Virginia SOL Test Items for CU and PK Comparison

PRESENTER'S KEY

Which of these *best* describes the niche of a lion?

A: **F:** Parasite

B: **G:** Prey

✓ **C:** **H:** Predator

D: **J:** Producer

VA SOL Released Spring 2000 Grade 8 Science, Question #39

PROCEDURAL KNOWLEDGE ITEM

Probing bill Grasping bill Crushing bill

Finches found on the isolated Galapagos islands are different species with different beak sizes and shapes, but are otherwise similar to a finch species found on the South American mainland.

Question 1

What might be the cause of the differences in the development of the beaks of these Galapagos finches?

✓ **A:** **F:** The different types of food available on the islands

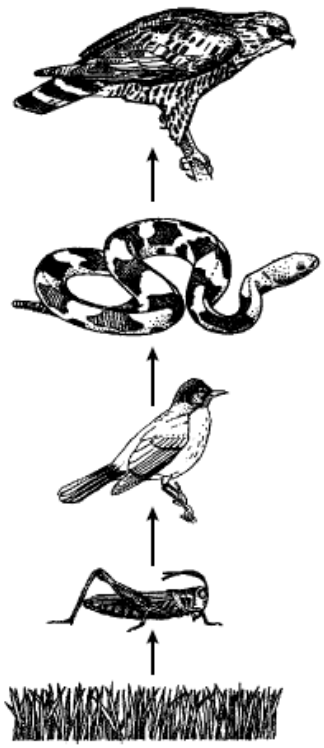
B: **G:** The original source of the finches

C: **H:** The differences in the types of nests the birds built

D: **J:** The type of predators found on the islands

VA SOL Released Spring 2000 Grade 8 Science, Question #49

CONCEPTUAL UNDERSTANDING ITEM



In a food chain, the numbers of each type of population are usually in a relatively stable combination. A diagram of a food chain is shown above.

Question 1

If humans interfered by spraying an insecticide to kill the insects, what would be the next thing that would happen?

A: **F:** The number of hawks would increase.

✓ **B:** **G:** The number of songbirds would decrease.

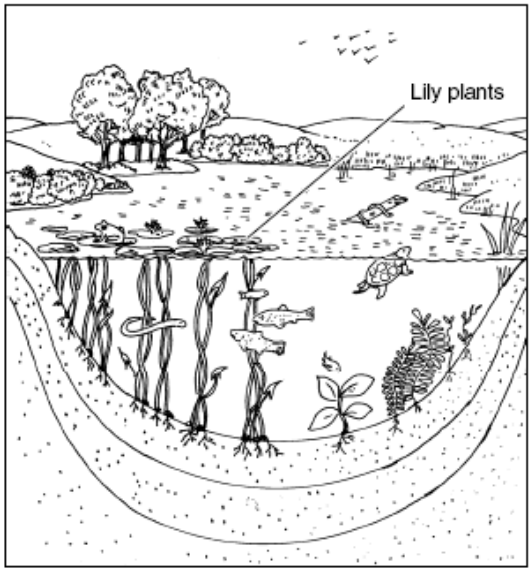
C: **H:** The number of grass plants would decrease.

D: **J:** The number of snakes would increase.

VA SOL Released Spring 2005 Grade 8 Science Question #33

CONCEPTUAL UNDERSTANDING ITEM

The picture shows a pond ecosystem.



Question 1

What would *most likely* happen if all the lily plants were removed from this community?

A: **F:** There would be more oxygen in the air.

B: **G:** The pond water currents would be slower.

C: **H:** There would be more kinds of animals in the pond.

✓ **D:** **J:** The animals would have fewer places to hide.

VA SOL Released Spring 2004 Grade 8 Science, Question 40

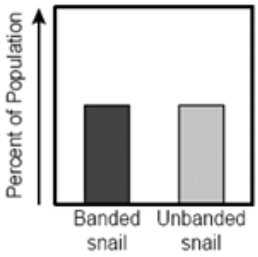
CONCEPTUAL UNDERSTANDING ITEM

Fifty banded and fifty unbanded snails of the same species were released in an area where the banded snails are easily camouflaged.

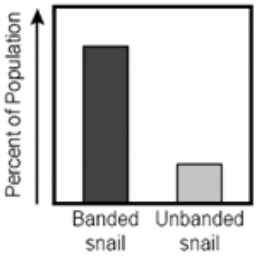
Question 1

Which of the following *best* represents the population of these snails after one year?

