

STUDENT SUPPORT MATERIALS

Sight Words

account

current

evaluate

event

factors

hypothesis

historically significant

impact

interrelated

invent

progress

resources

solutions

various

user groups

STUDENT SUPPORT MATERIALS

Reading

Word Find

P F M F T W R P R K P Y K L H L L L T Y N Y T
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www.WordSearchMaker.com

Account
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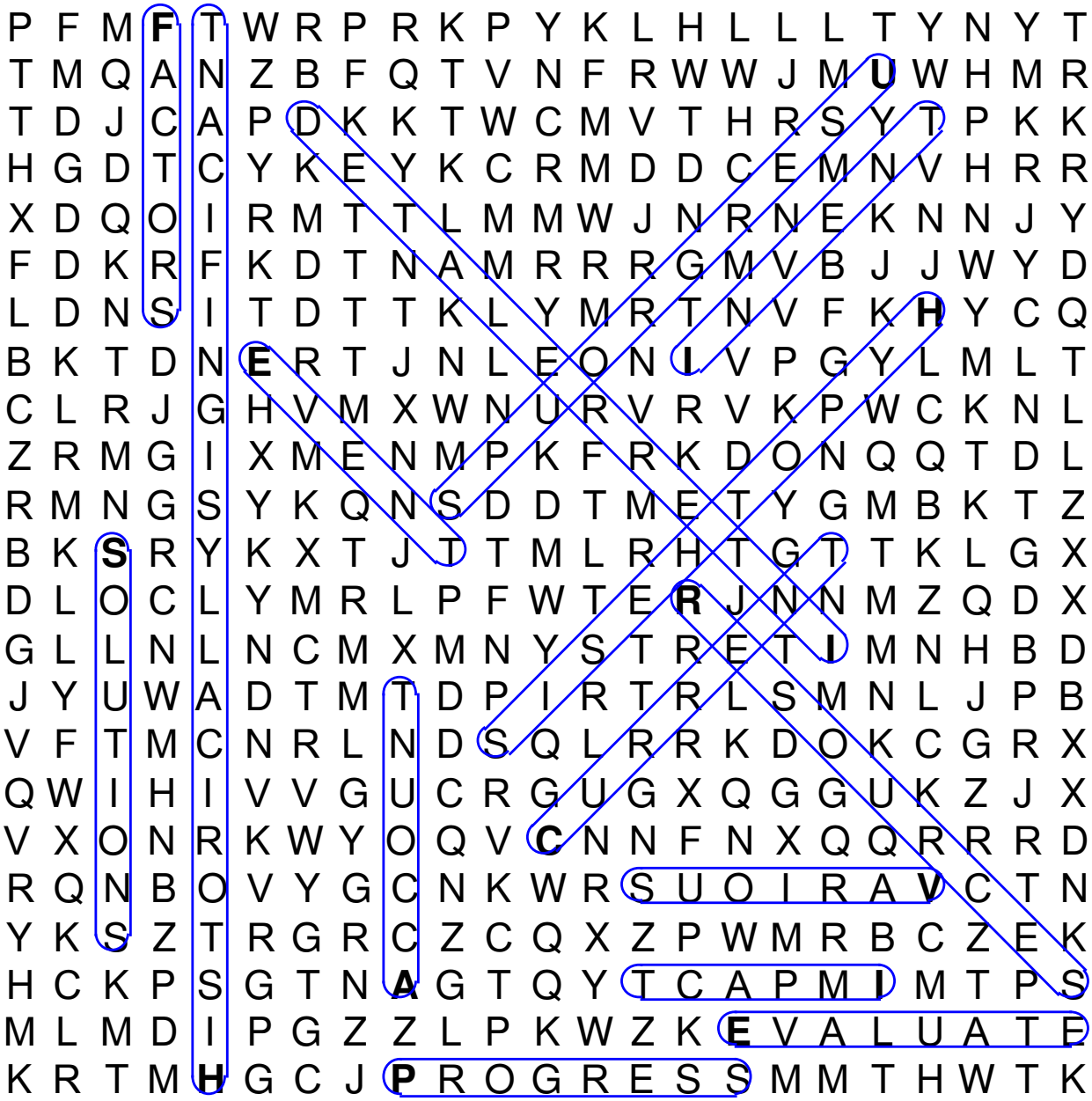
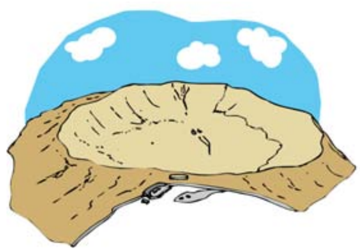
Factors
Historically Significant
Hypothesis
Impact
Interrelated
Invent
Progress
Resources
Solutions
User Groups
Various

Word Find Solution



Sight Words Activity Page

Have the students highlight or circle the words for the pictures.



