

2014

ISAT

Science Sample Book



**Illinois
Standards
Achievement
Test**

GRADE

7

Sample Items for Science

ILLINOIS STATE BOARD OF EDUCATION

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Table of Contents

Introduction	5
SCIENCE	
Structure of the Grade 7 Science ISAT	7
Item Formats.....	7
Science Sessions	7
Cumulative Knowledge	7
Multiple-Choice Sample Items	8
Answer Key with Assessment Objectives Identified	33

Introduction

This sample book contains sample ISAT science items classified with an assessment objective from the *Illinois Assessment Frameworks*. These 2014 samples are meant to give educators and students a general sense of how items are formatted for ISAT. All 2014 ISAT test booklets will be printed in color. This sample book does not cover the entire content of what may be assessed. Please refer to the *Illinois Assessment Frameworks* for complete descriptions of the content to be assessed at each grade level and subject area. The *Illinois Assessment Frameworks* are available online at www.isbe.net/assessment/IAFindex.htm. The Student Assessment Web site contains additional information about state testing (www.isbe.net/assessment).

Illinois Standards Achievement Test
Science Samples

Structure of the Grade 7 Science ISAT

ISAT Science testing in spring 2014 will consist of 82 criterion-referenced items written by Illinois educators.

Item Formats

All 82 items will be in multiple-choice format. All items are aligned to the *Illinois Science Assessment Framework*, which defines the elements of the Illinois Learning Standards that are suitable for state testing.

Science Sessions

All standard time administration test sessions are a minimum of 45 minutes in length. Any student who is still actively engaged in testing when the 45 minutes have elapsed will be allowed up to an additional 10 minutes to complete that test session. More details about how to administer this extra time will appear in the *ISAT Test Administration Manual*. This policy does not affect students who already receive extended time as determined by their IEP.

Science ISAT Grade 7	
Session 1 45 minutes	41 multiple-choice items
Session 2 45 minutes	41 multiple-choice items (Some items will be pilot items.)

Cumulative Knowledge

ISAT tests students on the knowledge and skills that they should have acquired by grade 4 and grade 7. Proper curriculum alignment can establish which assessment objectives are covered at each grade level so that by the spring of any given year, all objectives have been presented. It is not the sole responsibility of a 4th grade teacher or a 7th grade teacher to teach all of the assessment objectives contained within the framework.

The grade 4 ISAT will assess the grade 4 assessment objectives. The grade 7 ISAT will assess the grade 7 assessment objectives but may also include the assessment objectives from grade 4. The sample items within this booklet provide the reader with an opportunity to see the ISAT format and how the items align to the assessment framework.



1

Ramon sat two glasses of water outside next to each other for 15 minutes. Each glass had the same amount of water. One glass was covered with black paper and one was covered with white paper. He took the following temperatures.

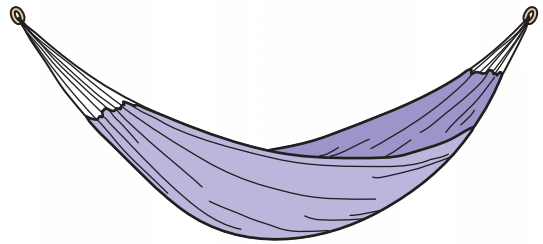
Time (Minutes)	Temperature of Water With Black Paper (°C)	Temperature of Water With White Paper (°C)
1	22	22
5	24	23
10	27	25
15	28	27

What is the variable being tested in this experiment?

- A The color of paper
- B The size of glass
- C The amount of water
- D The location of the glass

2

A manufacturer is conducting research using a hammock they want to sell to consumers. The manufacturer places different amounts of mass on the hammock and observes what happens to the hammock.



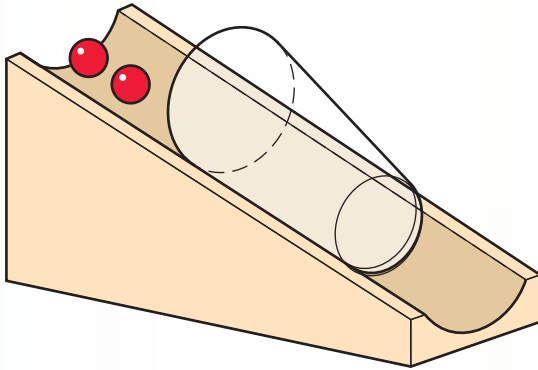
Which feature of the hammock is the manufacturer most likely testing?

- A The force required to break the ropes
- B The force required to swing the hammock
- C The color and style preference of consumers
- D The damage to the hammock caused by the sun



3

Tim rolled marbles down a ramp to discover how far a cup would move as more marbles were added.



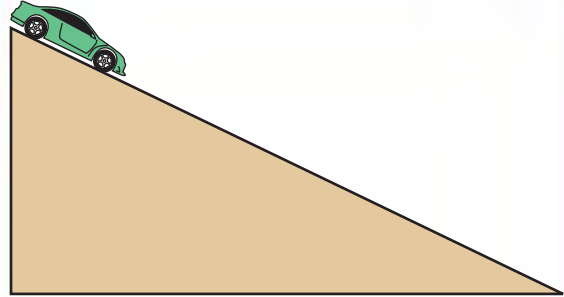
Marble Motion

Number of Marbles	Distance the Cup Slides
1	2 cm
2	3 cm
3	4 cm
4	5 cm

Which conclusion is best supported by the data?

- A** Using more marbles made the cup move farther.
- B** Using fewer marbles made the cup move faster.
- C** Gravity moved the cup no matter how many marbles were used.
- D** Friction stopped the cup when no marbles were used.

4



Miguel wants his toy car to reach the bottom of a ramp as fast as possible. Which ramp will result in the fastest speed?

