

**Released 2006
Achievement Test**

Science

GRADE

9

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This document contains a full release of test items from the 2006 Grade 9 Science Achievement Test.

Released test items, which contained approximately 25% of the total number of test items from previously secured achievement tests, were mailed to school administrators each fall from 2004 to 2006 and have been made available to teachers only in print form because of copyright limitations.

Every second year, as of the fall of 2007, a **complete test** for all achievement test subjects and grades (except Grades 6 and 9 Social Studies; Grades 3, 6, and 9 Français/French Language Arts; and Grade 9 Knowledge and Employability courses) will be **mailed** to school administrators in conjunction with the assessment highlights report for that year. In this way, teachers will receive complete forms of achievement tests. The parts of those tests that are released in print form for which electronic copyright permission is received will subsequently be posted on the Alberta Education website.

A test blueprint and an answer key that includes the difficulty, reporting category, language function, and item description for each test item will also be included. These materials, along with the Program of Studies and subject bulletin, provide information that can be used to inform instructional practice.

Assessment highlights provide information about the overall test, the test blueprints, and student performance on the English form of the Science Achievement Test in Grade 9. Also provided is commentary on student performance at the *acceptable standard* and the *standard of excellence* on selected items from the 2008 Achievement Test. This information is intended for teachers and is best used in conjunction with the multi-year and detailed school reports that are available to schools via the extranet.

Assessment highlights reports for all achievement test subjects and grades (except Grades 3, 6, and 9 Français/French Language Arts; and Grade 9 Knowledge and Employability courses) will be **posted on the Alberta Education website every year** in the fall.

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The Alberta Education Internet address is www.education.alberta.ca.

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2006 Achievement Test Questions

The questions presented in this document are from the previously secured 2006 Grade 9 Science Achievement Test and are representative of the questions that form achievement tests. These questions are released by Alberta Education for teacher and student use.

Grade 9 Achievement Test

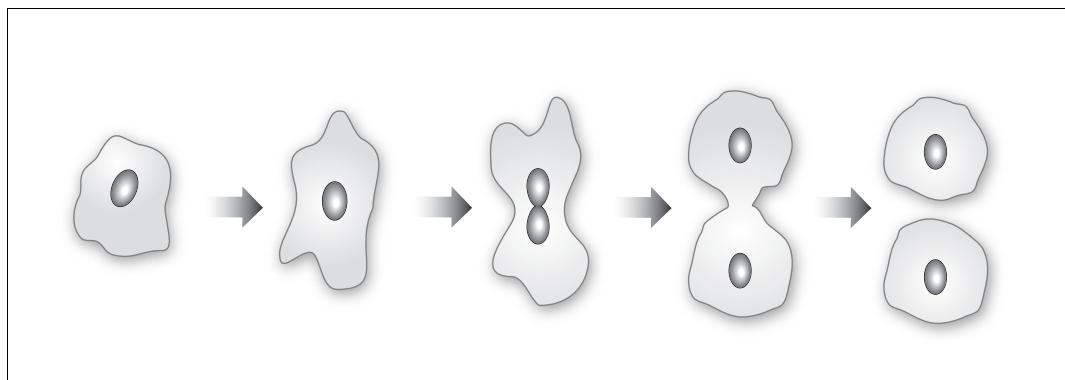
2006

Science

1. A sperm cell has the same number of chromosomes as
 - A. an egg cell
 - B. an embryo
 - C. a blood cell
 - D. a zygote

2. Scientists can insert a particular gene into corn kernels in order to protect corn against insect pests. This procedure is an example of
 - A. artificial selection
 - B. artificial insemination
 - C. selective breeding
 - D. genetic engineering

Use the following illustration to answer question 3.



3. Which of the following biological processes is **best** represented by the illustration above?
 - A. Meiosis
 - B. Budding
 - C. Binary fission
 - D. Spore production

Use the following information to answer question 4.

