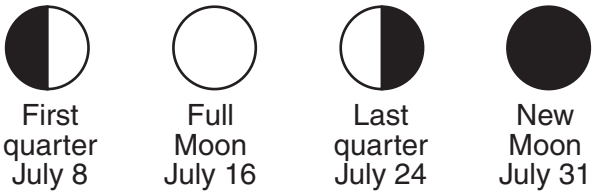
Part I

1 Which statement best explains why the Sun and the Moon appear to be about the same size in the sky?

(1) The Sun and the Moon have the same diameter.
(2) The Moon is larger in diameter and farther from Earth than the Sun.
(3) The Moon is smaller in diameter and is closer to Earth than the Sun.
(4) The Sun and the Moon are the same distance from Earth.

2 The diagram below shows four Moon phases observed during July.



On which date would the next New Moon occur?

(1) August 5
(2) August 10
(3) August 19
(4) August 29

3 Dust and ash entering the atmosphere as a result of volcanic eruptions can affect Earth's

(1) tidal activity
(2) orbital shape
(3) weather and climate
(4) rotation and revolution

4 The surface of Earth is covered by a relatively thin layer of water called the

(1) crust
(2) mantle
(3) hydrosphere
(4) atmosphere

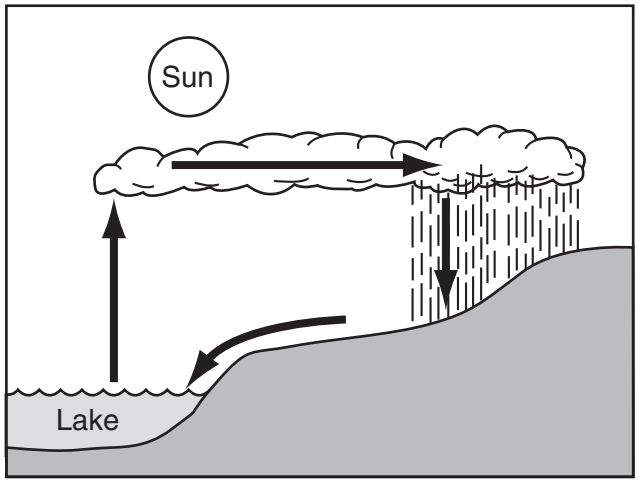
5 Movement of Earth's crust along plate boundaries produces

(1) fronts
(2) tides
(3) hurricanes
(4) earthquakes

6 In which type of rock are fossils generally found?

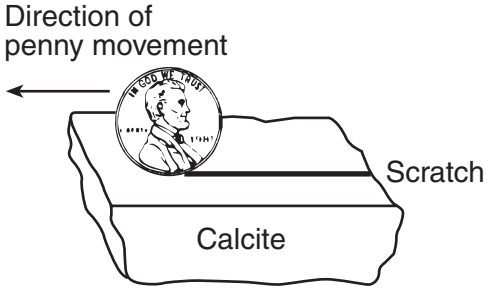
(1) igneous
(2) metamorphic
(3) sedimentary
(4) volcanic

7 Which title best describes the processes shown in the diagram below?



(1) The Rock Cycle
(2) The Water Cycle
(3) Plate Tectonics
(4) Chemical Changes

8 The diagram below shows a penny scratching the surface of the mineral calcite.



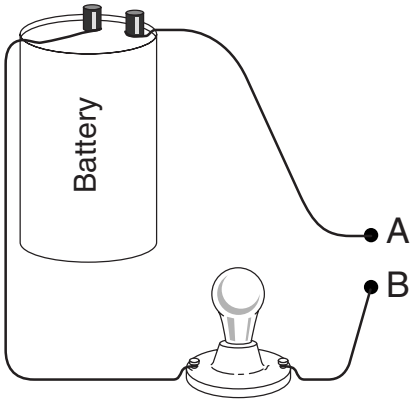
Which physical property of the calcite is being tested?

