

VIRGINIA STANDARDS OF LEARNING

Spring 2009 Released Test

GRADE 8 SCIENCE

Form S0119, CORE 1

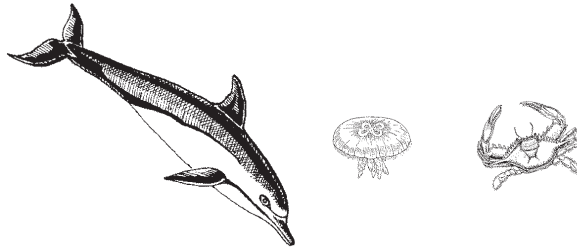
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Directions

Read each question and choose the best answer.

SAMPLE

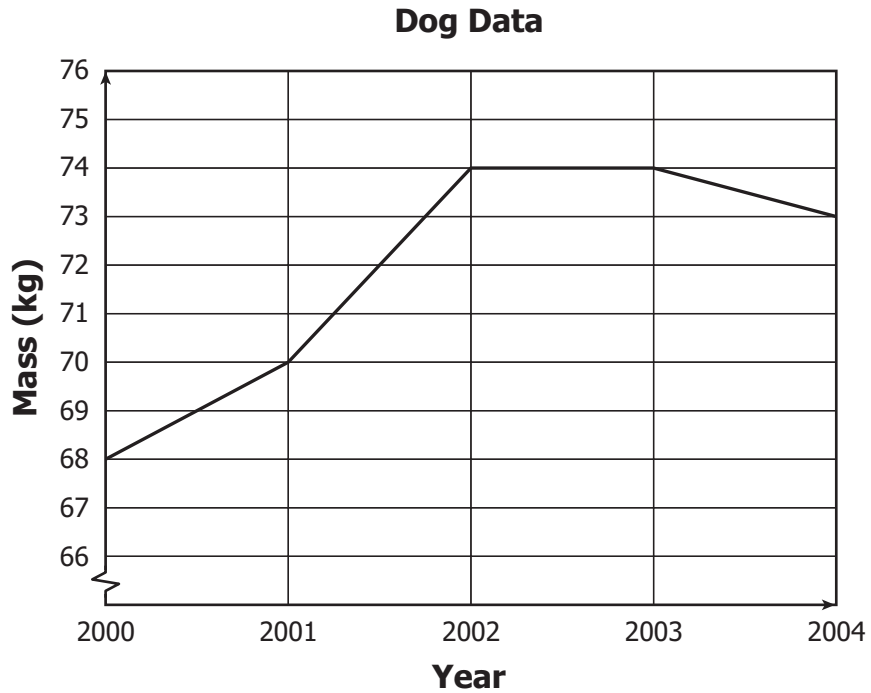


Dolphin Jellyfish Crab

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



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

- A** How the mass of the dog changed
- B** How much food the dog consumed
- C** What kinds of food the dog consumed
- D** When the dog was measured each month

2 All of these can be inherited by people EXCEPT —

- F** height
- G** eye color
- H** blood type
- J** language

3 Which of the following is an example of static electricity?

- A** A dry-cell battery connected to wires lights up a light bulb.
- B** A balloon sticks to a wall after it is rubbed with a piece of wool.
- C** A magnet sticks to a refrigerator door made of metal.
- D** A light switch that is turned on runs a ceiling fan.

4 During which phase does the Moon receive sunlight only on the side facing away from Earth?

- F** Full Moon
- G** New Moon
- H** Waning gibbous
- J** Waxing gibbous

Rubber Band Data

Rubber Band	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5
A	3.7 cm	3.9 cm	3.7 cm	3.4 cm	3.6 cm
B	2.5 cm	2.7 cm	2.8 cm	2.7 cm	2.7 cm

A lab group measured how far two rubber bands stretched when attached to 100-gram masses. Five measurements were made for each rubber band. What is the range of the data collected for rubber band B?

