

**VIRGINIA
STANDARDS OF LEARNING ASSESSMENTS**

Spring 2003 Released Test

**GRADE 8
SCIENCE**

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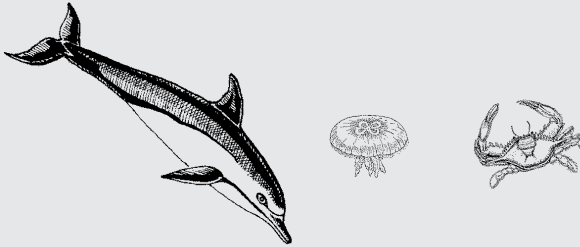
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Science

DIRECTIONS

Read each question carefully and choose the best answer.

SAMPLE



These animals are grouped together because all of them —

- A live in the water
- B are fish
- C are warm-blooded
- D lay eggs

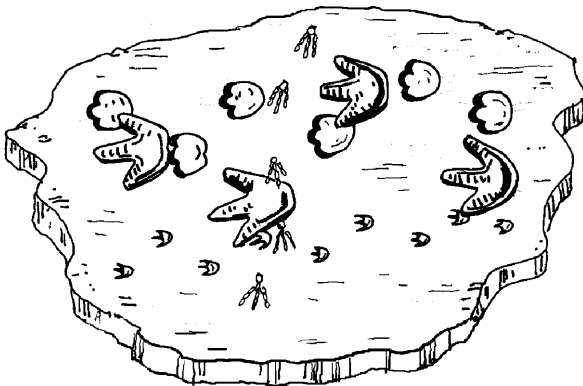
2 Which of these *best* completes the statement about the interaction of the respiratory system with the circulatory system? The lungs add —

- F nutrients to the blood
- G bile to the blood
- H oxygen to the blood
- J carbon dioxide to the blood

3 Which of these will cause water to change to ice?

- A Removing heat from the water
- B Stirring the water
- C Adding salt to the water
- D Putting the water in the sunlight

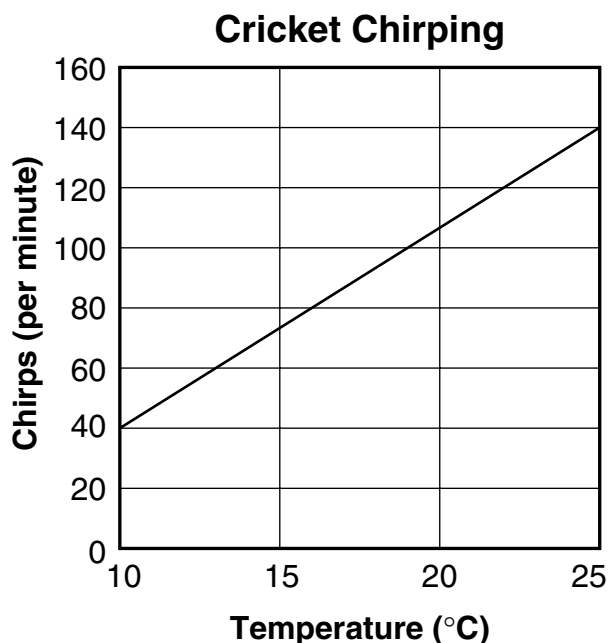
1



The picture shows dinosaur tracks found in rocks. How many dinosaurs left their tracks here?

- A 2
- B 4
- C 14
- D 24

4



Crickets chirp to attract other crickets. The temperatures and rates of their chirping are graphed above. Which statement below is most likely true for the data represented in the graph?

- F The cooler the temperature, the louder the crickets chirp.
- G The crickets cannot chirp at temperatures lower than 10°C.
- H The warmer the temperature, the more often crickets chirp.
- J The temperature and the chirping of crickets are not related.