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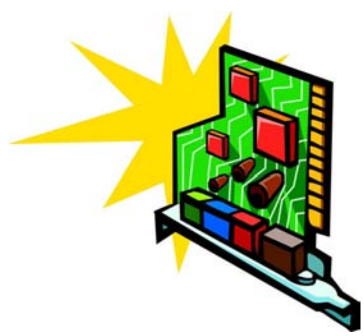

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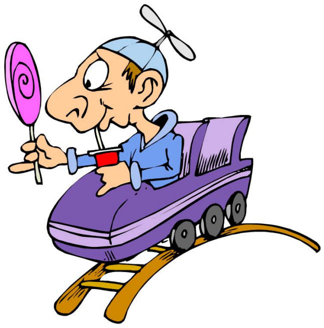

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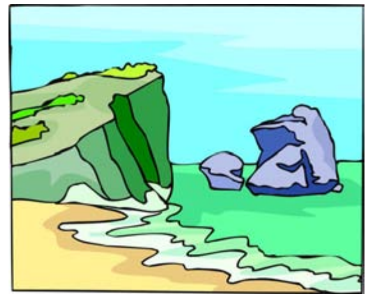

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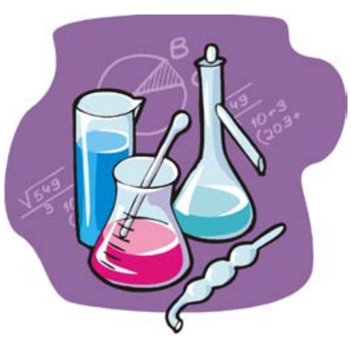

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Sentence Halves

Have the students write the numbers/letters for sentence halves that match.

1. Progress on the house was slow
2. If you invented a form of clean, renewable, inexpensive energy that does not pollute
3. The problems one has in school are interrelated with the problems at home
4. One solution to the potential problem of sea level rise
5. The current feeling in Washington is that
6. The impact of the discovery of cloning
7. Some natural resources, like trees, are renewable, while
8. The popular kid had various invitations to the prom,
9. The halibut fishery has multiple user groups,
10. I keep an account of every bit of food I eat
11. The events leading up to the election
12. Some discoveries, like the first observation of Jupiter's moons, might not seem historically significant
13. Sometimes the principal of the school will sit in on a teacher's class
14. There are many hypotheses about the birth of the moon
15. There are many factors that influence one's success hunting;

A. because the former causes the latter and vice versa.

B. do not determine the outcome—the vote does that!

C. your candidate does not have the support he needs to be successful in the election.

D. has yet to be felt by the general public.

E. marksmanship is one.

F. since the homeowner was out of town and the builders were working part-time as waiters.

G. but if one considers the philosophical shift that it helped promote, one would need to recon sider.

H. you would help this world be a better place for all.

I. others, like petroleum, are not.

J. so he elected to rent a van and go with all of them.

K. and over time the most well supported hypothesis will win.

L. including commercial fishermen, sportfishers, tourists, and charter boat captains.

M. on this complicated spreadsheet.

N. is to build on higher ground.

O. to evaluate how they are teaching.

ANSWERS
1/F 2/H 3/A 4/N 5/C 6/D 7/I 8/J 9/L 10/M 11/B 12/G 13/O 14/K 15/E

Word & Definition Match

Have the students write the word numbers on their matching definitions.

to examine and draw a conclusion	*an explanation that addresses a problem*	*can be seen in the Geologic record*	*to design a new process or mechanism*	*more than one indeterminate thing*
refers to advances in technology	*an event that changed the history of the Earth*	*set of people with similar interests or concerns*	*an explanation of observations that is testable*	*e.g explanations of phenomena*
a source of something	*e.g., a component of the environment affecting on another*	*the movement of electrons through a conductor*	*record of scientific findings*	*correlative*

1. account	2. current	3. evaluate	4. event	5. factors
6. historically significant	7. hypothesis	8. impact	9. interrelated	10. invent
11. progress	12. resources	13. solutions	14. user groups	15. various

Which Belongs?

Have the students circle/identify the word that is correct for each sentence.

1. Scientific progress/impact is something that happens continually, although in some social and cultural environments it moves more quickly than in others.
2. One way to become rich is to event/invent something that is useful and has the poten tial to become necessary.
3. My eating habits, exercise habits, and health are impacted/interrelated—they all influ ence each other.
4. In a typical math text book the solutions/resources to the odd problems are in the back of the book.
5. I haven't been able to reach you lately—what is your current/various phone number?
6. What would be the impact/resources on my financial situation if I quit my job?
7. No matter what your financial accounts/resources are you should try to travel out of your hometown at least once before you are twenty years old.
8. The convicted felon gave various/interrelated excuses for what he did, but the fact remained that he was held responsible for his actions on that hot air balloon ride in 2004.
9. There was much commotion over the closing of the local park because several user groups/solutions were disappointed to lose the opportunity to exploit the park.
10. It is important to have a written account/evaluation of the first several years of your children's lives since young parents have horrible memories.
11. In the invent/event of my death, I would like to donate my organs to folks who might need them and then have my ashes spread over Glacier Bay.
12. My life will not be historically significant/current except, perhaps, to my parents, off spring, other relatives, and close friends.
13. Informed teenagers spend a lot of time evaluating/factoring their options for after high school.
14. A good account/hypothesis can be supported or refuted through experimentation or further observations and it is never merely an educated guess.
15. What solutions/factors influence the popularity of a student at this school?

