

**VIRGINIA  
STANDARDS OF LEARNING ASSESSMENTS**

**Spring 2002 Released Test**

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**GRADE 8  
SCIENCE**

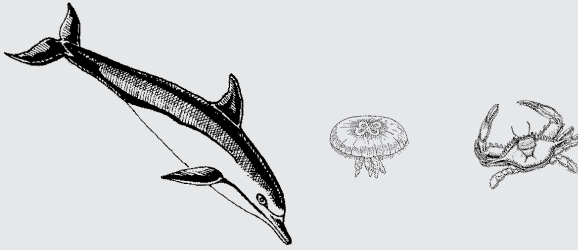
# Property of the Virginia Department of Education

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**DIRECTIONS**

Read each question carefully and choose the best answer. Then mark the space in the answer booklet for the answer you have chosen.

**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

**1 Which of these uses the force of gravity to make it move?**

- A A sailboat moving across a lake
- B A car making a right turn
- C A snow sled going downhill
- D A bicycle rolling to a stop

**2 The presence of permafrost is a characteristic of which major biome?**

- F Tundra
- G Taiga
- H Temperate forest
- J Grasslands

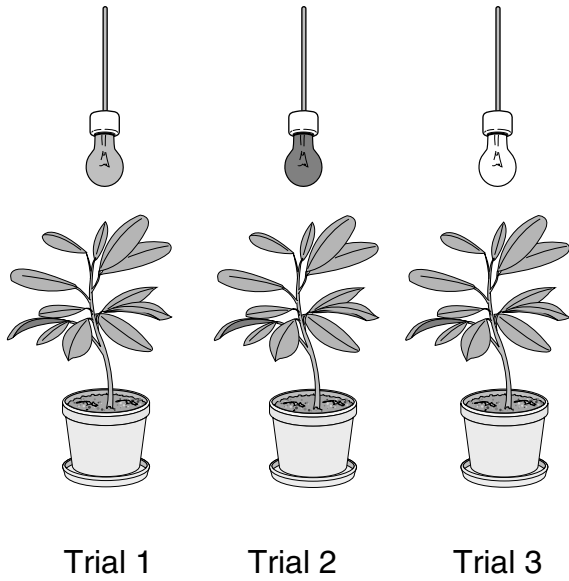
**3 Plants release oxygen into the air as a result of photosynthesis. Which of these do plants need for photosynthesis?**

- A Carbon dioxide
- B Nitrogen
- C Methane
- D Hydrogen

**4 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 —**

- F a container of a different size
- G a different amount of antifreeze
- H a different amount of water
- J exactly the same set-up as the first experiment

5 Red Green Yellow



This experiment was set up to test the hypothesis that plants grow faster in green light. What is the independent variable in this experiment?

- A Type of plant
- B Amount of water
- C Color of light
- D Size of pot

6

Period																									
Group		1 2															13 14 15 16 17 18								
1	1	H																2	He						
2	3	Li	4	Be											5	6	7	8	9	10					
3	11	Na	12	Mg	3												13	14	15	16	17	18			
4	19	K	20	Ca	21	Sc											29	30	31	32	33	34	35	36	
5	37	Rb	38	Sr	39	Y	4											47	48	49	50	51	52	53	54
6	55	Cs	56	Ba	*												79	80	81	82	83	84	85	86	
7	87	Fr	88	Ra	†												halogens								
		alkali metals				alkaline earth metals				noble gases															

Which of the following elements has 16 protons?

- F Oxygen
- G Chlorine
- H Sulfur
- J Germanium

7 The amount of gravitational attraction between the Earth and an object depends on the object's distance from the Earth and the object's —

- A shape
- B mass
- C state of matter
- D size

**8 Of the following, which is the correct progression in the food chain?**

- F Producers → herbivores → carnivores
- G Herbivores → producers → carnivores
- H Producers → carnivores → herbivores
- J Carnivores → herbivores → producers

**9 Which of these are found in plant cells but *not* in animal cells?**

- A Mitochondria
- B Chloroplasts
- C Cell membranes
- D Endoplasmic reticulum

**10 A student predicts that more sugar will dissolve in warm water than in cold water. She puts some water in a container, adds sugar, and then stirs. The amount of undissolved sugar is then observed. When this student repeats the experiment to verify her prediction, the only thing that should change is the —**