5

Period

Group

	1	2		13	14	15	16	17	18		
1	1 H								2 He		
2	3 Li	4 Be		5 B	6 C	7 N	8 O	9 F	10 Ne		
3	11 Na	12 Mg	3	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar		
4	19 K	20 Ca	21 Sc	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba	*	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra	†								

alkali metals

alkaline earth metals

halogens

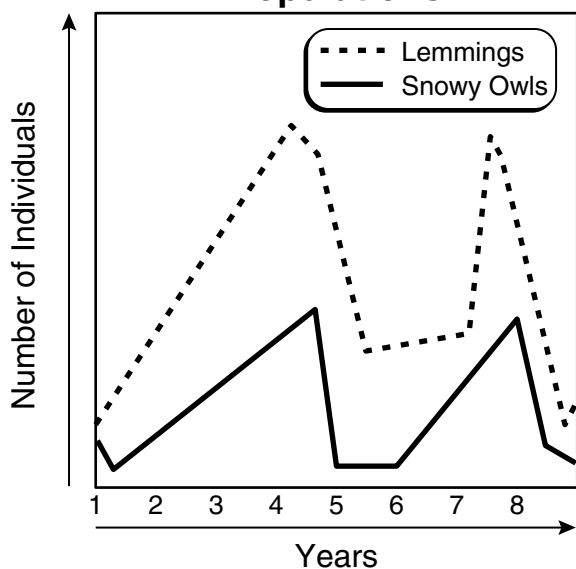
noble gases

Which of the following elements belongs to the family indicated?

- A Nitrogen belongs to the halogen family.
- B Helium belongs to the noble gas family.
- C Calcium belongs to the alkali family.
- D Sodium belongs to the alkaline earth family.

6

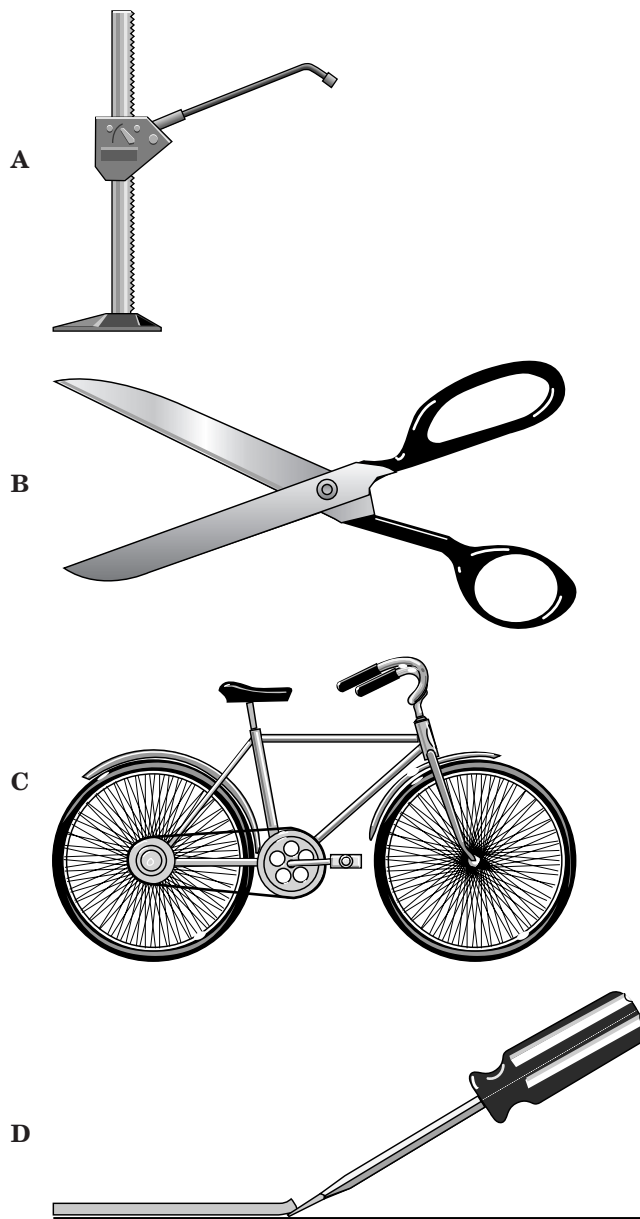
Lemming and Snowy Owl Populations



Lemmings are small mammals that experience a population explosion about once every four years. Snowy owls eat lemmings. Which of these statements is supported by the data in this graph?