ANSWERS

1. progress, 2. invent, 3. interrelated, 4. solutions, 5. current, 6. impact, 7. resources
8. various, 9. user groups, 10. account, 11. event, 12. historically significant
13. evaluating, 14. hypothesis, 15. factors

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

1. What are you doing if you are making progress toward a goal?
   - (a) You are moving in a direction that is counterproductive with regard to the goal.
   - b. You are sitting still in regard to the goal.
   - c. You are getting closer to accomplishing the goal.

2. What is said to be the mother of invention?
   - (a) Necessity
   - (b) Desire
   - (c) Time

3. Sometimes science seems to be a maze of interrelated:
   - (a) Houses.
   - (b) Disciplines.
   - (c) Scientists.

4. What is a good strategy when you are having difficulty finding the solution to a math problem?
   - (a) Ask your older sibling to solve it for you.
   - (b) Take a break and come back to it refreshed.
   - (c) Ask your mom to write you a note excusing you from the work.

5. Why do science teachers need to stay current?
   - (a) So that they are not teaching out-of-date material to their students.
   - (b) So that they can impress other teachers in the staff lounge.
   - (c) So that they can transfer more easily into a math position.

6. What would be the impact of a 20% sales tax?
   - (a) Consumers would buy more.
   - (b) Consumers would spend about the same.
   - (c) Consumers would spend less.

7. What was not one of the reasons that colonists were so successful in the Americas?
   - (a) Native Americans were decimated by disease that the colonists brought with them, leaving much of the land sparsely populated.
   - (b) They had access to satellite images which enabled them to plan their migrations across the continents.
   - (c) The Americas were very rich in natural resources which the colonists were able to exploit.

8. When painting a bedroom a new color, why is it important to look at the wall you are painting with bright lights and from various angles?
   - (a) Because it is difficult to see drips and spots that you missed without the lights and various viewing angles.
   - (b) Because the color will stick better if observed under bright lights.
   - (c) Because cutting in corners is easier if you keep changing your perspective.

What's The Answer?

Have the students read the questions and then select the correct answer for them. They should fill-in the appropriate circles, beside the answers of their choice.

9. What user groups would need to be consulted if one wanted to strip mine some state land on a small island in Southeast Alaska?
   - (a) Hunters, commercial fishermen, recreational boaters and hikers, property owners, and the state of Alaska.
   - (b) Horticulturalists, bee farmers, skiers.
   - (c) Heliskiers, snowmobilers, and industrial chemists.

10. If you do not have a written or other type of account of your discovery or invention, you may risk what?
   - (a) Slowing down your competitors.
   - (b) Running out of ink in your pen.
   - (c) Not remembering what you did.

11. If the family's event calendar is full for the month, you may not be able to do what?
   - (a) Schedule another event.
   - (b) Remove something from the calendar.
   - (c) Get sick.

12. Which of the following people are not historically significant?
   - (a) Abraham Lincoln
   - (b) Adolf Hitler
   - (c) Jeb William Florington

13. One could evaluate the historical significance of a person by doing what?
   - (a) A Google search of their name and reading what is known worldwide about the person.
   - (b) Asking a two-year-old child if she has heard of the person.
   - (c) Writing to the person and asking them their opinion on themselves.

14. A scientific hypothesis must be what?
   - (a) Testable and disprovable.
   - (b) Suspicious of the facts.
   - (c) Provable.