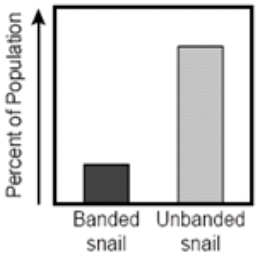
A: **F:**



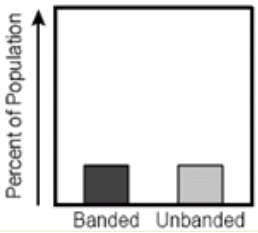
✓ **B:** **G:**



C: **H:**

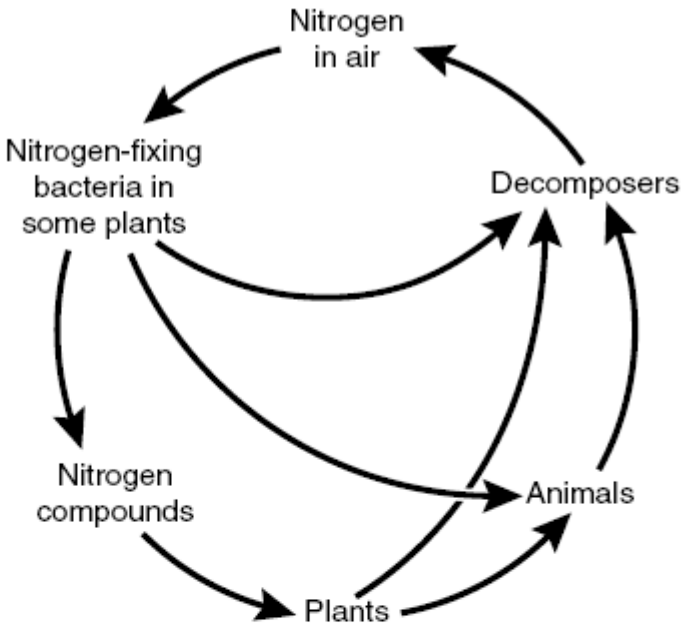


D: **J:**



CONCEPTUAL UNDERSTANDING ITEM

VA SOL Released Spring 2000 Grade 8 Science, Question #50



Which process is responsible for returning nitrogen to the air?

A: **F:** Excretion

✓ **B:** **G:** Decomposition

C: **H:** Photosynthesis

D: **J:** Nitrification

VA SOL Released Spring 2004 Biology EOC, Question #22

PROCEDURAL KNOWLEDGE ITEM

Bear Ranges and Food Sources

Species	Range	Foods
Brown bear	Europe, Asia, Canada, Western U.S. and Alaska	Fruits, nuts, roots, insects, fish, small vertebrates, and carrion
Black bear	Canada, U.S., Northern Mexico	Fruits, berries, nuts, roots, honey, insects, rodents, fish, and carrion
Polar bear	Arctic	Seals, fish, seabirds, hares, caribou, and musk oxen
Panda	Mountains of Central China	Bamboo stems and leaves

Which of these species would be *most* in danger of becoming extinct if one of their food sources became unavailable?

A: **F:** Brown bear

✓ **B:** **G:** Panda

C: **H:** Polar bear

D: **J:** Black bear

PROCEDURAL KNOWLEDGE ITEM

VA SOL Released Spring 2004 Grade 8 Science, Question #5

Otters have adaptive traits that allow them to survive by eating shellfish and crustaceans. If changes in biotic factors of the ecosystem result in reduced numbers of shellfish and crustaceans, the otters will *most* likely -

✓ **A:** **F:** experience a population decline

B: **G:** adapt to a different ecosystem

C: **H:** change the genetic makeup of their bodies

D: **J:** increase reproduction rates

VA SOL Released Spring 2009 Grade 8 Science SOL, Question #39

CONCEPTUAL UNDERSTANDING ITEM

Mouse Number	Food	Week 1 Mass Gain	Week 2 Mass Gain	Total Mass Gained
1	Rice	6 g	8 g	14 g
2	Grain	5 g	4 g	9 g
3	Corn	8 g	4 g	12 g
4	Mixture	12 g	8 g	20 g

Using the table above, what can you say about the relationship between the type of food and the mass of the mouse?

✓ **A:** **F:** The mixture-fed mouse gained the most mass.

B: **G:** The rice-fed mouse gained the least mass.

C: **H:** The grain-fed mouse gained more mass in week 2.