- F The snowy owls are becoming extinct.
- G Lemmings live much longer than snowy owls.
- H The habitat of the lemmings is continuously decreasing in size.
- J The snowy owl population increases because of an increase in lemmings.

7 Which of these has the greatest number of different simple machines?



8 The atom is composed of electrons, protons, and neutrons. What is the electric charge on the neutron?

- F -1
- G +1
- H 0
- J +2

9 A tick that feeds on the blood of animals is a —

- A predator
- B host
- C competitor
- D parasite

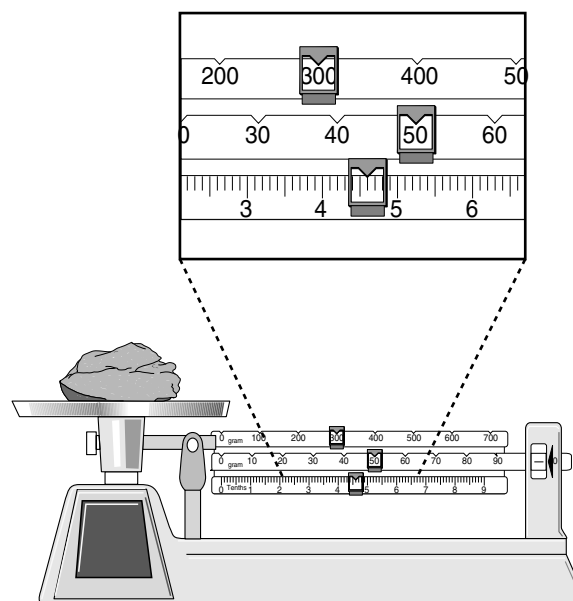
10 The distance between one point on a compression and the corresponding point on the next compression in a sound wave is called a —

- F wavelength
- G rarefaction
- H crest
- J trough

11 Which of the following do typical plant cells have that typical animal cells do not?

- A Cytoplasm
- B Nuclei
- C Mitochondria
- D Chloroplasts

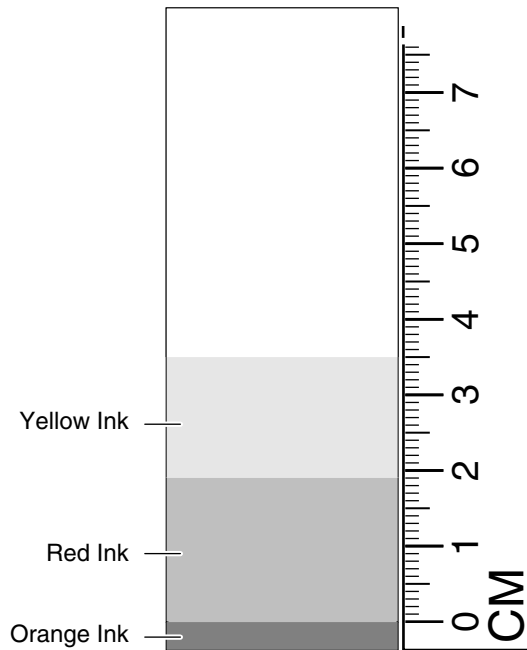
12



What is the mass of the rock?

- F 335.6 g
- G 350.6 g
- H 354.6 g
- J 356.0 g

13



The picture shows the results of putting a drop of orange ink from a marking pen on a piece of filter paper and allowing the colors in the ink to separate. About how much farther on the filter paper has the yellow pigment moved than the red pigment?

- A 0.5 cm
- B 1.6 cm
- C 2.7 cm
- D 3.5 cm

Note that due to varying printer properties, measurement items may not appear in exact proportions.

14 The kangaroo rat is able to get all of the water it needs through its food and, therefore, never needs to drink liquids. This animal has adapted to survive in which biome?