15. What is a significant risk factor for lung cancer?
   - (a) Smoking
   - (b) Color of hair
   - (c) Height

ANSWERS

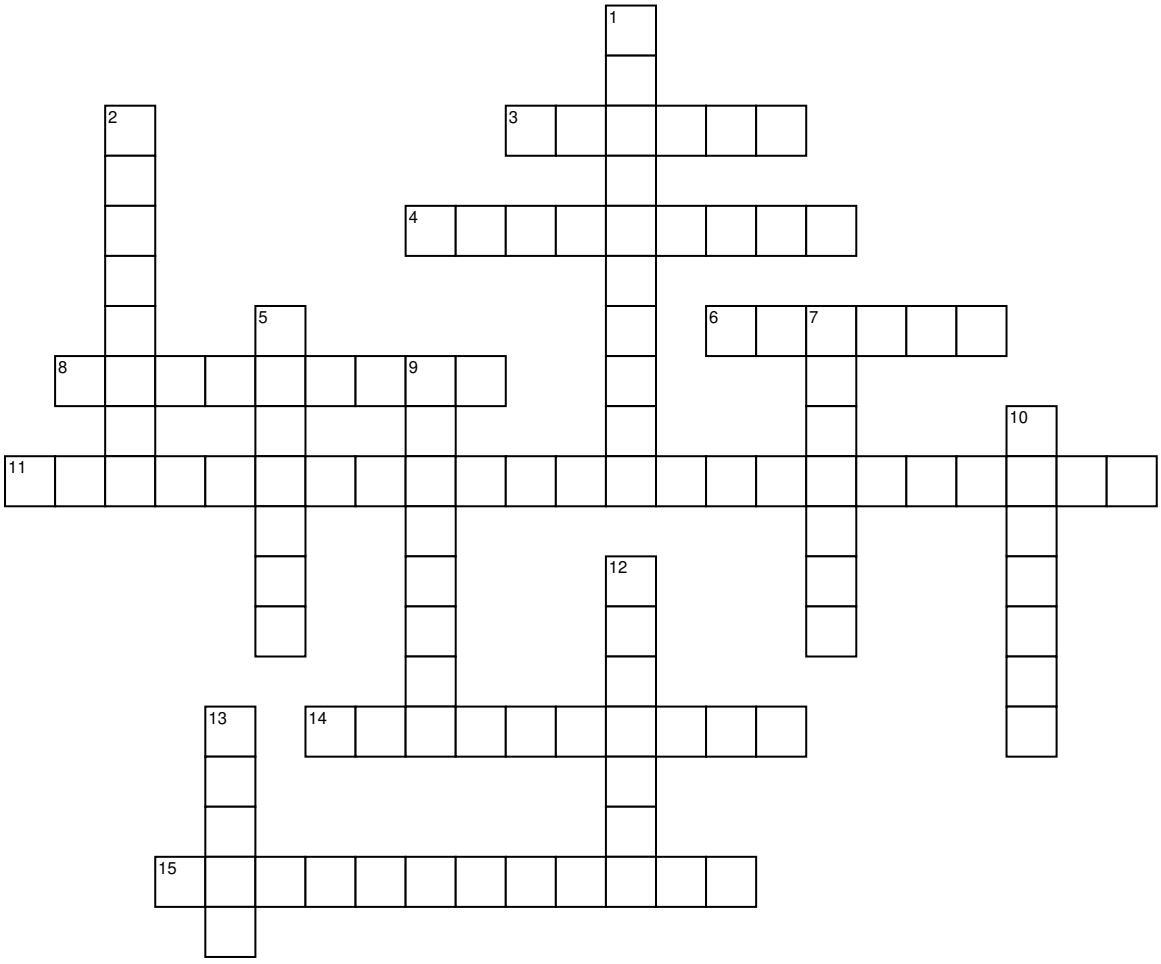
1. c, 2. a, 3. b, 4. b, 5. a, 6. c, 7. b, 8. a, 9. a, 10. c, 11. a, 12. c, 13. a, 14. a, 15. a

STUDENT SUPPORT MATERIALS

Writing

E-1 Science Technology

Unit 1



ACROSS

3 refers to the amount of change that a finding instigates in current thinking or devices constructed.
4 explanations that addresses a problem, or a method of approaching a problem that yields an effect that is agreeable.
6 to design a new process or mechanism.
8 A resource is refers to a source or supply of something.
11 an event that changed the Earth or life on the Earth, in a dramatic way that can be seen in the Geologic record.
14 a set of people who have similar interests, goals, or concerns. The members have regular meetings where they can share their ideas.
15 having a mutual or reciprocal relation or parallelism.