- A** 0.3 cm
- B** 0.5 cm
- C** 2.7 cm
- D** 2.8 cm

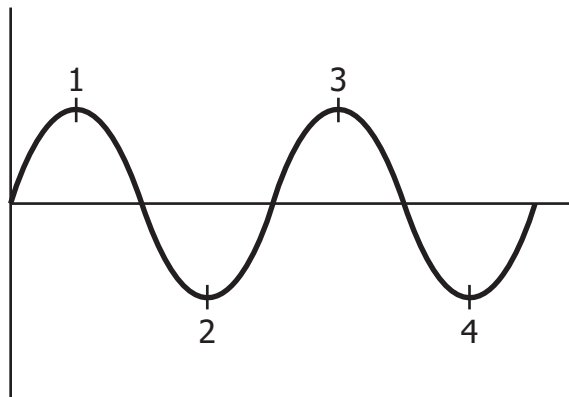
6 A coal-burning facility is constructed in an area containing several pond ecosystems. How will this human activity *most* likely affect the pond ecosystems?

- F** More nutrients will be available.
- G** Organism diversity will increase.
- H** Disease will become less common.
- J** Water quality will be reduced.

7 Which characteristic is used to classify frogs into a different phylum from squid, snails, and jellyfish?

- A** Frogs are predators.
- B** Frogs breathe oxygen.
- C** Frogs have backbones.
- D** Frogs live on land.

8



The illustration shows a wave. The wave's wavelength is the distance between points —

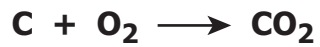
- F** 1 and 2
- G** 1 and 4
- H** 2 and 3
- J** 2 and 4

9 Which is an SI metric unit of measurement that is used to record the heat transfer of a solution in a classroom investigation?

- A** Liter
- B** Newton
- C** Volt
- D** Degree Celsius

10 Black bears roam over large territories. What effect would building shopping centers in these territories have on the bears?

- F** Promote an increase in black bear reproduction
- G** Stabilize the black bear population
- H** Reduce the black bears' habitat
- J** Introduce a new bear population to the area



According to this equation, what happened to the carbon and oxygen?

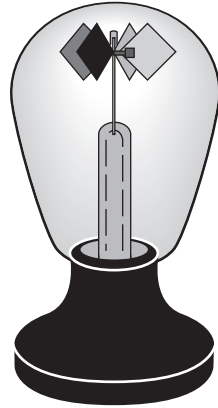
- A** They combined chemically to form a new compound.
- B** They combined chemically to form carbon and oxygen.
- C** They combined physically to form a new mixture.
- D** They combined physically to form a new element.

12 The average distance from Earth to the Moon is 384,401 km. How is the distance from Earth to the Moon expressed in scientific notation?

- F** 3.84×10^3 km
- G** 384×10^3 km
- H** 3.84×10^5 km
- J** 3.84×10^6 km

13 Which energy transformation occurs first in a coal-burning power plant?

- A** Chemical energy to thermal energy
- B** Thermal energy to mechanical energy
- C** Thermal energy to electrical energy
- D** Mechanical energy to electrical energy



This picture shows a radiometer. It is designed to be placed in a sunny window. One side of each thin blade of the radiometer is painted black, and the other side is painted white. The Sun's rays strike the blades, and the device begins to spin. The device is powered by which kind of energy?

- F** Wind
- G** Solar
- H** Electrical
- J** Geothermal

Effect of Soil Temperature on the Germination Rate of Pumpkin Seeds

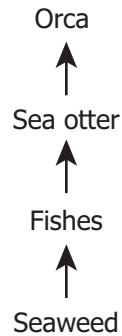
Soil Temperature (°C)	Germination Rate (%)			Average Germination Rate (%)
	X	X	X	
20	60	64	70	65
24	75	78	82	78
28	86	84	83	84
32	69	65	63	66

This data table shows the results of an investigation. What information should be used for the column headings marked X?

- A** Trial number
- B** Number of seeds
- C** Predicted value for the results
- D** Average of the data in each column

16 Which of the following is an example of potential energy?

- F** A glass jar sitting on a shelf
- G** A flag waving in the wind
- H** A ball rolling along a sidewalk
- J** A battery powering a radio

Marine Food Chain

What is the role of the Orca in this food chain?