D: **J:** The corn-fed mouse gained less mass in week 1.

VA SOL Released Spring 2000 Grade 8 Science, Question #9

PROCEDURAL KNOWLEDGE ITEM

Which amphibian is *most* aquatic?

A: **F:**

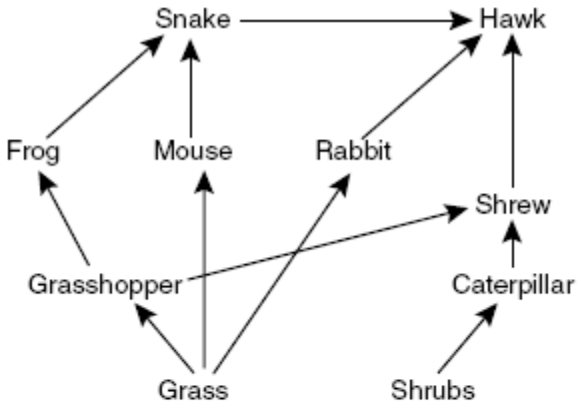
B: **G:**

✓ **C:** **H:**

D: **J:**

VA SOL Released Spring 2002 Grade 8 Science, Question #34

CONCEPTUAL UNDERSTANDING ITEM



In this food web, which organism has the greatest number of food sources?

A: **F:** Snake

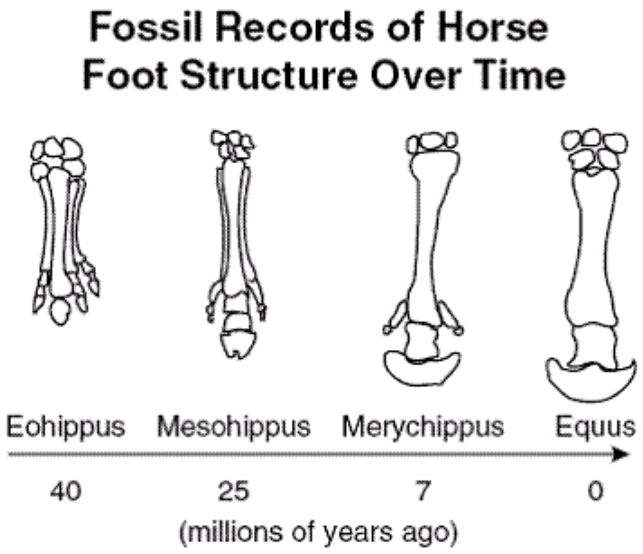
✓ **B:** **G:** Hawk

C: **H:** Shrew

D: **J:** Mouse

VA SOL Released Spring 2004 Grade 8 Science, Question #49

PROCEDURAL KNOWLEDGE ITEM



According to the diagram, during the last 40 million years, the structure of the horse's foot has ---

✓ **A:** **F:** lost its toes

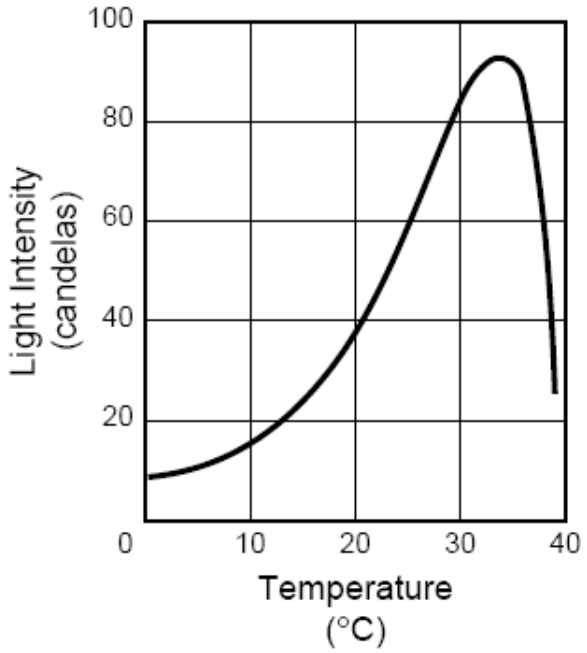
B: **G:** become smaller

C: **H:** grown toes

D: **J:** remained the same size

VA SOL Released Spring 2004 Biology, Question #24

PROCEDURAL KNOWLEDGE ITEM



Artificial lights can create a great deal of heat. If a gardener wanted to grow seedlings indoors that grow best at 25°C, which light intensity should be used?

