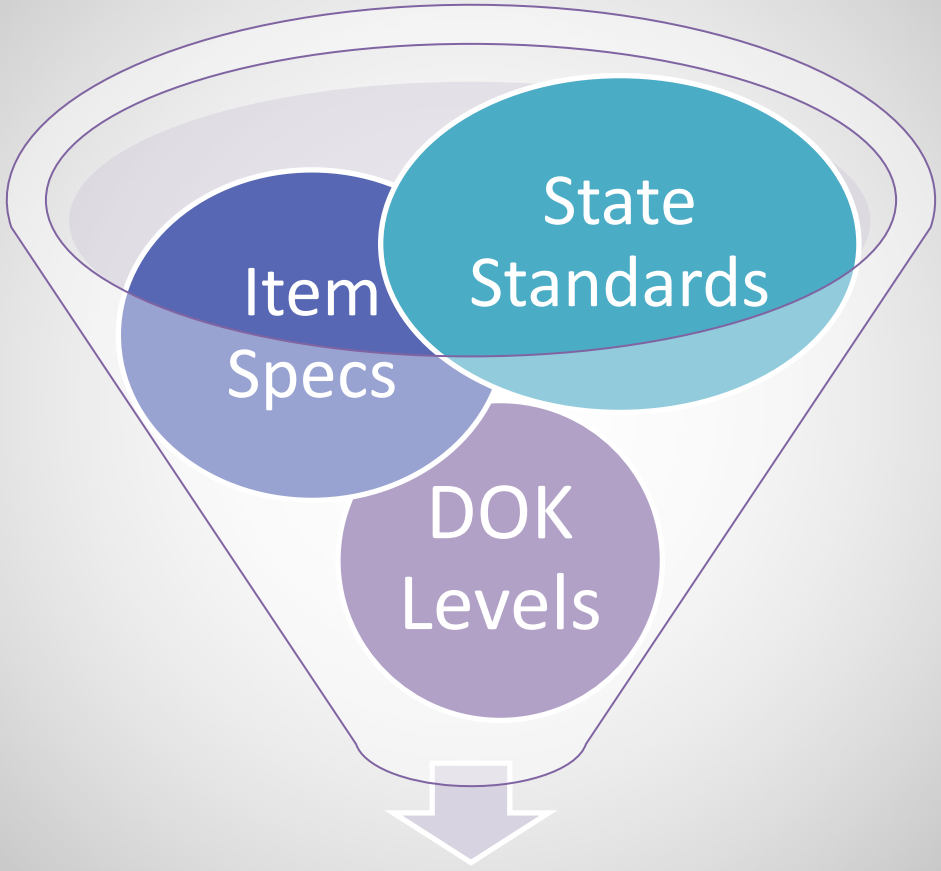
Preparing for the 8th Grade Science CRT Exam: Science Daily Review

Southern Nevada Regional Professional Development Program
K-12 Science

For additional support for the HSPE visit:
www.rpdp.net
http://rpdp.net/sciencetips_v3/

Preparing for the CRT



Quality Test Preparation

Southern Nevada Regional Professional Development Program
K-12 Science

Breakdown of the Science CRT

- 8th graders take the Science CRT during the spring
- 46 questions
  - 43 core multiple-choice questions
  - 3 constructed response items
- Questions are written at Depth of Knowledge levels 1-3

Comparing DOK Levels

DOK 1

- The question requires recall and there is nothing to "figure out"
- The student either knows the answer or they do not

DOK 2

- The student needs to apply information
- Typically multi-step
- Recall info, then decide what to do with that information

DOK 3

- Includes DOK level 1 and 2 processing
- Requires the student to decide how to approach the problem
- Make a prediction or inference while providing a justification

Science CRT Test Matrix

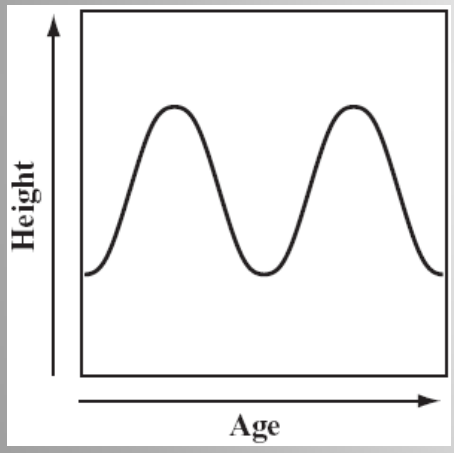
Content Strand	DOK Level 1	DOK Level 2	DOK Level 3	Points
C1 (Physical Science)	5	7	1	13 (28%)
C2 (Life Science)	5	7	1	13 (28%)
C3 (Earth Science)	5	6	1	12 (26%)
C4 (Nature of Science)	3	5	0	8 (18%)
Items	18 (39%)	25 (54%)	3 (7%)	46 Items (52 Points)

Nature of Science

N.8.A.1 http://www.rpdp.net/sciencetips_v3/N8A1.htm

Which graph is the **best** illustration of how the height of a corn plant changes as it grows?

A



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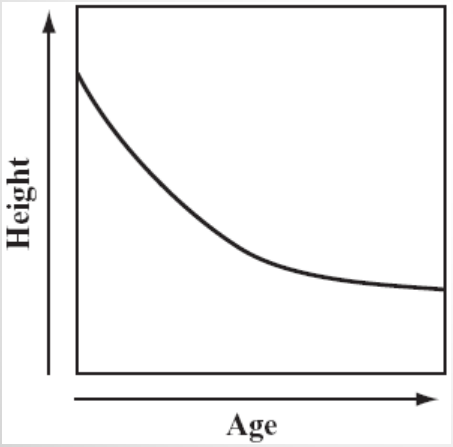

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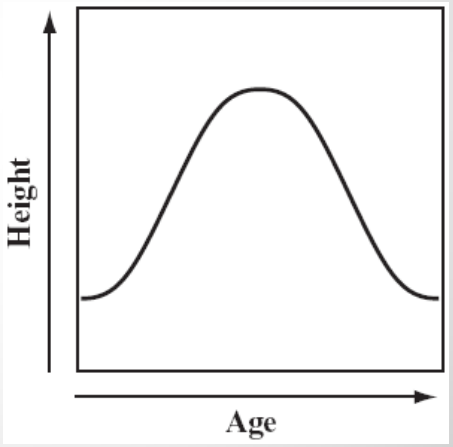

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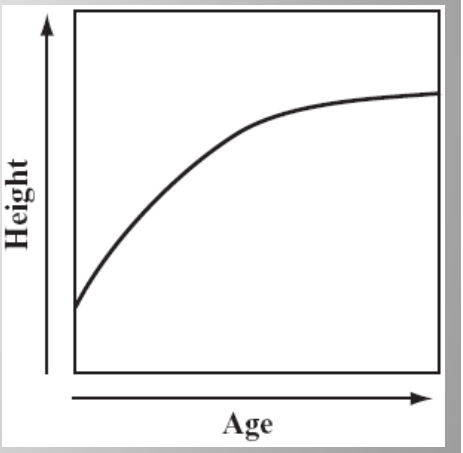


From: http://www.doe.mass.edu/

Nature of Science

N.8.A.1 http://www.rpdp.net/sciencetips_v3/N8A1.htm

The data table to the right shows the number of deaths caused by influenza and pneumonia from 1917-1918, during the time of the 1918 influenza pandemic.

According to the data table, which age group shows the **greatest increase** in death rates caused by influenza and pneumonia from 1917 to 1918?

A. <1
B. 1-4
C. 25-34
D. 45-54

U.S. Deaths per 100,000 Attributed to Influenza and Pneumonia, 1917-1918

Age	1917	1918
<1	2,940	4,540
1-4	420	1,440
5-14	48	350
15-24	78	1,180
25-34	120	2,000
35-44	190	1,100
45-54	290	690

Adapted from *Age-specific death rates (per 100,000), Influenza & Pneumonia, USA (Noymer, 2007)*

Nature of Science

N.8.A.1 http://www.rpdp.net/sciencetips_v3/N8A1.htm

A solid cube was put into a cylinder containing four liquids with different densities as shown in the diagram.

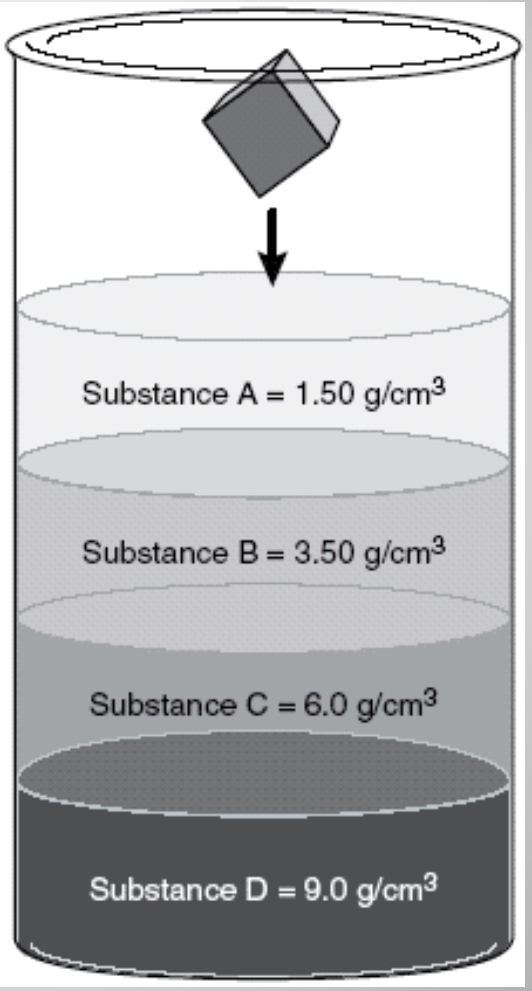
The cube descended through layer A and B, and stopped upon reaching layer C. The density of the cube most likely lies between

A. 1.01 and 1.50 g/cm^3.

B. 1.51 and 3.50 g/cm^3.

C. 3.51 and 6.00 g/cm^3.

D. 6.01 and 9.00 g/cm^3.



From: http://www.doe.mass.edu/

Nature of Science

N.8.A.1 http://www.rpdp.net/sciencetips_v3/N8A1.htm

The table shows the times of moonrise and moonset in Las Vegas during December 1st-December 6th.

Based upon this data, predict the moonrise and moonset times for December 9th.

A. Moonrise 12:48pm, Moonset 1:52am
B. Moonrise 1:23pm, Moonset 2:52am
C. Moonrise 1:38pm, Moonset 3:53am
D. Moonrise 2:33pm, Moonset 4:53am

Moonrise and Moonset Data

Date	Moonrise	Moonset
Dec 1	9:52am	7:51pm
Dec 2	10:26am	8:51pm
Dec 3	10:55am	9:51pm
Dec 4	11:22am	10:51pm
Dec 5	11:47am	11:52pm
Dec 6	12:13pm	12:52am
Dec 7		
Dec 8		
Dec 9		

Nature of Science

N.8.A.1 http://www.rpdp.net/sciencetips_v3/N8A1.htm

Students were asked to measure a piece of string. The actual length of the string was 8.25 cm long. Which of the following shows the measurements from the **most** accurate group and why?

A. 7.25cm, 7.75cm, 8.25cm, because these were the closest to the actual length.

B. 7.2cm, 7.25cm, 7.3cm, because these had the most agreement between lengths.

C. 8.25cm, 8.75cm, 9.25cm, because these had the most agreement between lengths.

D. 8.2cm, 8.25cm, 8.9cm, because these were the closest to the actual length.

Nature of Science

N.8.A.2 http://www.rpdp.net/sciencetips_v3/N8A2.htm

A science class measured the total amount of rainfall at their school each month from September through May. The total rainfall data is shown in the table below.

Based on the data in the table, which of these statements is an opinion?

A. January is the month that had the most rainfall.

B. May is the last month that rainfall data was collected.

C. September is the first month of the rainfall investigation.

D. April is the month that received the perfect amount of rainfall.

Rainfall Data	
Month	**Rainfall (cm)**
September	0.2
October	0.5
November	1.4
December	2.2
January	3.3
February	2.1
March	1.7
April	1.0
May	0.9

Nature of Science

N.8.A.2 http://www.rpdp.net/sciencetips_v3/N8A2.htm

Use the diagram below to answer this question. The diagram shows what occurred when a can of diet soda and a can of regular soda were placed into a container of water.

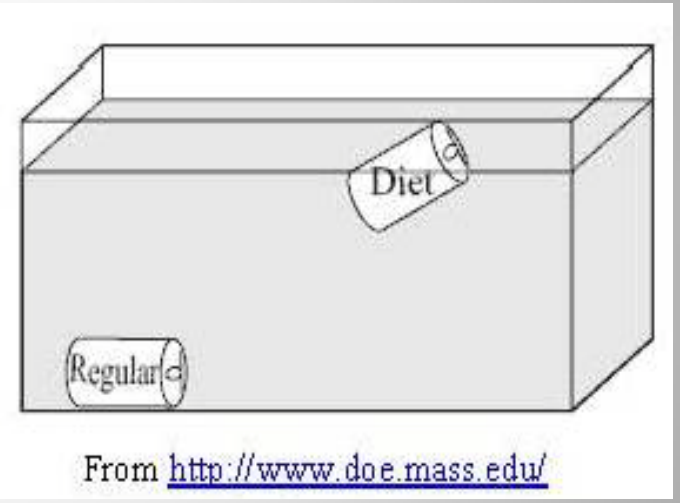
The can of regular soda sank to the bottom of the container, but the can of diet soda floated. Which statement **best** explains this observation?

A. The can of regular soda is less dense than the can of diet soda.

B. The can of regular soda is more dense than the can of diet soda.

C. The can of regular soda has a larger volume than the can of diet soda.

D. The can of regular soda has a smaller volume than the can of diet soda.



From http://www.doe.mass.edu/

Nature of Science

N.8.A.3 http://www.rpdp.net/sciencetips_v3/N8A3.htm

Global warming is a debated subject among scientists. Some scientists support that human activities alone are dramatically warming the planet. Other scientists conclude that human activities are only partly to blame. Lastly, some scientists conclude that the Earth is warming due to natural cycles.

How are different conclusions possible if all scientists are looking at the same experiments and data?

A. The scientists are experts in a narrow field so they ignore the data that is outside their expertise.
B. Since there can be only one right answer, one scientist has the correct answer and the rest are wrong.
C. Each scientist was able to fit the data together into a logical conclusion even though the resulting models were not identical.
D. Scientists pick a theory and then focus on the data that supports their theory.

Nature of Science

N.8.A.4 http://www.rpdp.net/sciencetips_v3/N8A4.htm

When investigating a new cancer-fighting drug, medical researchers give some of the subjects a pill that contains the drug. Some of the other subjects are given a pill that does not contain the drug.

The drug-free pill serves what purpose in the design of the investigation?

A. A control
B. A variable
C. A separate trial
D. A qualitative comparison

Nature of Science

N.8.A.5 http://www.rpdp.net/sciencetips_v3/N8A5.htm

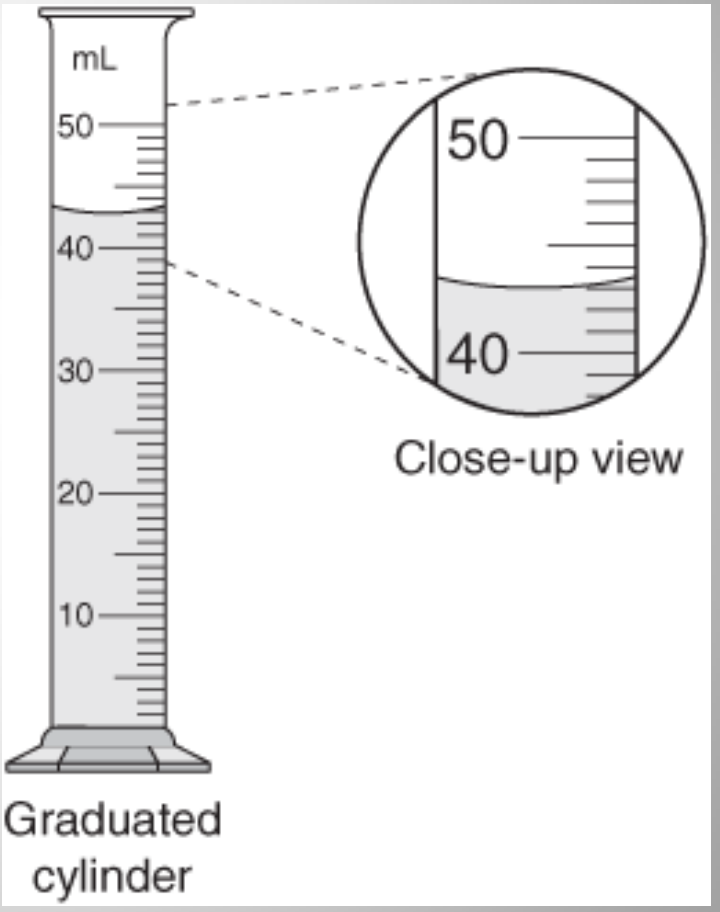
What volume of liquid is being measured in the graduated cylinder?

A. 43 mL

B. 44 mL

C. 45 mL

D. 46 mL



Nature of Science

N.8.A.5 http://www.rpdp.net/sciencetips_v3/N8A5.htm

In a science class, students are using hot plates to heat liquids during a laboratory investigation. What practice would **not** be safe when conducting this procedure?

A. Wearing goggles
B. Tying back long hair
C. Wearing loose-fitted clothing
D. Moving beakers with insulated gloves

Nature of Science

N.8.A.6 http://www.rpdp.net/sciencetips_v3/N8A6.htm

During an investigation, four plants were continuously exposed to various colors of light for a two-week period. The table below shows the increase in plant mass over the two-week period.

Which statement **best** explains why all of the plants were grown at a temperature of 22°C?

A. The main purpose of this investigation was to see how well plants grow at 22°C.

B. Since temperature was not the experimental variable in this investigation, it was kept the same for each plant.

C. The best temperature for the growth of this type of plant during an investigation was 22°C.

D. Temperature was an environmental factor in this investigation and can be changed.

Plant Growth Investigation

Plant	Light Color	Temp (C°)	Increase in Plant Mass (g)
1	Red	22	18
2	Blue	22	25
3	Green	22	10
4	White	22	30

Nature of Science

N.8.A.6 http://www.rpdp.net/sciencetips_v3/N8A6.htm

A student wants to test how music affects plant growth. He grows some plants in a bedroom window with music playing twenty-four hours per day. He grows a different variety of plants in his backyard with no music playing. What is the **main** problem with the design of this investigation?

A. There is more than one variable in the experiment.

B. There is no way to repeat the procedure.

C. There are too many ways to graph the data.

D. There is no way to accurately measure results.

Nature of Science

N.8.A.7 http://www.rpdp.net/sciencetips_v3/N8A7.htm

While conducting careful experimentation, a chemist discovered a new element. The international scientific community would **most likely**

A. ignore the new data because it did not fit into the generally accepted periodic table.

B. create a new classification system with the new information.

C. disagree on how to incorporate the new data and create many classification systems based on personal preference.

D. repeat the experiment and modify the current periodic table to include the new data.

Nature of Science

N.8.A.7 http://www.rpdp.net/sciencetips_v3/N8A7.htm

The data table shows the percentage of elements found in the human body.

What type of graph would **best** represent this data?

A. Pie chart
B. Line graph
C. Bar graph
D. Histogram

Elements of the Human Body

Elements	Percentage
Oxygen	65%
Carbon	18%
Hydrogen	10%
Nitrogen	3%
Calcium	1.5%
Phosphorus	1%
Trace Elements	1%

Nature of Science

N.8.B.1 http://www.rpdp.net/sciencetips_v3/N8B1.htm

Science, technology, and society affect each other in both positive and negative ways. One example was the discovery of antibiotics. Which of the following **best** describes the negative affect that antibiotics have on society?