(1) streak
(2) hardness
(3) melting point
(4) reaction to acid

9 Which equipment will best separate a mixture of iron filings and black pepper?

(1) magnet
(2) filter paper
(3) triple-beam balance
(4) voltmeter

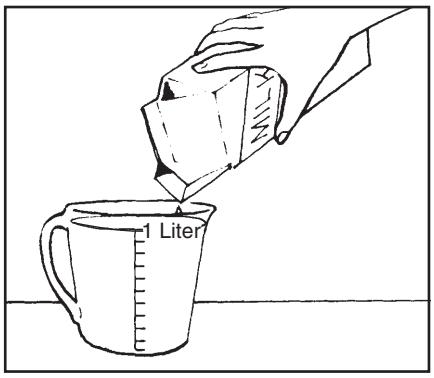
10 The diagram below shows an *incomplete* circuit.



Which item would allow the bulb to light up if it were used to connect point *A* to point *B*?

(1) a glass rod
(2) a metal coin
(3) a plastic comb
(4) a paper cup

11 The diagram below shows milk being poured into a measuring cup.



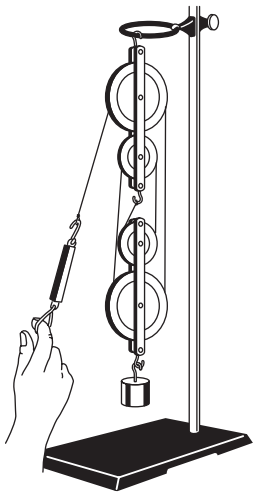
Which property of the milk can be directly measured using the cup?

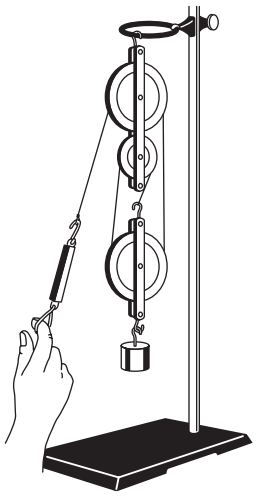
(1) mass
(2) density
(3) solubility
(4) volume

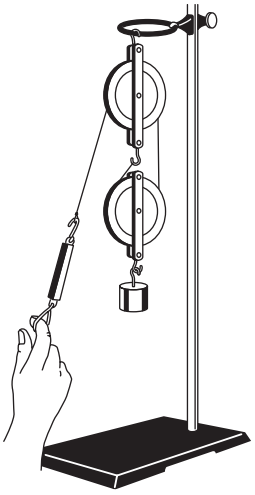
12 Hydrochloric acid is added to a beaker containing a piece of zinc. As a result, zinc chloride is formed and hydrogen gas is released. This is an example of

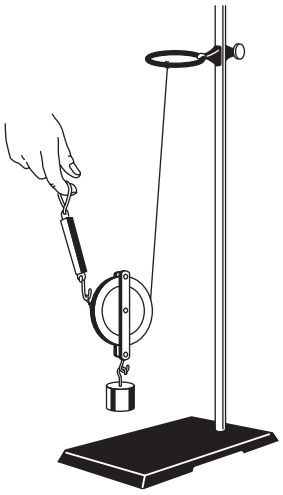
(1) a chemical reaction
(2) a physical change
(3) photosynthesis
(4) evaporation

13 Which setup below would require the *least* force to lift a 100-gram mass a distance of 10 centimeters?


(1)


(3)


(2)


(4)

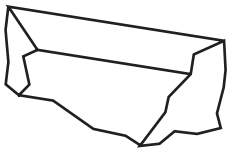
14 Which model is used by scientists to determine the properties of elements?