- A** A carpeted ramp
- B** A wood ramp
- C** A sandpaper ramp
- D** A cork ramp



5

SOLID WASTE IN THE UNITED STATES

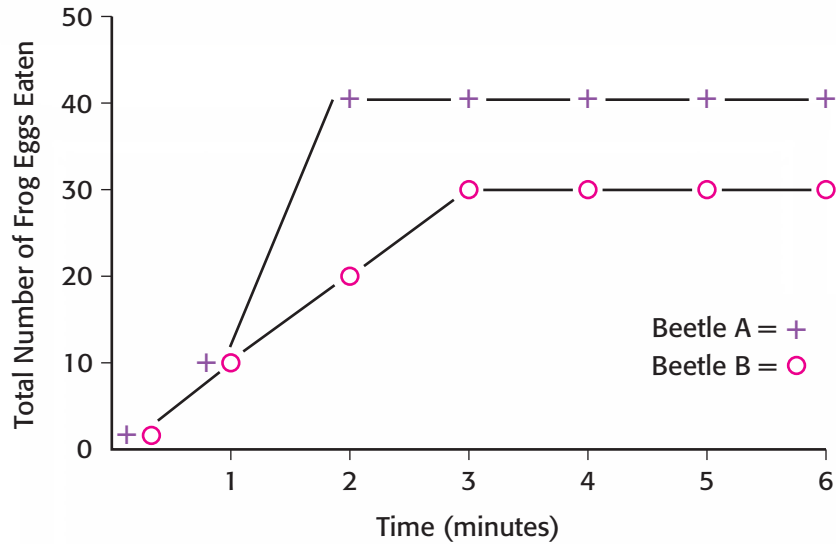
Type of Waste	Millions of Tons	Percent
Crop	2,340	52
Mineral Industries	1,620	36
Industrial (NOT hazardous)	225	5
Household	180	4
Paper	72	
Yard waste	32	
Rubber, cloth, wood	21	
Metals	15	
Plastics	14	
Food waste	13	
Glass	13	
Power Companies	90	2
Hazardous	45	1
Radioactive	3	0.0007

Crops produce the greatest amount of waste, mainly from plant parts not harvested as food. Why are most people less concerned about crop waste than other types of waste?

- A** Farmers burn the waste instead of sending it to landfills.
- B** Crop waste is returned to the soil to decompose and enrich the soil.
- C** Most crop waste is used to make new products.
- D** Crop waste only accounts for a small percent of all waste.

6

An experiment was conducted to determine the feeding rate at which two different water beetles eat frog eggs. The data are shown in the following graph.

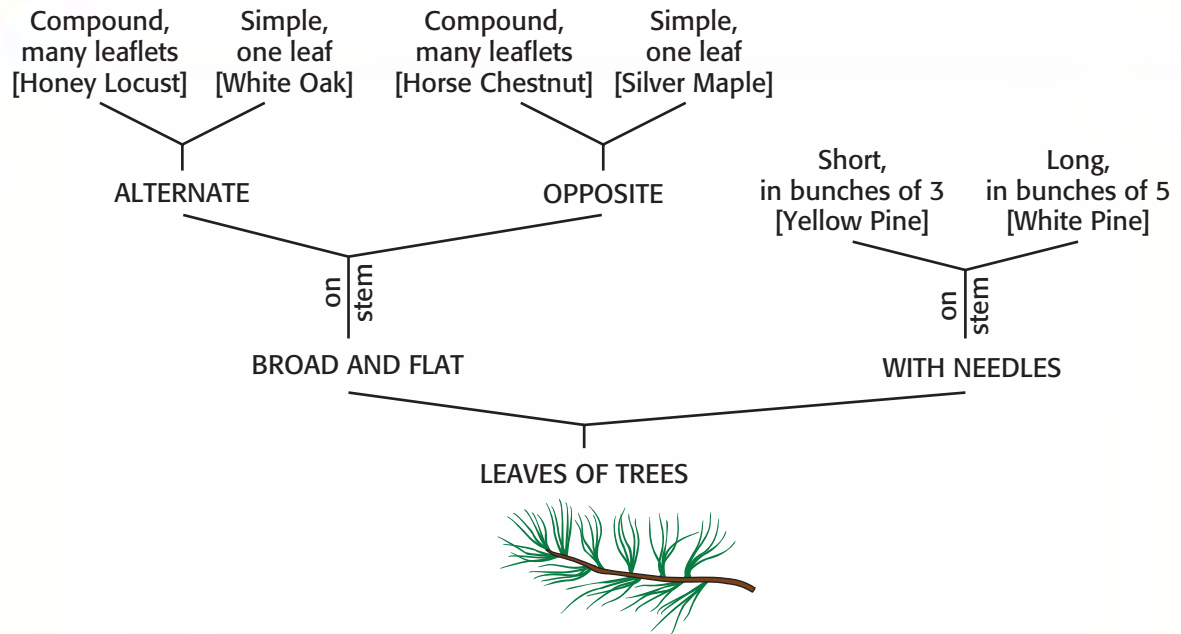


How many frog eggs did Beetle B eat in the first 4 minutes?

- A** 20
- B** 30
- C** 60
- D** 90



7

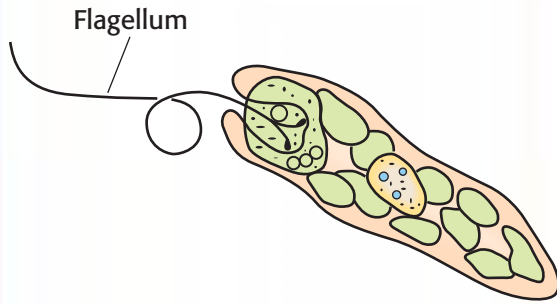


What is the name of this plant?

- A White Pine
- B Honey Locust
- C Silver Maple
- D White Oak

8

A Euglena contains a structure called a flagellum.



What is the function of the flagellum?

- A Reproduction
- B Movement
- C Protection
- D Food gathering

9

An amoeba divides into two identical daughter cells. They have exactly the same characteristics as the parent amoeba. Which best describes the amoeba's division?

- A Diffusion
- B Meiosis
- C Mitosis
- D Osmosis

10

	B	b
B	BB	Bb
b	Bb	bb

This is a diagram of a genetic cross. In guinea pigs, black hair color is dominant (B) and white hair color is recessive (b). What hair color are the guinea pigs' offspring?

- A All black
- B All white
- C Mostly black with some white
- D Mostly white with some black



11

In a food chain, which are the most efficient users of solar energy?

- A Herbivores
- B Carnivores
- C Omnivores
- D Parasites

12

In Illinois, the constellation Orion can be seen in the night sky in winter. Why can this constellation not be seen in the summer?

- A Earth is tilted away from the constellation.
- B Earth orbits to the other side of the sun.
- C Brighter constellations block Orion from view in the Northern Hemisphere.
- D The orbit of the moon blocks Orion from view in the Northern Hemisphere.

13

<u>Group A</u>	<u>Group B</u>
Grasshopper	Owl
Deer	Opossum
Robin	Moth
Beaver	Bat

Why were these animals placed into these groups?