Characteristics of an Unknown Organism

- Has its niche at the surface of the soil
- Uses water and minerals from the soil
- Supplies food and oxygen to other organisms

4. Given the characteristics listed above, the unknown organism could be a

- A. clover
 - B. mushroom
 - C. virus
 - D. worm
-

Use the following information to answer question 5.

Reproductive Characteristics of a Particular Species

- Able to reproduce once a year only
- Able to produce two offspring each time it reproduces
- Genetic information transferred to the offspring during reproduction
- One or two zygotes formed in the reproductive process

5. Which of the following statements correctly describes the reproductive process of this species?

- A. Reproduction is sexual because genetic information is transferred to the offspring only from the female.
- B. Reproduction is sexual because a zygote is formed.
- C. Reproduction is asexual because few offspring are produced at one time.
- D. Reproduction is asexual because the species might only have an offspring every six months.

Use the following information to answer questions 6 and 7.

Biotechnology Practices

- 1** Corn plants with desirable characteristics are identified within a crop. Only seeds from these plants are used to grow next year's crop.
- 2** Cells taken from a pea plant with desirable characteristics are reproduced in a Petri dish that contains nutrients necessary for growth.
- 3** Embryos are produced from the sperm and eggs of a prize bull and cow. These embryos are implanted into other cows.
- 4** Human genes are inserted into the fertilized eggs of cows.

6. Which biotechnology practice listed above has the **longest** history of use?

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

7. THIS TEST ITEM WAS DELETED IN 2006.

Use the following information to answer question 8.

Information About Malaria

- Malaria, a serious disease, is caused by a parasite that is spread by the bite of an infected mosquito.
- People travelling in areas where there is a high risk of contracting malaria used to be prescribed chloroquine pills to prevent the disease.
- Now, other treatments are usually prescribed because chloroquine is no longer guaranteed to be effective.

8. The **most probable** reason that chloroquine is less effective than it used to be in preventing the onset of malaria is that
- A. malaria parasites have developed a resistance to chloroquine
B. mosquitoes have developed a resistance to the malaria parasite
C. people have developed a resistance to chloroquine
D. people have developed a resistance to the malaria parasite
-

Use the following information to answer question 9.

Statements About Different Species

Statement I Passenger pigeons were overhunted.

Statement II Grizzly bears are no longer found in Mexico.

Statement III Panda bears rely mainly on one food source.

Statement IV Northern cod stocks off the coast of Newfoundland have been reduced.

9. Which of the statements above describes a species that has undergone extirpation?
- A. I
B. II
C. III
D. IV

Use the following table to answer question 10.

Characteristics of Five Students				
Student	Swimming Ability	Tongue-Rolling Ability	Skin Colour	Earlobe Shape
I	yes	no	light brown	hanging
II	yes	yes	light brown	hanging
III	no	yes	white	attached
IV	yes	yes	dark brown	hanging
V	no	no	white	attached

10. Which of the following pairs of students share a characteristic that is **not** a heritable trait?
- A. Students I and III
B. Students I and V
C. Students II and III
D. Students II and IV
-

Use the following information to answer numerical-response question 1.

White-tailed jackrabbits live on the prairies, are consumers, and have fur that

1 2 3

changes colour with the seasons.

4

Numerical Response

1. Match each of the underlined words numbered above to the term below that relates to it. Use each number only once.

Ecosystem

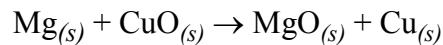
Niche

Species

Adaptation

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

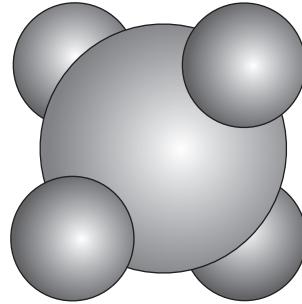
Use the following equation to answer question 11.



11. Which of the following word equations correctly restates the equation above?
- A. Magnesium + copper \rightarrow magnesium oxide + copper(II) oxide
 - B. Magnesium + copper \rightarrow magnesium oxide + oxide copper(II)
 - C. Magnesium + copper(II) oxide \rightarrow magnesium oxide + copper
 - D. Magnesium + oxide copper(II) \rightarrow magnesium oxide + copper
-

Use the following diagram to answer question 12.