(1) a Punnett square
(2) the Periodic Table
(3) a pedigree chart
(4) the rock cycle

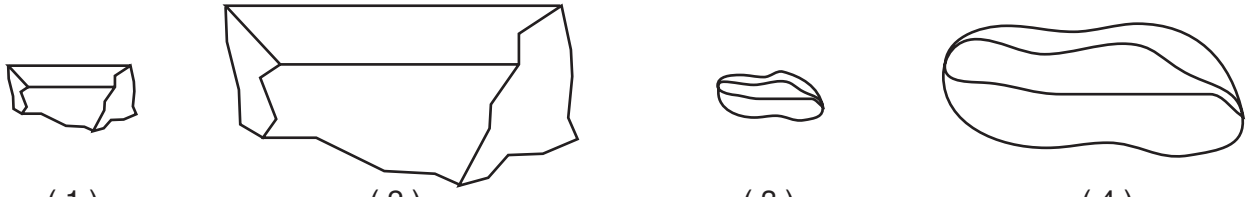
15 Which energy resource is renewable?

(1) fuel oil
(2) natural gas
(3) wind
(4) coal

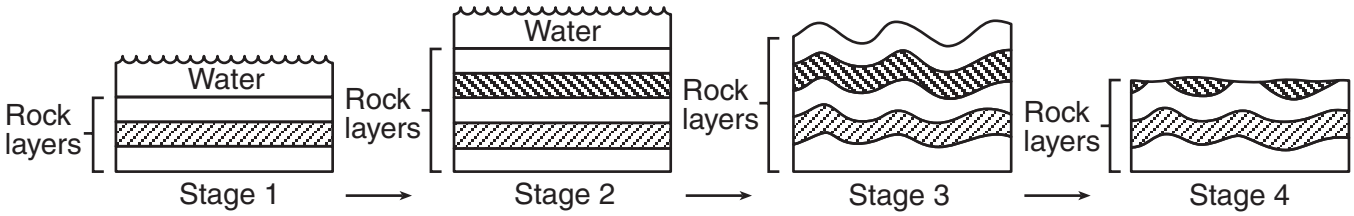
16 The drawing below shows the original size and shape of a rock sample before it is thrown into a rapidly moving stream.



Which drawing best shows the actual size and shape the rock will have after being carried several hundred miles downstream and deposited?



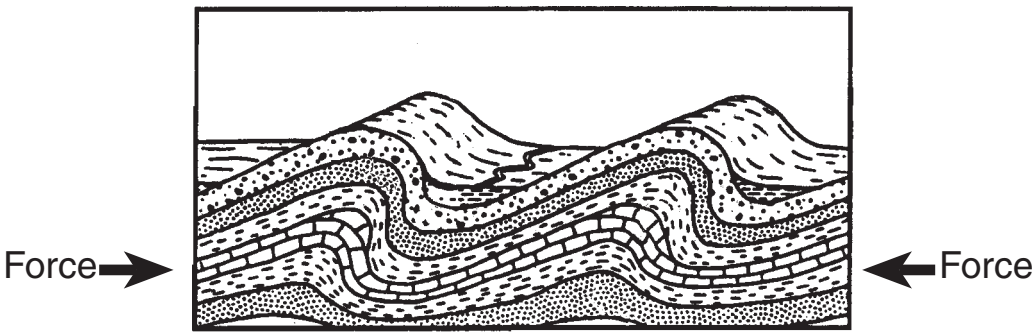
17 The diagram below shows stages in the development of a certain landscape.



When did erosion become the most dominant process in the development of the landscape shown in stage 4?