- F Forest
- G Tundra
- H Desert
- J Grassland

15 The science of astronomy is concerned with the observation and analysis of the movements of celestial objects. The invention of which instrument was *most* helpful to the advancement of astronomy?

- A Telescope
- B Microscope
- C Camera
- D Geiger counter

16 There are many reasons why the use of oil needs to be managed carefully. Which of the following is *not* one of these reasons?

- F There are only limited supplies of oil in the Earth.
- G Oil spills at sea have killed many marine animals.
- H Burning oil contributes to acid rain and the greenhouse effect.
- J Oil was created by plants and animals.

17 Several centuries ago, men called alchemists tried to transform common metals into gold. Even though they tried many different chemical and physical methods, they never succeeded because —

- A they could not heat common metals to extremely high temperatures
- B the common metals they worked with were not pure
- C they did not add the correct material to the common metal
- D elements cannot be changed to other elements by physical or chemical means

18

Group	Group Size	Brand of Artificial Plant Light	Average Height Before Using Plant Light (cm)	Average Height 2 Weeks After Using Plant Light (cm)
1	25	A	5.4	28.0
2	25	B	5.3	27.0
3	25	C	5.2	28.0
4	25	D	5.5	25.5

The chart shows the results of an experiment to test the effects of different plant lights on plant seedling growth. Which group of plants showed the greatest gain in height?

- F Group 1
- G Group 2
- H Group 3
- J Group 4

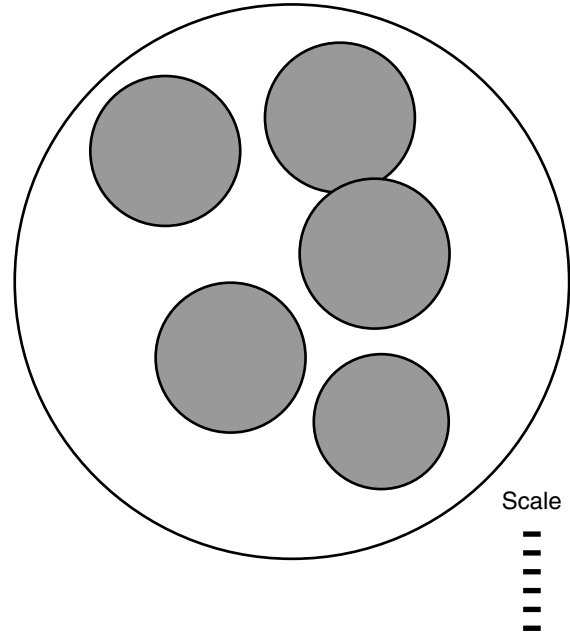
19 Mercury is a liquid metal that is used in many thermometers. The mercury in the thermometer rises because it —

- A is sucked upward by vacuum
- B expands when heated
- C is compressed by air pressure
- D increases in density when heated

20 Which of these could cause a decrease in the number of squirrels in a population?

- F An increase in cooperation with birds in the area
- G An increase in the squirrels' territory
- H An increase in competition with other nut-eating animals
- J An increase in the squirrels' food supply

21



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

- A 4—5 micrometers
- B 7—8 micrometers
- C 10—11 micrometers
- D 12—13 micrometers

22 Which level of organization below is the most basic or primary level of organization?

- F Cell
- G Tissue
- H Organ
- J Organ system

23 Ellen noticed that she often sneezes when she visits her friend Robert, who has a cat and a parrot. Ellen wonders if she may have allergies to Robert's pets and decides to conduct a scientific investigation. What should Ellen do next?

- A Ellen should tell Robert that she cannot visit him until he gives away his pets.
- B Ellen should visit Sue who has a horse, a dog, a goldfish, and a hamster.
- C Ellen should call her doctor and insist that she needs shots for allergies.
- D Ellen should visit a friend who has only cats and one who has only parrots.