- A One group is active during the day; the other group is active at night.
- B One group lives near prairies; the other group lives near forests.
- C One group benefits people; the other group is a pest to people.
- D One group eats only plants; the other group eats only meat.

14

Green plants are important to animals because the plants —

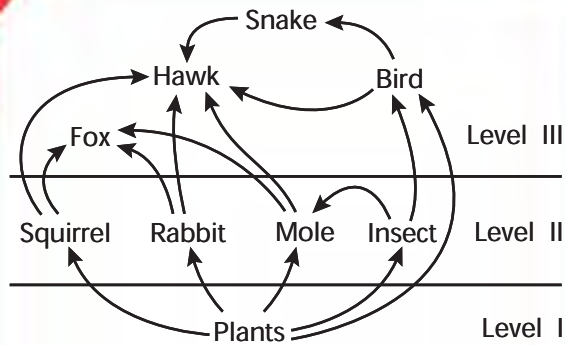
- A consume food and give off oxygen
- B consume food and give off carbon dioxide
- C produce food and give off oxygen
- D produce food and give off carbon dioxide

15

Snakes feed on mice. The mice eat grain crops. When the crops are plentiful, what will happen?

- A** The mouse population will decrease.
- B** The snake population will increase.
- C** The snake population will decrease.
- D** The mouse population will not change.

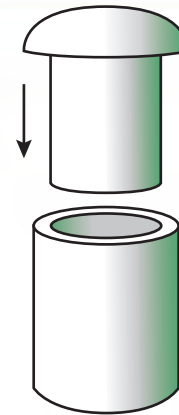
16



If foxes and hawks are removed from this food web, one result will be —

- A** a decrease in snakes
- B** an increase in rabbits
- C** an increase in insects
- D** a decrease in moles

17



You need to put a metal rod into a hole in a metal cylinder. It is too tight. Which would be the best strategy to make the rod fit?

- A** Heat the rod and cylinder.
- B** Cool the rod and cylinder.
- C** Heat the rod and cool the cylinder.
- D** Cool the rod and heat the cylinder.



18

Which is the best method for a student to identify a solution as an acid or a base?

- A Use litmus paper.
- B Taste the solution.
- C Dilute in water.
- D Heat the solution.

20

What property of light waves can be observed as light waves pass from one medium to another and change speed?

- A Diffraction
- B Refraction
- C Reflection
- D Separation

19

Most of the chemical energy of the gasoline burned in a car is not used to move the car but is changed into —

- A electricity
- B heat
- C magnetism
- D sound

21

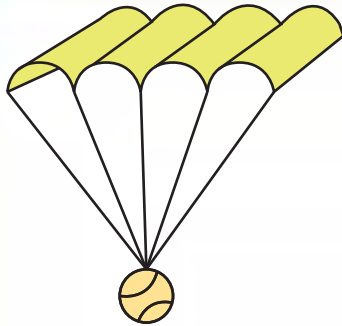


Applying the brakes on this bicycle causes it to slow down because the brakes —

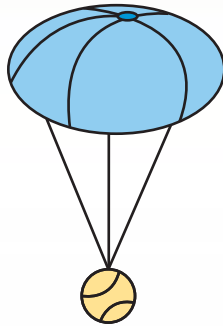
- A produce friction
- B use gravity to slow down the bicycle
- C add energy to the bicycle
- D help cool the bicycle's tires



22



1



2



3



4

If these four identical balls are dropped at the same time and from the same height, which ball will land first?

- A** Ball 1
- B** Ball 2
- C** Ball 3
- D** Ball 4



23

Which of these parts of an animal would be most likely to form a fossil?

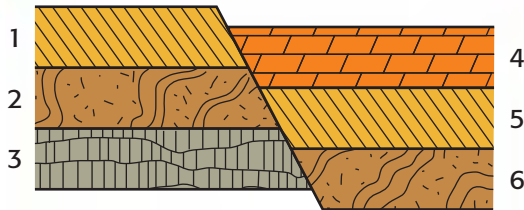
- A Heart
- B Kidney
- C Eye
- D Tooth

25

What type of rock is formed in layers?

- A Sedimentary
- B Igneous
- C Granite
- D Obsidian

24

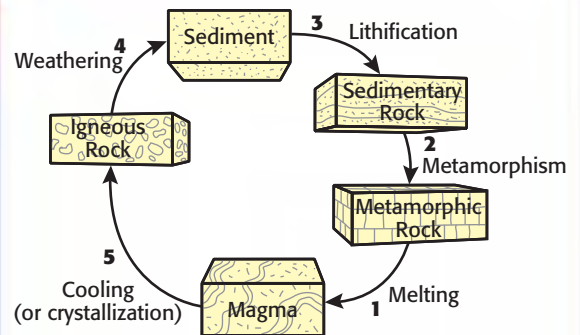


Which rock layer is probably the oldest?

- A 1
- B 3
- C 4
- D 6

26

Rock Cycle



Erosion occurs at —

- A position 1
- B position 2
- C position 3
- D position 4

27

Wind occurs when air masses move from one place to another. What causes the movement of air masses?

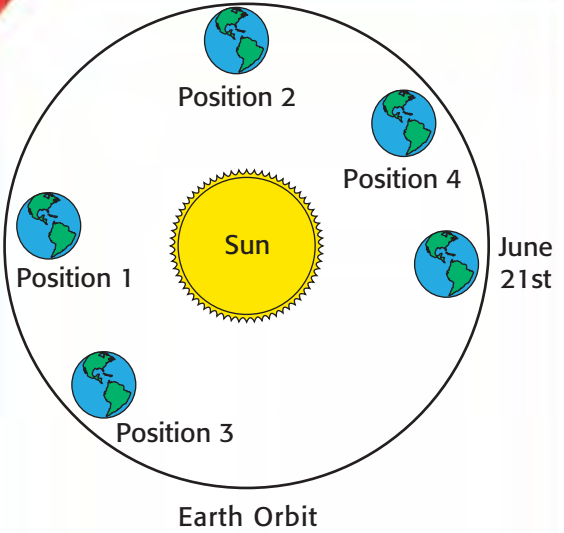
- A The position of the moon
- B The heating of the air
- C The rotation of Earth
- D The condensation of air

28

What does the color of a star indicate?

- A Age
- B Size
- C Distance
- D Temperature

29



At which position in Earth's orbit are daytime and nighttime equal?