A: **F:** 85 candelas

B: **G:** 60 candelas

C: **H:** 25 candelas

D: **J:** 15 candelas

VA SOL Released Spring 2000 Grade 8 Science, Question #8

PROCEDURAL KNOWLEDGE ITEM

After fishing in the ocean, a student left his fishing gear in the sun to dry. Later, he noticed that small white crystals had formed on the rod, reel, and fishing line. Which of these is the *best* explanation of what occurred?

A: **F:** The water evaporated from the fishing gear, and sand was attracted to it.

B: **G:** The fish that were caught left scales on the fishing gear.

C: **H:** The salt in the ocean water reacted with the fishing gear and caused it to rust.

✓ **D:** **J:** The water evaporated from the fishing gear, and salt from the ocean was left behind.

VA SOL Released Spring 2005 Grade 8 Science, Question #20

CONCEPTUAL UNDERSTANDING ITEM

John and Emily were experimenting with the effects of road salt on plant growth. To do this, they watered plants daily with the same amount of salt water. They could *best* improve their experiment by ---

A: **F:** increasing the amount of salt added to the water each day

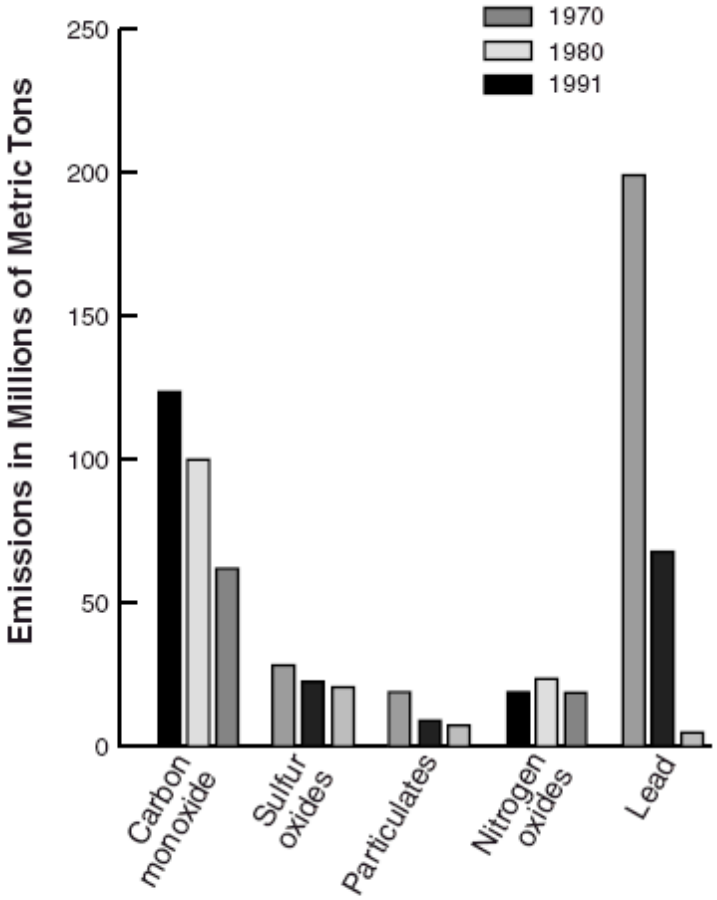
B: **G:** cooling the salt water before watering the plants

C: **H:** adding food color to see how far the salt penetrates the plants

✓ **D:** **J:** watering half the plants with pure water and half with salt water

VA SOL Released Spring 2004 Grade 8 Science, Question #48

CONCEPTUAL UNDERSTANDING ITEM



According to the graph, which air pollutant decreased the *most* from 1970 to 1991?

A: **F:** Carbon monoxide

B: **G:** Sulfur oxides

C: **H:** Particulates

✓ **D:** **J:** Lead

PROCEDURAL KNOWLEDGE ITEM

VA SOL Released Spring 2005 Grade 8 Science, Question #2

Because burning fossil fuels creates much pollution, alternatives are being investigated. What might limit the use of wind as a major energy source?

✓ **A:** **F:** The strength of the wind varies.

B: **G:** Wind machines have huge blades to capture the wind.