- F amount of water used
- G temperature of the water
- H amount of sugar used
- J amount of time stirring

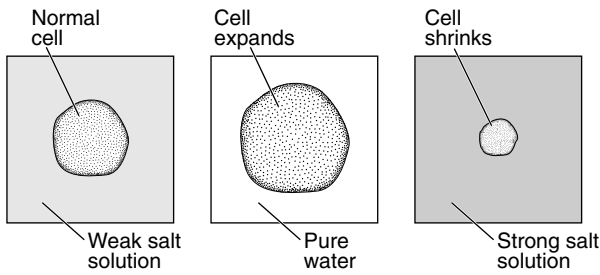
**11 Which of the following molecules does *not* contain three atoms?**

- A O<sub>3</sub>
- B N<sub>2</sub>
- C H<sub>2</sub>O
- D CO<sub>2</sub>

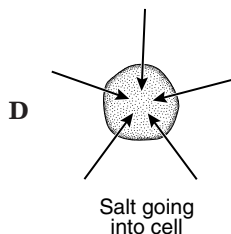
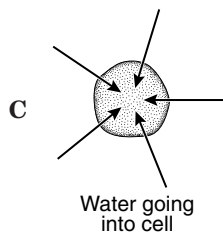
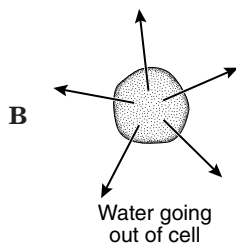
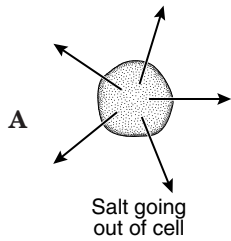
**12 The function of a cell nucleus is to —**

- F direct the activities of the cell
- G help the cell expel waste
- H digest foreign substances
- J transport substances around the cell

13



Which of these best shows what is happening to the cell in pure water?



14 Which of these processes in the water cycle causes dew to form in the morning?

- F Condensation
- G Evaporation
- H Transpiration
- J Precipitation

15 A student conducted an experiment on plant growth that required adding about one cupful of liquid fertilizer to several plants each week. In order to accurately measure the fertilizer given to each plant, the fertilizer volume should be measured in —

- A cubic meters
- B milliliters
- C cubic feet
- D kiloliters

16 Early space flights were unmanned because —

- F humans had no interest in space exploration
- G reliable life-support systems were not yet developed
- H rockets flew too fast for human survival
- J humans could not withstand the force of takeoff

17 One way plants and animals are alike is that they both —

- A move to get their food
- B make their own food
- C use carbon dioxide
- D use oxygen

18 Consumers of electrical energy are billed according to how much energy they use. The unit most commonly used for measuring electrical energy consumption is the —

- F millivolt
- G ohmmeter
- H newton-meter
- J kilowatt-hour

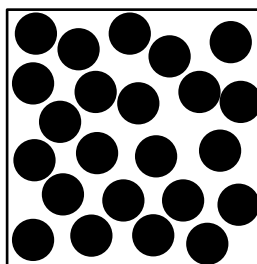
19 Which of these *cannot* be separated into its parts by an ordinary chemical or physical process?

- A A mixture of salts (NaCl, KI)
- B A compound of nitrogen ( $\text{NH}_3$ )
- C An atom of carbon (C)
- D An acid of chlorine (HCl)

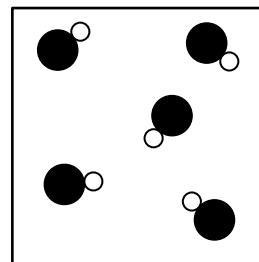
20 A student determined the mass and volume of a gold ring. What physical property of the gold can be determined using these two measurements?

- F Its reactivity
- G Its expansion rate
- H Its density
- J Its melting point

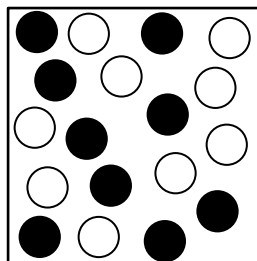
21 Which of these *best* shows particles in a mixture?