The extensive use of antibiotics

A. has led to the evolution of resistant strains of bacteria.
B. has caused several forms of new cancers to develop.
C. in consumer products has led to increased obesity in humans.
D. resulted in an over-abundance of medical professionals.

Nature of Science

N.8.B.1 http://www.rpdp.net/sciencetips_v3/N8B1.htm

Which of the following is a **negative** impact caused by mining for resources?

The mining industry

A. contributes to the economy and provides employment.
B. practices reclamation procedures when a mine closes.
C. uses leaching techniques that might cause heavy metals to enter the water supply.
D. provides the raw materials needed to make the items used daily by society.

Nature of Science

N.8.B.2 http://www.rpdp.net/sciencetips_v3/N8B2.htm

In August 2006, the International Astronomical Union changed Pluto's status from a planet to that of a dwarf planet. What prompted the reclassification of Pluto?

A. A new telescope introduced in 2006 allowed scientists to see a better view of Pluto.

B. Scientists based their decision on known data from Pluto and other objects in the solar system.

C. A manned mission to Pluto provided evidence to make it a dwarf planet.

D. Scientists were biased to make the solar system have eight planets.

Nature of Science

N.8.B.2 http://www.rpdp.net/sciencetips_v3/N8B2.htm

Which statement **best** describes the process of science?

A. Scientists are objective and free of prejudice.

B. Scientists generally discover new ideas without the help of others.

C. Scientific ideas evolve or change over time.

D. New ideas in science generally result from planned experiments.

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

What molecule allows hereditary information to be passed from generation to generation?

A. DNA

B. ATP

C. Lipids

D. Proteins

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

Which of the following is a **true** statement about normal human reproduction?

A. Each parent contributes an equal number of chromosomes to their offspring.
B. Mothers contribute a greater number of chromosomes to daughters than sons.
C. Fathers contribute a greater number of chromosomes to sons than daughters.
D. The mother's egg cell contains extra chromosomes that are passed on to both sons and daughters.

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

In mice, brown (B) fur is dominant to white (b) fur. If a mouse with the genotype Bb is crossed with a mouse with a genotype Bb, what percentage of the offspring are expected to have brown fur?

A. 25%
B. 50%
C. 75%
D. 100%

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

A hitchhiker's thumb (h) is a recessive trait compared to a straight-thumb (H). If an individual who is homozygous for a straight-thumb has offspring with an individual who is heterozygous with a straight-thumb, then what is the probability that the offspring will have a hitchhiker's thumb?

A. 75%
B. 50%
C. 25%
D. 0%

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

A process that involves fusing two parent cells to form a new organism is known as

A. asexual reproduction.
B. sexual reproduction.
C. meiosis.
D. mitosis.

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

Which of the following is the **primary** advantage of sexual reproduction when compared to asexual reproduction?

A. There is a greater number of offspring.
B. There is more food available to offspring.
C. There is greater genetic variety in offspring.
D. There is a longer development time for offspring.

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

Mr. and Mrs. Smith recently had a baby. The nurses at the hospital were not careful and mixed up the name tags of 3 babies (**A, B, and C**), one of which belongs to the Smiths. Baby **A** has type O blood and freckles. Baby **B** has type A blood, and no freckles. Baby **C** has type B blood, and freckles. Use this and the following information to determine which baby belongs to the Smiths. Be sure to justify your answer with both an explanation and by drawing the Punnett squares for each trait.

A. Freckles (F) are dominant over no freckles (f). Mr. Smith is homozygous dominant for freckles, while Mrs. Smith has no freckles.

B. Type A and B blood are codominant to type O blood. Mr. Smith is heterozygous type A blood, while Mrs. Smith has type AB blood.

Life Science

L.8.A.1 http://www.rpdp.net/sciencetips_v3/L8A1.htm

Punnett Square for Freckles

	F	F
f	Ff	Ff
f	Ff	Ff

Punnett Square for Blood Types

	A	o
A	AA	Ao
B	AB	Bo

- Both Punnett squares should be drawn and completed correctly.
  - Results for freckles:
    - There is 100% probability that Mr. and Mrs. Smith would have a child with freckles. Therefore, Baby B cannot belong to them because it does not have freckles.
  - Results for blood types:
    - The Punnett squares show that Mr. and Mrs. Smith can only have babies with the blood types A, B, or AB. Baby A has type O blood and cannot be theirs.
- By using the results of the Punnett squares and the process of elimination, Baby C should belong to Mr. and Mrs. Smith.

Life Science

L.8.A.2 http://www.rpdp.net/sciencetips_v3/L8A2.htm

A change in genetic material that has the potential to produce variation within a species is a

A. mutation.

B. translation.

C. transcription.

D. replication.

Life Science

L.8.A.2 http://www.rpdp.net/sciencetips_v3/L8A2.htm

In order for a mutation to be passed from one generation to the next, the mutation must be present in which of these cells?

A. Skin
B. Egg
C. Blood
D. Heart

Life Science

L.8.A.3 http://www.rpdp.net/sciencetips_v3/L8A3.htm

Although all modern breeds of dogs are members of the same species, they exhibit a wide range of physical characteristics.

Which statement provides the **best** evidence that this range of characteristics is the result of artificial selection?

A. The rate of change between modern dog breeds has decreased.

B. Some modern dog breeds are poorly adapted to living in natural environments.

C. The ancestors of modern dog breeds were more genetically diverse than breeds today.

D. Many modern dog breeds are well adapted to living in both small and large populations.

From http://nde.doe.nv.gov/Assessment_HSPE.htm

Life Science

L.12.A.4 http://www.rpdp.net/sciencetips_v3/L8A4.htm

Imagine that you are a doctor and you need to give the following patient advice.

A pregnant mother is diagnosed with skin cancer and concerned that her child will be born with skin cancer.

A. Use your knowledge of mutations and inheritance to give a detailed explanation to the mother why the baby will or will not be born with skin cancer.

B. Provide the mother with a reason for how she may have developed skin cancer and give advice on how to prevent skin cancer in the future.

Life Science

L.12.A.4 http://www.rpdp.net/sciencetips_v3/L8A4.htm

Baby chicks peck their way out of their shells when they hatch. This activity is an example of which type of behavior?

A. Innate
B. Learned
C. Planned
D. Social

From: http://www.doe.mass.edu/mcas/

Life Science

L.12.A.4 http://www.rpdp.net/sciencetips_v3/L8A4.htm

Animals kept in captivity, such as those in zoos, are provided with all of their basic needs, including food. Wild dogs, such as wolves, born in captivity cannot survive if released into the wild, because they cannot hunt. Wild cats, such as cougars, born in captivity can survive and will hunt if released into the wild. What is the **best** explanation for this phenomenon?

A. Hunting is an innate behavior in all animals.
B. Wild cats learn to hunt , but wild dogs inherit the trait.
C. Hunting is an innate behavior in wild cats, but a learned behavior in wild dogs.
D. Both wild cats and wild dogs must learn to hunt from their parents.

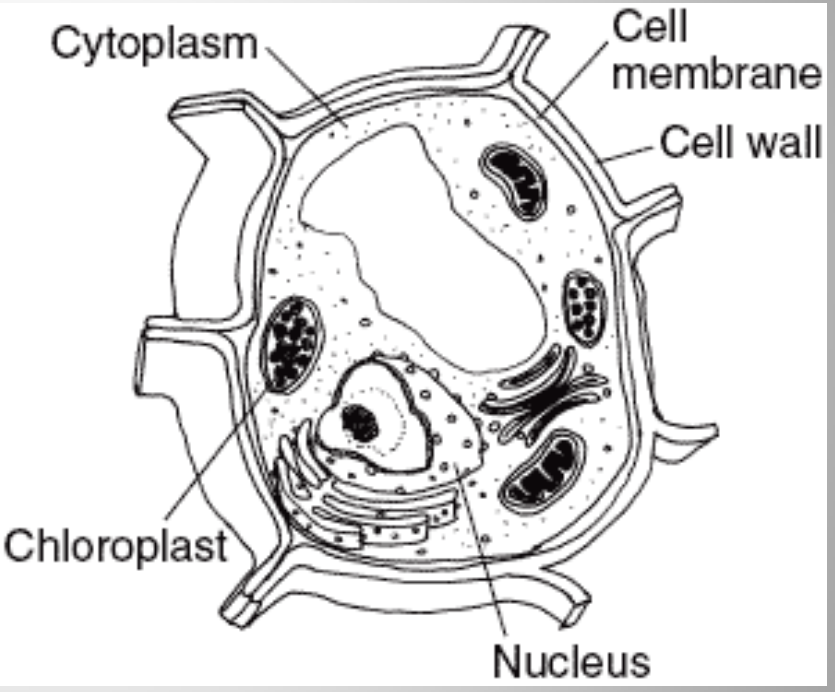
Life Science

L.8.B.1 http://www.rpdp.net/sciencetips_v3/L8B1.htm

The diagram below shows a cell.

Where would this cell **most likely** be found?

A. Skin of an animal
B. Leaf of a plant
C. Cap of a mushroom
D. Root of an plant



Life Science

L.8.B.1 http://www.rpdp.net/sciencetips_v3/L8B1.htm

Which of the following is present in a typical plant cell but **not** in an animal cell?

A. Mitochondria
B. Cell Wall
C. Ribosome
D. Cell Membrane

Life Science

L.8.B.1 http://www.rpdp.net/sciencetips_v3/L8B1.htm

Which cellular organelle contains DNA and controls the function of the cell?

A. Ribosome
B. Endoplasmic Reticulum
C. Golgi Body
D. Nucleus

Life Science

L.8.B.1 http://www.rpdp.net/sciencetips_v3/L8B1.htm

Both organisms in Diagram A and B can be seen only with a microscope. Since these are one-celled organisms, each cell must be able to carry out all important life functions, such as moving from place to place and getting food.

A. Infer from the diagram the ways these two organisms move. Be sure to include information from the diagrams in your answer.
B. Compare the ways these two organisms obtain nutrients. Determine if each organism is a heterotroph or autotroph. Be sure to include information from the diagrams in your answer.

Diagram A

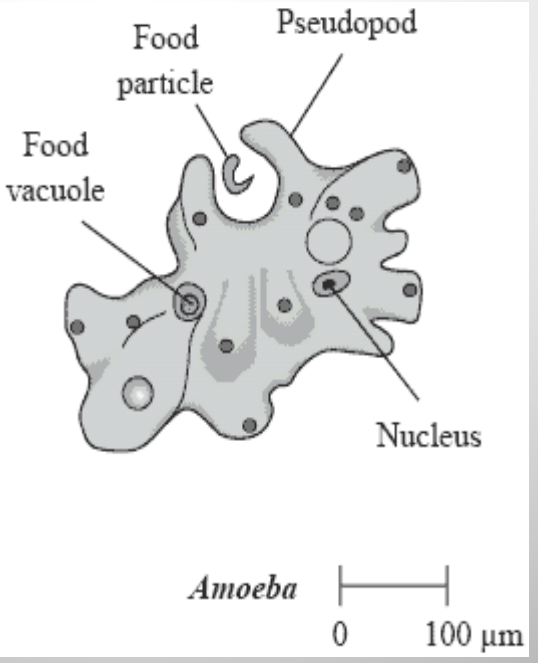
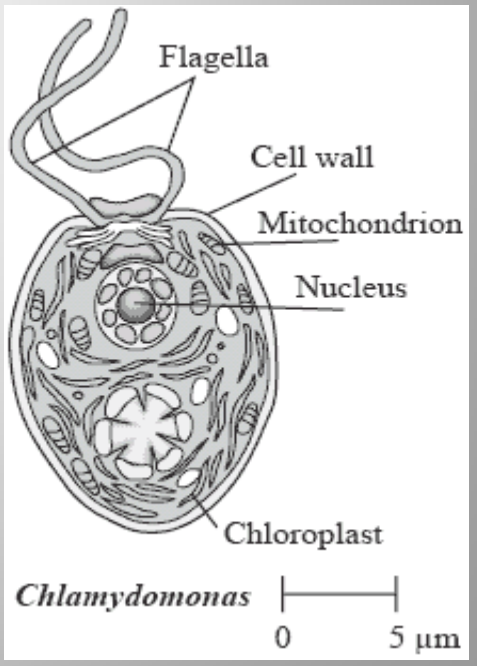


Diagram B



Life Science

L.8.B.2 http://www.rpdp.net/sciencetips_v3/L8B2.htm

Substances enter any plant or animal cell by passing through which of the following structures?

A. Nucleus

B. Cell membrane

C. Vacuole

D. Cell Wall

Life Science

L.8.B.2 http://www.rpdp.net/sciencetips_v3/L8B2.htm

In which cell of the human body would you expect to find the **most** mitochondria?

A. A muscle cell in the leg muscle of a runner.
B. A cell of the stomach lining that manufactures digestive enzymes.
C. A red blood cell that transports oxygen.
D. A nerve cell that transmit signals to the brain stem.

Life Science

L.8.B.2 http://www.rpdp.net/sciencetips_v3/L8B2.htm

Complete the following statement about photosynthesis and plant growth to make it correct.

Most plant growth comes from

A. soil nutrients used during photosynthesis.
B. water used during photosynthesis.
C. the energy used during photosynthesis.
D. carbon dioxide used during in photosynthesis.

Life Science

L.8.B.2 http://www.rpdp.net/sciencetips_v3/L8B2.htm

Cells have a variety of organelles, each with a specific function. The organelles must work together in order for the cell to survive.

A. Describe the function of a chloroplast and a mitochondrion. Include a basic description of the chemical reaction that takes place in each organelle.

B. Describe how the chloroplast and a mitochondrion work together to help a plant cell survive.

C. Predict what would happen if a plant cell lacked mitochondria. Justify your answer.

Life Science

L.8.B.3 http://www.rpdp.net/sciencetips_v3/L8B3.htm

Which of the following is **not** an example of cell specialization?

A. A bacterium that carries out photosynthesis.
B. A muscle cell that maintains a heart beat.
C. A red blood cell that carries oxygen throughout an organism.
D. A skin cell that helps form a barrier around an organism.

Life Science

L.8.B.3 http://www.rpdp.net/sciencetips_v3/L8B3.htm

A tissue sample is composed of cells with long projections to send signals to other cells. This tissue is **most likely** composed of

A. muscle cells.
B. nerve cells.
C. adipose cells.
D. bone cells.

Life Science

L.8.B.4 http://www.rpdp.net/sciencetips_v3/L8B4.htm

Which of the following is the correct ranking of organizational hierarchy of organisms from simplest to most complex?

A. cells, organs, tissues, organ systems, organisms
B. cells, tissues, organs, organ systems, organisms
C. tissues, cells, organs, organ systems, organisms
D. tissues, organs, cells, organ systems, organisms

Life Science

L.8.B.4 http://www.rpdp.net/sciencetips_v3/L8B4.htm

Use the diagram of the human body to answer the following question.

Which of the following **best** describes the primary function of this body system?

A. Supports the skeletal system
B. Absorbs nutrients from food
C. Responds to stimuli in the environment
D. Exchanges gases with the environment

From http://www.doe.mass.edu/mcas/

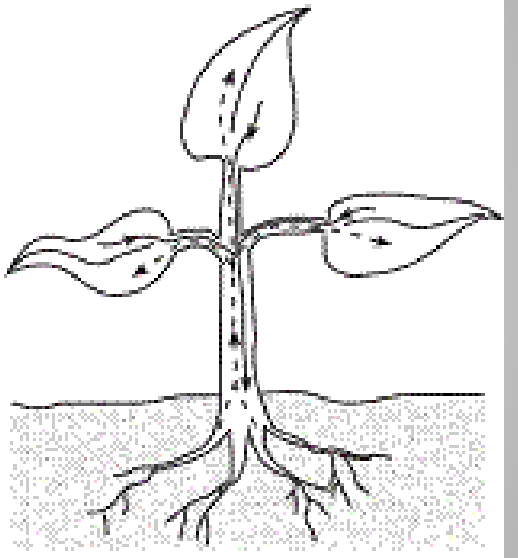
Life Science

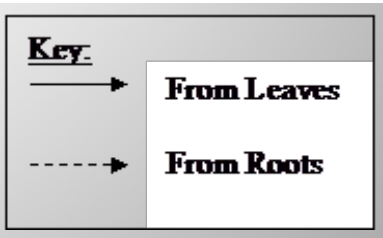
L.8.B.4 http://www.rpdp.net/sciencetips_v3/L8B4.htm

Use the diagram of the plant to answer the question.

Which organ system in humans performs a similar function as shown by the arrows in the plant?

A. Circulatory
B. Respiration
C. Digestion
D. Excretory



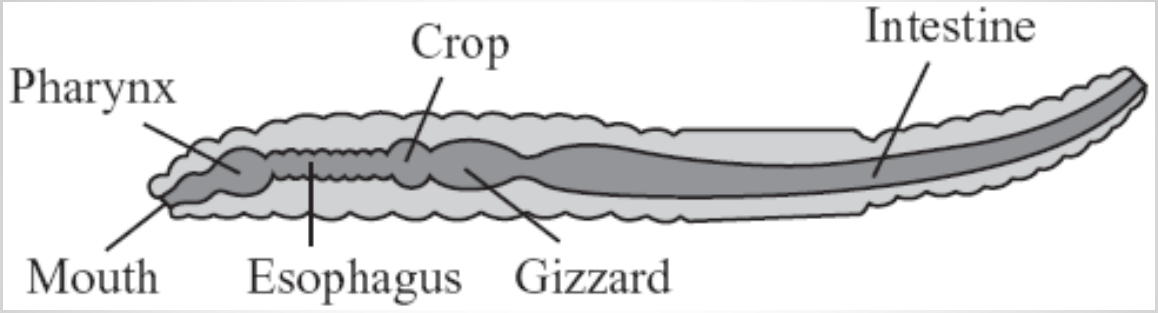


From http://school.discoveryeducation.com/clipart/category/scie.html /

Life Science

L.8.B.4 http://www.rpdp.net/sciencetips_v3/L8B4.htm

The diagram below shows the digestive system of an earthworm.



A. Compare the earthworm's digestive system to a human's digestive system. Identify three digestive organs in the earthworm that are also found in the human body.

B. Provide a detailed description of the function that each organ you identified in part (A) has in the human body.

Life Science

L.8.B.5 http://www.rpdp.net/sciencetips_v3/L8B5.htm

The explanation that diseases are caused by microorganisms is known as the

A. cell theory.
B. immune theory.
C. germ theory.
D. infection theory.

Life Science

L.8.B.5 http://www.rpdp.net/sciencetips_v3/L8B5.htm

Exposure to a weakened or mild form of a pathogen to produce immunity is the basis for using a(n)

A. vitamin.
B. interferon.
C. vaccine.
D. antibiotic.

Life Science

L.8.B.5 http://www.rpdp.net/sciencetips_v3/L8B5.htm

Malaria is a disease that is caused by a protist known as *Plasmodium*. When a mosquito bites a person infected with malaria, then bites a healthy person, the malaria-causing pathogens can infect the healthy person. What is the vector in this case?

A. Human
B. Plasmodium
C. Mosquito
D. Blood

Life Science

L.8.B.5 http://www.rpdp.net/sciencetips_v3/L8B5.htm

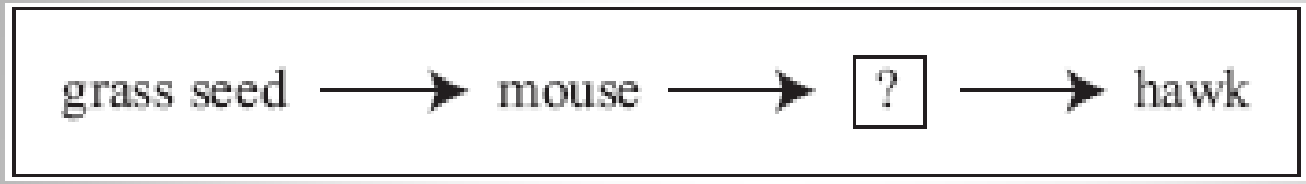
A group of students took potato salad made with mayonnaise to a picnic on a very hot day.