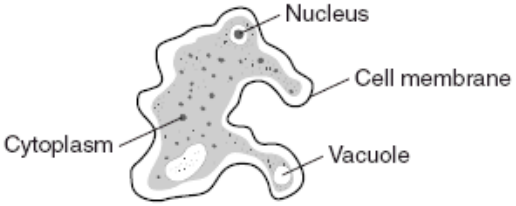
C: **H:** Turbines and generators in the wind machines create electricity.

D: **J:** Wind power does not create pollution.

VA SOL Spring 2003 Grade 8 Science, Question #24

CONCEPTUAL UNDERSTANDING ITEM

Single-Celled Organism



In this diagram of a single-celled organism, which organelle functions as a place to store extra water?

A: **F:** Cell membrane

✓ **B:** **G:** Vacuole

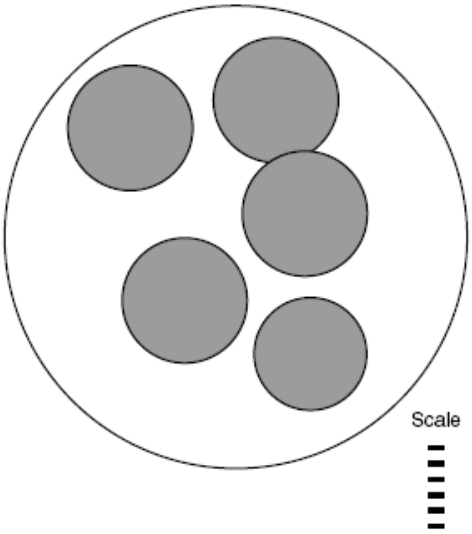
C: **H:** Cytoplasm

D: **J:** Nucleus

VA SOL Released Spring 2005 Grade 8 Science, Question #7

PROCEDURAL KNOWLEDGE ITEM

The picture represents five red blood cells seen through a microscope. The lines represent a scale also visible through the microscope. Each division on the scale represents one micrometer.



Question 1

Use the scale to estimate the diameter of the average red blood cell.

A: **F:** 4-5 micrometers

B: **G:** 7-8 micrometers

C: **H:** 10-11 micrometers

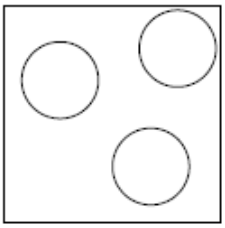
D: **J:** 12-13 micrometers

VA SOL Released Spring 2003 Grade 8 Science, Question #21

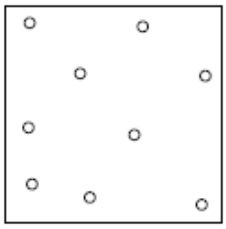
PROCEDURAL KNOWLEDGE ITEM

Some students were building models of solids, liquids, and gases by gluing plastic balls to a sheet of cardboard. Which of their models *best* shows the particles in a solid?

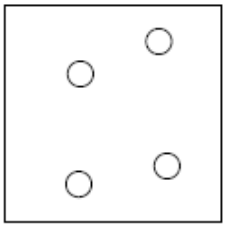
A: **F:**



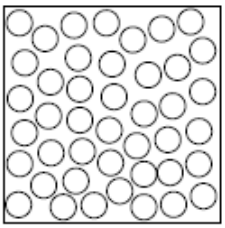
B: **G:**



C: **H:**



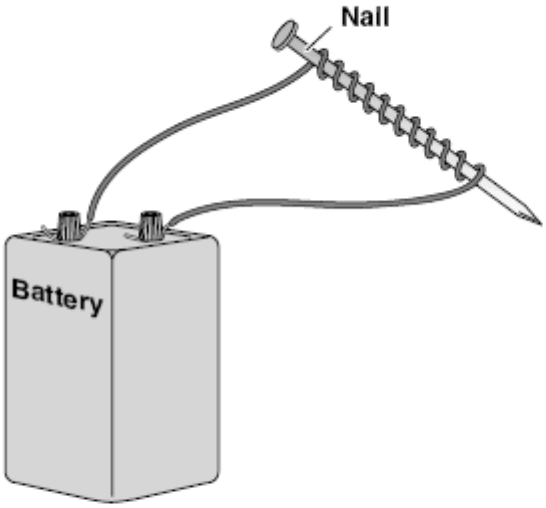
✓ **D:** **J:**



CONCEPTUAL UNDERSTANDING ITEM

VA SOL Released Spring 2000 Grade 8 Science, Question #20

This picture shows how to make an electromagnet.



Question 1

Which of these would make the electromagnet strongest?