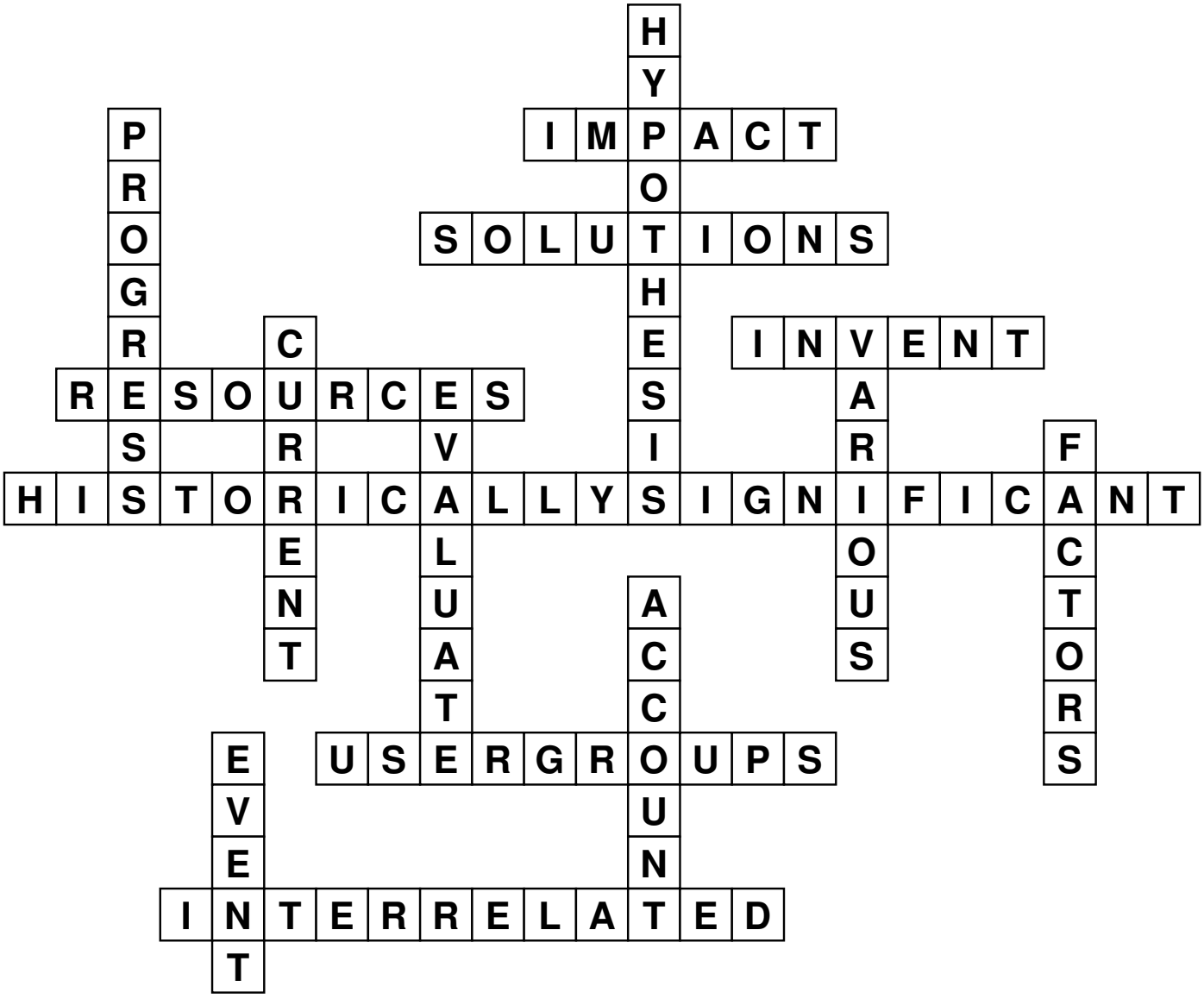
DOWN

1 a testable explanation of observations.
2 refers to advances in technology and new scientific findings.
5 the movement of electrons through a wire or other conductor.
7 more than one indeterminate thing.
9 to draw conclusions from by examining.
10 refers to any component of the environment that has an effect on another.
12 refers to written record of scientific findings.
13 refers to an occurrence that changed the history of the Earth and/or life on Earth.

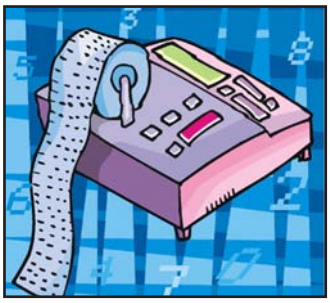
E-1 Science Technology

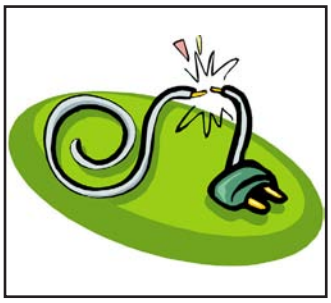
Unit 1

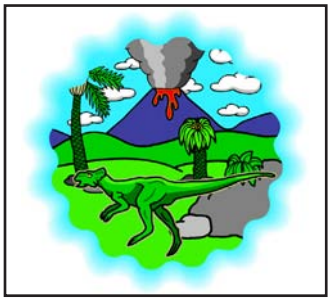
Solution:

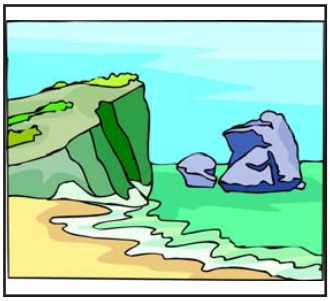


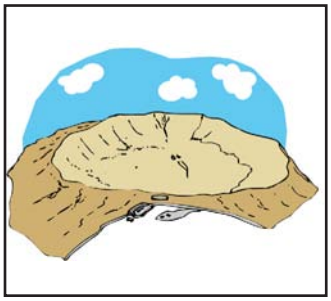
Write The Words!