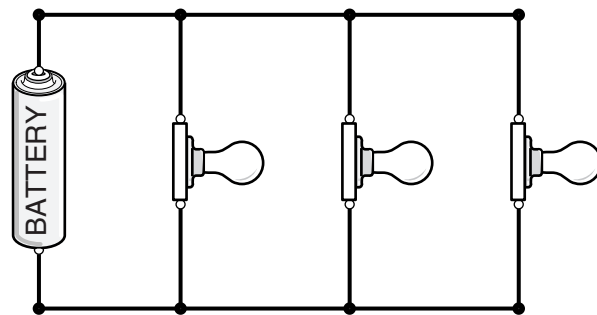
24 Because burning fossil fuels creates much pollution, alternatives are being investigated. What might limit the use of wind as a major energy source?

- F The strength of the wind varies.
- G Wind machines have huge blades to capture the wind.
- H Turbines and generators in the wind machines create electricity.
- J Wind power does not create pollution.

25 Sponges are classified as animals because they cannot —

- A move from place to place
- B make their own food
- C get rid of waste products
- D catch their own food

26



Which of the following is shown in this diagram?

- F Alternating current
- G Short circuit
- H Series circuit
- J Parallel circuit

27 Which of the following is a physical property of copper?

- A Ductile, can be drawn into a wire
- B Liquid at room temperature
- C Readily reacts with water to form an acid
- D Readily reacts with oxygen

28 Northern garter snakes exhibit a unique behavior in which they gather in deep dens by the hundreds or thousands. They then coil together in a huge ball. This behavior could help to —

- F reduce heat loss
- G increase camouflage
- H locate food sources
- J increase oxygen consumption

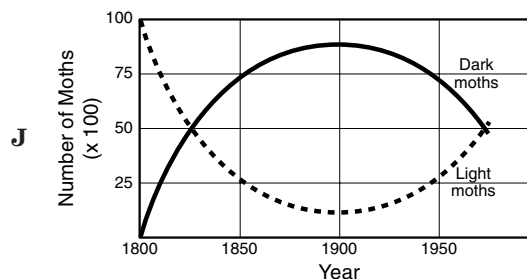
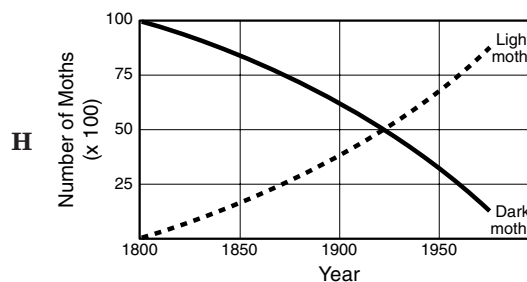
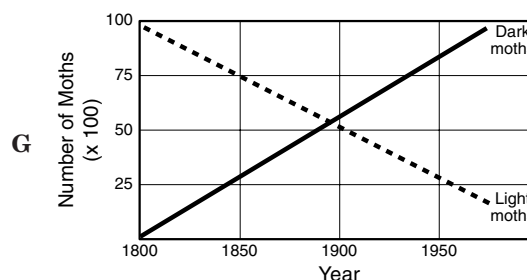
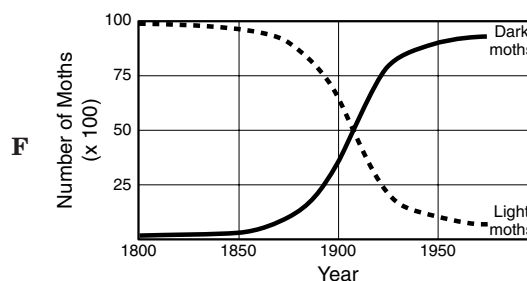
29 When plants perform photosynthesis, they use sunlight to produce food. This is an example of light energy being converted to —