- A 1
- B 2
- C 3
- D 4



30

When modern disease-controlling medicines and practices are introduced in developing countries, the first major change is that —

- A** life spans increase
- B** birthrates decrease
- C** the population decreases
- D** the water supply increases

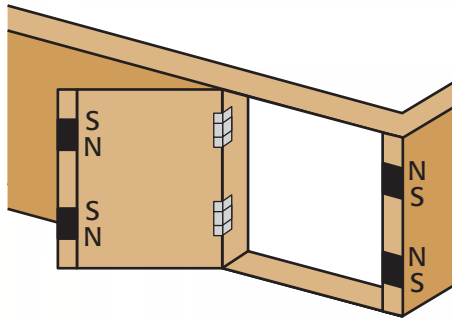
31

Karen just bought a new battery for her car. What should she do with the old battery?

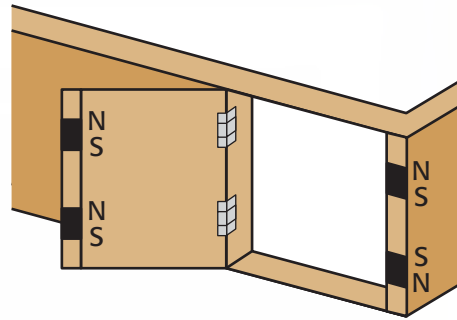
- A** Wrap the battery in a biodegradable bag and bury it.
- B** Put it in the garbage to be taken to a landfill.
- C** Dispose of it in the empty field behind her house.
- D** Leave it with the dealer to recycle.

32

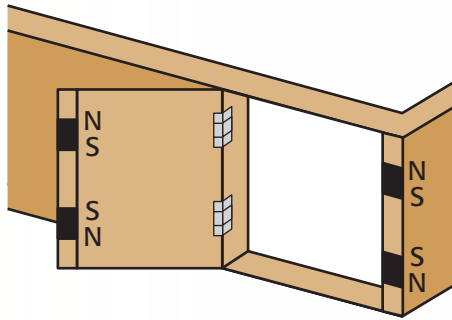
Which pole arrangement of the four magnets will hold the cabinet door shut most tightly when it is closed?



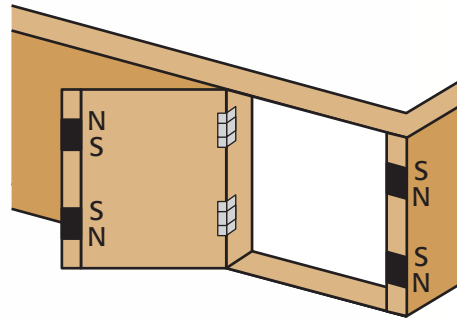
A



C



B



D



33

New studies on a drug that regulates blood pressure show that it can cause harmful side effects if used for many years. What should the manufacturer do?

- A** Inform the public and remove the drug from the market immediately.
- B** Ignore the new studies because all drugs have harmful long-term side effects.
- C** Market the drug under a new name to avoid bad publicity.
- D** Destroy the new results.

35

Why are different constellations of stars seen during different seasons?

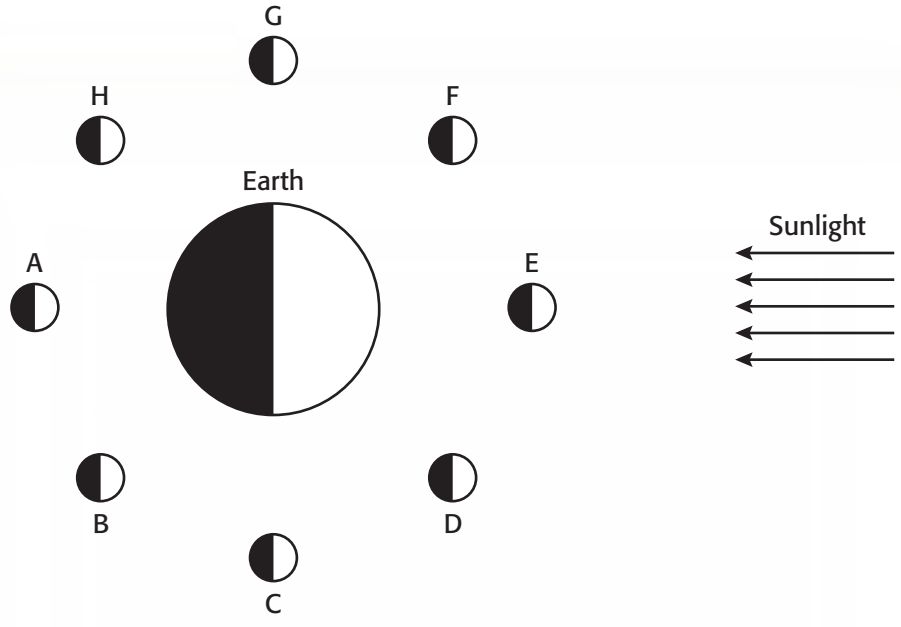
- A** Earth is on a different side of the sun during each season.
- B** Seasonal changes in the magnetic poles create the northern lights, which block the view.
- C** The Milky Way revolves to a different position with each season.
- D** Constellations move around the sun during different seasons.

34

DNA testing is important in—

- A** architecture.
- B** law enforcement.
- C** computer programming.
- D** banking.

36

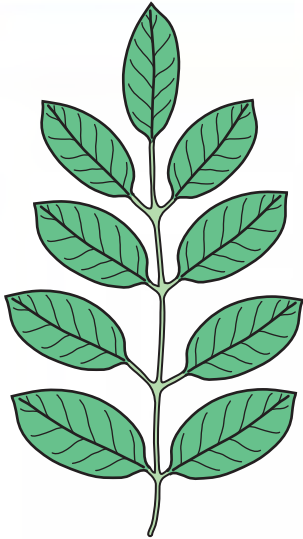


As seen from Earth, at which position would the moon appear to be full?

- A** Position A
- B** Position B
- C** Position C
- D** Position D



37

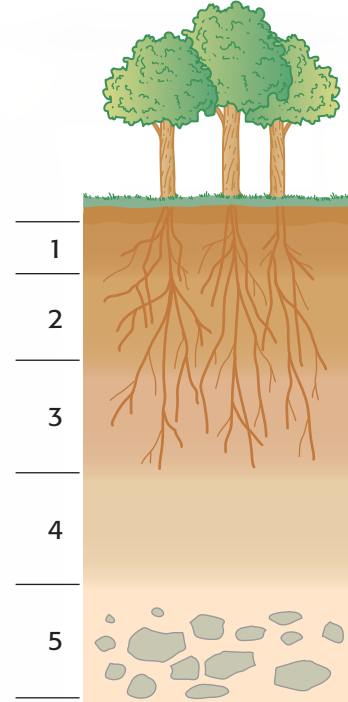


Which best describes the characteristics of this leaf?