(1) at stage 1
(2) at stage 2
(3) between stages 2 and 3
(4) between stages 3 and 4

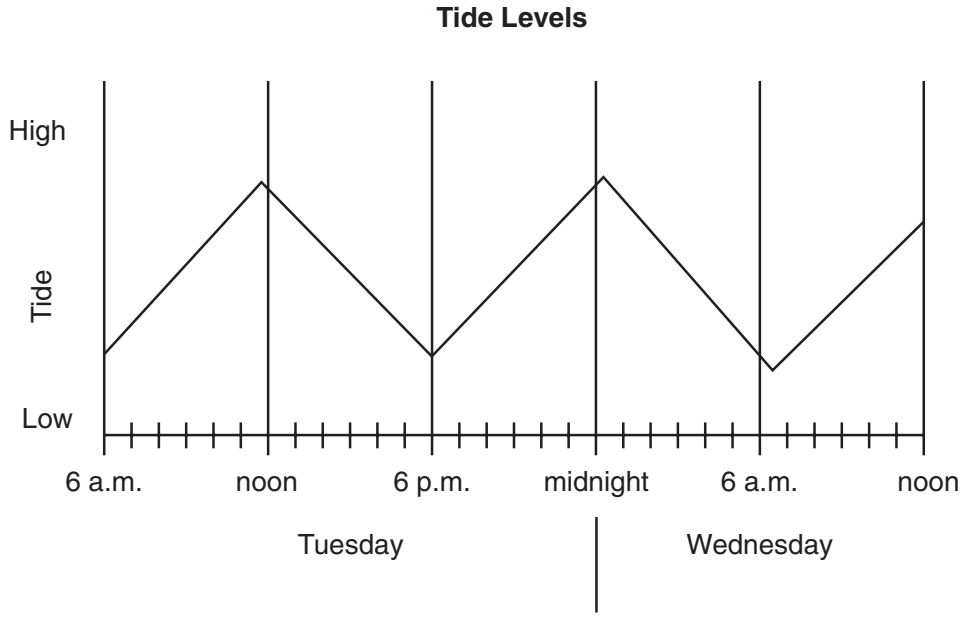
18 The diagram below shows a cross section of rock layers in Earth's crust.



The forces shown in the diagram caused the rock layers to

(1) fault
(2) fold
(3) form
(4) expand

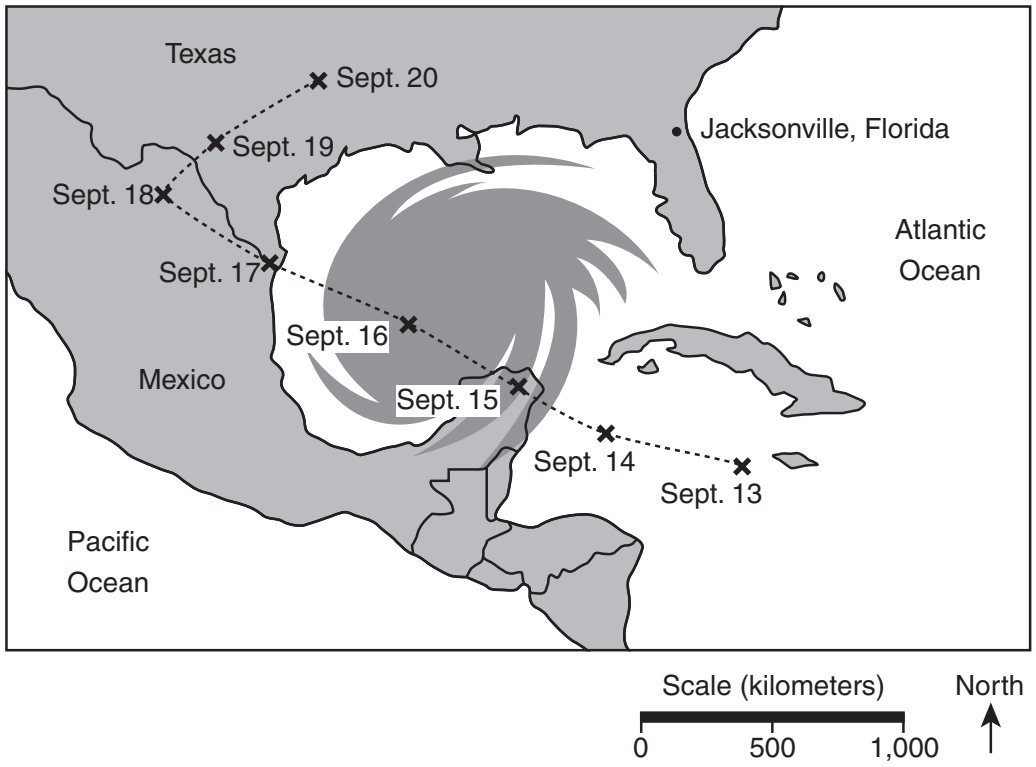
19 The graph below shows tide levels for two days at an ocean location.