A. Explain how eating the potato salad that is not refrigerated could cause food poisoning.
B. Why would refrigerating the potato salad prevent the people who eat it from getting food poisoning?

Life Science

L.8.C.1 http://www.rpdp.net/sciencetips_v3/L8C1.htm

An incomplete food chain is shown below.



Which of the following organisms would **best** complete the food chain?

A. Rabbit
B. Robin
C. Snake
D. Tree

From http://www.doe.mass.edu/mcas/

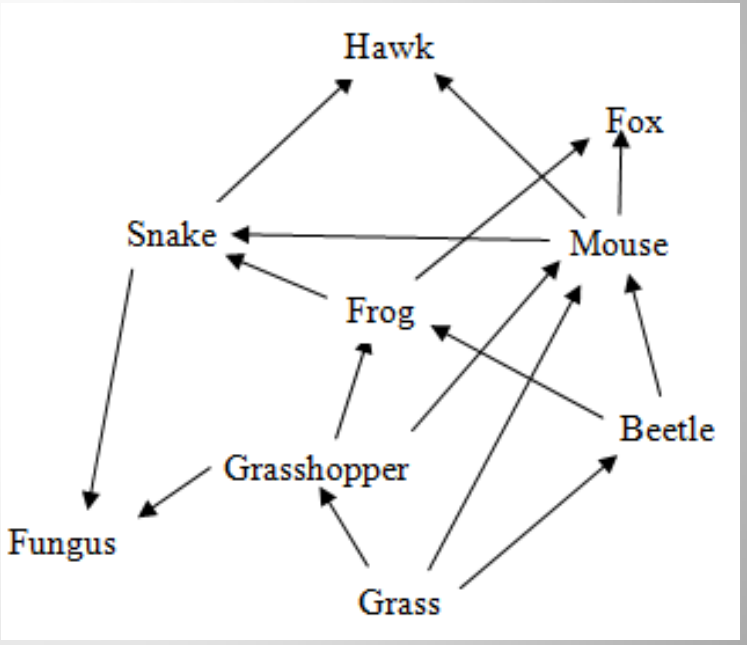
Life Science

L.8.C.1 http://www.rpdp.net/sciencetips_v3/L8C1.htm

Use the food web below to answer the question.

What animal in the food web is an omnivore?

A. Grasshopper
B. Frog
C. Mouse
D. Hawk



Life Science

L.8.C.1 http://www.rpdp.net/sciencetips_v3/L8C1.htm

The primary source of energy used by animals on our planet is

A. the animals they eat.
B. the plants they eat.
C. sunlight absorbed by animals.
D. sunlight absorbed by plants.

Life Science

L.8.C.1 http://www.rpdp.net/sciencetips_v3/L8C1.htm

The organisms in an ecosystem interact in many ways to survive. For example, a rosebush, aphids, beetles, spiders, and orioles all interact in a rosebush ecosystem. **The diagram on the next slide** shows how these organisms interact in a partial food web.

A. Identify the producer organism in this food web. Explain the reasoning for your answer.

B. Identify the primary consumer organism in this food web. Explain the reasoning for your answer.

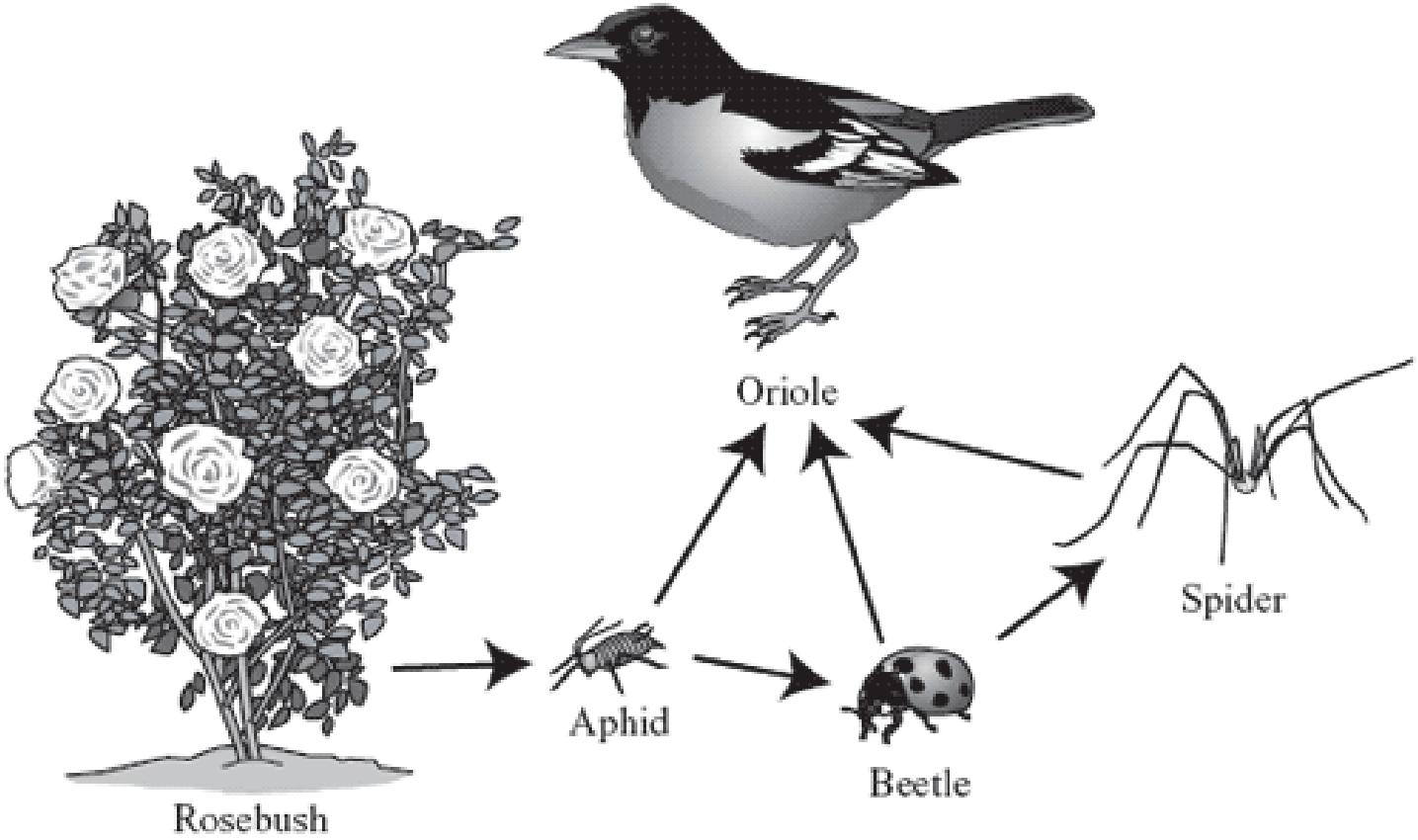
C. Predict what would **most likely** happen to each of the organisms in the food web if the beetle population were suddenly destroyed. Explain the reasoning for your answer for each organism.

From http://www.doe.mass.edu/mcas/

A. Identify the producer organism in this food web. Explain the reasoning for your answer.

B. Identify the primary consumer organism in this food web. Explain the reasoning for your answer.

C. Predict what would **most likely** happen to each of the organisms in the food web if the beetle population were suddenly destroyed. Explain the reasoning for your answer for each organism.



Life Science

L.8.C.2 http://www.rpdp.net/sciencetips_v3/L8C2.htm

Use the food web to answer the following question.

What organism is a primary consumer in the food web?

A. Raspberry bush
B. Rabbit
C. Fox
D. Mountain lion

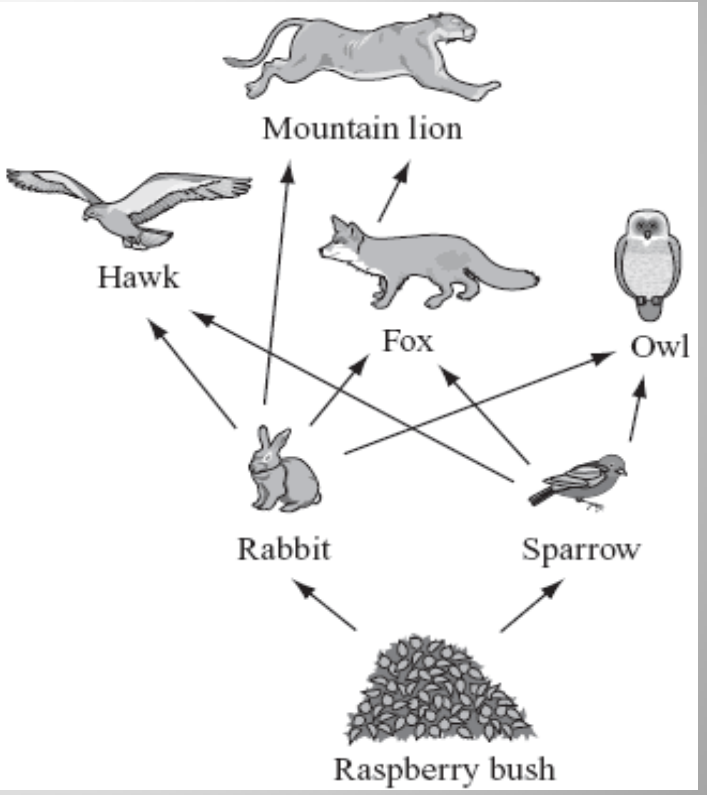


Image from http://www.doe.mass.edu/mcas/

Life Science

L.8.C.2 http://www.rpdp.net/sciencetips_v3/L8C2.htm

The complete removal of decomposers from an ecosystem will have the **greatest** effect on which of the following?

A. The spread of disease
B. The availability of water
C. The recycling of nutrients
D. The distribution of organisms

From http://www.doe.mass.edu/mcas/

Life Science

L.8.C.2 http://www.rpdp.net/sciencetips_v3/L8C2.htm

The symbiotic relationship between a flower and the insect that feeds on its nectar is **most likely** an example of

A. mutualism because the flower provides the insect with food, and the insect pollinates the flower.
B. commensalism because the insect lives off the nectar but the flower does not benefit.
C. parasitism because the insect harms the flower by removing the nectar.
D. predation because the insect feeds on the flower and the flower dies.

Life Science

L.8.C.2 http://www.rpdp.net/sciencetips_v3/L8C2.htm

Use the diagram below representing different stages in ecological succession to answer the following question

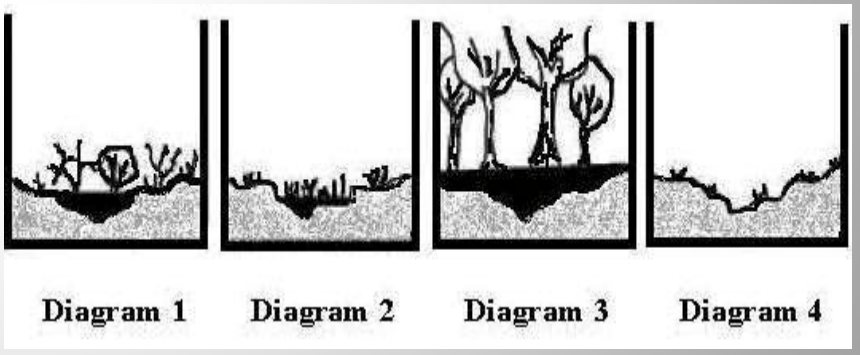
Select the order that **best** represents how succession progresses in an ecosystem.

A. Diagram 1, 2, 3, 4

B. Diagram 2, 4, 1, 3

C. Diagram 4, 2, 1, 3

D. Diagram 3, 4, 2, 1



Life Science

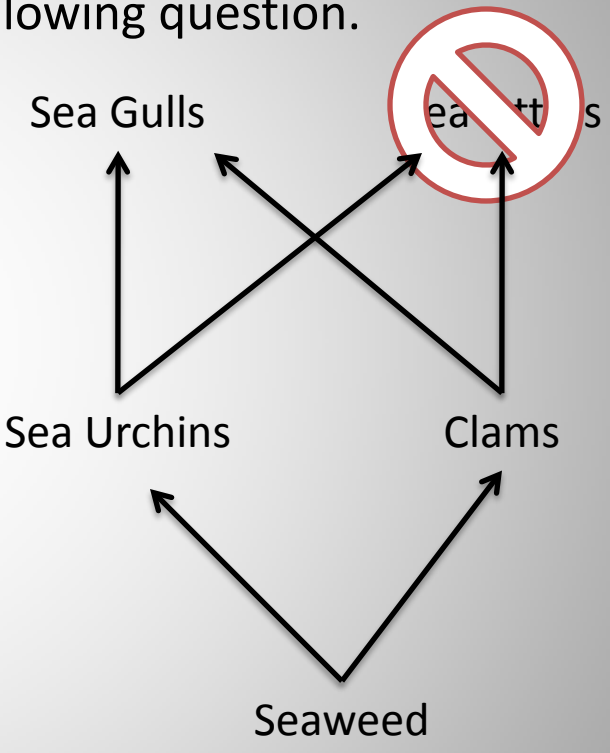
L.8.C.3 http://www.rpdp.net/sciencetips_v3/L8C3.htm

Use the description below to answer the following question.

In a marine ecosystem, disease killed most of the sea otters. This allowed the sea urchins and clams to increase in number. As a result, the sea gull population increased and the seaweed population decreased.

Identify a secondary consumer in this marine ecosystem.

A. Seaweed
B. Clam
C. Sea urchin
D. Sea gull



Life Science

L.8.C.3 http://www.rpdp.net/sciencetips_v3/L8C3.htm

Carefully examine the food web in the figure below.

A drought has caused the producer populations to significantly decrease. Which statement **best** describes an immediate effect caused by the decrease of producers?

A. The hawk population would increase.

B. The rabbit population would decrease.

C. The sparrow population would increase.

D. The mountain lion population would decrease.

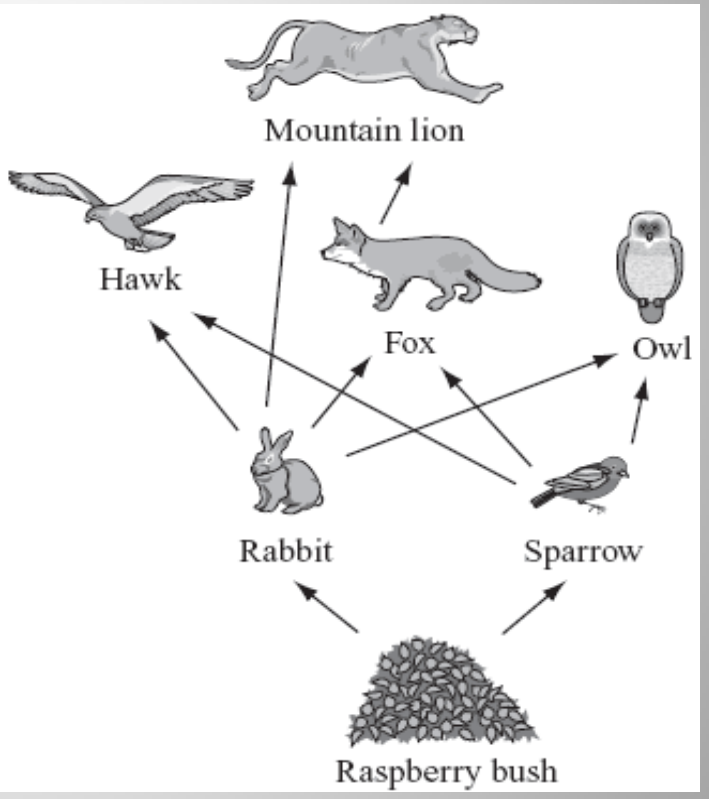


Image from http://www.doe.mass.edu/mcas/

Life Science

L.8.C.4 http://www.rpdp.net/sciencetips_v3/L8C4.htm

There is a limit to how large any given population can grow. Which statement **best** explains why a population must eventually stop growing?

A. A low female-to-male ratio develops as the population grows.

B. Older individuals outnumber the younger members of the population.

C. Natural selection causes the gene pool to shift as the population increases.

D. The available resources necessary for life are used up by the population as it grows.

From http://www.doe.mass.edu/mcas/

Life Science

L.8.C.4 http://www.rpdp.net/sciencetips_v3/L8C4.htm

The data table shows the number of rabbits that lived in a grassland habit over a ten year period.

A. Use the data to graph the growth of the rabbits over the ten year period. Be sure to correctly label the X and Y axes.

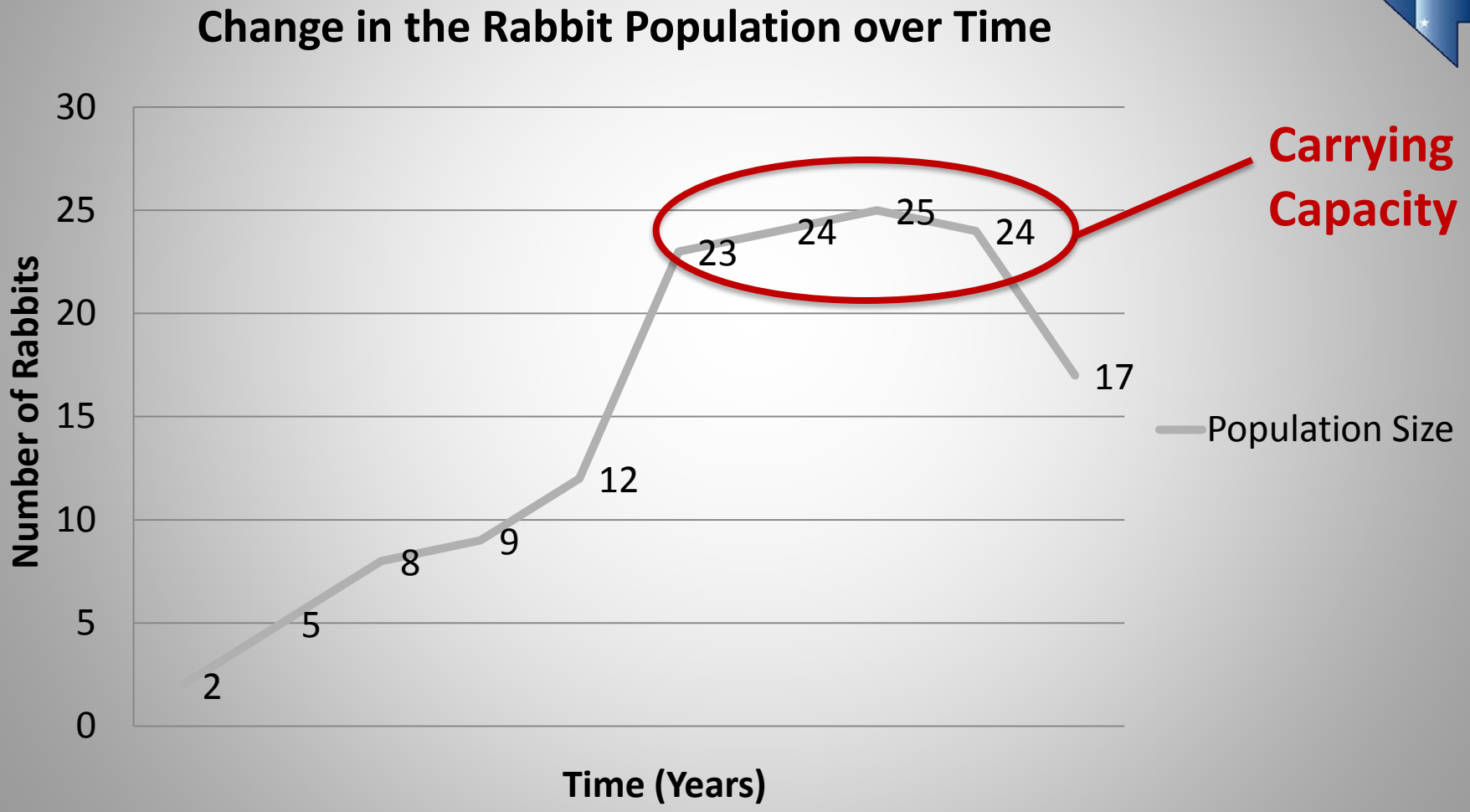
B. What is meant by the term carrying capacity? Identify on the graph where the carrying capacity for the rabbits occurs.