Carbon Tetrahydride (Methane)



12. The chemical formula for the molecular compound shown above is
- A. C₄H
 - B. CH₄
 - C. C₄H₃
 - D. C₃H₄

Use the following table to answer question 13.

Observations from Four Experiments That Involve Mixtures		
Experiment	Procedure	Observation
I	White powder is added to water.	Gas is given off.
II	A solution is heated until it boils.	Vapour rises, and solute is left in the beaker.
III	Yellow powder is added to water.	Powder dissolves.
IV	A pure solution is added to another pure solution.	A powder appears at the bottom of the beaker.

13. In which two of the experiments above did a physical change occur?
- A. I and III
B. I and IV
C. II and III
D. II and IV
-
14. The chemical formula for iron(II) chloride is FeCl_2 . The total number of atoms in one molecule of iron(II) chloride is
- A. 1
B. 2
C. 3
D. 4

Use the following excerpt from the periodic table to answer questions 15 to 18.

1 H hydrogen	2 He helium
3 6.94 Li lithium	4 9.01 Be beryllium
11 22.99 Na sodium	12 24.31 Mg magnesium
5 10.81 B boron	6 12.01 C carbon
13 26.98 Al aluminium	7 14.01 N nitrogen
14 28.09 Si silicon	8 16.00 O oxygen
15 30.97 P phosphorus	9 19.00 F fluorine
16 32.07 S sulfur	10 20.18 Ne neon
17 35.45 Cl chlorine	18 39.95 Ar argon

Legend for Elements

Solid	Gas
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Note: The legend denotes the states of elements at a temperature of 25°C.

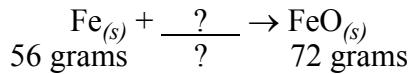
Key

3 6.94 Li lithium	Atomic number Symbol Name	Atomic molar mass Common ion charges (most common first)
--------------------------------	---------------------------------	---

15. Which of the following statements presents correct information about an element in the excerpt from the periodic table shown above?
- A. Fluorine atoms can have 6 protons.
 - B. Carbon atoms can have 20 protons.
 - C. Sodium atoms can have 16 protons.
 - D. Phosphorus atoms can have 15 protons.
16. Which of the following elements is the least reactive?
- A. Chlorine
 - B. Sodium
 - C. Argon
 - D. Boron
17. When solid LiF is added to water, the resulting solution is
- A. molecular and does not conduct electricity
 - B. ionic and does not conduct electricity
 - C. molecular and conducts electricity
 - D. ionic and conducts electricity

Use the following additional information to answer question 18.

A Chemical Reaction



18. The unknown reactant and its mass are

- A. oxide and 16 g
 - B. oxide and 128 g
 - C. oxygen and 16 g
 - D. oxygen and 128 g
-

Use the following information to answer question 19.

A teacher demonstrated a procedure to dilute a concentrated acid. The temperature of the reactants was 20 °C, and the temperature of the products was 75 °C.

19. Which of the following rows identifies the type of reaction that occurred in the procedure and the change in the temperature of the solution?

Row	Type of Reaction	Temperature Change
A.	Exothermic	Increase
B.	Exothermic	Decrease
C.	Endothermic	Increase
D.	Endothermic	Decrease

Use the following information to answer question 20.

In an experiment, a student immerses four nails composed of different metals in a dilute corrosive solution. Each nail has the same surface area. The student measures the mass of each nail before the experiment and then again after the nail has been immersed in the corrosive solution for 20 minutes. The results are recorded in the table below.