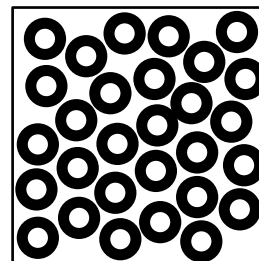
A



C

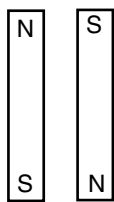


B

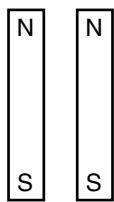


D

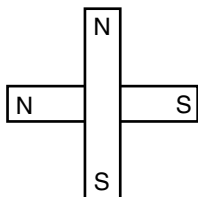
22 Which of the following orientations of magnets would result in the *greatest* attraction between the two magnets?



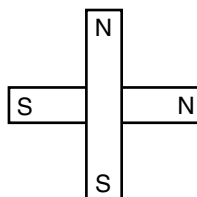
F



H



G



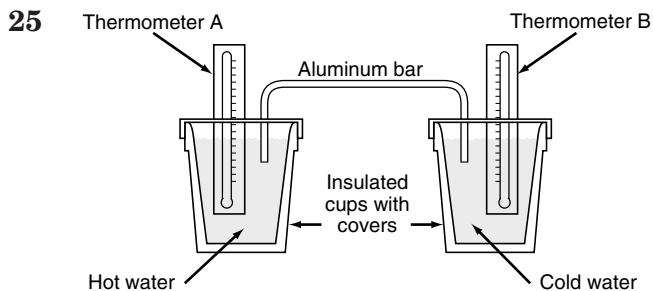
J

23 The Earth is warmed by solar energy. How is this energy transferred from the sun to the Earth?

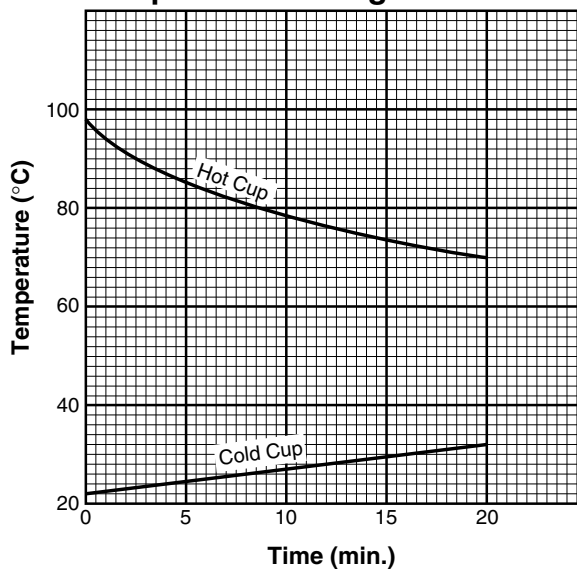
- A Radiation
- B Convection
- C Conduction
- D Ultrasonic

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

- F a girl swinging on a swing
- G a train moving down a track
- H electric charges moving in a straight path
- J a plate sitting on the edge of a table



Temperature Changes Over Time



The above apparatus was set up as shown, and thermometer readings were recorded for 20 minutes. The results were then graphed. By how many degrees did the temperature of the hot water decrease in the 20 minutes that readings were taken?

- A 10°C
- B 14°C
- C 20°C
- D 28°C



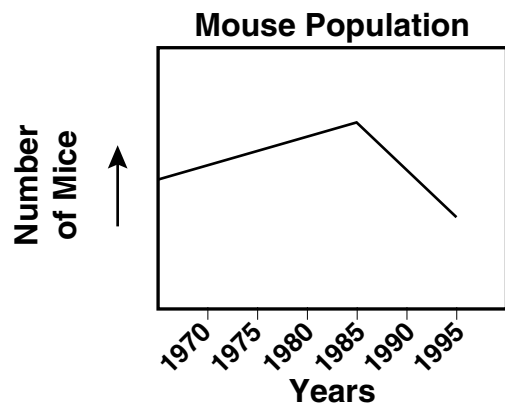
26 A new medication dissolves blood clots. However, if too much is used, excessive bleeding occurs. Which method should scientists use to determine the best dosage of this new medication?