C. Describe the effect that a specific abiotic and biotic factor could have on the carrying capacity of this grassland habit.

Population Growth of Rabbits	
Year	Population Size
1	2
2	5
3	8
4	9
5	12
6	23
7	24
8	25
9	24
10	17

Life Science

L.8.C.4 http://www.rpdp.net/sciencetips_v3/L8C4.htm



Life Science

L.8.D.1 http://www.rpdp.net/sciencetips_v3/L8D1.htm

A tool used by scientists to identify the name of unknown organisms based on observable characteristics is called a

A. dichotomous key.
B. scientific name.
C. taxonomic Tree.
D. homologous structure

Life Science

L.8.D.1 http://www.rpdp.net/sciencetips_v3/L8D1.htm

Which of the following provides the **best** evidence that organisms of two different species share a common ancestor?

A. They live in the same ecosystem.

B. They reproduce at the same time.

C. They have similar DNA sequences.

D. They have similar body movements.

From http://www.doe.mass.edu/mcas/

Life Science

L.12.D.2 http://www.rpdp.net/sciencetips_v3/L8D2.htm

Which of the following **best** explains how the fossil record provides evidence that evolution has occurred?

A. It indicates that forms of life existed on Earth at least 3.5 billion years ago.

B. It indicates the exact cause of structural and behavioral adaptations of organisms.

C. It shows how the embryos of many different vertebrate species are very similar.

D. It shows that the form and structure of groups of organisms have changed over time.

From http://www.doe.mass.edu/mcas/

Life Science

L.12.D.2 http://www.rpdp.net/sciencetips_v3/L8D2.htm

Fossils are most commonly preserved in

A. igneous rock.
B. metamorphic rock.
C. sedimentary rock.
D. transitional rock.

Life Science

L.12.D.2 http://www.rpdp.net/sciencetips_v3/L8D2.htm

Scientists discovered fossils of whale ancestors that have well-developed hip and thigh bones, which are typically used for walking by mammals. Modern whales **most likely** evolved from ancestors who

A. lived in the sea, and then became better adapted for land.

B. lived on land, and then became better adapted for the sea.

C. evolved in the sea and remained in the sea.

D. evolved on land and remained on land.

Life Science

L.8.D.3 http://www.rpdp.net/sciencetips_v3/L8D3.htm

The unifying concept that provides an explanation for the vast diversity of life on our planet is the

A. cell theory.
B. theory of evolution.
C. binomial nomenclature system.
D. gene-chromosome theorem.

Life Science

L.8.D.3 http://www.rpdp.net/sciencetips_v3/L8D3.htm

Which term refers to the process by which organisms that are better adapted to their environment are more likely to survive and reproduce?

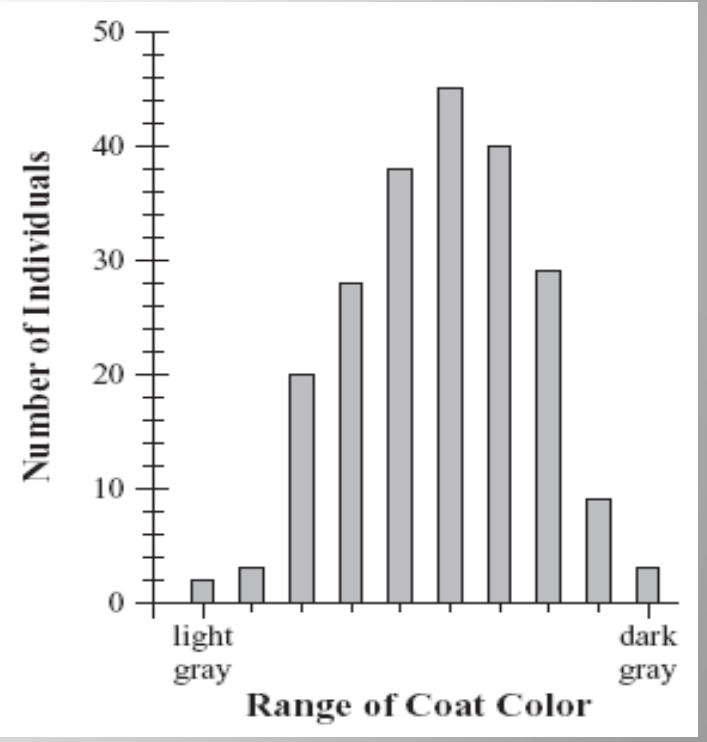
A. Variation
B. Competition
C. Overproduction
D. Natural selection

Life Science

L.8.D.3 http://www.rpdp.net/sciencetips_v3/L8D3.htm

The graph shows the number of gray squirrels in a small population and their coat colors. This squirrel population has been separated from other squirrel populations by a new highway and several construction sites. The main predators of these squirrels are cats and hawks.

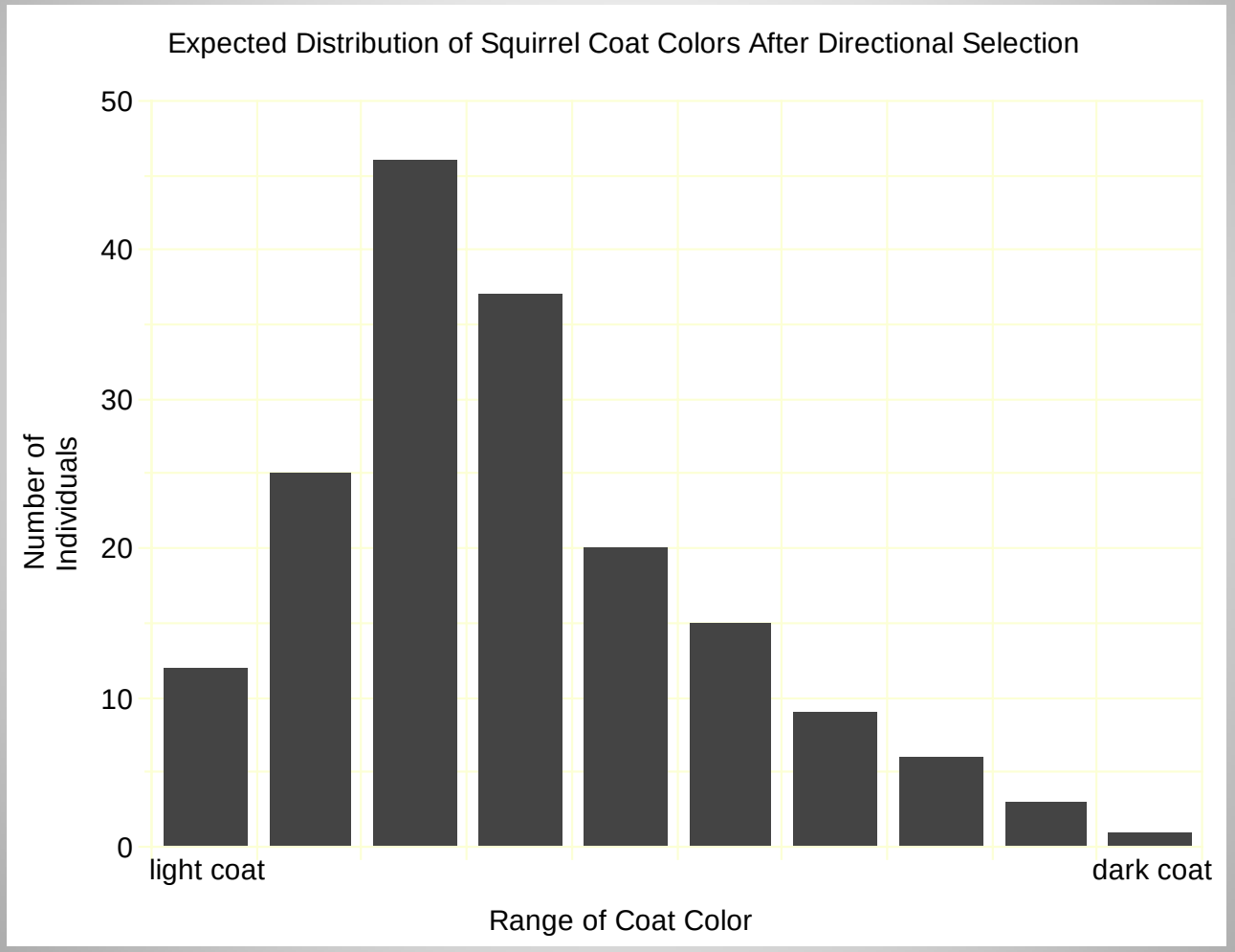
A. Assume that dark gray squirrels are very visible in this new environment. What will **most likely** happen to the distribution of coat color in this squirrel population over several generations?
B. Using graph paper, sketch a graph to show the predicted distribution of the squirrel population, and explain your answer.
C. Assume that dark gray squirrels are very visible on the ground, and light gray squirrels are very visible in the trees. Explain what is likely to happen to the distribution of coat color in the squirrel population over several generations.



Graph from http://www.doe.mass.edu/mcas/

Life Science

L.8.D.3 http://www.rpdp.net/sciencetips_v3/L8D3.htm



Earth Science

E.8.A.1 http://www.rpdp.net/sciencetips_v3/E8A1.htm

Which statement **best** describes how climate conditions in Nevada would be different if the tilt of Earth's axis was at 0°?

A. The seasons in Nevada would be opposite from the current seasons.

B. Nevada would experience climate conditions that change very little throughout the year.

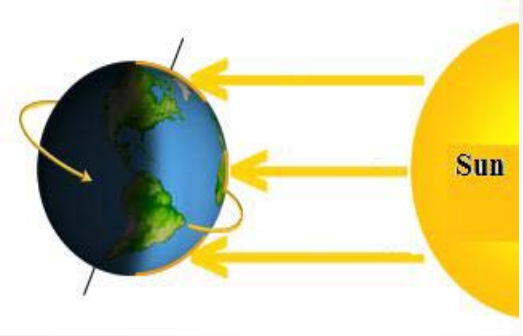
C. Climate conditions in Nevada would be coolest when Earth is closest to the sun.

D. Nevada would receive the most energy from the sun in the summer and the least in the winter.

Earth Science

E.8.A.1 http://www.rpdp.net/sciencetips_v3/E8A1.htm

Use the diagram to answer the following question.



Which of the following is **not** a contributing factor to the uneven warming of Earth's surface?

A. Different surfaces warm at different rates.

B. Different surfaces retain energy differently.

C. The Sun is farther from Earth during winter.

D. The Sun's rays hit the surface at varied angles.

Earth Science

E.8.A.1 http://www.rpdp.net/sciencetips_v3/E8A1.htm

Draw a diagram the Earth in its orbit around the Sun and include the following labels and explanations.

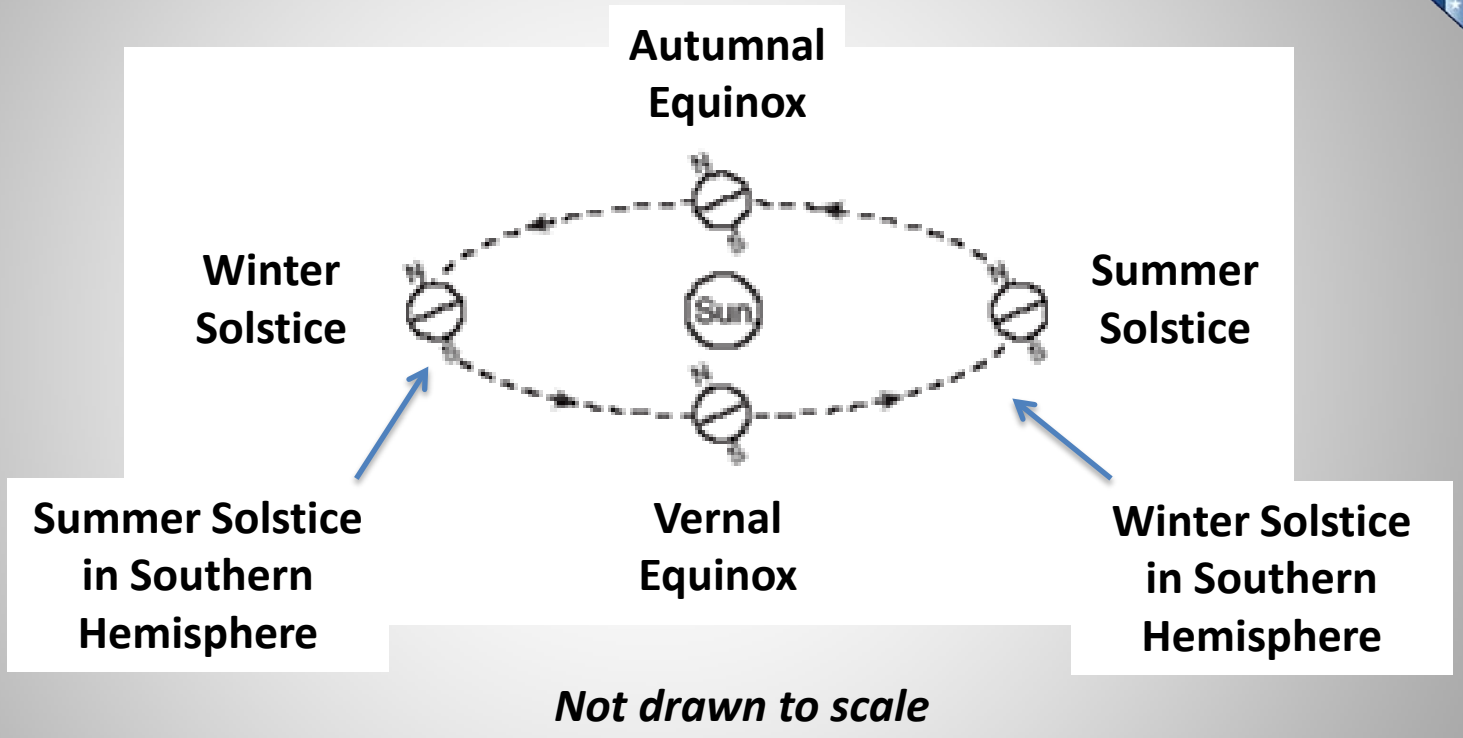
A. The Earth's tilt must be represented along with labels for each solstice and equinox as experienced in the Northern Hemisphere. The terms summer solstice, winter solstice, vernal (spring) equinox, and autumnal (fall) equinox must be used.

B. Identify the position that shows the Southern Hemisphere receiving the greatest **and** least amount of direct solar energy. Provide evidence to support these choices.

C. Predict what the seasons would be like on Earth if there were no axial tilt.

Earth Science

E.8.A.1 http://www.rpdp.net/sciencetips_v3/E8A1.htm



Earth Science

E.8.A.2 http://www.rpdp.net/sciencetips_v3/E8A2.htm

What is the primary energy source behind the water cycle?

A. Earth's internal energy
B. Sun's electromagnetic radiation
C. Moon's gravitational attraction
D. Radioactive decay of elements

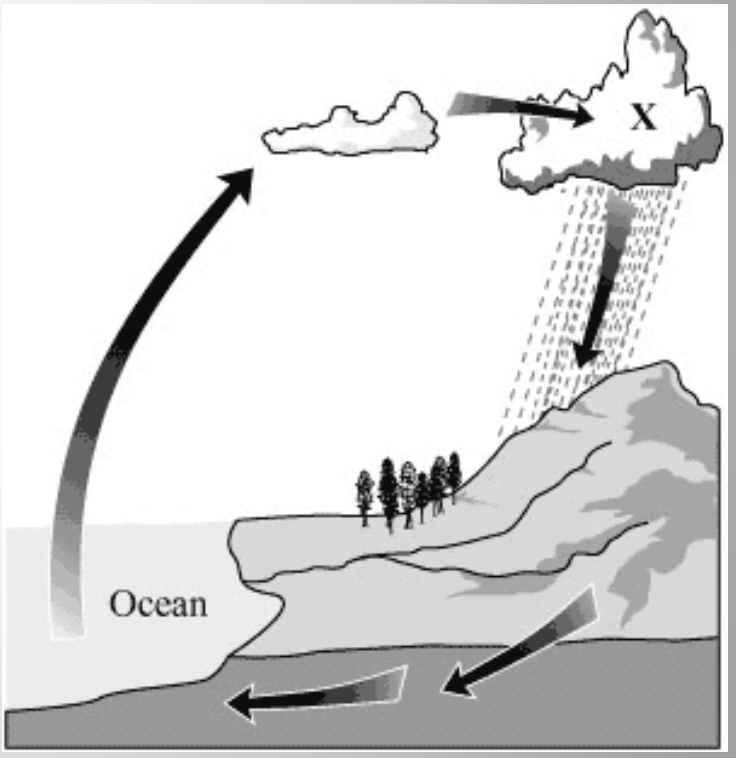
Earth Science

E.8.A.2 http://www.rpdp.net/sciencetips_v3/E8A2.htm

Use the diagram of the water cycle to answer the question.

Water on Earth cycles in different forms and in different locations. What process occurs at the location labeled X on this diagram?

A. Condensation
B. Evaporation
C. Runoff
D. Transpiration



From http://www.doe.mass.edu/mcas/

Earth Science

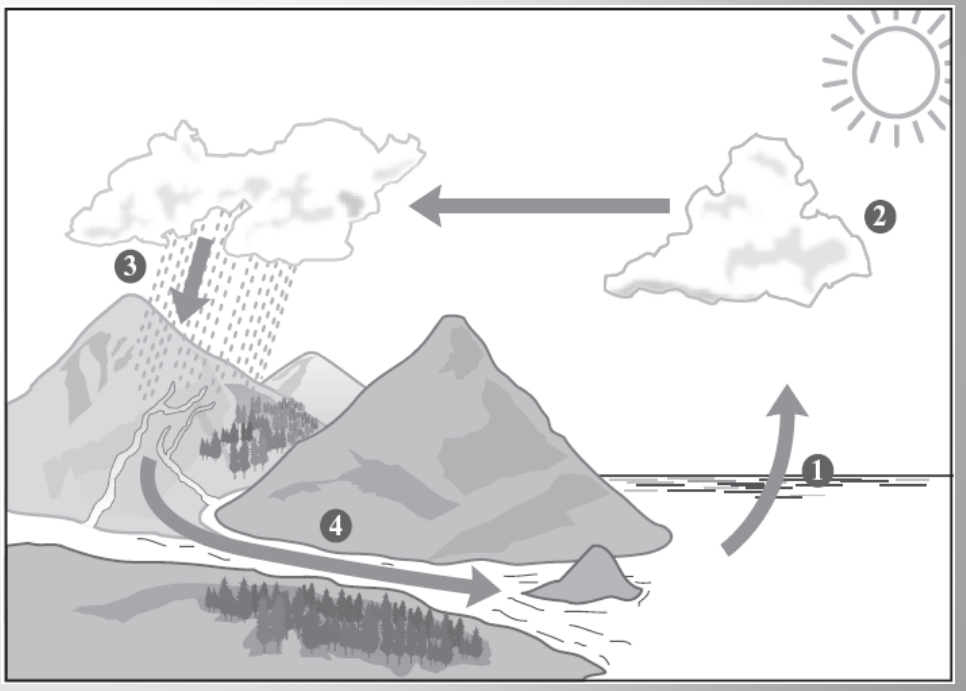
E.8.A.3 http://www.rpdp.net/sciencetips_v3/E8A3.htm

Use the diagram of the water cycle to answer the question.

What change is occurring in stage 1 of the diagram?

Water is changing from a

A. liquid to a gas.
B. solid to a liquid.
C. gas to a liquid.
D. liquid to a solid.



From http://www.doe.mass.edu/mcas/

Earth Science

E.8.A.3 http://www.rpdp.net/sciencetips_v3/E8A3.htm

Which of the following statements **best** explains why ice floats on a freshwater lake?