- A** Producer
 - B** First-order consumer
 - C** Second-order consumer
 - D** Third-order consumer
-
- 18** **A car manufacturer reduces the mass of a car by 250 kg. If the new design is otherwise identical to the old design, how will the new car compare to the old car?**
- F** It will have a greater gravitational attraction to the road.
 - G** It will require more fuel to operate.
 - H** It will need less force to move.
 - J** It will release more gas emissions.

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

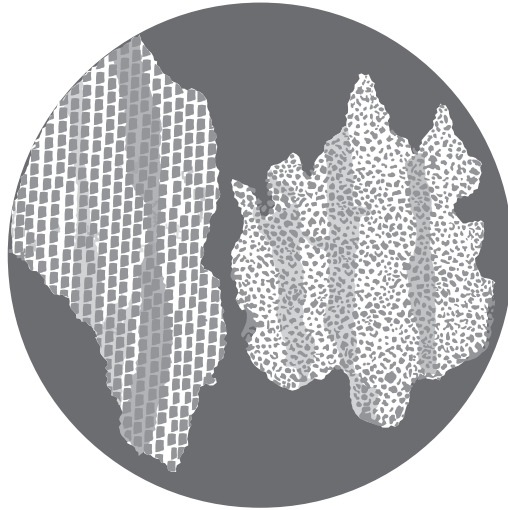
- A** Measure and compare the volume of the pot and the microwave.
- B** Determine the volume of liquid water made by each ice cube.
- C** Observe and record the time for each ice cube to completely change to a liquid.
- D** Identify and record the temperature of each ice cube before each trial.

20 Which of these *best* describes the particle motion taking place as CO₂ gas is exposed to freezing temperatures?

- F** The particles decrease in speed.
- G** The particles move with more force.
- H** The motion of the particles becomes random.
- J** The motion of the particles is unchanged.

21 The *best* scientific reason for a scientist to accept a specific theory is —

- A** to obtain funding for the research
- B** that research and observations support the theory
- C** because there can only be one correct theory
- D** to gain recognition as a great scientist

Microscopic View of Cork

Robert Hooke looked at a piece of cork under a microscope. The little boxes he saw in the cork are called —

- F** cells
- G** genes
- H** nuclei
- J** chromosomes

23 There are harvesting regulations for many fish species that limit the number and size of the fish that may be kept. What is the *most* likely reason these limits have been placed on harvesting these fish?

- A** To have enough fish for zoo aquariums
- B** To keep other game fish species populations low
- C** To have people spend more money on fishing
- D** To keep a healthy population of adult fish

24 How is the modern model of an atom different from the Bohr atomic model?

- F** The masses of the atomic particles are different.
- G** The numbers of electrons are different.
- H** The shapes of the nuclei are different.
- J** The arrangements of the electrons are different.

25 It is important to protect air quality because —

- A** storms worsen as air pollution decreases
- B** acid rain is caused by air pollution
- C** wind currents change when the air is polluted
- D** energy produced by the Sun decreases when air is polluted

26 As the energy needs for Virginia increase, new sources of energy are required to replace or supplement the nonrenewable sources of energy now in use. Two sources of energy that are renewable and available in Virginia are —

- F** natural gas and wind power
- G** coal and hydropower
- H** petroleum and solar power
- J** wind power and solar power

27 Human sweat is the direct result of which life functions?

- A** Respiration and cellular growth
- B** Digestion and disease prevention
- C** Reproduction and cellular transport
- D** Waste removal and temperature control

28 What is one advantage of using a hydroelectric plant?

- F** It is expensive to build.
- G** It provides renewable energy to human populations.
- H** It has little effect on water flow.
- J** It has little effect on wildlife when being constructed.