A: **F:** Using a longer wire from the battery to the nail

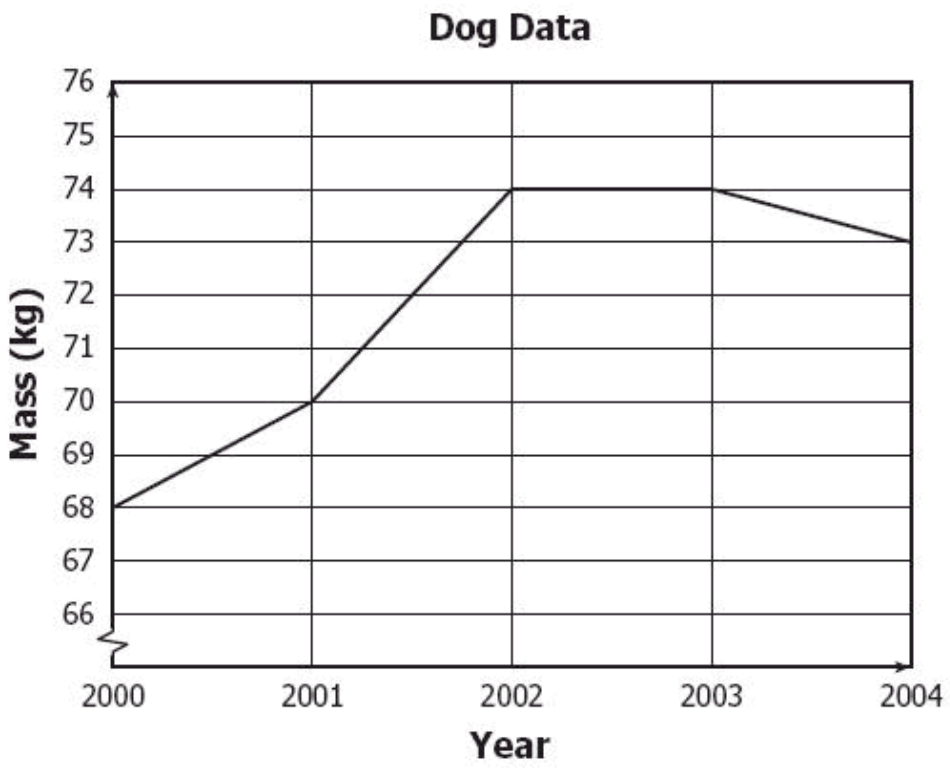
✓ **B:** **G:** Wrapping the wire around the nail more times

C: **H:** Wrapping the wire around a nonmetallic object

D: **J:** Making the loops of wire less tightly coiled

VA SOL Released Spring 2001 Grade 8 Science, Question #10

CONCEPTUAL UNDERSTANDING ITEM



The line graph shows five years of data about a dog. What information does the graph show?

✓ **A:** **F:** How the mass of the dog changed

B: **G:** How much food the dog consumed

C: **H:** What kinds of food the dog consumed

D: **J:** When the dog was measured each month

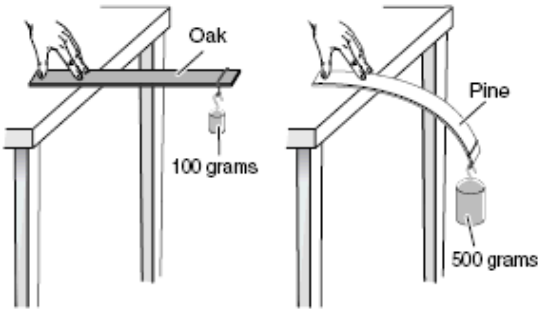
VA SOL Released Spring 2009 Grade 8 Science SOL, Question #1

PROCEDURAL KNOWLEDGE ITEM

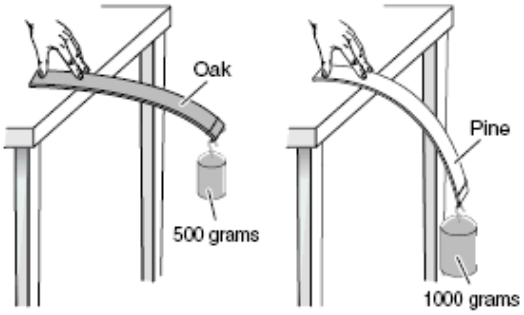
Which of these would be the *best* way to prove that a pine stick is more flexible than an oak stick?