Approximately how many hours are between the high tide on Tuesday and the first high tide on Wednesday?

(1) 6 hours
(2) 9 hours
(3) 12 hours
(4) 18 hours

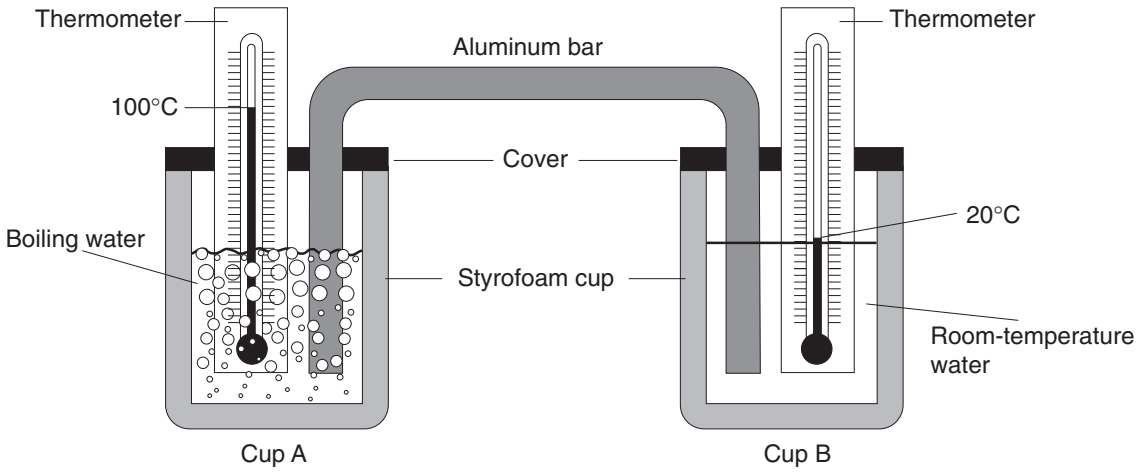
20 The map below shows the relative size and track of a certain weather event.



Which weather event is shown on the map?

(1) tornado
(2) blizzard
(3) hurricane
(4) thunderstorm

Base your answers to questions 21 and 22 on the diagram below, which shows two insulated Styrofoam cups of water connected by an aluminum bar. The thermometers show the temperature of the water in cup *A* and cup *B* at the beginning of a heat-flow experiment.



21 Over the next 15 minutes, which changes would most likely occur?

(1) The temperature in cup *A* will decrease and the temperature in cup *B* will increase.
(2) The temperature in cup *A* will decrease and the temperature in cup *B* will decrease.
(3) The temperature in cup *A* will increase and the temperature in cup *B* will increase.
(4) The temperature in cup *A* will increase and the temperature in cup *B* will decrease.