29 Which of the following are products of combustion?

- A** Heat and light
- B** Newly discovered elements
- C** Liquid and solid water
- D** Additional atoms

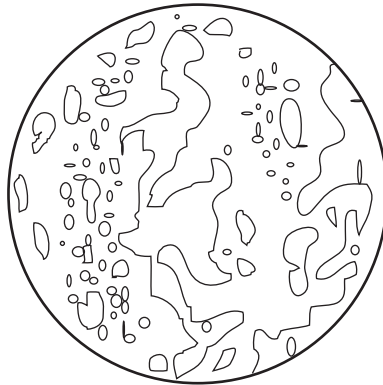
30 Which of these substances is an element?

- F** Steel
- G** Chlorine
- H** Plastic
- J** Sugar

31 The quality of pond water can be determined by identifying the number and types of organisms found living in the water. Which piece of equipment will *best* help students identify some of these organisms?

- A** Microscope
- B** pH paper
- C** Binoculars
- D** Pan balance

Mercury



1 cm = 1,000 km



A scale model of the planet Mercury is shown. Based on the scale, which of the following is the *most* accurate diameter of Mercury?

- F 1,000 km
- G 5,000 km
- H 50,000 km
- J 500,000 km

33 Where is water *most* likely to become contaminated?

- A In a forest
- B By a dam
- C Near a cattle farm
- D At the ocean bottom

34 A student makes a drawing of a carbon atom. Which of these should the student show in the nucleus of the atom?

- F** Ions
- G** Protons
- H** Electrons
- J** Molecules

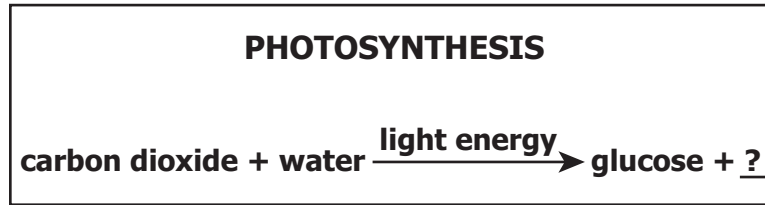
35 For separate ecosystems to be classified as the same type of biome, they must —

- A** have deciduous forests
- B** be located along the equator
- C** have similar organisms and climates
- D** be at least one hundred square meters in area

36 Clouds are formed when millions of drops of water become suspended in the air. Which of the following is a step in the process of cloud formation?

- F** Expansion of cold air
- G** Formation of carbon dioxide
- H** Condensation of water vapor
- J** Breakdown of atmospheric ozone

37



The equation for photosynthesis is shown. Which of these is required to complete the equation for photosynthesis?

- A Carbon
- B Oxygen
- C Nitrogen
- D Hydrogen

38

$$P = W/t$$

To complete a project, 200,000 Joules of work are needed. The time taken to complete the project is 20 seconds. How much power is needed?

- F 0.0001 J/s
- G 10,000 J/s
- H 200,020 J/s
- J 1,000,000 J/s

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

- A** experience a population decline
- B** adapt to a different ecosystem
- C** change the genetic makeup of their bodies
- D** increase reproduction rates

40 Which of the following *best* describes why the Moon orbits Earth?

- F** The distance the Moon and Earth are from the Sun
- G** The energy reflected from the surface of Earth
- H** The winds generated on Earth by the energy of the Sun
- J** The gravitational attraction between the Moon and Earth

41 A student suspects that there is a relationship between the amount of sunny weather in a given state and the amount of solar energy used by its inhabitants. In order to find out if this idea is correct, the student will need which information for each state?

- A** The efficiency of solar technology used in that state
- B** The location and type of solar cells used in that state
- C** The percentage of days that have enough sunlight to power a solar water heater
- D** The number of sunny days per year and the amount of solar power used per year

42 During a fireworks show, a family sees the spray of sparkles from an exploding firework high in the sky and, a moment later, hears the pop. Which of these *best* explains why the pop and spray do not seem to occur at the same time?

- F** Light and sound travel through air.
- G** Sound travels through a vacuum.
- H** Sound travels slower than light.
- J** Light and sound travel at the same speed.

43 Which gas do animals need to carry out life processes?

- A** Oxygen
- B** Carbon monoxide
- C** Helium
- D** Carbon dioxide

44 On a sunny morning, students standing in front of a store window noticed an image of themselves in the glass. Why did the students see their image in the glass?