- A heat energy
- B electrical energy
- C mechanical energy
- D chemical energy

30 Number of Moths By Year (x100)

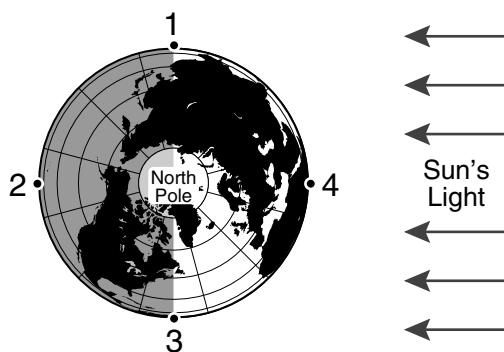
Kind of Moth	1800	1850	1875	1900	1925	1950	1975
light	100	97	90	65	21	10	7
dark	0	3	10	35	79	90	93

Scientists have spent many years studying the peppered moth, which is a species that has adapted its color from light to dark in reaction to environmental pollution. Which of the following line graphs represents the data from the table?



- 31 Mendel's early work with pea plants demonstrated a significant genetic discovery. The crossing of homozygous tall pea plants with homozygous short pea plants always resulted in tall plants and demonstrated that tallness in pea plants is a trait that is —
- A blended
 - B dominant
 - C mutated
 - D recessive

32



At which of these points is it 12:00 noon?

- F 1
 - G 2
 - H 3
 - J 4
- 33 Which of the following is an example of kinetic energy?
- A A baseball moving from the pitcher to the catcher
 - B A rock sitting on the top of a large hill
 - C A pendulum at the top of its swing
 - D A new flashlight battery

- 34 Many scientists believe that nuclear fusion will become a possible energy source within the next 10 years. What resource would be *most* effective in tracking the progress of this energy source?

- F The local newspaper
- G A chemical encyclopedia
- H A physics textbook
- J Scientific periodical

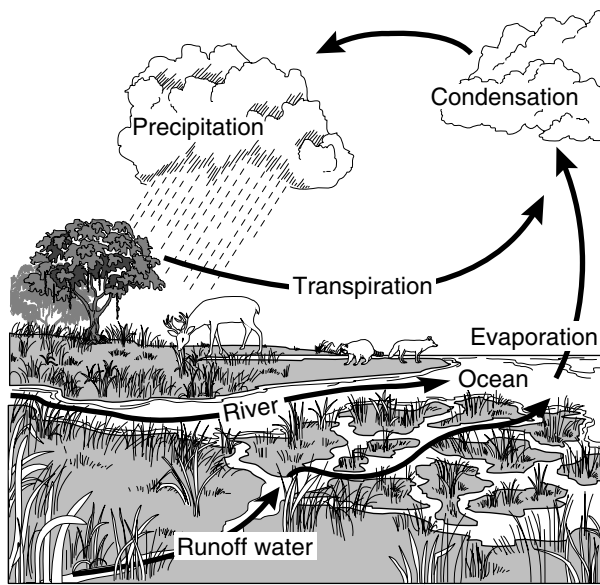
35



Objects with like charges repel and unlike charges attract. The girl's hair and the comb have —

- A unlike charges
- B like charges
- C neutral charges
- D no charges

The Water Cycle



The loss of which of these would have the *least* effect on the water cycle?

- F Soil
- G Rivers
- H Animals
- J Plants

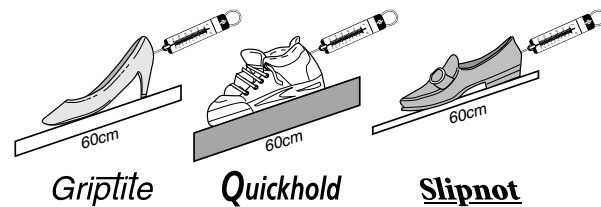
37 Which of these processes helps extract energy from food?

- A Reproduction
- B Digestion
- C Excretion
- D Circulation

38 Which of these is a change in chemical composition?

- F A lake freezes solid.
- G Gravel, sand, and water are mixed.
- H A copper bar is rolled into a flat sheet.
- J Vinegar bubbles when baking soda is added.

39



The picture shows a test for non-slip surfaces to be used on a ramp. Which of these must be done to provide more meaningful results?