- F Use people of many different ages as test subjects
- G Have the test subjects eat a wide variety of foods with the medication
- H Change the times the medication is given to determine if timing affects bleeding
- J Vary only the dosages of the medication while keeping everything else constant

27 In an experiment combining vinegar and baking soda, gas is given off. In this chemical reaction, the vinegar and baking soda are —

- A reactants
- B products
- C elements
- D suspensions

28



Suppose that in a certain area, mice are the main food source for wolves. Based on the graph, in which year would there be the *least* amount of competition among wolves for food?

- F 1975
- G 1980
- H 1985
- J 1990

29 A wheel-and-axle is a lever that rotates around a fixed point. All of the following machines employ a wheel-and-axle *except* a —

- A bicycle
- B skateboard
- C pencil sharpener
- D crowbar

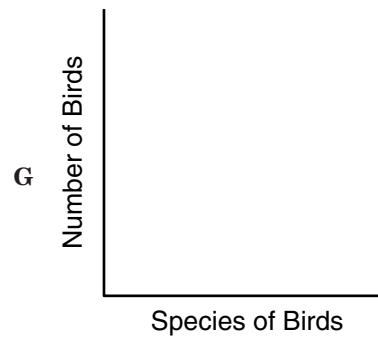
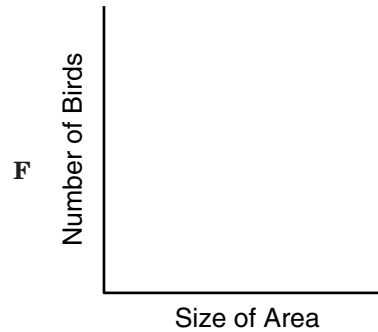
30 Scientists have been able to find no atmosphere around this planet because it has little gravity and is closest to the sun. The planet described is —

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

31 As a supplement to some diets, iron is taken in tablet form. The mass of iron in these tablets is often measured in —

- A milliliters
- B calories
- C centimeters
- D milligrams

32 Some students counted the birds in an area. They counted the number of species present and the number of birds in each species. Which of these would be best to use to report the results?



33 An experiment determined that 20 g of mass were gained by a mouse on a corn diet, 15 g by a mouse on a rice diet, and 18 g for the mouse on a grain diet. The corn-fed mouse started out at 95 g, the rice-fed at 98 g, and the grain-fed at 92 g. Which of the following tables describes these data and any other data which can be directly computed from these numbers?

A

Mouse	Initial Mass (g)	Final Mass (g)	Increase in Mass (g)	Increase in Mass (%)
Corn-fed	95	115	20	21%
Rice-fed	98	113	15	15%
Grain-fed	92	110	18	20%

B

Mouse	Initial Mass (g)	Increase in Mass (g)	Increase in Mass (g)
Corn-fed	92	110	18
Rice-fed	98	113	15
Grain-fed	95	115	20

C

Mouse	Initial Mass (g)	Increase in Mass (g)	Increase in Mass (%)
1	95	20	17%
2	98	15	13%
3	92	18	16%

D

Mouse	Initial Mass (g)	Final Mass (g)	Increase in Mass (g)	Increase in Mass (%)
1	115	95	18	19%
2	113	98	20	20%
3	110	92	15	16%