A. Water has a higher specific heat than ice.

B. Ice has the same molecular mass as water.

C. Heat is absorbed when water changes from the solid state to the liquid state.

D. Hydrogen bonding causes water to be less dense in the solid state than in the liquid state.

Earth Science

E.8.A.3 http://www.rpdp.net/sciencetips_v3/E8A3.htm

Use the data table to answer the following question.

The majority of water on Earth exists as saltwater. Which water source would increase the **most** if ice caps and glaciers melt?

A. Oceans
B. Groundwater
C. Surface water
D. Atmosphere

Water Source	% of Total Water on Earth
Oceans	97.2
Ice Caps/ Glaciers	2.38
Groundwater	0.397
Surface Water	0.022
Atmosphere	0.001

From http://www.epa.gov/NE/students/pdfs/ww_intro.pdf

Earth Science

E.8.A.4 http://www.rpdp.net/sciencetips_v3/E8A4.htm

Greenhouse gases help keep Earth at a habitable temperature by

A. blocking the cold winds and ices originating in outer space.
B. serving as essential nutrients for atmospheric phytoplankton.
C. allowing only infrared light to reach Earth's surface.
D. retaining some of the Sun's energy in our lower atmosphere.

Earth Science

E.8.A.4 http://www.rpdp.net/sciencetips_v3/E8A4.htm

What gas is the **most** abundant in Earth's atmosphere?

A. Carbon Dioxide
B. Oxygen
C. Nitrogen
D. Ozone

Earth Science

E.8.A.5 http://www.rpdp.net/sciencetips_v3/E8A5.htm

The map shows the continental United States and four arrows representing wind directions.

Which arrow **best** represents the direction of the jet stream that influences weather across the continental United States?

A. Arrow 1
B. Arrow 2
C. Arrow 3
D. Arrow 4

From http://www.doe.mass.edu/mcas/

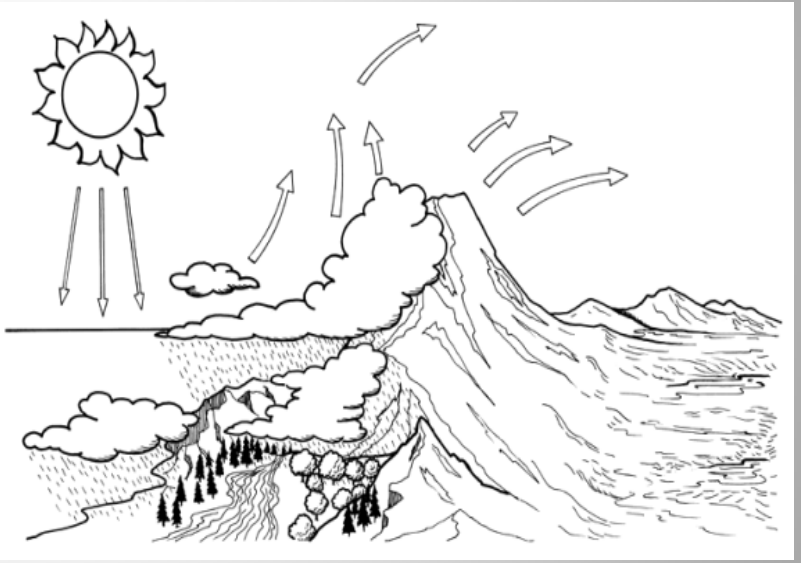
Earth Science

E.8.A.6 http://www.rpdp.net/sciencetips_v3/E8A6.htm

Use the diagram of a rain shadow effect below to answer the question.

Clouds usually form on the windward side of mountains because this is where the air

A. rises and cools.
B. rises and warms.
C. sinks and cools.
D. sinks and warms.



From: http://www.fao.org/docrep/006/ad316e/AD316E79.gif

Earth Science

E.8.A.6 http://www.rpdp.net/sciencetips_v3/E8A6.htm

In what layer of the atmosphere does most weather occur?

A. Troposphere
B. Mesosphere
C. Exosphere
D. Stratosphere

Earth Science

E.8.B.1 http://www.rpdp.net/sciencetips_v3/E8B2.htm

Which of the following is the **best** estimate of the number of stars in a typical galaxy?

A. Hundreds
B. Thousands
C. Millions
D. Billions

Earth Science

E.8.B.3 http://www.rpdp.net/sciencetips_v3/E8B3.htm

Which of the following is an accurate statement when comparing the terrestrial and gaseous planets?

A. Terrestrial planets are denser even though they are smaller than gaseous planets.

B. Gaseous planets are less massive because of the lower density of their materials.

C. Terrestrial planets have the same chemical composition as the gaseous planets.

D. Gaseous planets have a shorter orbit around the Sun compared to the terrestrial planets.

Earth Science

E.8.B.3 http://www.rpdp.net/sciencetips_v3/E8B3.htm

Which of the following drawings **best** represents the motion of a planet and its moon around the Sun in our solar system?

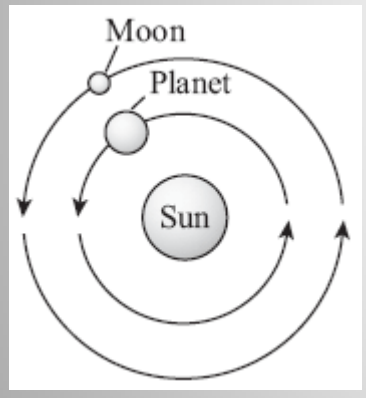


Diagram A

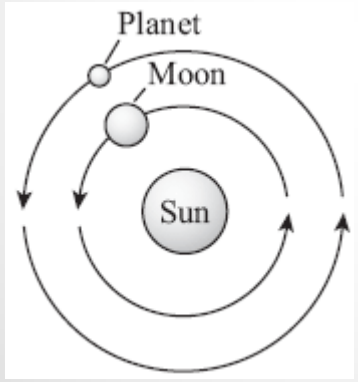


Diagram B

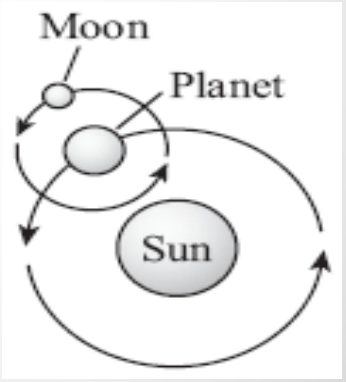


Diagram C

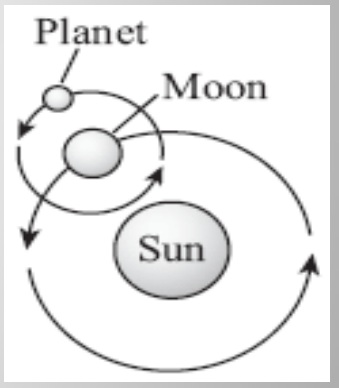


Diagram D

From http://www.doe.mass.edu/mcas/

Earth Science

E.8.B.3 http://www.rpdp.net/sciencetips_v3/E8B3.htm

Which one of the following answers is the **best** explanation as to why the gas giant planets have so many moons as compared to the inner planets?

A. Solar flares burned up the moons associated with the inner planets.

B. The gas giant planets have a stronger gravitational pull capable of holding more moons.

C. The inner planets rotate so rapidly that the moons cannot stay in orbit.

D. New moons periodically grow from the thick atmospheres of the gas giant planets.

Earth Science

E.8.B.4 http://www.rpdp.net/sciencetips_v3/E8B4.htm

The following symbols are used to represent separate regions of space.

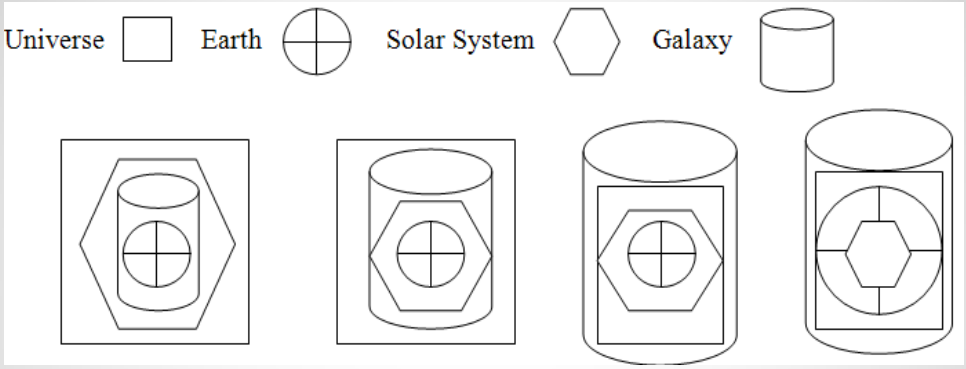


Diagram 1 **Diagram 2** **Diagram 3** **Diagram 4**

Which of the following diagrams represents Earth's place in the universe?

A. Diagram 1
B. Diagram 2
C. Diagram 3
D. Diagram 4

Earth Science

E.8.B.6 http://www.rpdp.net/sciencetips_v3/E8B6.htm

Compared to other stars in the Milky Way Galaxy, the Sun's diameter classifies it as a

A. micro-sized star.
B. smallest-sized star.
C. medium-sized star.
D. largest-sized star.

Earth Science

E.8.B.7 http://www.rpdp.net/sciencetips_v3/E8B7.htm

What is the term used to describe the accepted theory that the Sun is at the center of our solar system?

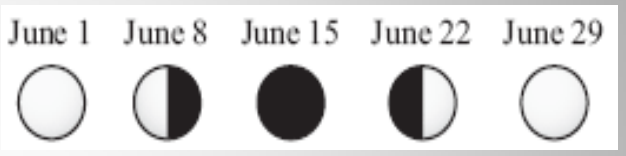
A. Eccentric
B. Geocentric
C. Heliocentric
D. Starcentric

Earth Science

E.8.B.7 http://www.rpdp.net/sciencetips_v3/E8B7.htm

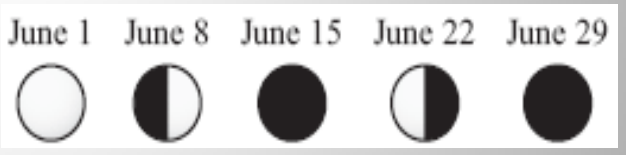
A student observed the shape of the Moon once every 7 days during the month of June. Which of the following sets of drawings shows how the Moon's shape could have changed during the month of June?

A.

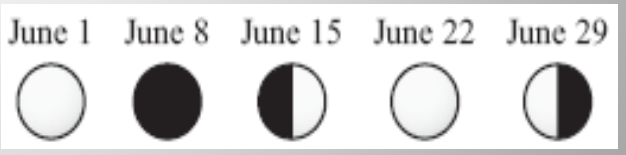


B.

C.



D.



From http://www.doe.mass.edu/mcas/

Earth Science

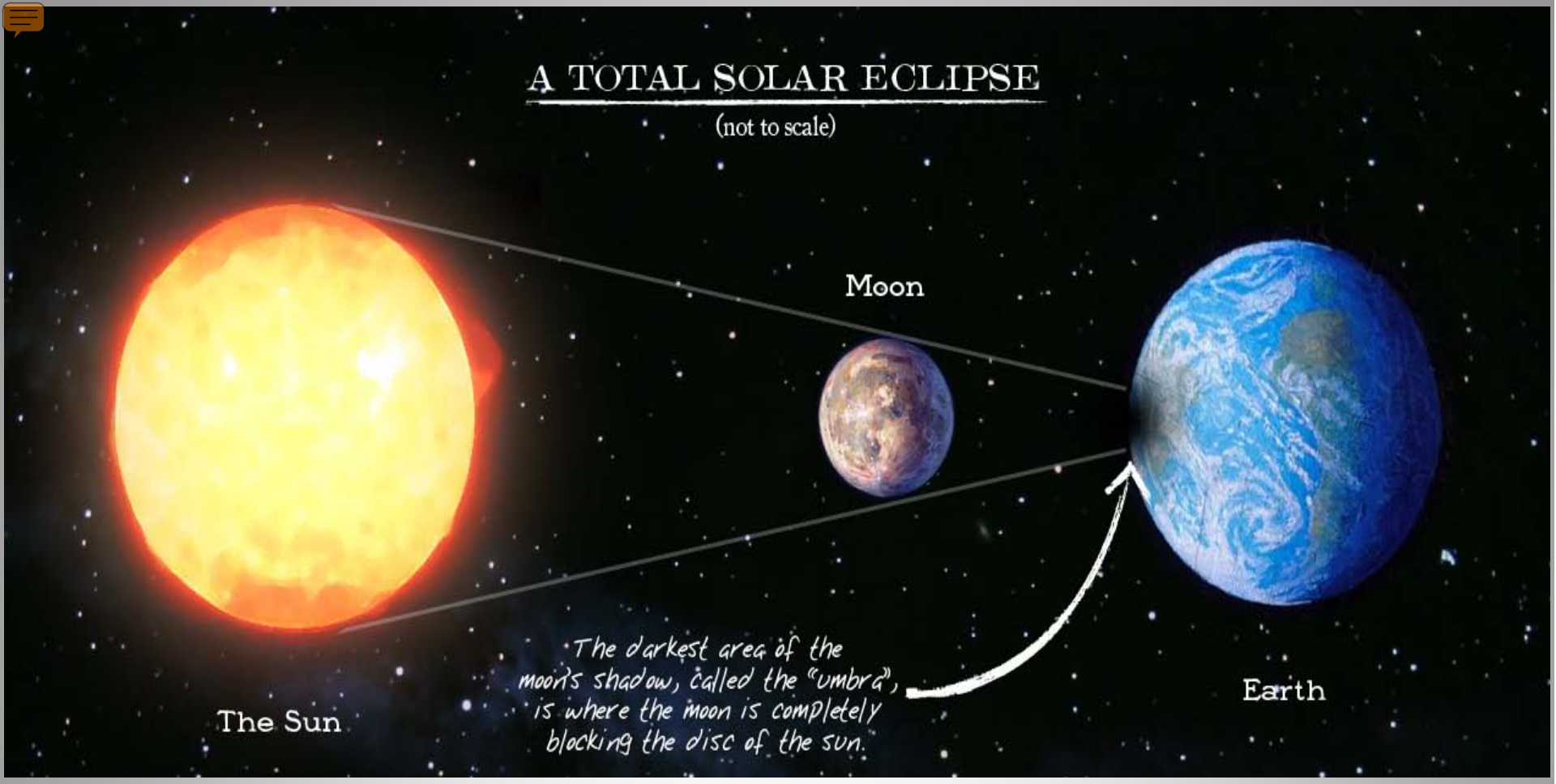
E.8.B.7 http://www.rpdp.net/sciencetips_v3/E8B7.htm

Answer each of the following questions regarding a solar eclipse.

A. Describe why a solar eclipse occurs.

B. Draw a labeled diagram of a solar eclipse including the moon, Sun, and Earth.

C. Explain why an observer's ability to view a total solar eclipse would depend on the observer's location on Earth.



From: http://eclipse.gsfc.nasa.gov/solar.html

- A solar eclipse occurs when the moon passes between the Earth and the Sun. The moon blocks out the view of the Sun for viewers on Earth.
- Due to the size of the moon, only a small amount of viewers on Earth would see a total solar eclipse due to the small area of the shadow cast on Earth.

Earth Science

E.8.C.1 http://www.rpdp.net/sciencetips_v3/E8C1.htm

The **best** indicator of an area's ancient environmental conditions and climate would be the

A. type and distribution of fossils.
B. present plant and animal life.
C. amount of carbon-14 in rock layers.
D. depth and composition of soil.

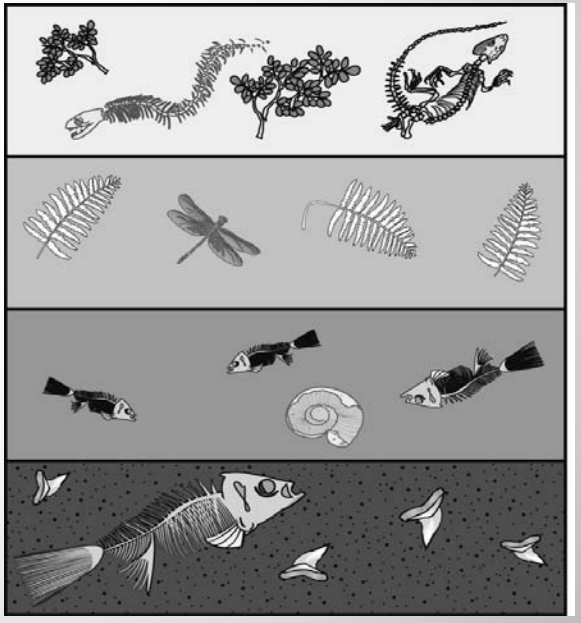
Earth Science

E.8.C.1 http://www.rpdp.net/sciencetips_v3/E8C1.htm

The diagram below shows four layers of undisturbed sedimentary rock that contains fossils.

Which layer of rock is **most likely** the oldest?

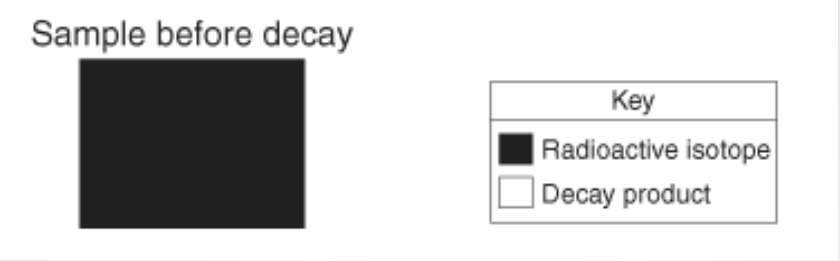
A. Layer 1
B. Layer 2
C. Layer 3
D. Layer 4



Earth Science

E.8.C.1 http://www.rpdp.net/sciencetips_v3/E8C1.htm

The diagram below represents a sample of a radioactive isotope.



What diagram **best** represents the percentage of this radioactive isotope sample that will remain after 2 half-lives?

A. Diagram 1
B. Diagram 2
C. Diagram 3
D. Diagram 4

Diagram 1 **Diagram 2** **Diagram 3** **Diagram 4**

Earth Science

E.8.C.2 http://www.rpdp.net/sciencetips_v3/E8C2.htm

Which type of rock forms when lava cools?

A. Coal
B. Igneous
C. Limestone
D. Metamorphic

Earth Science

E.8.C.2 http://www.rpdp.net/sciencetips_v3/E8C2.htm

The process by which rocks are broken down by water, wind, or ice is

A. mechanical weathering.
B. chemical weathering.
C. biological weathering.
D. structural weathering.

Earth Science

E.8.C.3 http://www.rpdp.net/sciencetips_v3/E8C3.htm

The diagram below shows four layers of Earth. Each layer is identified by a number.

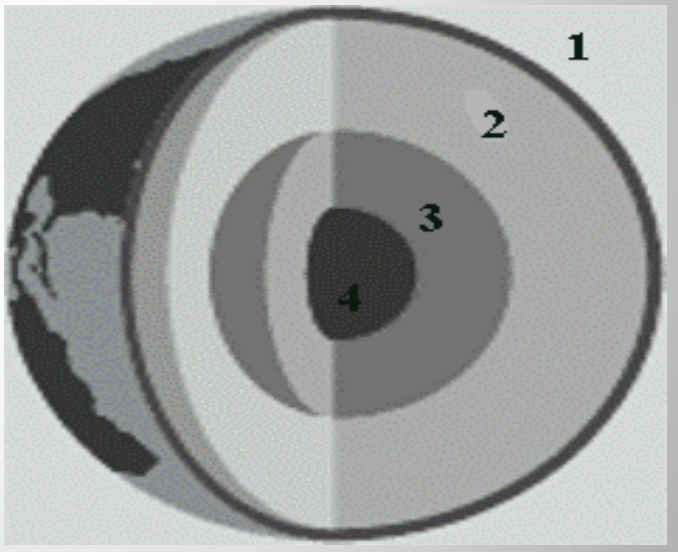
Which layer of the Earth represents the mantle?