- A Simple, pinnate
- B Simple, palmate
- C Compound, pinnate
- D Compound, palmate

38

A Soil Profile



According to the soil profile, in which layer are most of the soil's nutrients most likely found?

- A 1
- B 2
- C 3
- D 5



39

After a recent experiment, a scientist noticed that the computer simulation varied from the actual experiment. What should the scientist do?

- A** Repeat the experiment several times in order to verify the results.
- B** Adjust the computer's program so it matches the actual results.
- C** Ignore the actual results as inaccurate because computers are very precise.
- D** Ignore the simulation as inaccurate because of a possible computer virus.

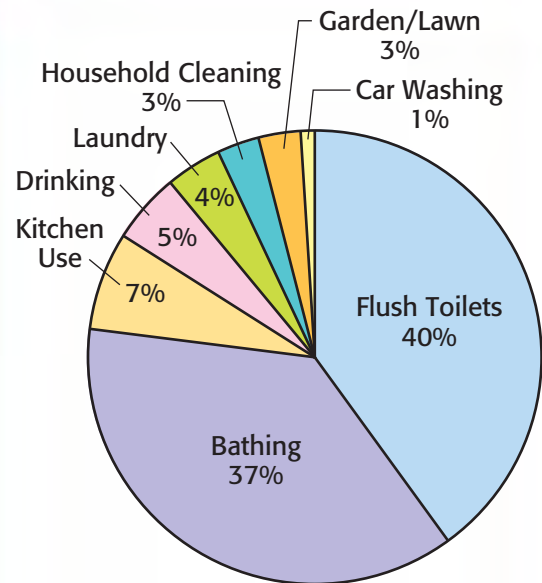
40

Which structure makes a plant cell rigid?

- A** Chromosome
- B** Chloroplast
- C** Cell wall
- D** Cell membrane

41

Percentage Home Use of Water (U.S.)



The percentages show how water is used in homes in the United States. Which is most likely to conserve the most water?

- A** Reducing the water used to flush toilets
- B** Putting suds savers on washing machines
- C** Prohibiting the use of treated water for lawns and gardens
- D** Reducing the amount of water used per load in a dishwasher



42

A scientific illustrator was asked to draw the human digestive system. Knowledge of which branch of science would help her the most?

- A Geology
- B Ecology
- C Anatomy
- D Paleontology

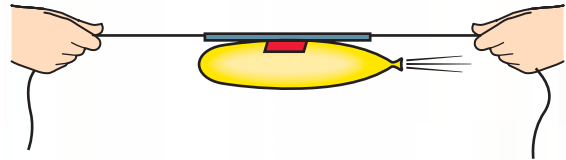
43

Why does the moon have more effect on the tides than the sun?

- A The moon is more dense than the sun.
- B The moon is in motion in space, while the sun is not.
- C The moon is larger than the sun.
- D The moon is nearer to Earth than the sun.

44

A lab group is given 5 meters of string, a drinking straw, a balloon, and tape. The group uses these materials to demonstrate rocket motion as shown below.

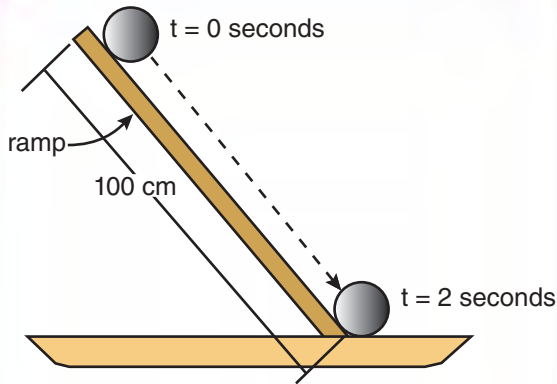


What would most likely make the balloon rocket go faster?

- A Holding the string so that it is less tight
- B Using a wider straw
- C Filling the balloon with more air
- D Wrapping the tape all the way around the balloon



45



In 2 seconds, a ball travels 100 cm. What is the average speed of the ball?

- A 25 cm/sec
- B 50 cm/sec
- C 100 cm/sec
- D 200 cm/sec

46

A politician supports a bill to increase the drilling of offshore oil wells. What is the most likely reason that he supports the bill?

- A Hurricanes offshore could cause oil pollution.
- B Offshore wildlife will increase in numbers.
- C People would have more oil to use.
- D Beaches along the shore could be polluted.

47

Some scientists are concerned that television, radio, and newspapers report the outcome of experiments too quickly. What would be the major *scientific* concern?

- A Conclusions may be drawn by the public before the results are verified by other laboratories.
- B Other agencies may hear of the experiments and claim credit for them.
- C Commercial organizations may copy the ideas and sell them for profit.
- D The level of scientific research is lowered to a media event.

48

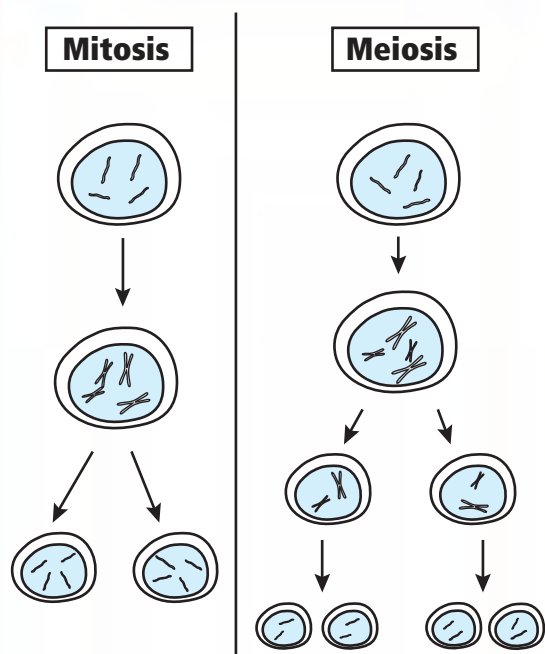
$\text{work} = \text{force} \times \text{distance}$

A girl weighs 200 newtons. How much work does she do climbing 10 meters of steps?