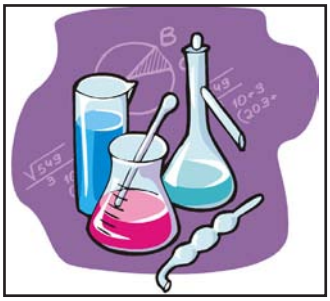


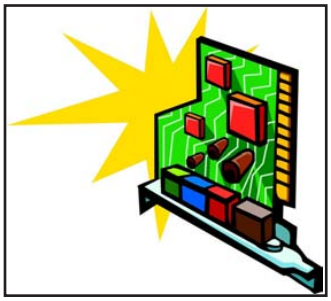


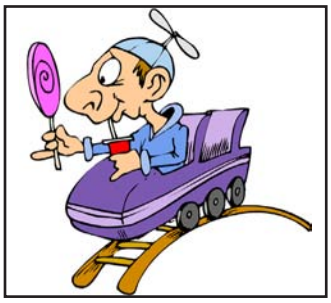












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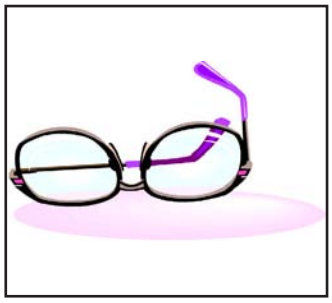

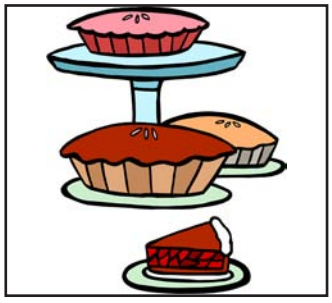

Complete The Sentence

Have the students write the key words in the blanks.

1. _____ is sometimes slow when learning math, but at other times it seems to come very quickly.
2. If I were to _____ a car that was powered by falling rain I could make a few bucks in Southeast Alaska.
3. Form and function are _____ in the anatomy of an organism.
4. The _____ to the problem is not always the first one discussed.
5. The _____ situation in the warring colonies is dire—they need a ceasefire now!
6. How big of an _____ crater would a school-bus-sized meteorite make if it landed on a sandy beach?
7. The other politician has so much support from companies and individuals that his financial _____ are staggering to think about.
8. _____ people have tried the super-hot-wish-I-hadn't-tried-it brand of hot salsa—but none have survived.
9. The various _____ gathered to discuss how to manage the local park and dog walkers were very well represented.
10. Travelers often keep an _____ of their travels in a journal or notebook so that they can keep the facts of their journey straight.
11. My wedding was quite the _____--my mother hired five mariachi bands and close to 500 friends and family traveled to Shelter Island to celebrate with us.
12. It's hard to know what events of each year will be viewed as _____ by future generations; although some events, like the election of the first African American president in the United States of America, is a sure bet.
13. When a super spy enters an enemy's lair she _____ his weaknesses and strengths in order to determine a plan of action.
14. Not all studies have _____--some are designed to be explorations.
15. What _____ will affect the flight of the balloon after it leaves the child's hand at the parade?

ANSWERS

1. progress, 2. invent, 3. interrelated, 4. solution, 5. current, 6. impact, 7. resources, 8. various

9. user groups, 10. account, 11. event, 12. historically significant, 13. evaluates. 14. hypotheses

15. factors

Creative Writing Activity Page

Have the students write sentences of their own, using the key words from this unit. When the students' sentences are finished, have them take turns reading their sentences orally. The students should say "Blank," for the key words; the other students must name the "missing" words. You may wish to have the students write the "definitions" for the key words.

invent

progress

solutions

interrelated

current

impact

Creative Writing Activity Page

Have the students write sentences of their own, based on the picture below. When finished, have each student read his/her sentences to the others.

STUDENT SUPPORT MATERIALS

Reinforcement Activities

Creating Your Own Compass

To create a compass the same way people did hundreds of years ago, you will need the following materials:

- A needle or some other wire-like piece of steel (a straightened paper clip, for example)
- Something small that floats such as a piece of cork, the bottom of a Styrofoam coffee cup, a piece of plastic or the cap from a milk jug
- A dish, preferably a pie plate, 9 to 12 inches (23 - 30 cm) in diameter, with about an inch (2.5 cm) of water in it

Method

The first step is to turn the needle into a magnet. The easiest way to do this is with another magnet — stroke the magnet along the needle 10 or 20 times in the same direction.
Place your “float” in the middle of the pan of water and place the magnetized needle on the float.

Your needle will very slowly point toward north. You have created a compass!