- F** Some of the light was reflected off the surface of the glass.
- G** Some of the light passed through the glass window.
- H** Some of the light was absorbed by the glass surface.
- J** Some of the light separated into different colors.

45 Which of the following is a nonrenewable energy source?

- A** Solar collector
- B** Wind turbine
- C** Fossil fuel
- D** Hydroelectric generator

46 Energy from the Sun is distributed around Earth by —

- F** subduction and rift zones
- G** radiation and convection
- H** tectonic plates
- J** solar flares

Unknown Liquids Data

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

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

- A** Sample
- B** Indicator
- C** Color change
- D** Identification

48 Chloroplasts are found only in organisms that are able to —

- F** generate their own energy
- G** grow to a larger size
- H** migrate to other ecosystems
- J** hunt for prey

49 Laundry in a clothes dryer often becomes charged with static electricity while drying. Which of these *best* explains why a clothes dryer often generates static electricity?

- A** Short circuits in the dryer charge the laundry.
- B** Clothes with metal pieces conduct electricity in the dryer.
- C** Electrons are transferred as clothes rub against each other in the dryer.
- D** Heat from the dryer charges the air and produces lightning.

50 Earth is different from the other planets in our solar system because it —

- F** orbits a star
- G** has collided with meteorites
- H** has oceans and lakes
- J** makes up the majority of the mass of our solar system



Answer Key-8058-S0119

Test Sequence Number	Correct Answer	Reporting Category	Reporting Category Description
1	A	001	Scientific Investigation
2	J	003	Life Systems
3	B	002	Force, Motion, Energy & Matter
4	G	005	Earth and Space Systems
5	A	001	Scientific Investigation
6	J	004	Ecosystems
7	C	003	Life Systems
8	J	002	Force, Motion, Energy & Matter
9	D	001	Scientific Investigation
10	H	004	Ecosystems
11	A	002	Force, Motion, Energy & Matter
12	H	001	Scientific Investigation
13	A	002	Force, Motion, Energy & Matter
14	G	005	Earth and Space Systems
15	A	001	Scientific Investigation
16	F	002	Force, Motion, Energy & Matter
17	D	004	Ecosystems
18	H	002	Force, Motion, Energy & Matter
19	C	001	Scientific Investigation
20	F	002	Force, Motion, Energy & Matter
21	B	001	Scientific Investigation
22	F	003	Life Systems
23	D	005	Earth and Space Systems
24	J	002	Force, Motion, Energy & Matter
25	B	005	Earth and Space Systems
26	J	005	Earth and Space Systems
27	D	003	Life Systems
28	G	005	Earth and Space Systems
29	A	002	Force, Motion, Energy & Matter
30	G	002	Force, Motion, Energy & Matter
31	A	004	Ecosystems
32	G	001	Scientific Investigation
33	C	004	Ecosystems
34	G	002	Force, Motion, Energy & Matter
35	C	004	Ecosystems
36	H	005	Earth and Space Systems
37	B	003	Life Systems
38	G	002	Force, Motion, Energy & Matter
39	A	004	Ecosystems
40	J	005	Earth and Space Systems
41	D	001	Scientific Investigation
42	H	002	Force, Motion, Energy & Matter
43	A	003	Life Systems
44	F	002	Force, Motion, Energy & Matter
45	C	005	Earth and Space Systems
46	G	005	Earth and Space Systems
47	A	001	Scientific Investigation
48	F	003	Life Systems
49	C	002	Force, Motion, Energy & Matter
50	H	005	Earth and Space Systems

Grade 8 Science, Core 1

If you get this many items correct:	Then your converted scale score is:
0	000
1	184
2	220
3	242
4	258
5	271
6	282
7	292
8	300
9	308
10	315
11	322
12	328
13	334
14	340
15	345
16	350
17	355
18	360
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26	398
27	402
28	407
29	411
30	416
31	421
32	426
33	431
34	436
35	441
36	447
37	452
38	458
39	464
40	471
41	478
42	486
43	495
44	504
45	515
46	528
47	545
48	567
49	600
50	600