- A 20 joules
- B 190 joules
- C 210 joules
- D 2000 joules



49



Why does a gamete produced during meiosis have half as many chromosomes as a daughter cell produced during mitosis?

- A Meiosis does not involve a step in which the original cell makes a copy of its chromosomes.
- B Meiosis involves a second cell division that separates identical chromosomes.
- C Mitosis does not involve a step in which the original cell makes a copy of its chromosomes.
- D Mitosis involves a second cell division that separates identical chromosomes.

50

The picture below shows a section of the periodic table of elements.

7 N 14.007	8 O 15.999	9 F 18.998
15 P 30.974	16 S 32.06	17 Cl 35.453
33 As 74.922	34 Se 78.96	35 Br 79.904

Which three elements should be classified together?

- A Nitrogen, fluorine, bromine
- B Astatine, sulfur, fluorine
- C Nitrogen, sulfur, bromine
- D Oxygen, sulfur, selenium

51

When heated, sulfuric acid breaks down into sulfur trioxide and water. From the equation below, which answer shows the equation as balanced?

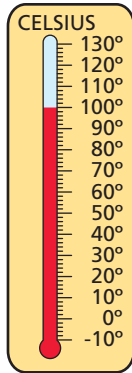
$$\text{H}_2\text{SO}_4 \rightarrow \text{H}_2\text{O} + \text{S}___$$

- A O₃
- B O₂
- C O₄
- D O₅

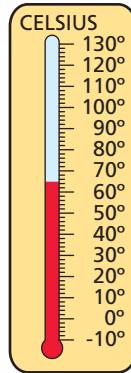


52

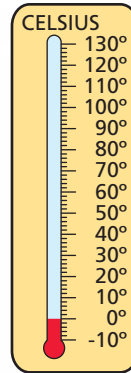
Ryan and Kim-Lee boiled some water in a beaker. Then they turned off the heat source and added five ice cubes to the water. Which of these thermometers shows what most likely happened to the temperature of the water after ten minutes?



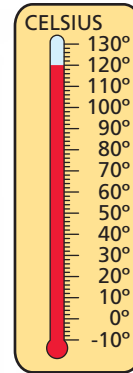
A



B



C



D

53

Dave read that on January 1, Earth is slightly closer to the sun than on July 1. Why, then, is it colder in Illinois in January than in July?

- A The Northern Hemisphere is tilted away from the sun in January.
- B The greenhouse effect is stronger in the Northern Hemisphere in July.
- C The snow on the ground lowers the air temperature in January.
- D The moon pulls the heat away from Earth in January.

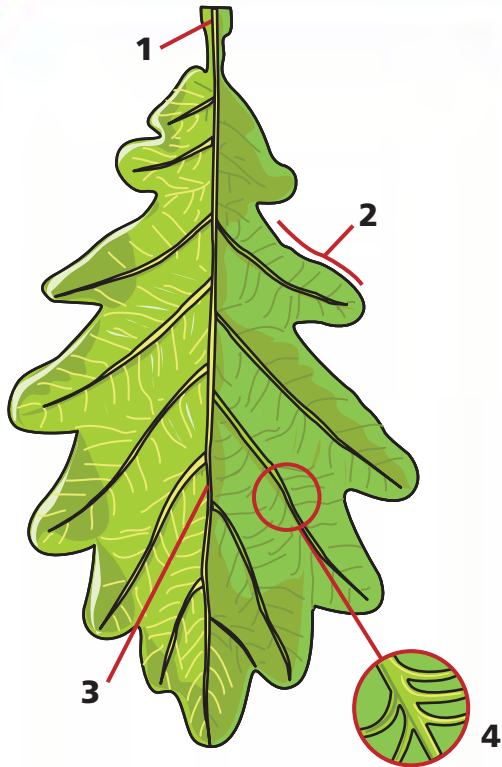
54

Jenna flips a coin ten times. It lands on heads seven times and on tails three times. She concludes that a coin lands on heads more often than on tails. Why is her conclusion possibly invalid, even though it agrees with her results?

- A Her results would probably differ if she collected more data.
- B Newton's third law of motion contradicts her conclusion.
- C She should have flipped the coin only twice.
- D She did not state a hypothesis.



55

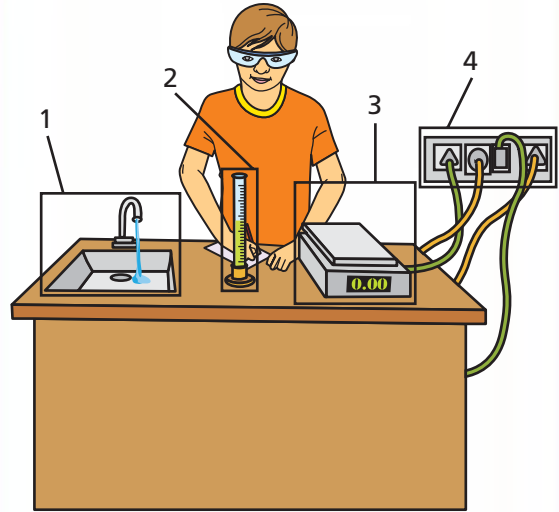


In the diagram, which feature is most useful in classifying this leaf as a dicot?

- A 1
- B 2
- C 3
- D 4

56

Which label represents the greatest potential hazard in the lab setup shown?

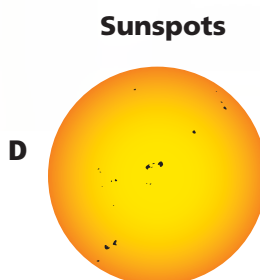
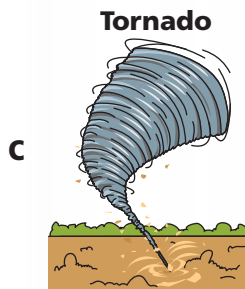
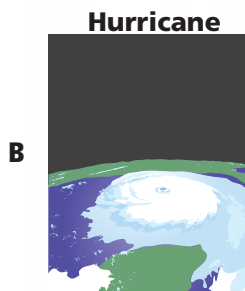
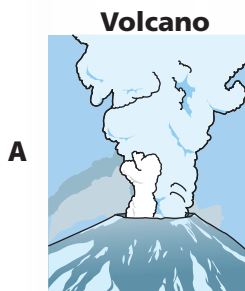


- A 1
- B 2
- C 3
- D 4



57

Will and Adelle are making a slide show presentation. The topic of the presentation is, "The Effects of Movement in the Lithosphere." Which of these slides would most likely be included in their presentation?