Mass of Nail (g)		
Type of Metal Nail	Before	After
Metal W	1.1	0.6
Metal X	1.3	0.7
Metal Y	1.5	1.2
Metal Z	1.8	1.4

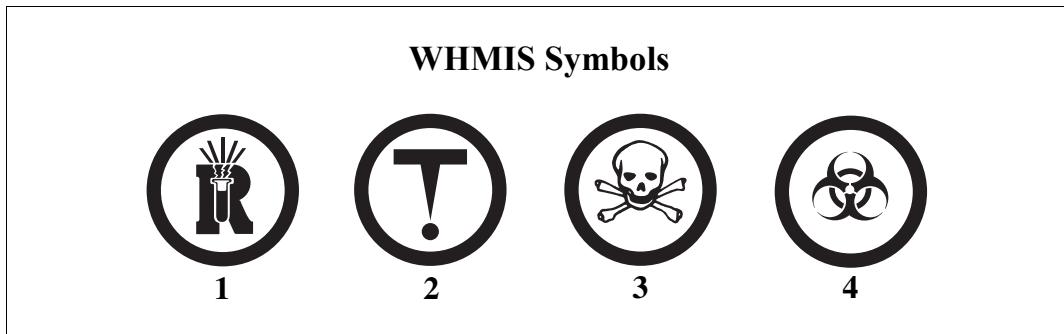
20. According to the information above, the metal that would react **most readily** to a dilute corrosive solution is
- A. Metal W
 - B. Metal X
 - C. Metal Y
 - D. Metal Z
-

Use the following information to answer question 21.

A researcher hypothesized that ultraviolet radiation prevents pigeon eggs from hatching. To test this hypothesis, the researcher divided fertilized pigeon eggs into six groups. During incubation, five of the groups were exposed to different intensities of ultraviolet radiation for 24 hours, but the sixth group was not. The number of eggs that hatched in each group was recorded.

21. What is the responding variable in this experiment?
- A. Intensity of ultraviolet radiation
 - B. Amount of time exposed to ultraviolet radiation
 - C. Group of eggs not exposed to ultraviolet radiation
 - D. Number of eggs that hatched after exposure to ultraviolet radiation

Use the following diagram to answer numerical-response question 2.



Numerical Response

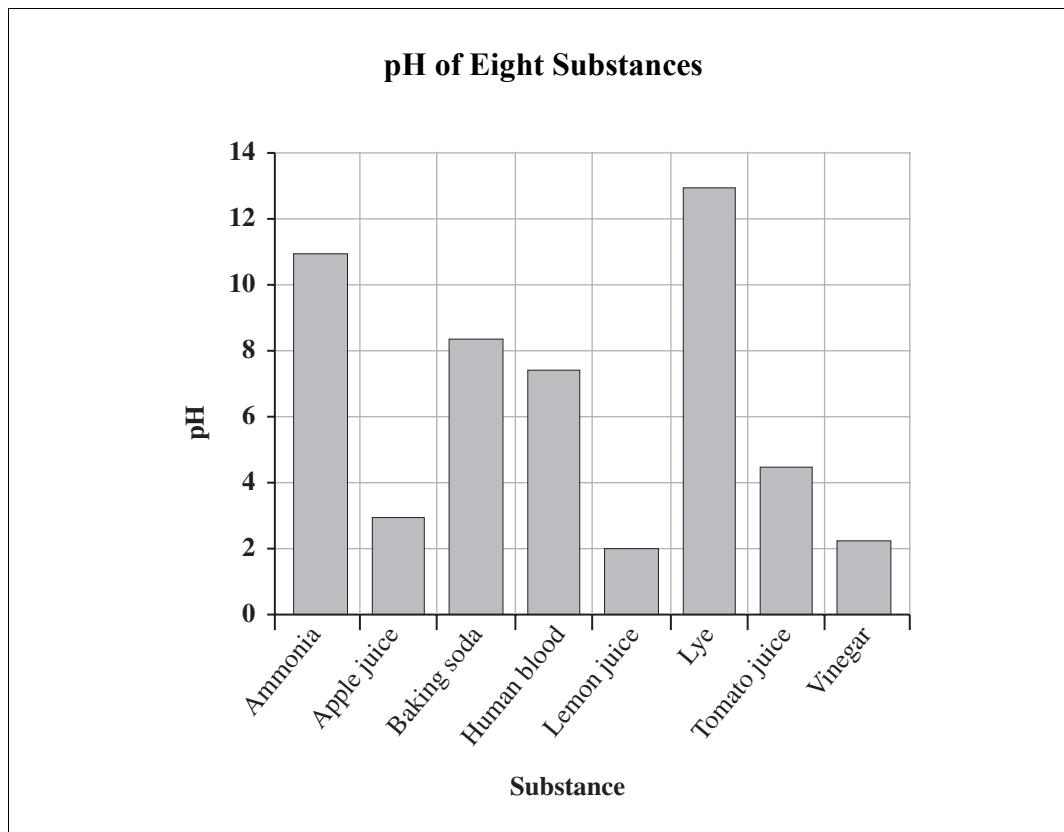
- 2.** Match each WHMIS symbol above with its corresponding description, as given below. Use each number only once.