A. Layer 1

B. Layer 2

C. Layer 3

D. Layer 4



http://www.virted.org/MAPS&GLOBES/Earth.html

Earth Science

E.8.C.4 http://www.rpdp.net/sciencetips_v3/E8C4.htm

The cross section below shows the direction of movement of an oceanic plate over a mantle hot spot, resulting in the formation of a chain of volcanoes labeled A, B, C, and D. The geologic age of volcano C is shown.

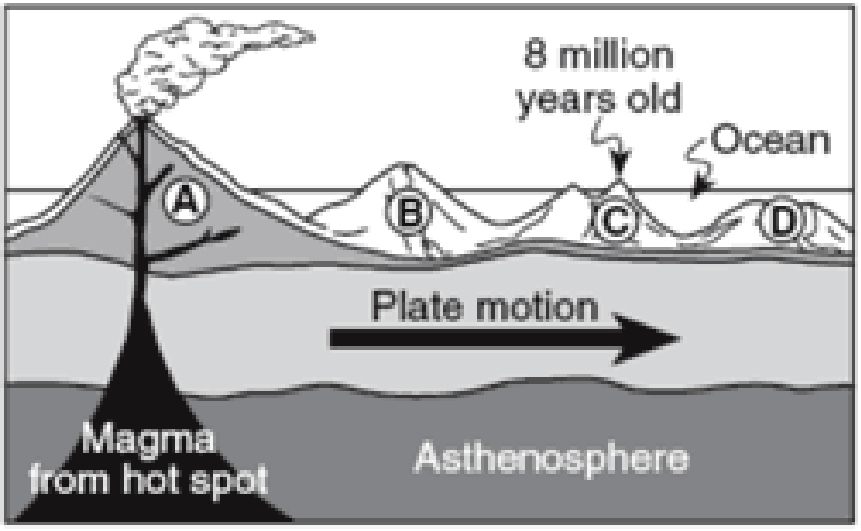
Using the diagram, what are the approximate ages of volcanoes B and D?

A. B is 5 million years old and D is 12 million years old.

B. B is 2 million years old and D is 6 million years old.

C. B is 9 million years old and D is 9 million years old.

D. B is 10 million years old and D is 4 million years old.



From http://www.nysedregents.org/testing/scire/es806.pdf

Earth Science

E.8.C.4 http://www.rpdp.net/sciencetips_v3/E8C4.htm

On the map below, dark circles indicate the positions of volcanoes in the "Ring of Fire" in and around the Pacific Ocean. Dark lines indicate tectonic plate boundaries of Earth's crust.

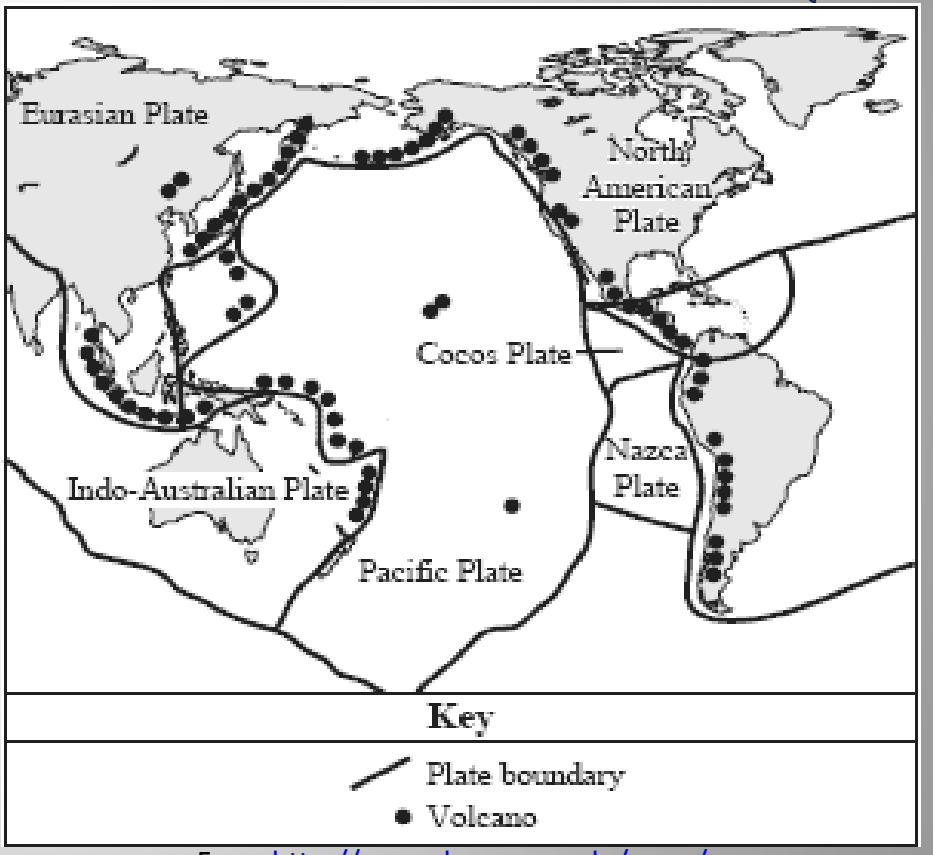
How would a map showing the location of earthquakes epicenters compare to the map showing the location of active volcanoes?

A. Only a small percentage of earthquakes would be in the same regions as the volcanoes.

B. A large percentage of earthquake epicenter locations would be in the same regions as the volcanoes.

C. There would be no match between the locations of the volcanoes and epicenters.

D. The location of the volcanoes and epicenters would only match in the ocean regions.



From http://www.doe.mass.edu/mcas/

Earth Science

E.8.C.4 http://www.rpdp.net/sciencetips_v3/E8C4.htm

The diagram on ***the next slide*** shows two land masses separated by an ocean. Use the key to the right to aid in your written explanation.

A scientist studying these two land masses hypothesizes that the land masses were once together.

A. Using the diagram, identify and explain two pieces of evidence that support the scientist's theory that the land masses were once together.

B. Use your knowledge of plate tectonics to propose a reason why the land masses moved to their current position.

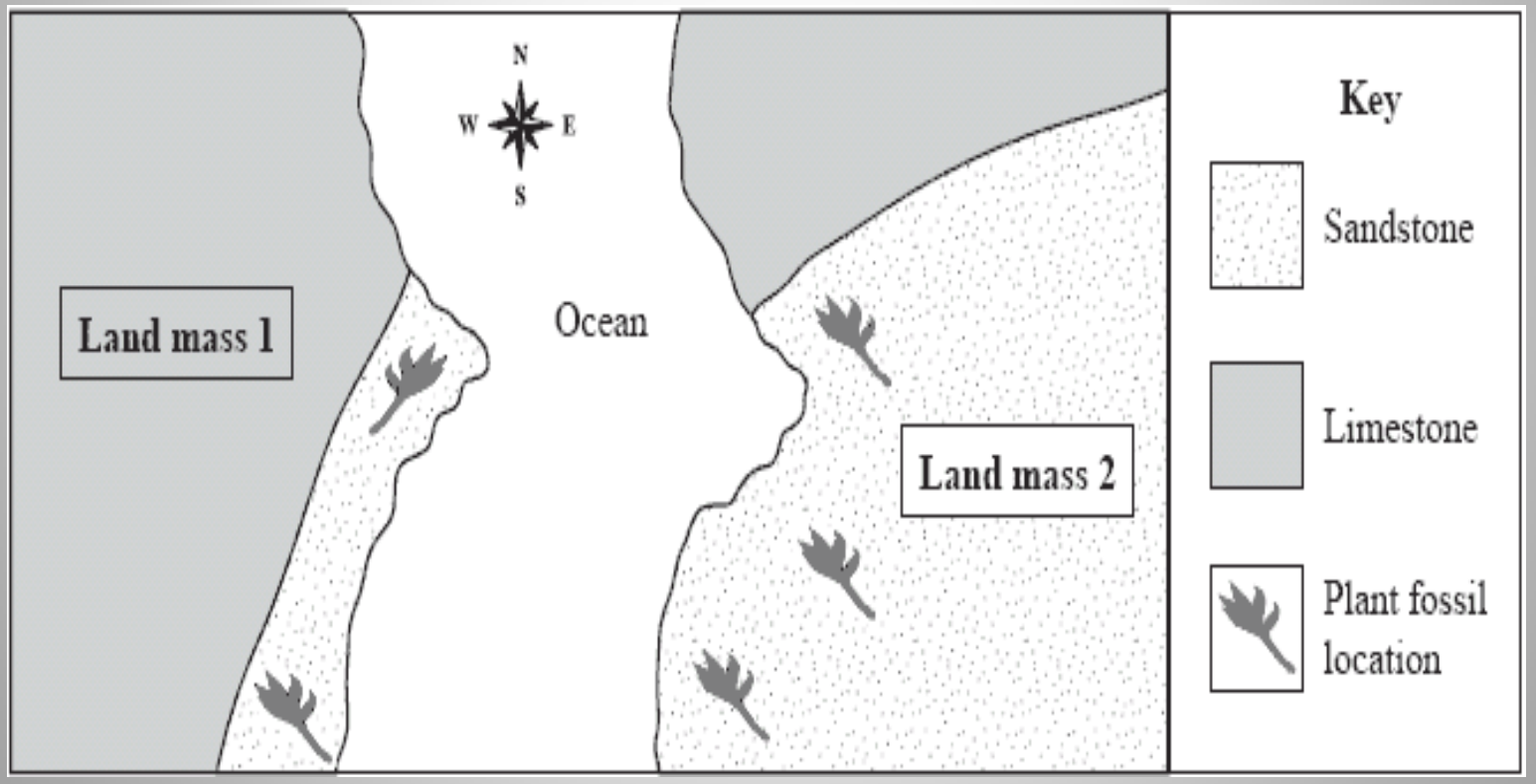
C. If the crustal movement continues, predict where the land masses will move in the future.

From http://www.doe.mass.edu/mcas/

Earth Science

E.8.C.4 http://www.rpdp.net/sciencetips_v3/E8C4.htm

The diagram shows two land masses separated by an ocean. Use the key to the right to aid in your written explanation.



Earth Science

E.8.C.5 http://www.rpdp.net/sciencetips_v3/E8C5.htm

Which statement **best** explains why earthquakes occur more frequently in Nevada than in Nebraska?

A. The rock found in Nevada is igneous, but the rock found in Nebraska is sedimentary.

B. Nevada has more active faults compared to Nebraska.

C. The rock under Nevada is soft, but the rock under Nebraska is hard.

D. Nevada is located on a continental plate, but Nebraska is not.

Earth Science

E.8.C.5 http://www.rpdp.net/sciencetips_v3/E8C5.htm

Which of the following landforms in Nevada are formed as a result of erosion?

A. Canyon and volcano
B. Alluvial fan and canyon
C. Mountain and volcano
D. Alluvial fan and mountain

Earth Science

E.8.C.6 http://www.rpdp.net/sciencetips_v3/E8C6.htm

Kendra has a mineral that she wants to identify. It is white in color, has a glassy luster, and has a hardness of 5.

Based on the information in the table, Kendra's mineral is **most** similar to

A. calcite.
B. fluorite.
C. apatite.
D. topaz.

The table below shows some properties of selected minerals.

Mineral	Color	Luster	Hardness
Calcite	White	Dull or Pearly	3
Fluorite	White, Blue, Green, Violet	Glassy	4
Apatite	White, Green, Brown, Violet	Glassy or Greasy	5
Topaz	Yellow, Red, White, Blue	Glassy	8

From http://www.doe.mass.edu/mcas/

Earth Science

E.8.C.6 http://www.rpdp.net/sciencetips_v3/E8C6.htm

A student sorted mineral samples into two groups: dull and shiny.

Which of the following properties did the student use to sort the mineral samples into groups?

A. Cleavage
B. Color
C. Luster
D. Streak

From http://www.doe.mass.edu/mcas/

Earth Science

E.8.C.7 http://www.rpdp.net/sciencetips_v3/E8C7.htm

Which of the following is a benefit to using renewable energy resources?

A. Renewable energy power plants are inexpensive to build.
B. Solar power is available everywhere in the United States.
C. Renewable energy resources require less equipment to operate.
D. The resources can be replenished in a relatively short amount of time.

Earth Science

E.8.C.7 http://www.rpdp.net/sciencetips_v3/E8C7.htm

If the need for copper becomes greater in the future, then copper mining will increase. One way of supplying this possible copper need without further depleting the resource would be to

A. import copper from other countries.
B. make copper in laboratories.
C. recycle copper that is no longer used.
D. outlaw the use of copper.

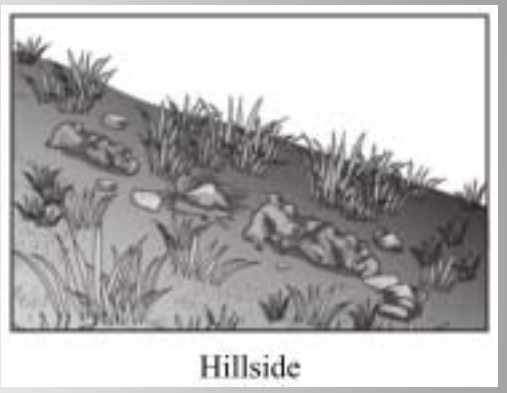
Earth Science

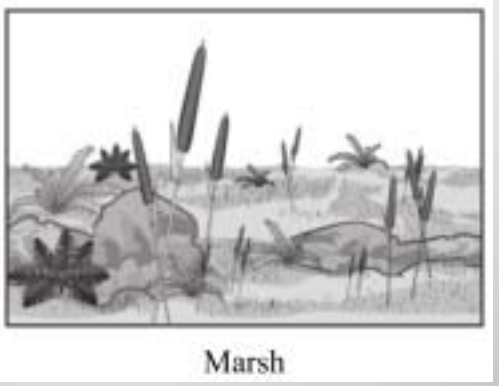
E.8.C.8 http://www.rpdp.net/sciencetips_v3/E8C8.htm

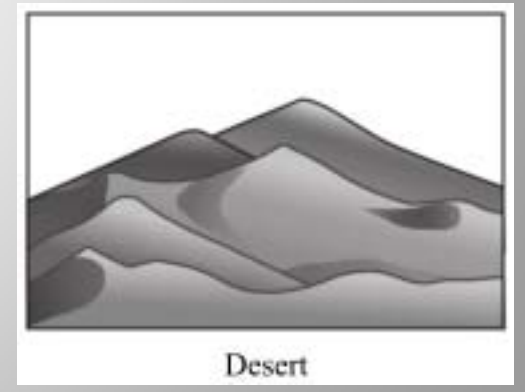
Select the location where new soil will **most likely** form at the slowest rate over time?

A. Forest
B. Hillside
C. Marsh
D. Desert


Forest


Hillside


Marsh


Desert

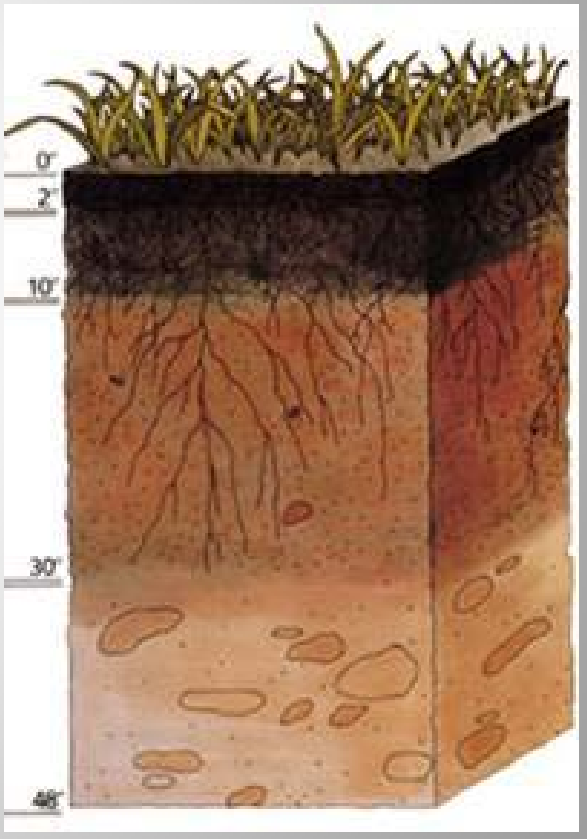
From http://www.doe.mass.edu/mcas/

Earth Science

E.8.C.8 http://www.rpdp.net/sciencetips_v3/E8C8.htm

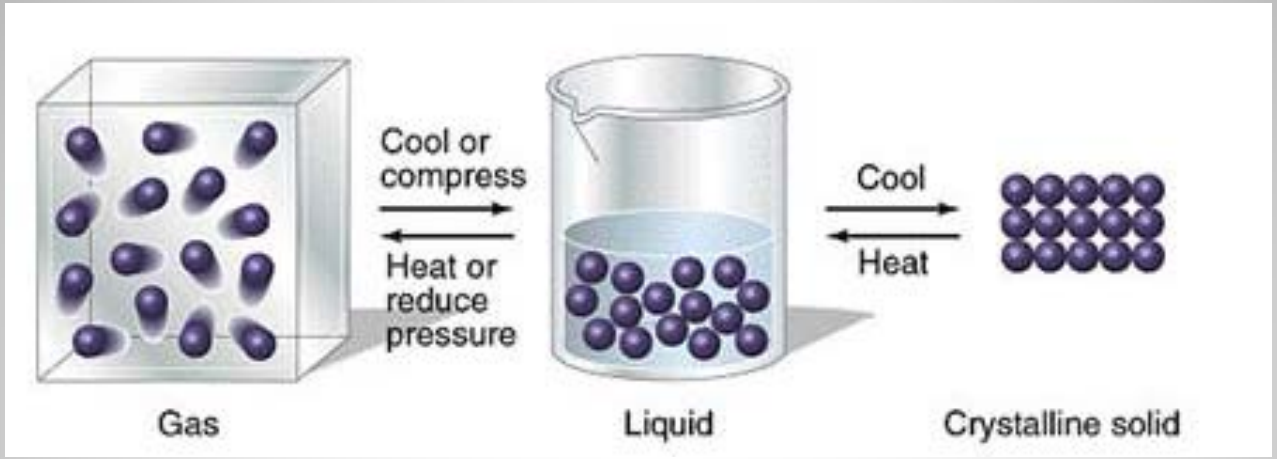
The diagram showing a soil profile might assist you in answering the following questions.

A. List and describe two factors that affect water retention in soil.
B. Describe the relationship between particle size and the ability of the soil to retain water.
C. Explain why the soil that forms in a desert climate will differ from the soil that forms in rainforest climate.



Physical Science

P.8.A.1 http://www.rpdp.net/sciencetips_v3/P8A1.htm



What happens to the particles of a gas as it changes into a liquid?

A. They slow down and spread apart because energy is being added.
B. They slow down and become closer because energy is being removed.
C. They speed up and spread apart because energy is being added.
D. They speed up and become closer because energy is being removed.

Physical Science

P.8.A.2 http://www.rpdp.net/sciencetips_v3/P8A2.htm

Use the periodic table on the next slide to answer the following question.

Which group of elements would be expected to have similar properties?