22 Which process is most responsible for the temperature changes that will take place?

(1) radiation of heat from the water in the cups to the thermometers
(2) conduction of heat through the aluminum bar
(3) radiation of heat from the water in the cups into the air
(4) conduction of heat through the air to the water in the cups

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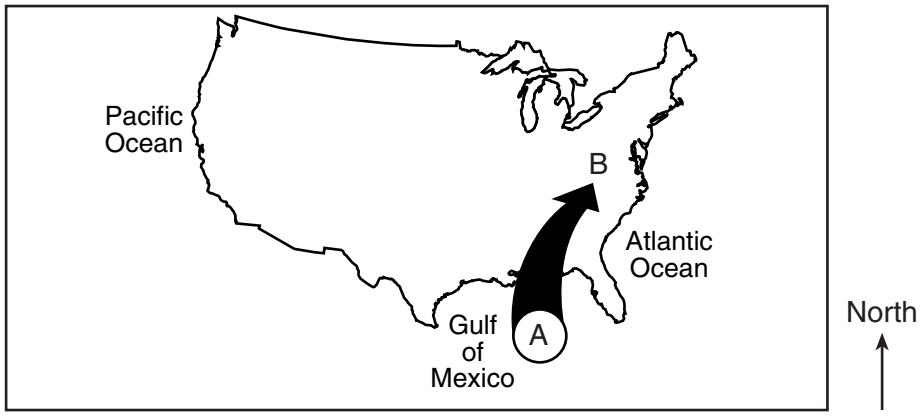
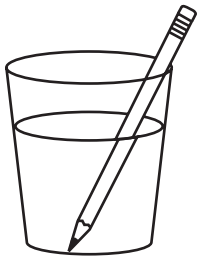
23 The map below shows an air mass that formed over the Gulf of Mexico at location *A*.



Once air mass *A* reaches location *B*, the weather conditions at location *B* will most likely become

(1) warmer and drier
(2) warmer and more humid
(3) colder and more humid
(4) colder and drier

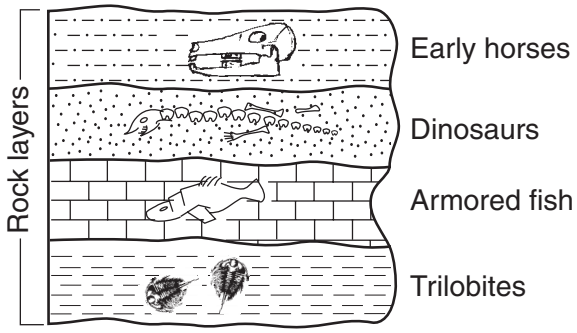
24 The diagram below shows a pencil in a glass of water.



When viewed from the side, the pencil appears to be broken. What process causes this to happen?

(1) absorption
(2) evaporation
(3) reflection
(4) refraction

25 The cross section below shows fossils and the rock layers in which they are found. Crustal movement has *not* displaced the rock layers.



(Not drawn to scale)

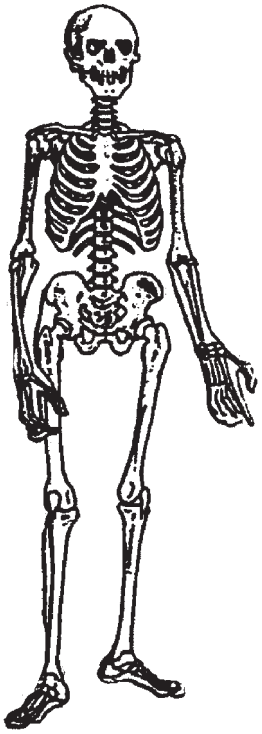
Which fossil is considered the oldest in the cross section shown?

(1) armored fish
(2) dinosaurs
(3) early horses
(4) trilobites

26 Several tomato plants are grown indoors next to a sunny window. The plants receive water and fertilizer and remain on the windowsill. What will most likely happen?

(1) Most of the leaves on the window side will wilt and die.
(2) The roots of the plants will grow upward from the soil.
(3) Water droplets will collect on the leaves facing away from the window.
(4) The stem will bend toward the window.

27 The diagram below shows a human body system.



What are two of the functions performed by this body system?