VA

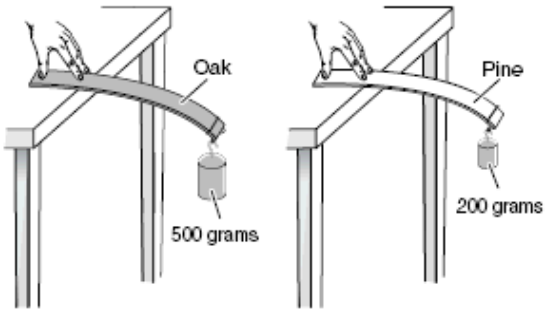
A: **F:**



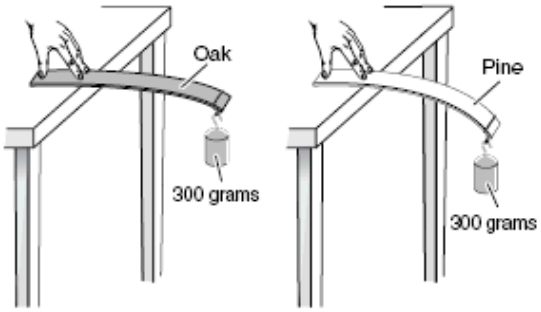
B: **G:**



C: **H:**



✓ **D:** **J:**



CONCEPTUAL UNDERSTANDING ITEM

SOL Released Spring Grade 8 Science, Question #23

Unknown Liquids Data

Sample	Indicator	Color Change	Identification
Unknown 1	Litmus Paper	Red	Acid
Unknown 2	Litmus Paper	Pink	Acid
Unknown 3	Litmus Paper	Pink	Acid
Unknown 4	Litmus Paper	Blue	Base

Students conducted an investigation to determine if unknown liquids were acids or bases. What was the independent variable in this investigation?

A: **F:** Sample

B: **G:** Indicator

C: **H:** Color change

D: **J:** Identification

VA SOL Released Spring 2009 Grade 8 Science SOL, Question #47

CONCEPTUAL UNDERSTANDING ITEM

A student wanted to test the hypothesis that adding antifreeze to water lowers the freezing point of water. The student found that pure water froze at 0°C, while the water/antifreeze mixture froze at -20°C. In order to confirm the results, the student should repeat the experiment using ---

A: **F:** a container of a different size

B: **G:** a different amount of antifreeze

C: **H:** a different amount of water

✓ **D:** **J:** exactly the same set-up as the first experiment

VA SOL 2002 Grade 8 Science, Question #4

CONCEPTUAL UNDERSTANDING ITEM

5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.007
13 Al Aluminum 26.982	14 Si Silicon 28.086	15 P Phosphorous 30.974

KEY

17	Atomic Number
Cl	Symbol
Chlorine	Name
35.453	Average Atomic Mass

Which of these elements has the *greatest* average atomic mass?

A: **F:** B

B: **G:** C

C: **H:** N

✓ **D:** **J:** Al

VA SOL Released Spring 2001 Grade 8 Science #16

PROCEDURAL KNOWLEDGE ITEM

At what speed would a car have to move in order to travel 20 kilometers in two hours?

A: **F:** 5 km/hr

✓ **B:** **G:** 10 km/hr

C: **H:** 20 km/hr

D: **J:** 40 km/hr

VA SOL Released Spring 2004 Grade 8 Science, Question #7

PROCEDURAL KNOWLEDGE ITEM

An example of kinetic energy continuously being changed to potential energy and back again might be ---