A. Oxygen, sulfur, selenium
B. Boron , carbon, nitrogen
C. Sodium, magnesium, aluminum
D. Neon, beryllium, iron

Periodic Table of the Elements

hydrogen 1 H 1.0079																	helium 2 He 4.0026
lithium 3 Li 6.941	beryllium 4 Be 9.0122											boron 5 B 10.811	carbon 6 C 12.011	nitrogen 7 N 14.007	oxygen 8 O 15.999	fluorine 9 F 18.998	neon 10 Ne 20.180
sodium 11 Na 22.990	magnesium 12 Mg 24.305											aluminium 13 Al 26.982	silicon 14 Si 28.086	phosphorus 15 P 30.974	sulfur 16 S 32.065	chlorine 17 Cl 35.453	argon 18 Ar 39.948
potassium 19 K 39.098	calcium 20 Ca 40.078	scandium 21 Sc 44.956	titanium 22 Ti 47.867	vanadium 23 V 50.942	chromium 24 Cr 51.996	manganese 25 Mn 54.938	iron 26 Fe 55.845	cobalt 27 Co 58.933	nickel 28 Ni 58.693	copper 29 Cu 63.546	zinc 30 Zn 65.39	gallium 31 Ga 69.723	germanium 32 Ge 72.61	arsenic 33 As 74.922	selenium 34 Se 78.96	bromine 35 Br 79.904	krypton 36 Kr 83.80
rubidium 37 Rb 85.468	strontium 38 Sr 87.62	yttrium 39 Y 88.906	zirconium 40 Zr 91.224	niobium 41 Nb 92.906	molybdenum 42 Mo 95.94	technetium 43 Tc [98]	ruthenium 44 Ru 101.07	rhodium 45 Rh 102.91	palladium 46 Pd 106.42	silver 47 Ag 107.87	cadmium 48 Cd 112.41	indium 49 In 114.82	tin 50 Sn 118.71	antimony 51 Sb 121.76	tellurium 52 Te 127.60	iodine 53 I 126.90	xenon 54 Xe 131.29
caesium 55 Cs 132.91	barium 56 Ba 137.33	57-70 *	lutetium 71 Lu 174.97	hafnium 72 Hf 178.49	tantalum 73 Ta 180.95	tungsten 74 W 183.84	rhenium 75 Re 186.21	osmium 76 Os 190.23	iridium 77 Ir 192.22	platinum 78 Pt 195.08	gold 79 Au 196.97	mercury 80 Hg 200.59	thallium 81 Tl 204.38	lead 82 Pb 207.2	bismuth 83 Bi 208.98	polonium 84 Po [209]	astatine 85 At [210]	radon 86 Rn [222]
francium 87 Fr [223]	radium 88 Ra [226]	89-102 **	lawrencium 103 Lr [262]	rutherfordium 104 Rf [261]	dubnium 105 Db [262]	seaborgium 106 Sg [266]	bohrium 107 Bh [264]	hassium 108 Hs [269]	meitnerium 109 Mt [268]	ununnilium 110 Uun [271]	unununium 111 Uuu [272]	ununbium 112 Uub [277]		ununquadium 114 Uuq [289]			

*Lanthanide series	lanthanum 57 La 138.91	cerium 58 Ce 140.12	praseodymium 59 Pr 140.91	neodymium 60 Nd 144.24	promethium 61 Pm [145]	samarium 62 Sm 150.36	europium 63 Eu 151.96	gadolinium 64 Gd 157.25	terbium 65 Tb 158.93	dysprosium 66 Dy 162.50	holmium 67 Ho 164.93	erbium 68 Er 167.26	thulium 69 Tm 168.93	ytterbium 70 Yb 173.04
**Actinide series	actinium 89 Ac [227]	thorium 90 Th 232.04	protactinium 91 Pa 231.04	uranium 92 U 238.03	neptunium 93 Np [237]	plutonium 94 Pu [244]	americium 95 Am [243]	curium 96 Cm [247]	berkelium 97 Bk [247]	californium 98 Cf [251]	einsteinium 99 Es [252]	fermium 100 Fm [257]	mendelevium 101 Md [258]	nobelium 102 No [259]

Physical Science

P.8.A.3 http://www.rpdp.net/sciencetips_v3/P8A3.htm

When salt dissolves in water, the water is the

A. solute.
B. solvent.
C. solubility.
D. solution.

Physical Science

P.8.A.3 http://www.rpdp.net/sciencetips_v3/P8A3.htm

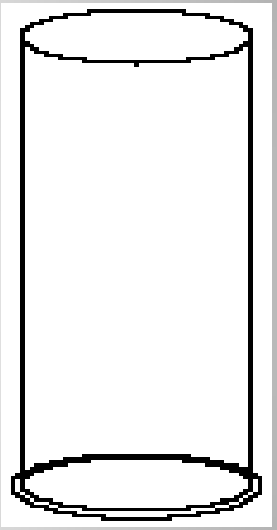
Which of the following describes the physical separation of the components of a mixture?

A. Water is broken down into hydrogen and oxygen.
B. Salt is isolated from seawater through evaporation.
C. Propane reacts with oxygen to form carbon dioxide and water.
D. Calcium carbonate decomposes to form calcium oxide and carbon dioxide.

Physical Science

P.8.A.3 http://www.rpdp.net/sciencetips_v3/P8A3.htm

A demonstration is performed using this cylinder (shown to the right), a small rubber ball, and three liquids. The liquids are mercury (density of 13.4 g/mL), vegetable oil (density of 0.8 g/mL), and water (density of 1.0 g/mL), which are poured into the cylinder.



A. Draw and label the arrangement of these three liquids within the cylinder. Justify the reasons for your arrangement of the liquids.

B. The small rubber ball, with a density of 0.9 g/mL, is dropped into the cylinder with the liquids. Predict where the ball will stop, draw it on the diagram, and justify your reasoning.

Physical Science

P.8.A.4 http://www.rpdp.net/sciencetips_v3/P8A4.htm

Which of the following is the **best** example of a chemical change?

A. Apples turning brown as they decompose.
B. Sugar cubes dissolving in water.
C. A glass breaking when it falls from a table.
D. Melted butter turning to solid when it cools.

Physical Science

P.8.A.4 http://www.rpdp.net/sciencetips_v3/P8A4.htm

How many different elements are in the compound sodium carbonate (Na_2CO_3)?

A. 3

B. 4

C. 6

D. 7

Physical Science

P.8.A.4 http://www.rpdp.net/sciencetips_v3/P8A4.htm

Pure water is neutral and has a pH of 7. When lemon juice is added to water the pH will become lower than 7 and turns litmus paper red. Lemon juice is

A. a salt.

B. an acid.

C. a base.

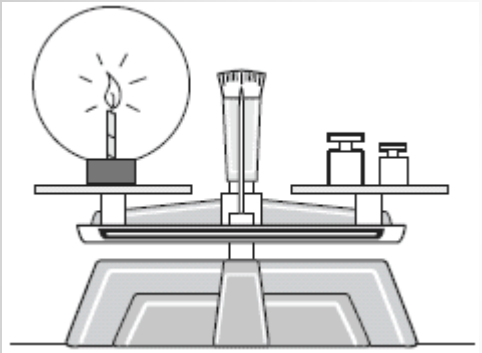
D. neutral.

Physical Science

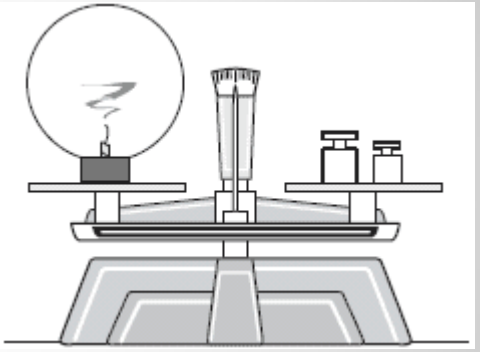
P.8.A.5 http://www.rpdp.net/sciencetips_v3/P8A5.htm

The diagram below shows a balance being used to measure a burning candle in a sealed glass ball before and after the burning is complete.

Before



After



As the candle burns, the size of the candle decreases, but the reading on the balance does not change. Which of the following is demonstrated by this experiment?

A. The total mass of the system is constant.
B. Energy is converted to mass when the candle is burned.
C. Smoke particles have more mass than the molecules of candle wax.
D. Kinetic energy is converted to potential energy when the candle is burned.

Physical Science

P.8.A.5 http://www.rpdp.net/sciencetips_v3/P8A5.htm

The chemical equation below represents the chemical reaction between the elements hydrogen and oxygen when the compound water is formed.

$$2H_2 + O_2 \rightarrow 2H_2O$$

This equation supports the law of conservation of mass because

A. the total number of hydrogen and oxygen atoms in the reactants and products is twelve.
B. the mass of hydrogen and oxygen in the reactants is equal to the mass of the water in the product.
C. atoms of the elements hydrogen and oxygen are in the reactants and also in the products.
D. atoms of the elements hydrogen and oxygen react to form molecules of the compound water

Physical Science

P.8.A.6 http://www.rpdp.net/sciencetips_v3/P8A6.htm

What is the smallest unit of an element that still has the properties of that element?

A. An atom
B. A compound
C. An electron
D. A molecule

Physical Science

P.8.A.7 http://www.rpdp.net/sciencetips_v3/P8A7.htm

Which of the following comparisons correctly describes subatomic particles?

A. An electron has a negative charge and a mass greater than a proton.
B. A neutron has a negative charge and a mass less than the mass of a proton.
C. A neutron has a neutral charge and a mass greater than an electron.
D. A proton has a positive charge and a mass less than the mass of an electron.

Physical Science

P.8.A.8 http://www.rpdp.net/sciencetips_v3/P8A8.htm

Atoms of different elements are unique from one another due to their number of

A. protons.
B. electrons.
C. neutrons.
D. nucleons.

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

A girl riding on a skateboard at 2 m/s suddenly hits the curb. The girl will fall

A. backward with a speed greater than 2 m/s.
B. forward with a speed greater than 2 m/s.
C. backward at a speed equal to 2 m/s.
D. forward at a speed equal to 2 m/s.

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

A car is traveling at a constant speed of 5 m/s. How far will the car travel in ten minutes?

A. 300 m
B. 500 m
C. 1500 m
D. 3000 m

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

A 2000 kg car is pulling a 1000 kg trailer. The car's engine exerts a 6000 N force to move the car and the trailer. In addition, the car and the trailer each experience a 1000 N frictional force as they are being pulled, as represented below.

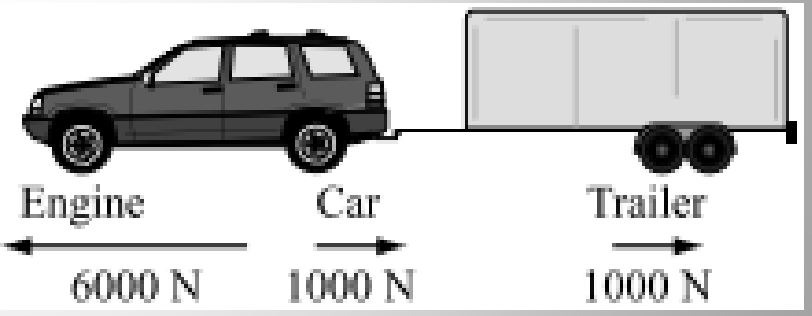
What is the magnitude of the net force on this system?

A. 2000 N

B. 4000 N

C. 5000 N

D. 8000 N



From: http://www.doe.mass.edu/

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

A bat strikes a baseball into the outfield. If the action force is the bat hitting the ball, the reaction force is

A. the ball hitting the bat.
B. the ball hitting the ground.
C. the ball flying into the air.
D. the bat being dropped.

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

A car is parked on a hill. Which of the following **most likely** prevents the car from moving down the hill?

A. The car has too much mass to move easily.

B. There is friction in the door hinges of the car.

C. There is friction between the tires and the ground.

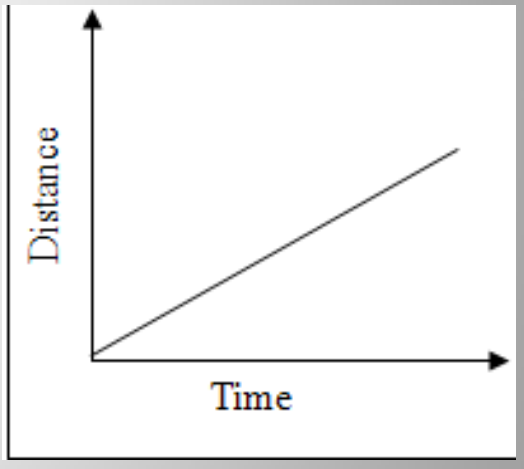
D. The weight of the car is mostly on the front wheels.

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

Below is a **distance vs. time** graph showing the action of a person over time.

What statement is the **best** description of the person's action?



A. The person is walking up a large hill.
B. The person is walking faster as time increases.
C. The person is walking at a slowing speed up a hill.
D. The person is walking at a constant speed.

Physical Science

P.8.B.1 http://www.rpdp.net/sciencetips_v3/P8B1.htm

Below is a **velocity vs. time** graph showing the movement of a train over time. Use this graph to answer the following question.

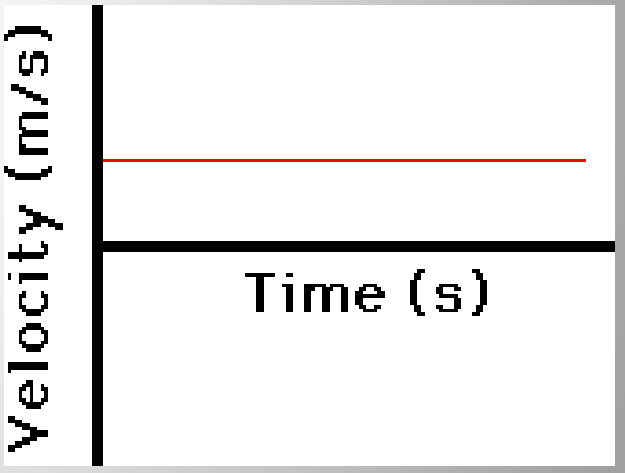
What statement is the **best** description of the train's motion?

A. The train is not moving in any direction.

B. The train is continuously accelerating.

C. The train is moving with a constant velocity.

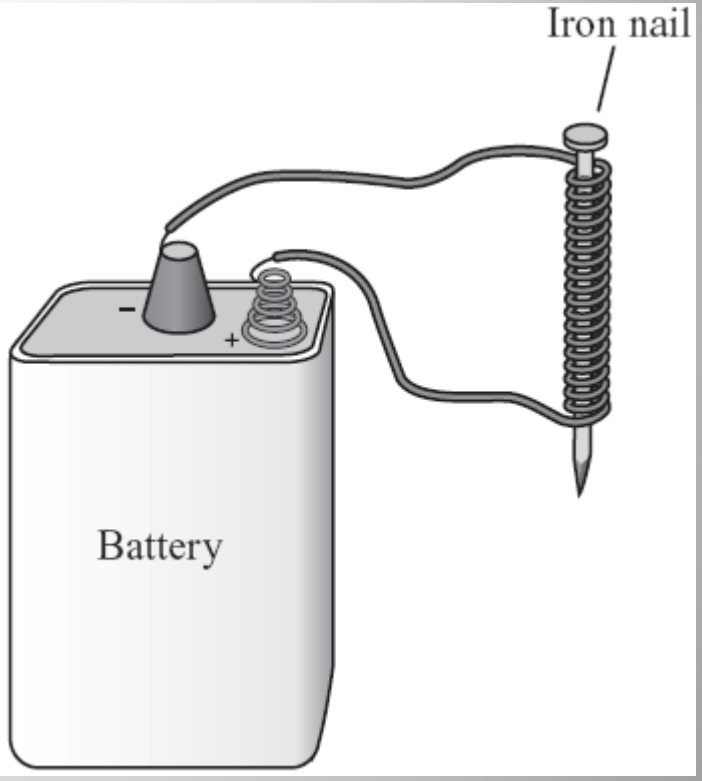
D. The train is accelerating slowly.



Physical Science

P.8.B.2 http://www.rpdp.net/sciencetips_v3/P8B2.htm

During a science investigation, a student made the device shown below.



From: http://www.doe.mass.edu/

This device can best be used as a

A. heater.
B. magnet.
C. light source.
D. simple radio.

Physical Science

P.8.B.2 http://www.rpdp.net/sciencetips_v3/P8B2.htm

Which of the following will **increase** the strength of the magnetic field in an electromagnet?

A. Decreasing the current in the wire that surrounds the iron core.
B. Removing the iron core from the center of the electromagnet.
C. Decreasing the number of loops of wire around the iron core.
D. Increasing the number of loops of wire around the iron core.

Physical Science

P.8.B.3 http://www.rpdp.net/sciencetips_v3/P8B3.htm

Astronauts on the orbiting space station 335 km above Earth appear to be weightless because

A. there is no gravity in space so they do not weigh anything.
B. space is a vacuum and there is no gravity in a vacuum.
C. they are too far from Earth to have weight.
D. the astronauts are in a state of free fall.

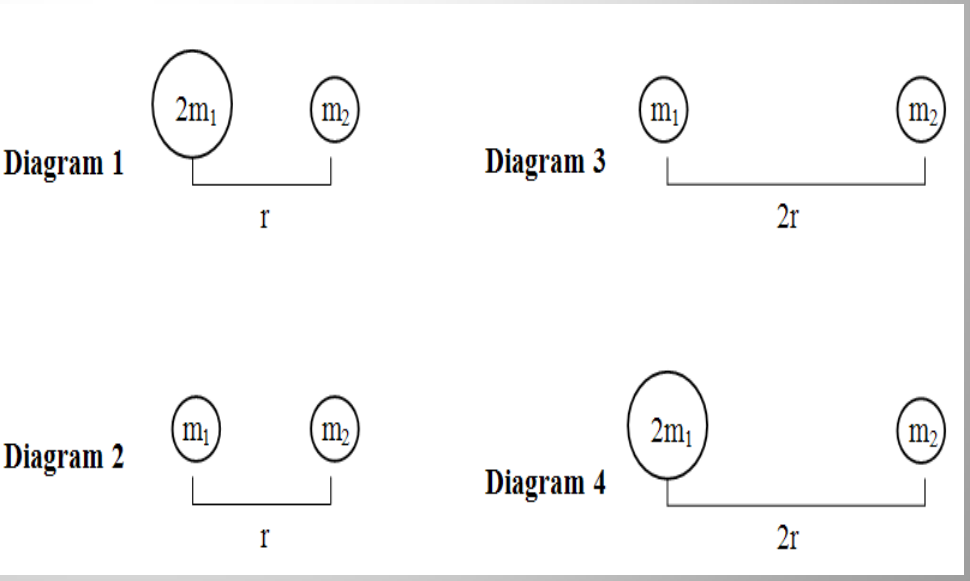
Physical Science

P.8.B.3 http://www.rpdp.net/sciencetips_v3/P8B3.htm

In each diagram below, the mass of two objects is labeled. These masses are separated by a radius.

Which diagram would produce the **greatest** gravitational force between the two objects?

A. Diagram 1
B. Diagram 2
C. Diagram 3
D. Diagram 4



Physical Science

P.8.C.1 http://www.rpdp.net/sciencetips_v3/P8C1.htm

What part of the electromagnetic spectrum can be directly observed by humans?

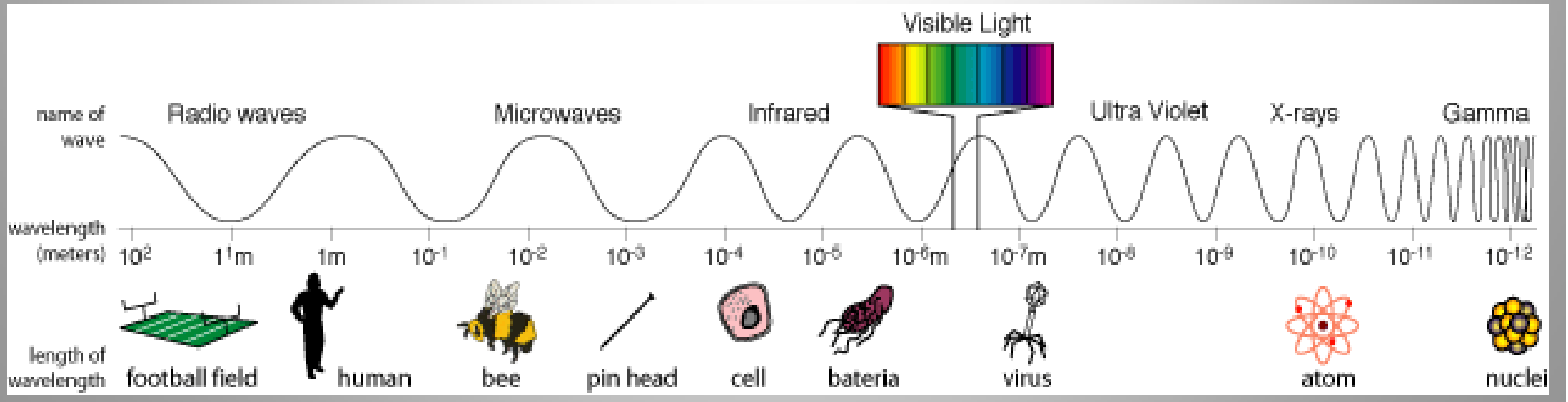
A. Visible light
B. Radio waves
C. Ultraviolet light
D. Gamma rays

Physical Science

P.8.C.1 http://www.rpdp.net/sciencetips_v3/P8C1.htm

Which type of electromagnetic wave has the longest wavelength?