- A Use the same shoe on each surface
- B Use boards of the same thickness
- C Use the same shoe size for each type of shoe
- D Use shoes with soles designed for sports

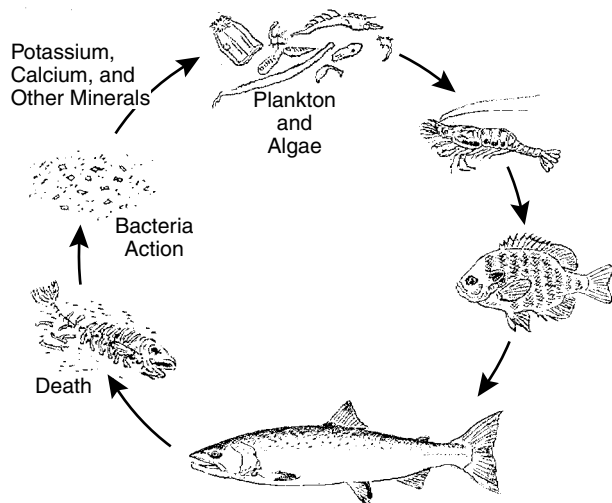
40

Planet	Average Distance from Sun (kilometers)
Earth	149.5 million
Jupiter	777.3 million
Mars	227.9 million
Mercury	57.9 million
Venus	108.2 million

According to this chart, which planet will most likely have the highest temperatures?

- F Earth
- G Mars
- H Mercury
- J Venus

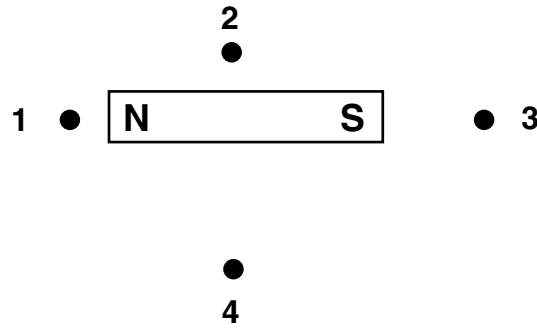
41



According to this diagram, both of these fish —

- A eat bacteria
- B give off toxic wastes
- C take in minerals through their gills
- D get their energy from other animals

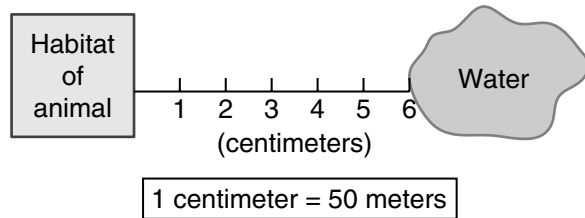
42



At which point is the magnetic field the strongest?

- F Point 1
- G Point 2
- H Point 3
- J Point 4

43



The picture above illustrates the habitat of a population of animals and its distance from the nearest water source. How far does an animal have to travel to obtain water?

- A 6 centimeters
- B 12 meters
- C 50 meters
- D 300 meters

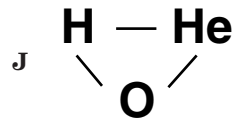
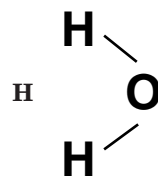
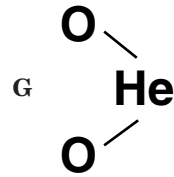
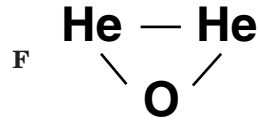
44 Most of the hereditary information within the cell is carried in the —

- F ribosomes
- G vacuoles
- H chromosomes
- J Golgi bodies

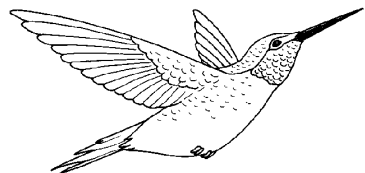
45 The time in which Earth makes one revolution around the sun is approximately one —

- A year
- B season
- C month
- D day

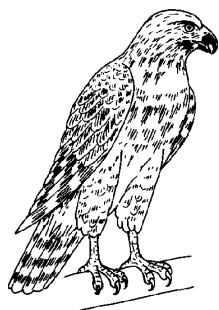
46 Which picture illustrates the structure of a molecule of water?