Write a paragraph explaining the importance of the ***invention*** of the compass and the **impact** that it has had on exploration.

Science Research Paper

Go to your teacher to develop an appropriate research topic that focuses on an ***event*** that is ***historically significant.***.

- Research your topic by answering the following questions.
- What is your topic? (Define your topic and describe the 3 major things about your topic that makes it regionally or globally important:)
- How has your topic affected the Earth over time?
- What regional or global changes are taking place in regards to your topic?
- Who does your topic affect (regionally or worldwide)?
- Who does it affect (locally)?
- How does it affect you and everyone else in the world?
- What are two careers held by people dealing with your topic? (at least one page should be dedicated to this topic).
- Describe their jobs, thoroughly.
- Where do these people work?
- Discuss one major historic event associated with your topic.
- What predictions do scientists have about the Earth, in regards to your topic?

*This paper should have a minimum of five pages. You will need to include at least five citations and a bibliography page. It will need to be peer reviewed at least twice before submitting.

Research Paper Rubric

____/5 Thesis statement

____/9 Definition of at least 3 elements that make the topic regionally or globally important

____/5 Explanation of how your topic affects the Earth

____/10 Explanation of regional or global changes taking place

____/10 Explanation of who is affected by your topic

____/15 Explanation of local affects of your topic

____/20 Description of two jobs of people studying / working in the field of your topic

____/11 Explanation of one major historical event associated with topic

____/5 Explanation of theories or predictions about the relationship of your topic to regional or global changes

____/10 Proof of two peer reviews

____/5 Five citations

____/5 Bibliography page

_____/100 Total possible points

80 (+) proficient
90 (*) advanced

Unit Assessment

Unit 1 Quiz

Grade 10 Science E1, Unit 1 Quiz

Name: _____
Date: _____

Multiple Choice: Choose the best answer for each of the questions below. Circle your answer.

1) To design a new process or mechanism is _____.

   a) to invent

   b) to imagine

   c) to explore

2) Which of the following definitions means TO PROGRESS?

   a) to find a new solution

   b) to make advances in technology and scientific findings

   c) to go backwards

3) The amount of current flowing through an electrical system is measured in _____.

   a) amperes

   b) wattage

   c) circuits

Fill in the Blank: Complete the following sentences by filling in the blank with the correct missing word. Choose from the words listed in the Word Bank. Some words may be used more than once.

Word Bank		
current	impact	impact
interrelated	solution	solutions

4) Explanations that address problems are called _____.

5) A method of approaching a problem that yields an effect that is good or agreeable is called a _____.

6) In science and technology _____ refers to the amount of change that a finding has upon current thinking. The computer chip has had a large _____on science, technology and today's world.

7) The movement of electrons through a wire or other conductor is electric _____.

8) When a mutual or reciprocal relation exists it is _____.

Grade 10 Science E1, Unit 1 Quiz

Name: _____
Date: _____

Multiple Choice: Choose the best answer for each of the questions below. Circle your answer.

1) To design a new process or mechanism is _____.

a) to invent

b) to imagine

c) to explore

2) Which of the following definitions means TO PROGRESS?

a) to find a new solution

b) to make advances in technology and scientific findings

c) to go backwards

3) The amount of current flowing through an electrical system is measured in _____.

a) amperes

b) wattage

c) circuits

Fill in the Blank: Complete the following sentences by filling in the blank with the correct missing word. Choose from the words listed in the Word Bank. Some words may be used more than once.

Word Bank		
current	impact	impact
interrelated	solution	solutions

4) Explanations that address problems are called **solutions**.

5) A method of approaching a problem that yields an effect that is good or agreeable is called a **solution**.

6) In science and technology **impact** refers to the amount of change that a finding has upon current thinking. The computer chip has had a large **impact** on science, technology and today's world.

7) The movement of electrons through a wire or other conductor is electric **current** .

8) When a mutual or reciprocal relation exists it is **interrelated** .

. **Grade 10, F1, Unit 1, Cultural, Social Personal Perspectives**
G1, Unit 1, Nature of Science
Quiz

Name: _____
Date: _____

Matching:

Match the key words from the column on the left with the best definition from the column on the right. Place the letter from the definition in front of the correct word.

1) _____ resources
2) _____ various
3) _____ user groups

a. more than one indeterminate thing.
b. is a set of people who have similar interests, goals, or concerns
c. refers to a source or supply of something.

Fill in the Blank: Fill in the blanks in the sentences below with the best word to complete the sentences. Choose the words from the list provided in the Word Bank.

Word Bank		
account	diary	event
historically significant	hypothesis	resources

4) A/an _____ is a testable explanation of observations.

5) A/an _____ refers to an occurrence that changed the history of the Earth and/or life on Earth.

6) A/an _____ event is one that changed the Earth or life on the Earth, in a dramatic way that can be seen in the geologic record

7) When a scientist records his/her scientific findings, the scientist writes a/an _____ of the findings.