A. Visible light
B. Radio waves
C. Ultraviolet
D. Gamma rays



Physical Science

P.8.C.1 http://www.rpdp.net/sciencetips_v3/P8C1.htm

There are two bright stars in a constellation. One of the stars appears blue. The other star appears red. Which of the following is the **best** explanation for the difference in the stars' color? The blue star must

A. have a smaller mass compared to the red star.

B. be larger size compared to the red star.

C. have a greater surface temperature compared to the red star.

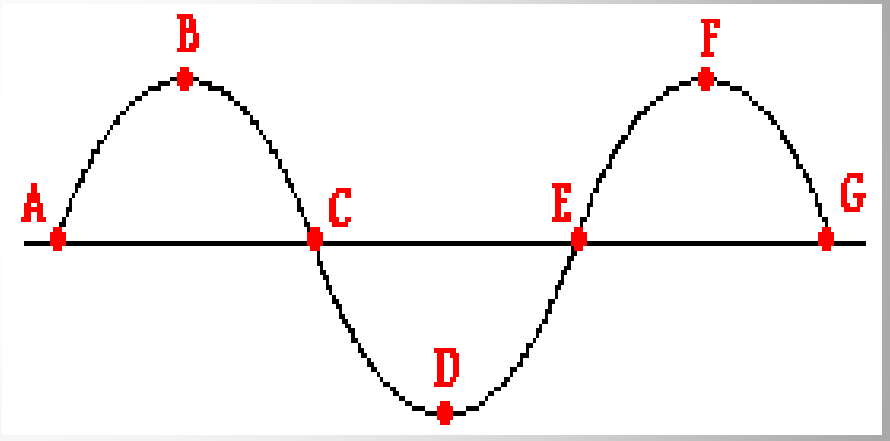
D. be moving toward the Earth and the red star away from Earth.

Physical Science

P.8.C.2 http://www.rpdp.net/sciencetips_v3/P8C2.htm

Use the diagram below to answer the following question.

Which interval represents one full wavelength?



A. Point A to Point C
B. Point B to Point D
C. Point A to Point G
D. Point C to Point G

Physical Science

P.8.C.2 http://www.rpdp.net/sciencetips_v3/P8C2.htm

The distance between the Earth and the Moon was determined by measuring the time it took for light waves from Earth to travel to the Moon and back. Why was it **not** possible to use sound waves for this experiment?

A. Sound waves must move through a medium.
B. Sound waves would change frequency on the return to Earth.
C. Sound waves move too slowly for the technique to be accurate.
D. Sound waves move more slowly in Earth's atmosphere than in space.

Physical Science

P.8.C.2 http://www.rpdp.net/sciencetips_v3/P8C2.htm

The reason a fire truck's siren sounds higher in pitch as it approaches you is because the truck pushes the sound waves together so that the sound wavelengths in front of the truck get shorter. This causes

A. frequency to increase which increases the pitch.
B. amplitude to decrease which increases the frequency.
C. frequency to decrease which decreases the pitch.
D. wavelengths to elongate increasing the pitch.

Physical Science

P.8.C.2 http://www.rpdp.net/sciencetips_v3/P8C2.htm

When a student listens to music, sound waves propagate from the speaker to her ear. Which of the following is a physical description of this process?

A. Particles produced at the speaker move to the student's ear.

B. Energy is transported from the speaker to the student's ear.

C. Material is transferred from the speaker to the student's ear.

D. Clusters of air molecules are sent from the speaker to the student's ear.

Physical Science

P.8.C.2 http://www.rpdp.net/sciencetips_v3/P8C2.htm

Sound is a form of energy that is transmitted through vibrations.

A. Describe how sound waves are affected by their frequency and the medium through which the sound wave passes.

B. A science fiction film shows an explosion in space that is heard by the space travelers on board a spaceship. Critique this portrayal and provide evidence for your argument.

Physical Science

P.8.C.3 http://www.rpdp.net/sciencetips_v3/P8C3.htm

Which of the following types of reactions will release the **most** energy per kilogram of reactant?

A. Chemical synthesis
B. Chemical combustion
C. Nuclear fusion
D. Nuclear fission

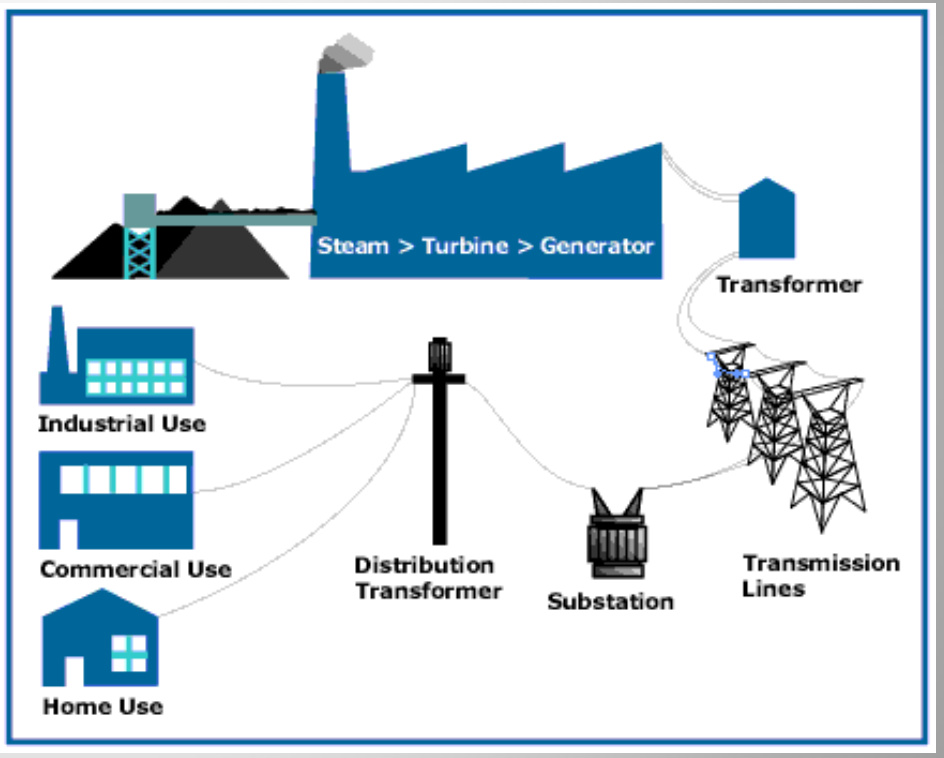
Physical Science

P.8.C.3 http://www.rpdp.net/sciencetips_v3/P8C3.htm

This picture shows the path that energy takes from the power plant to your home.

A. Starting at the power plant, explain what form the energy is in. As the energy travels to the next location in the picture, explain how the energy is transformed. Continue explaining how energy is transformed until it reaches the end user (labeled “industrial use,” “commercial use,” and “home use”). Some transitions may contain more than one transformation.

B. Will all of the energy from the power plant reach the end users? Justify why or why not.



From: http://www.tvakids.com/electricity/transmission.htm

Physical Science

P.8.C.4 http://www.rpdp.net/sciencetips_v3/P8C4.htm

Which of the following is a transfer of chemical energy to thermal energy?

A. A hairdryer is turned on to dry a girl's hair.
B. A boy digests an apple which regulates his body temperature.
C. An atom is split to increase the temperature of water
D. An ice cube is placed in warm soup and melts.

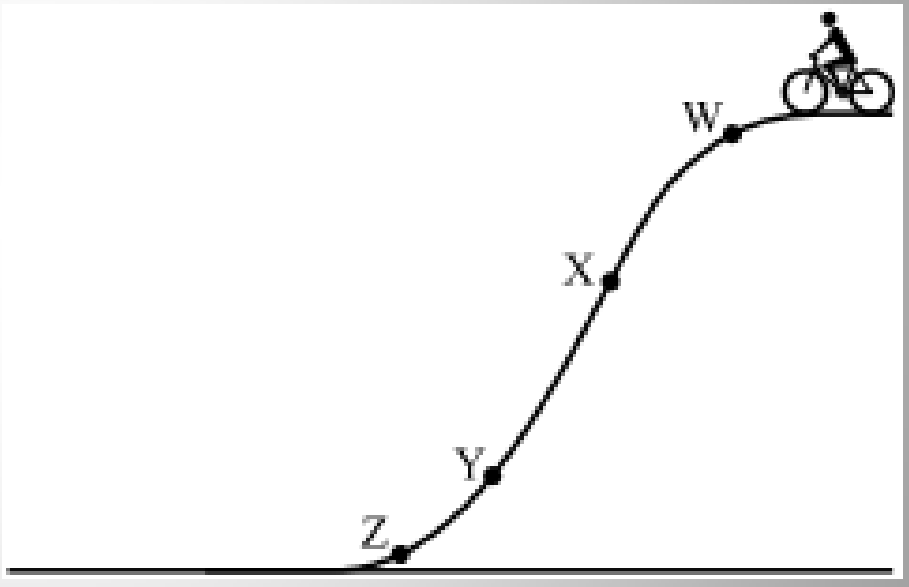
Physical Science

P.8.C.4 http://www.rpdp.net/sciencetips_v3/P8C4.htm

The diagram below represents a bicyclist at the top of a hill, with four points labeled W, X, Y, and Z.

Assume that the bicyclist does not apply the brakes as he rides down the hill. At which point will the bicyclist's kinetic energy be closest to zero?

A. Point W
B. Point X
C. Point Y
D. Point Z



From: http://www.doe.mass.edu/mcas/

Physical Science

P.8.C.4 http://www.rpdp.net/sciencetips_v3/P8C4.htm

A toy car with initial kinetic energy rolls to a stop along a flat track. Because of friction, some of kinetic energy was transferred to

A. thermal energy.
B. gravitational potential energy.
C. elastic energy.
D. chemical energy.

Physical Science

P.8.C.4 http://www.rpdp.net/sciencetips_v3/P8C4.htm

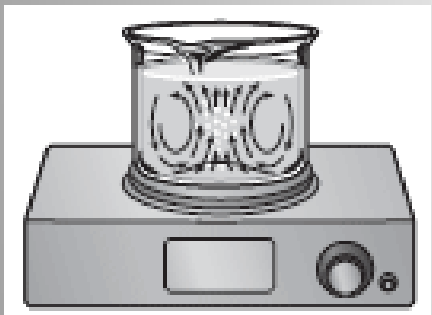
A student bends a paperclip rapidly back and forth. When he touches the point where he was bending the paperclip, he finds that its temperature has increased. This indicates that the atoms in that part of the paperclip have increased in

A. conductivity.
B. mass.
C. density.
D. kinetic energy.

Physical Science

P.8.C.5 http://www.rpdp.net/sciencetips_v3/P8C5.htm

Which of the following is the **best** example of heat transfer by radiation?

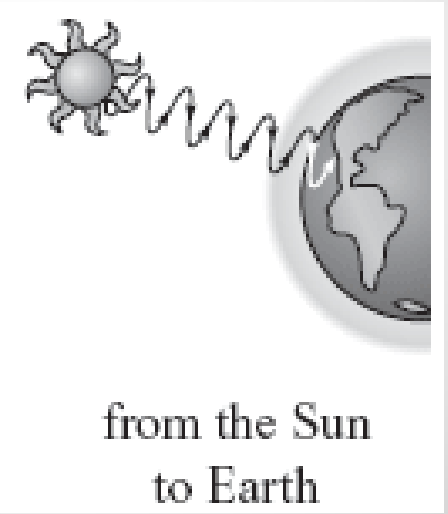


from the lower water to the surface

A.

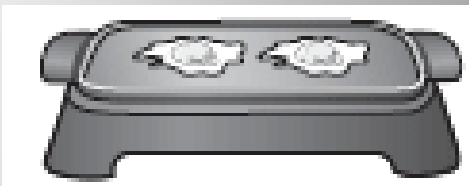
from the iron to the shirt

B.



from the Sun to Earth

C.



from the griddle to the eggs

D.

From: http://www.doe.mass.edu/mcas/

Physical Science

P.8.C.5 http://www.rpdp.net/sciencetips_v3/P8C5.htm

The diagram below represents an electric furnace.

Cold air enters through the cold air return and hot air is blown out the supply duct.

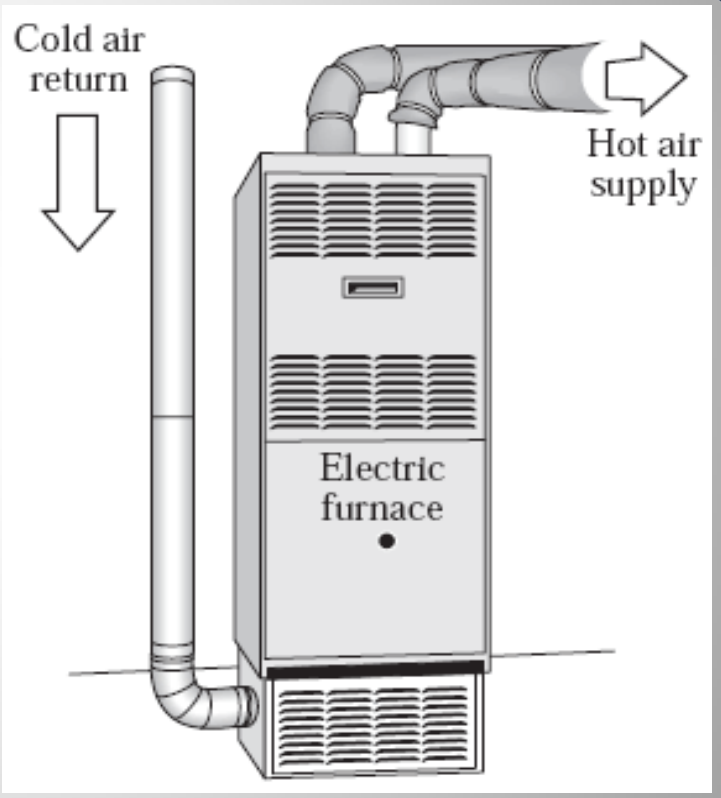
Which statement **best** describes heat transfer within the furnace?

A. The furnace transfers heat by condensation.

B. The furnace transfers heat through combustion.

C. The furnace decreases heat transfer by radiation.

D. The furnace increases heat transfer through convection.



From: http://www.doe.mass.edu/mcas/

Physical Science

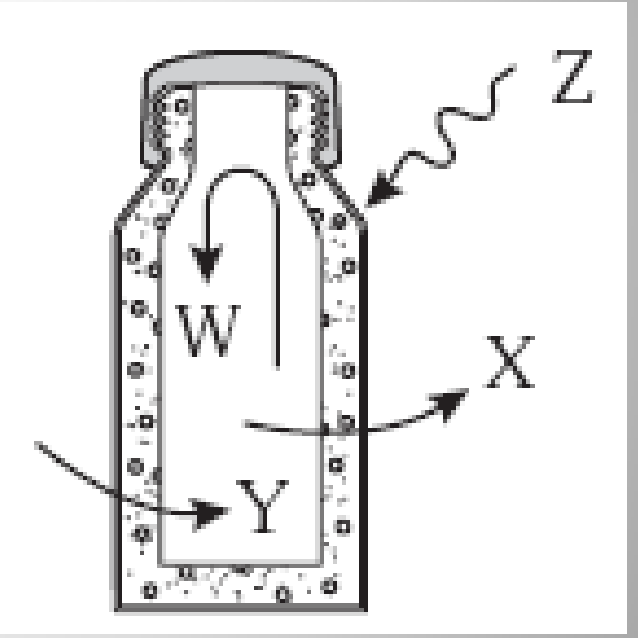
P.8.C.5 http://www.rpdp.net/sciencetips_v3/P8C5.htm

The drawing below shows a cross section of an insulated bottle filled with hot tea. Several arrows labeled W, X, Y, and Z are drawn to show possible paths for heat transfer.

This insulated bottle was filled with hot tea and allowed to sit at room temperature for several hours. The temperature of the tea cooled from 86°C to 58°C.

Which of the following **best** represents the heat transfer path by conduction as the tea cools?

A. W
B. X
C. Y
D. Z

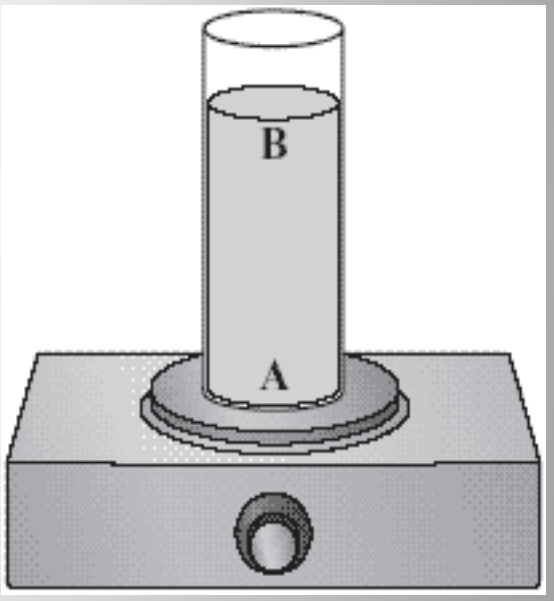


From: http://www.doe.mass.edu/mcas/

Physical Science

P.8.C.5 http://www.rpdp.net/sciencetips_v3/P8C5.htm

The illustration shows a container of water on an electric hot plate. Point A represents the point closest to the heat source and point B is near the top of the container. The water in the container is at room temperature before the hot plate is turned on.



A. Describe the differences in the average motion of the water molecules at point A and at point B shortly after the hot plate is turned on.

B. The water is heated until a thermometer placed in the center of the container reaches 100°C. Compare the average motion of the water molecules at points A and B at this temperature and explain your answer.

C. The hot plate is then turned off. Predict the average motion of the molecules at points A and B after several hours.

Physical Science

P.8.C.6 http://www.rpdp.net/sciencetips_v3/P8C6.htm

The difference between a parallel and series circuit is

A. the number of loads on the circuit.
B. the number of energy sources on the circuit.
C. the number of switches on the circuit.
D. the number of paths on the circuit.

Physical Science

P.8.C.6 http://www.rpdp.net/sciencetips_v3/P8C6.htm

Which of the following describes the primary function of an alkaline battery in the circuit of a typical flashlight?

A. It opens and closes the circuit path.

B. It provides resistance to generate light.

C. It converts chemical energy to electrical energy for the circuit.

D. It serves as a conductor through which electrical energy flows.

Physical Science

P.8.C.6 http://www.rpdp.net/sciencetips_v3/P8C6.htm

What function does a circuit serve in your home?

A. It protects your home against lightning strikes.
B. It increases the voltage from the power lines outside your house.
C. It provides a complete path through which electrical energy can flow.
D. It provides a barrier against electromagnetic radiation from the outside.

Physical Science

P.8.C.6 http://www.rpdp.net/sciencetips_v3/P8C6.htm

A teenager removes the plastic wrapping from a music CD. The pieces of wrap cling to her hand.

Which force causes the wrap to cling to her hand?

A. Electrostatic
B. Gravitational
C. Magnetic
D. Nuclear