(1) protects and supports the body
(2) produces and transports oxygen within the body
(3) produces and excretes waste products
(4) controls and coordinates body activities

28 The main function of the human digestive system is to

(1) break down foods for absorption into the blood
(2) exchange oxygen and carbon dioxide in the lungs
(3) release energy from sugars within the cells
(4) carry nutrients to all parts of the body

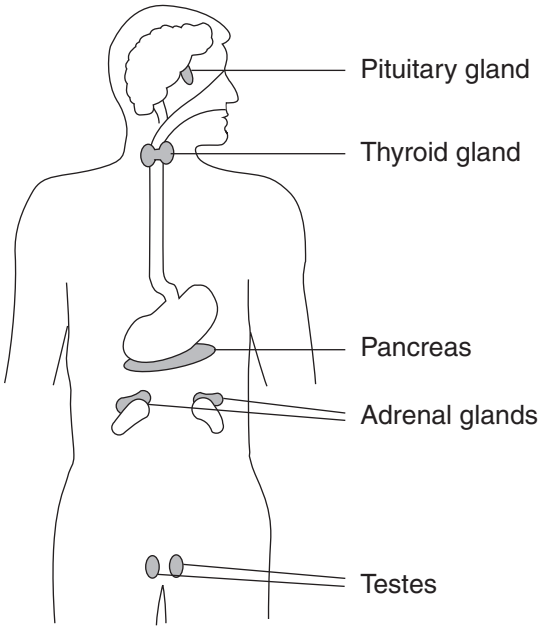
29 Which sequence lists the levels of organization in the human body from simplest to most complex?

(1) organ system → tissue → cell → organ
(2) tissue → cell → organ → organ system
(3) organ → organ system → tissue → cell
(4) cell → tissue → organ → organ system

30 Which three systems of the human body function together to move and control body parts?

(1) nervous, skeletal, and muscular
(2) muscular, endocrine, and excretory
(3) digestive, excretory, and reproductive
(4) circulatory, endocrine, and respiratory

31 The labeled organs in the diagram below are part of which human body system?



(1) respiratory
(2) endocrine
(3) digestive
(4) circulatory

32 Evidence that living things have evolved over hundreds of millions of years can be found in

(1) particles in the air
(2) rocks containing fossils
(3) tree rings from recently logged trees
(4) chemicals in human hair

33 Extinction of a species is most likely to occur as a result of

(1) evolution
(2) migration
(3) selective breeding
(4) environmental changes

Base your answers to questions 34 and 35 on the diagram below which shows a model of human inheritance.

	A	*A*
a	*Aa*	*Aa*
a	*Aa*	*Aa*

KEY
A = Straight hairline (dominant)
a = Peaked hairline (recessive)

34 The parent whose genes are *aa*

(1) must be dominant
(2) has a straight hairline
(3) has a peaked hairline
(4) may have *AA* offspring

35 The diagram shown is called a

(1) Punnett square
(2) pedigree chart
(3) dichotomous key
(4) flowchart

36 Some kinds of fish live most of their lives in salt water but lay their eggs in freshwater. Their ability to survive in different environments is an example of

(1) adaptation
(2) developmental stages
(3) a habit
(4) selective breeding

37 Which example would result in new cells that are most different from the parent cells?

(1) yeast cells splitting into new cells
(2) bacteria cells dividing into new cells
(3) skin cells dividing to produce more skin cells
(4) sperm and egg cells uniting to produce fertilized egg cells