58

Which statement is a lab safety rule?

- A** Work in small groups.
- B** State your hypothesis.
- C** Carefully record all data.
- D** Wear safety goggles when pouring chemicals.

59


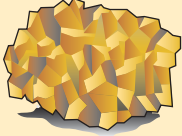
How many different elements are found in the chemical compound AgNO_3 ?

- A** 2
- B** 3
- C** 4
- D** 5



60

A student compares two minerals. The student determines the mass, volume, and density for each mineral.

Mineral Picture		
Mass	400 g	100 g
Volume	21 mL	20 mL
Density (mass/volume)	19 g/mL	5 g/mL

Which property alone proves that these are two different minerals?

- A Color
- B Mass
- C Volume
- D Density

Answer Key with Assessment Objectives Identified

Item Number	Correct Answer	Assessment Objective
1	A	11.7.04 Define a variable as some factor which changes in different phases of an experiment. Define a constant as something kept the same in every phase of the experiment. Understand that most scientific experiments are designed so that only one variable is tested in each experiment. Identify constants and variables in described experiments.
2	A	11.7.09 Given certain tests which could be performed on a prototype, identify which one is testing for a given feature (e.g., "Given certain tests to be performed on a car, which one is testing for its fuel efficiency?").
3	A	11.7.06 Analyze patterns in data from an experiment to determine whether the information gathered helps to answer a given question or hypothesis (e.g., all of the plants fertilized in a vegetable garden grew taller than the ones not fertilized. Understand that this is an indication that the fertilizer caused the plants to grow taller.)
4	B	11.7.08 Compare design solutions; select which one is best given certain restrictions on available materials, tools, cost effectiveness, and safety.
5	B	13.7.06 Understand that important social decisions are made on the basis of risk/benefit analysis (e.g., whether to administer a smallpox vaccine or not).
6	B	11.7.02 Distinguish among and answer questions about performing the following: observing, drawing a conclusion based on observation, forming a hypothesis, conducting an experiment, organizing data, constructing and reading charts and graphs, and comparing data. Recognize the common units of the metric system.
7	A	12.7.01 Understand how scientists classify organisms. Identify common insects, flowers, birds, reptiles, and mammals using a dichotomous key.
8	B	12.7.04 Understand that some organisms are unicellular, others multi-cellular. Understand that some unicellular organisms are like tiny animals, able to propel themselves or change their shape and that they are endowed with sensation.
9	C	12.7.06 Understand that cells divide to increase their numbers, and the process of cell division called mitosis results in two daughter cells each with identical sets of chromosomes.

Item Number	Correct Answer	Assessment Objective
10	C	12.7.12 Understand that heredity is based on the probability of inheriting a given trait for which one or both of the parents carries a gene, and that this probability can be calculated given the genetic make-up of the parents with regard to that kind of trait (e.g., blue eyes) using a Punnett Square.
11	A	12.4.07 Understand the concept of food chains and food webs and the related classifications of plants or animals (e.g., producers, decomposers, consumers, herbivores, carnivores).
12	B	12.4.47 Identify the order of planets from the sun, and know that the further planets take longer to go around the sun. Understand that all planets in our solar system revolve around the sun. Because Earth revolves around the sun, objects (e.g., stars, planets, constellations) in the sky appear to change position throughout the year. Know that it takes Earth 365 $\frac{1}{4}$ days to revolve around the sun.
13	A	12.4.10 Identify the basic classifications of animals based on how they interact with their environment [e.g., (a) Some animals are active in the daytime (diurnal), others in the night time (nocturnal). (b) Some animals have a body temperature that stays the same regardless of significant temperature changes in their immediate environment (warm blooded), others have a body temperature that rises and falls with the temperature changes of their environment (cold blooded). (c) Some animals are herbivores, others are carnivores].
14	C	12.7.25 Understand that three important cycles for the survival of living things in Earth's ecosystems are the carbon dioxide-oxygen cycle, the water cycle, and the nitrogen cycle.
15	B	12.7.26 Understand that the number of organisms an ecosystem can support depends on the resources available and abiotic factors (e.g., the quantity of light and water, the range of temperatures, soil composition). Know that given adequate biotic and abiotic resources and no disease or predators, populations can increase at rapid rates. Understand that lack of resources and other factors (e.g., predation, climate) limit the growth of populations in specific niches in the ecosystem.
16	B	12.7.28 Distinguish the various members of a food web and identify the order of dependence among these members.
17	D	12.4.15 Understand that an increase in temperature generally causes things to expand, and that a decrease in temperature generally causes things to contract. Understand that particles move more slowly in a solid than they do in a liquid or a gas.
18	A	12.7.47 Identify the basic properties of acids and bases. Know the relationship between acids, bases, and indicators (e.g., blue litmus paper changes to red when placed in an acid).

Item Number	Correct Answer	Assessment Objective
19	B	12.7.49 Understand that energy appears in many forms, such as heat, light, sound, chemical, mechanical, solar, nuclear, and electromagnetic energy. Understand the basic characteristics of each of these kinds of energy. Understand the nature of kinetic and potential energy.
20	B	12.7.57 Understand that light travels at different speeds in different materials. Understand that this is why light refracts—or changes direction—namely because it goes from one material in which it moves at one speed into another material through which it moves at a different speed.
21	A	12.4.26 Identify the basic forces, such as friction, magnetism, and gravity. Identify which force is operative in a simple scenario.
22	D	12.4.26 Identify the basic forces, such as friction, magnetism, and gravity. Identify which force is operative in a simple scenario.
23	D	12.4.33 Understand that some rocks contain plant and animal fossils. Know how they were formed.
24	B	12.7.75 Understand that that there are strata (layers) in many places in the crust of the earth. Understand that the crust of the earth is mostly igneous/metamorphic, with a relatively thin veneer of sedimentary rock layers in many, but not all places. Understand the principle of superposition: in a layered sedimentary sequence, the oldest rocks are usually at the bottom.
25	A	12.7.75 Understand that that there are strata (layers) in many places in the crust of the earth. Understand that the crust of the earth is mostly igneous/metamorphic, with a relatively thin veneer of sedimentary rock layers in many, but not all places. Understand the principle of superposition: in a layered sedimentary sequence, the oldest rocks are usually at the bottom.
26	D	12.7.78 Understand that some changes in the solid earth can be described as the rock cycle: rocks at the earth's surface weather, forming sediments that are buried, then compacted, heated, and often recrystallized into new rock. Eventually, those new rocks may be brought to the surface by the forces that drive plate motions, and thus the rock cycle continues. Identify the three basic kinds of rock. Igneous rock is the result of cooled magma; granite, pumice, and scoria are examples. Sedimentary rock is the result of fine particles from eroded rocks being re-deposited by water or wind; sandstone and limestone are examples. Metamorphic rock is the result of rocks being changed by high temperatures and/or pressures; marble is an example.
27	B	12.7.87 Understand patterns of atmospheric movement and how they influence weather. Understand that oceans have a major affect on climate because water in the oceans holds and distributes a large amount of heat.