34 Which amphibian is most aquatic?



F



H



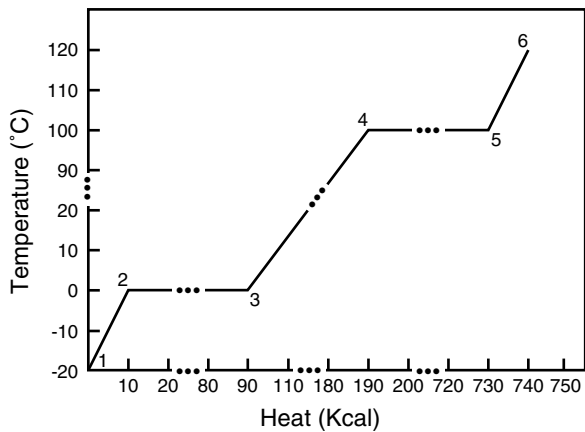
G



J

35

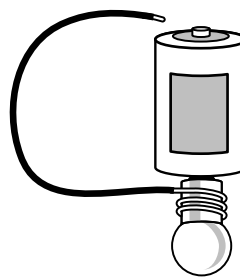
## 1 Kilogram of Water Heating



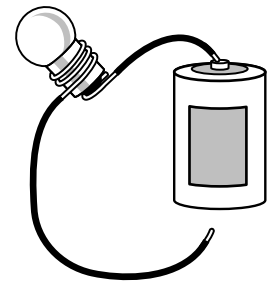
Between points 4 and 5, energy is being used to change water from a —

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

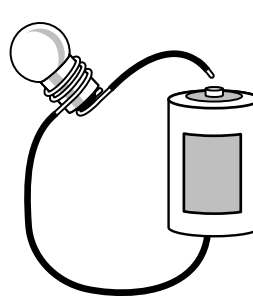
36 Which drawing shows a circuit that will cause the light to come on?



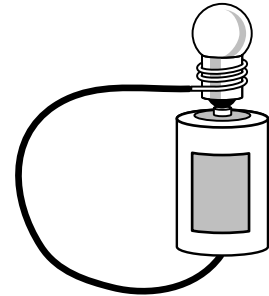
F



H



G

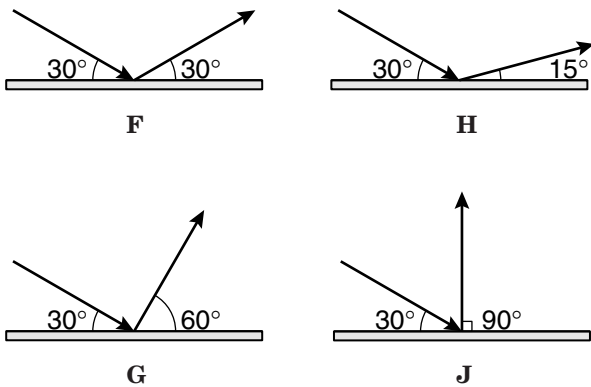


J

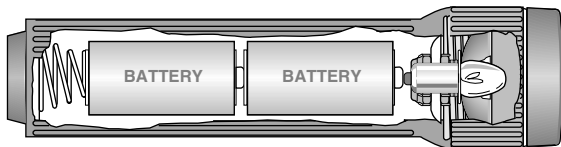
37 A compound is a molecule made up of atoms from at least two elements. Which of the following gases is a compound?

- A Ozone ( $O_3$ )
- B Oxygen ( $O_2$ )
- C Methane ( $CH_4$ )
- D Nitrogen ( $N_2$ )

38 Which of these correctly shows how a light ray is reflected from a mirror?



39



This flashlight uses three different forms of energy. Which of these shows the energy changes in the correct order?

- A Mechanical → heat → chemical
- B Heat → chemical → light
- C Electrical → mechanical → chemical
- D Chemical → electrical → light

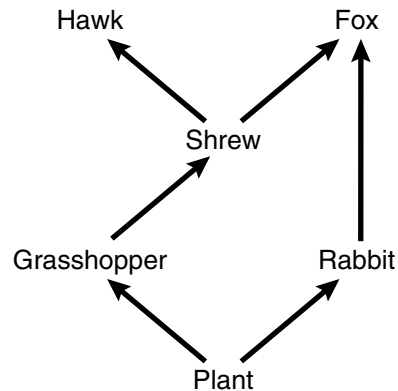
40 In humans, which of these is required for carrying oxygen from the lungs to body cells?