47



**Ruby-throated
Hummingbird**



Red-tailed Hawk



**Yellow-bellied
Sapsucker**

These birds all live in Virginia. One of the bird's main sources of food is the nectar inside long, trumpet-shaped flowers. A second bird eats mostly rodents. The third bird often is seen pecking into the bark of the local trees to get the insects just inside. Which of the following lists has correctly matched the pictured birds with their diets?

- A Ruby-throated Hummingbird–nectar;
Red-tailed Hawk–insects;
Yellow-bellied Sapsucker–rodents
- B Ruby-throated Hummingbird–insects;
Red-tailed Hawk–nectar;
Yellow-bellied Sapsucker–rodents
- C Ruby-throated Hummingbird–rodents;
Red-tailed Hawk–nectar;
Yellow-bellied Sapsucker–insects
- D Ruby-throated Hummingbird–nectar;
Red-tailed Hawk–rodents;
Yellow-bellied Sapsucker–insects

48

5 B Boron 10.811	6 C Carbon 12.011	7 N Nitrogen 14.0067
13 Al Aluminum 26.9815	14 Si Silicon 28.0855	15 P Phosphorus 30.97376

Which of these elements has an atomic number of 14?

- F N
- G Al
- H Si
- J P

49 In which biome would you find the most variety of life?

- A Tundra
- B Desert
- C Grassland
- D Rain forest

50 Tearing paper is an example of a —

- F physical change
- G chemical change
- H chemical reaction
- J solution

Answer Key

Test Sequence	Correct Answer	Reporting Category	Reporting Category Description
1	B	019	Earth and Space Systems
2	H	017	Life Systems
3	A	016	Force, Motion, Energy, and Matter
4	H	015	Scientific Investigation
5	B	016	Force, Motion, Energy, and Matter
6	J	018	Ecosystems
7	C	016	Force, Motion, Energy, and Matter
8	H	016	Force, Motion, Energy, and Matter
9	D	018	Ecosystems
10	F	016	Force, Motion, Energy, and Matter
11	D	017	Life Systems
12	H	015	Scientific Investigation
13	B	015	Scientific Investigation
14	H	018	Ecosystems
15	A	019	Earth and Space Systems
16	J	019	Earth and Space Systems
17	D	016	Force, Motion, Energy, and Matter
18	H	015	Scientific Investigation
19	B	016	Force, Motion, Energy, and Matter
20	H	018	Ecosystems
21	B	015	Scientific Investigation
22	F	017	Life Systems
23	D	015	Scientific Investigation
24	F	016	Force, Motion, Energy, and Matter
25	B	017	Life Systems
26	J	016	Force, Motion, Energy, and Matter
27	A	016	Force, Motion, Energy, and Matter
28	F	018	Ecosystems
29	D	016	Force, Motion, Energy, and Matter
30	F	015	Scientific Investigation
31	B	017	Life Systems
32	J	019	Earth and Space Systems
33	A	016	Force, Motion, Energy, and Matter
34	J	015	Scientific Investigation
35	A	016	Force, Motion, Energy, and Matter
36	H	018	Ecosystems
37	B	017	Life Systems
38	J	016	Force, Motion, Energy, and Matter
39	A	015	Scientific Investigation
40	H	019	Earth and Space Systems
41	D	018	Ecosystems
42	F	016	Force, Motion, Energy, and Matter
43	D	015	Scientific Investigation
44	H	017	Life Systems
45	A	019	Earth and Space Systems
46	H	016	Force, Motion, Energy, and Matter
47	D	015	Scientific Investigation
48	H	016	Force, Motion, Energy, and Matter
49	D	018	Ecosystems
50	F	016	Force, Motion, Energy, and Matter