Grade 10, F1, Unit 1, Cultural, Social Personal Perspectives
G1, Unit 1, Nature of Science
Quiz

Name: _____
Date: _____

Matching:

Match the key words from the column on the left with the best definition from the column on the right. Place the letter from the definition in front of the correct word.

1) **c** resources
2) **a** various
3) **b** user groups

a. more than one indeterminate thing.
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Fill in the Blank: Fill in the blanks in the sentences below with the best word to complete the sentences. Choose the words from the list provided in the Word Bank.

Word Bank		
account	diary	event
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4) A/an **hypothesis** is a testable explanation of observations.

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7) When a scientist records his/her scientific findings, the scientist writes a/an **account** of the findings.

Grade 10,
D1 Unit 1, E1 Unit 1, F1 Unit 1, G1 Unit 1
TEST

Name: _____
Date: _____

Matching: On the left are key vocabulary words. Match these words with the best the definition on the right.

1) _____ terrigenous
2) _____ interrelationship
3) _____ reformation
4) _____ nebula
5) _____ erosion
6) _____ biogenous
7) _____ sedimentation
8) _____ formation

a. the buildup in an aquatic environment on the bottom of a lake river or other water source
b. A relationship between multiple things
c. a cloud of dust and stellar matter in which new starts and bodies are formed
d. sediments of biological origins
e. sediments of terrestrial origin, such as silt
f. A set of conditions for, and the process by which, various minerals are formed
g. rocks are recreated through this process
h. the process of breaking down terrestrial material created sometimes by weather or water

Multiple Choice: Read each question carefully. Choose the answer the answer that is most likely to be correct.

9) Which of the following statements is most likely to be correct? MITIGATION is a....

a) a procedure that avoids using natural resources and protects them

b) a procedure that is initiated to prevent damage to the environment or to atone for impacts to the environment.

c) a procedure that is initiated to use all the resources available in the environment

10) EROSION is the process of...

a) breaking down terrestrial material by weather.

b) breaking down due to faulty wiring

c) breaking down due to human wear and tear

11) Another word for the crust of the earth, is the _____ of the earth.

a) surface

b) outer body

c) outside

12) A celestial object that has a gravity field so strong that light cannot escape from it is known as a...

a) dark cloud

b) black hole

c) nebula

13) The word IMPACT has many different meanings. which of the following is NOT a definition.

a) It's an affect you have on something.

b) It's a place where two bodies make contact.

c) It's something exploding from the inside out.

d) It's a collision between two bodies.

True/False: Read the statement carefully and determine if it is true or false. Put an X by the correct answer.

14) The result or outcome of a cause is called the effect.

a) True

b) False

15) Amperes are a unit of weight.

a) True

b) False

16) The movement of electrons through a wire or other conductor is electric current.

a) True

b) False

17) When there are advances in technology and new scientific findings then there is progress.

a) True

b) False

18) The source or reason of an event or action is the cause.

a) True

b) False

Fill in the Blanks: Fill in the blanks in the sentences below with the best word. Choose the words from the list provided below.

Hypothesis invents account resources evaluates various user groups event

19) A source or supply of something are _____.

20) When there is more than one indeterminate thing, there are _____ things.

21) When a scientist records her scientific findings, she writes a/an _____ of the finding.

22) A/an _____ is an explanation of observations that can be tested over and over.

23) When a scientist designs a new process or mechanism he _____ something new.

24) When a scientist draws a conclusions from by examining evidence, he _____ what he finds.

25) The term _____ refers to a set of people who have similar interests, goals or concerns.

Grade 10,
D1 Unit 1, E1 Unit 1, F1 Unit 1, G1 Unit 1
TEST

Name: _____
Date: _____

Matching: On the left are key vocabulary words. Match these words with the best the definition on the right.

1) e terrigenous
2) b interrelationship
3) g reformation
4) c nebula
5) h erosion
6) d biogenous
7) a sedimentation
8) f formation

a. the buildup in an aquatic environment on the bottom of a lake river or other water source
b. A relationship between multiple things
c. a cloud of dust and stellar matter in which new starts and bodies are formed
d. sediments of biological origins
e. sediments of terrestrial origin, such as silt
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Fill in the Blanks: Fill in the blanks in the sentences below with the best word. Choose the words from the list provided below.

hypothesis invents account resources evaluates various user groups event

19) A source or supply of something are **resources** .

20) When there is more than one indeterminate thing, there are **various** things.

21) When a scientist records her scientific findings, she writes a/an **account** of the finding.

22) A/an **hypothesis** is an explanation of observations that can be tested over and over.

23) When a scientist designs a new process or mechanism he **invents** something new.

24) When a scientist draws a conclusions from by examining evidence, he **evaluates** what he finds.

25) The term **user groups** refers to a set of people who have similar interests, goals or concerns.