- F Plasma
- G Platelets
- H Red blood cells
- J White blood cells

41 The only place visited by manned exploration outside Earth is —

- A the sun
- B the moon
- C Venus
- D Mars

42



The primary producer in the ecosystem above is the —

- F plant
- G rabbit
- H hawk
- J fox

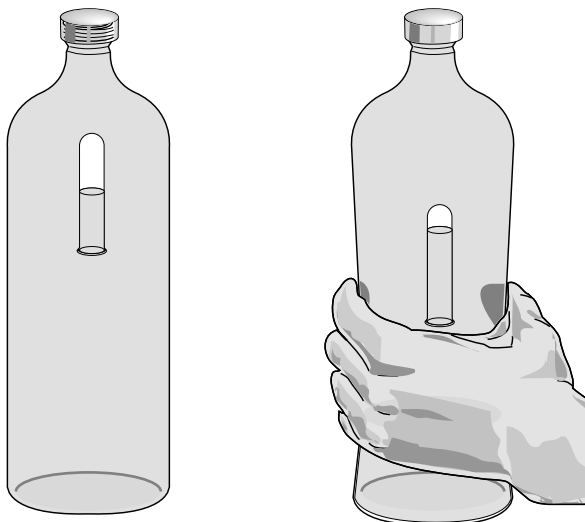
43 During mitosis, the doubling of chromosomes ensures that both new cells —

- A have identical genetic makeup
- B are twice the size of the parent cell
- C serve different functions
- D remain attached to each other

44 Many living organisms have body structures that go from very simple to very complex. Which of these places the structures in the correct order, from least complex to most complex?

- F System, organ, tissue, cell
- G Organ, tissue, cell, system
- H Cell, system, organ, tissue
- J Cell, tissue, organ, system

45



Before

After

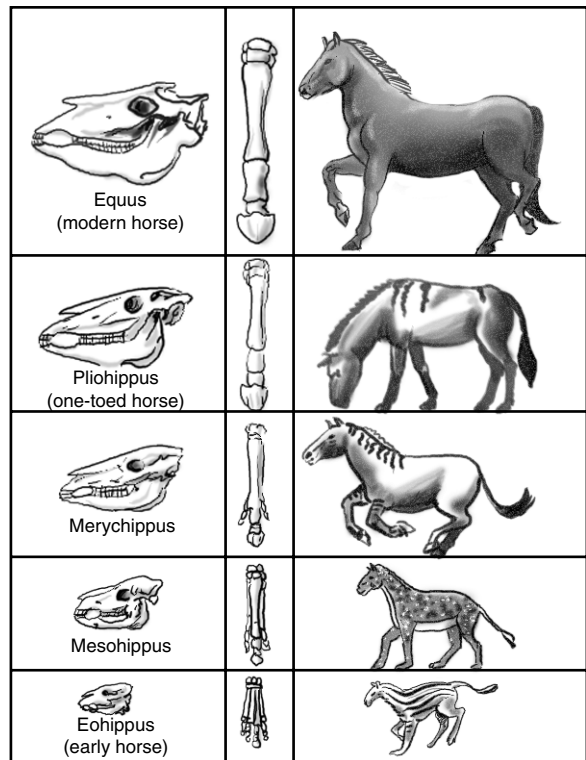
The picture shows a Cartesian diver made from a plastic bottle filled with water and an inverted test tube partially filled with water. What causes the diver to sink as the bottle is squeezed?

- A The size of the diver increases.
- B The volume of air in the diver decreases.
- C The water in the bottle becomes less dense.
- D The air in the water comes out of solution.

46 Which of these illustrates a predator-prey relationship?

- F An eagle catching a fish
- G A flea feeding on a dog
- H A horse eating grass
- J A rooster fighting another rooster

47



The diagram above shows the changes over time in the horse. Evidence for these changes *most likely* came from —

- A carbon-dating
- B hypotheses of scientists
- C observations of modern horses
- D the fossil record

**48 During the process of evaporation, liquid water becomes —**

- F tiny drops of water
- G separate atoms of water
- H molecules of water vapor
- J atoms of hydrogen and oxygen

**49 Which of the following is an example of a decomposer at work in the food web?**

- A A tree growing in a field
- B A grasshopper eating leaves
- C A seagull catching a fish
- D A fungus growing on a log

**50 Because it can be transported easily and converted into other forms of energy, the energy form *most* commonly used in households is —**

- F chemical
- G nuclear
- H heat
- J electrical



## Answer Key

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