✓ **A:** **F:** a girl swinging on a swing

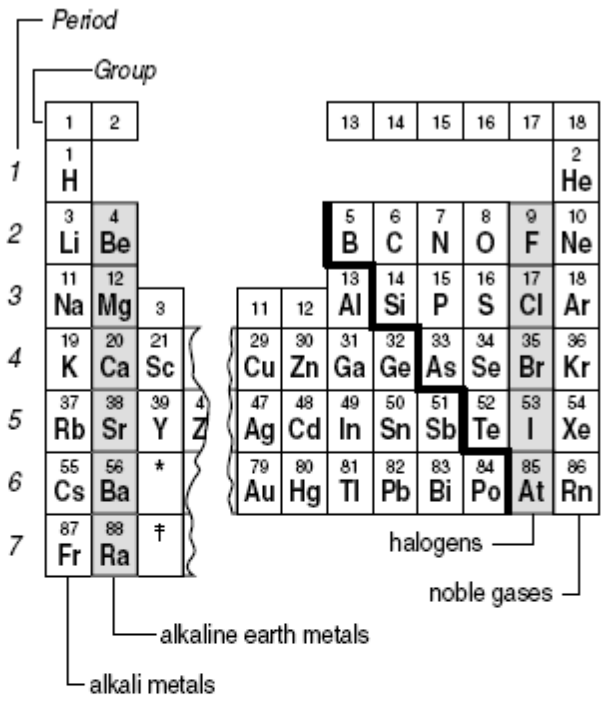
B: **G:** a train moving down a track

C: **H:** electric charges moving in a straight path

D: **J:** a plate sitting on the edge of a table

VA SOL Released 2002 Grade 8 Science, Question #24

CONCEPTUAL UNDERSTANDING ITEM



Which of the following elements has 16 protons?

A: **F:** Oxygen

B: **G:** Chlorine

✓ **C:** **H:** Sulfur

D: **J:** Germanium

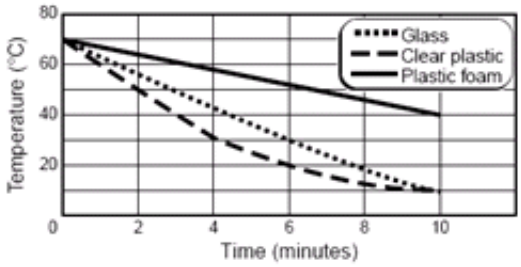
PROCEDURAL KNOWLEDGE ITEM

VA SOL Released Spring 2002 Grade 8 Science, Question #6

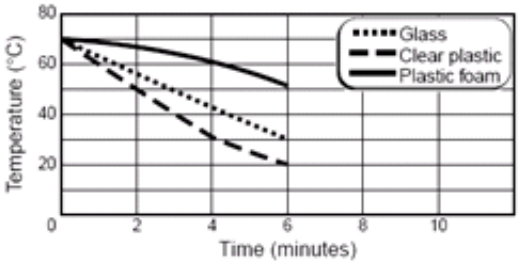
Time (minutes)	Temperature (°C)		
	Glass	Clear Plastic	Plastic Foam
0	70	70	70
2	55	50	68
4	43	30	60
6	30	20	51

The picture above shows a flask of hot water in a container of cooler water. This test was carried out to find out which type of container would hold heat the longest. Which of these graphs *best* shows all of the data from this experiment?

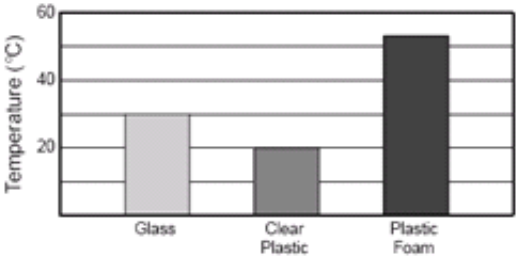
A: F:



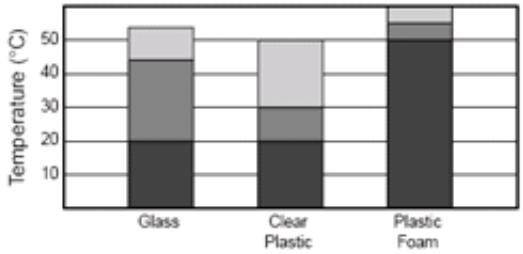
✓ **B: G:**



C: H:



D: J:



VA SOL Released 2000 Grade 8, Question 4

CONCEPTUAL UNDERSTANDING ITEM

A student predicts that similar ice cubes will melt faster in a microwave than in a pot on the stove. How should this hypothesis be tested?

A: **F:** Measure and compare the volume of the pot and the microwave.

B: **G:** Determine the volume of liquid water made by each ice cube.

✓ **C:** **H:** Observe and record the time for each ice cube to completely change to a liquid.

D: **J:** Identify and record the temperature of each ice cube before each trial.

VA SOL Released Spring 2009 Grade 8 Science SOL, Question #19

CONCEPTUAL UNDERSTANDING ITEM

Which of these is *best* classified as a mixture?

A: **F:** Carbon dioxide

B: **G:** Water

✓ **C:** **H:** Soil

D: **J:** Iron

VA SOL Released Spring 2004 Grade 8 Science, Question #23

PROCEDURAL KNOWLEDGE ITEM