Item Number	Correct Answer	Assessment Objective
28	D	12.7.99 Understand that the sun is an average star. Know that a solar system consists of a sun and planets and other objects that revolve around it. Know that the planets closest to the sun are hotter than the planets farther away from the sun. Understand that the color of a star depends on its temperature.
29	B	12.7.100 Identify the relative positions of the earth, moon, and sun when the moon appears full, new, half, and when a lunar or solar eclipse occurs. Given a diagram of the sun and the earth in some definite position with its axis of rotation drawn (and with the poles labeled), identify the earth in the positions of summer solstice, winter solstice, spring equinox, and fall equinox (for the northern hemisphere).
30	A	13.7.08 Understand that the introduction of a new technology can affect human activities worldwide.
31	D	13.4.13 Identify ways to reduce, reuse and recycle materials.
32	A	11.7.07 Identify a design problem and establish criteria for determining the success of a solution.
33	A	13.7.06 Understand that important social decisions are made on the basis of risk/benefit analysis (e.g., whether to administer a smallpox vaccine or not).
34	B	13.7.09 Describe how occupations use scientific and technological knowledge and skills.
35	A	12.4.47 Identify the order of planets from the sun, and know that the further planets take longer to go around the sun. Understand that all planets in our solar system revolve around the sun. Because Earth revolves around the sun, objects (e.g., stars, planets, constellations) in the sky appear to change positions throughout the year. Know that it takes Earth 365 $\frac{1}{4}$ days to revolve around the sun.
36	A	12.7.91 Understand that objects in the solar system are for the most part in regular and predictable motion. Know that those motions explain such phenomena as the day, the year, the phases of the moon, and eclipses.
37	C	12.7.17 Identify the basic anatomy of leaves: blade, vein, and petiole; classify leaves as dicot or monocot, simple or compound, and palmately compound or pinnately compound.
38	A	12.7.72 Understand that soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria. Understand that soils are often found in layers, with each having a different chemical composition and texture.

Item Number	Correct Answer	Assessment Objective
39	A	13.7.04 Understand that one set of data is not sufficient evidence for making a generalization. Identify the kind of reasoning called induction, and know that the more cases that are seen, the greater the certainty of the generalization drawn from those cases.
40	C	12.7.03 Identify the main differences between plant cells and animal cells, namely that plant cells have chloroplasts and cell walls (which provide rigidity to the plant, since plants have no skeletons). Identify the basic cell organelles and their functions.
41	A	13.4.13 Identify ways to reduce, reuse, and recycle materials.
42	C	13.7.09 Describe how occupations use scientific and technological knowledge and skills.
43	D	12.7.92 Understand that gravity is the force that keeps planets in orbit around the sun and governs the rest of the motion in the solar system. Know that changes in gravitational forces explain the phenomenon of the tides. Know that what an object weighs on Earth is different than what it weighs on the moon or other planets in our solar system. This is due to gravity.
44	C	11.7.08 Compare design solutions; select which one is best given certain restrictions on available materials, tools, cost effectiveness, and safety.
45	B	12.7.68 Understand how to calculate average speeds, given the distance traveled and the time taken.
46	C	13.7.12 Analyze the effects of policies on science and technology issues.
47	A	13.7.02 Explain how peer review helps to assure the accurate use of data and improves the scientific process. Results from scientific investigations can be discussed.
48	D	12.7.65 Understand the concept of work. A force acting through distance is work. Recognize applications of simple machines (wedge, lever, inclined plane, pulley, screw, and wheel and axle) in common tools.
49	B	12.7.07 Understand that multi-cellular organisms begin as zygotes (a single egg cell fertilized by a single sperm cell) and that a zygote grows by cell division and that as the cells multiply, they also differentiate. Understand the process of meiosis.
50	D	12.7.38 Understand that substances can be grouped by similarities in their physical properties.
51	A	12.7.48 Know the laws of the conservation of matter and energy. Apply the conservation of matter as a reason why the number and kinds of atoms in a chemical change remains constant.

Item Number	Correct Answer	Assessment Objective
52	B	12.7.50 Understand that heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature (thermal equilibrium).
53	A	12.7.98 Understand that the cause of the earth's seasons and the change in the amount of daylight throughout the year is the tilt of its axis of rotation with respect to the plane of its orbit. Given a diagram of the earth depicting (1) its relative position to the sun and (2) the orientation of its axis of rotation and (3) some circle of latitude, identify the following: (a) the season of the year (if the circle of latitude is other than the equator), and (b) whether there is more daylight or more dark hours at that time of year. Understand why the seasons and daylight hours in opposite hemispheres are opposite to each other.
54	A	13.7.04 Understand that one set of data is not sufficient evidence for making a generalization. Identify the kind of reasoning called induction, and know that the more cases that are seen, the greater the certainty of the generalization drawn from those cases.
55	D	12.7.17 Identify the basic anatomy of leaves: blade, vein, and petiole; classify leaves as dicot or monocot, simple or compound, and palmately compound or pinnately compound.
56	D	13.7.01 Identify potential hazards in the laboratory and the means of reducing them.
57	A	12.7.70 Understand that lithospheric plates constantly move at rates of centimeters per year in response to movements in the mantle. Understand that major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from these plate motions. Understand that over very long periods of time (millions of years), old mountains wear down, but new ones arise from catastrophic volcanic and earthquake activity.
58	D	13.4.02 Identify the basic safety procedures (e.g., "Keep your clothes and hair away from open flames," "Don't taste substances without permission.") when conducting science activities.
59	B	12.7.45 Identify the number of different kinds of elements in a chemical formula.
60	D	12.7.34 Define and distinguish the properties of matter: mass, weight, volume, density, color, odor, shape, texture, and hardness.

To view all the science assessment objectives, download the *Illinois Science Assessment Framework for Grades 4 and 7* online at www.isbe.net/assessment/IAFindex.htm.