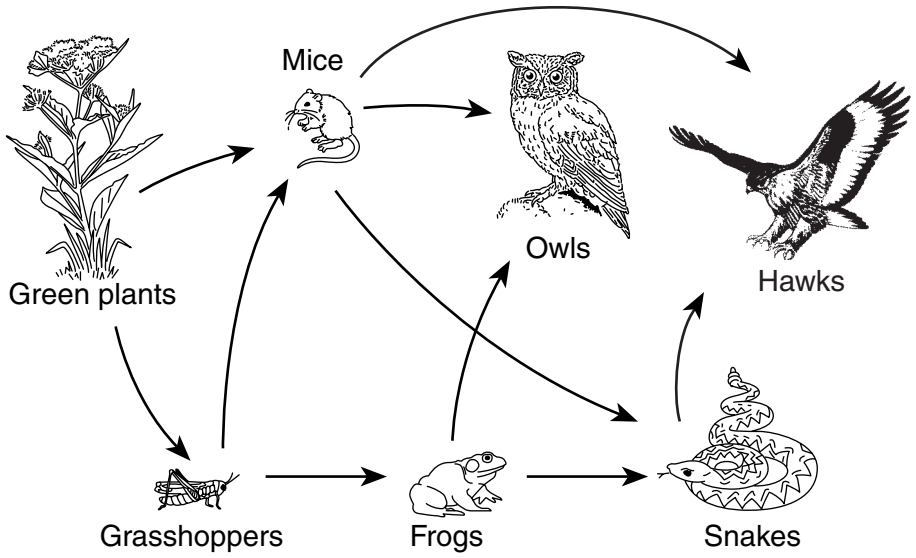
38 The table below shows the symptoms of some diseases that are caused by bacteria.

Disease	Symptoms
botulism	vomiting, abdominal pain, coughing, muscular weakness, visual disturbance
pneumonia	inflammation of lungs, fever, shortness of breath, fluid in lungs
typhoid fever	red rashes, high fever, intestinal bleeding
tetanus	uncontrolled contractions of voluntary muscles

Which two diseases listed in the table affect the digestive system?

(1) botulism and typhoid fever
(2) botulism and pneumonia
(3) tetanus and pneumonia
(4) tetanus and typhoid fever

Base your answers to questions 39 and 40 on the diagram below, which shows a partial food web.



(Not drawn to scale)

39 How many organisms in this food web feed on the mice?

(1) 5
(2) 2
(3) 3
(4) 4

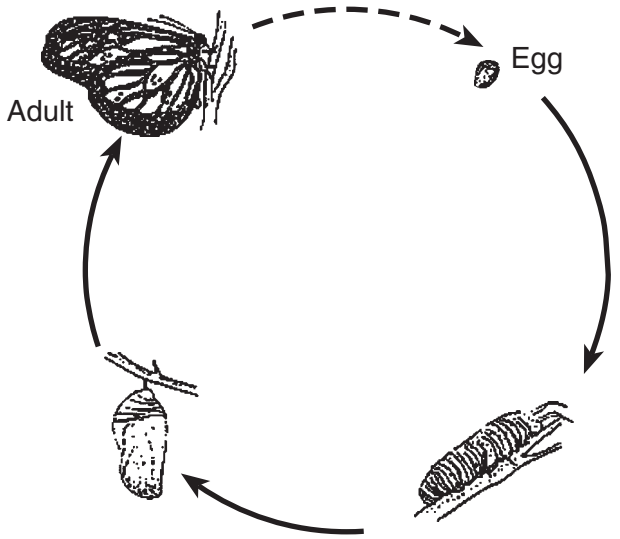
40 Which group of organisms is missing from this food web?

(1) carnivores
(2) herbivores
(3) omnivores
(4) decomposers

41 Growth and repair in multicellular organisms are the result of

(1) excretion
(2) locomotion
(3) cell division
(4) decomposition

42 The diagram below shows changes that a butterfly undergoes as it develops from an egg into an adult.



Which process is illustrated in the diagram?

(1) mutation
(2) photosynthesis
(3) germination
(4) metamorphosis

43 Which observation of a plant supports the inference that photosynthesis can take place?

(1) a strong, sweet smell
(2) a dry, rough texture
(3) a green color
(4) a smooth stem

44 Populations living in one place form a

(1) community
(2) system
(3) habitat
(4) species

45 Which situation is the best example of ecological succession?

(1) An organism survives a difficult winter.
(2) The populations in an area remain the same.
(3) One species replaces another species in an ecosystem.
(4) Each of several species uses the same amount of resources.