WHMIS Symbol:	_____	_____	_____	_____
Description:	Poisonous and infectious material causing immediate and serious toxic effects	Biohazardous infectious material	Dangerously reactive material	Poisonous and infectious material causing other toxic effects

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

- 22.** The process by which toxins are concentrated as they move up the food chain is called
- A. pollution
 - B. biomagnification
 - C. web magnification
 - D. biomass stratification

Use the following graph to answer question 23.



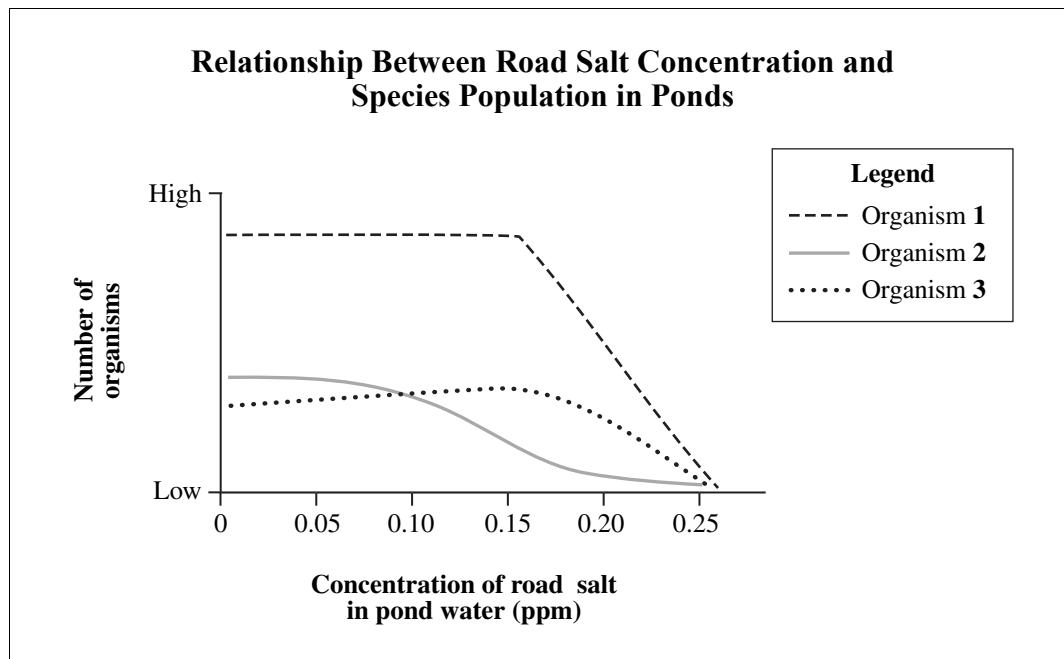
23. Which of the following conclusions can be made from the graph above?

- A. Vinegar is more basic than lye.
- B. Ammonia is more acidic than apple juice.
- C. Baking soda is more basic than human blood.
- D. Tomato juice is more acidic than lemon juice.

24. Which of the following statements describes one characteristic shared by **all** biodegradable substances?

- A. They can be broken down by inorganic compounds.
- B. They can be broken down by simple organisms.
- C. They decompose faster at low temperatures.
- D. They decompose faster in dry conditions.

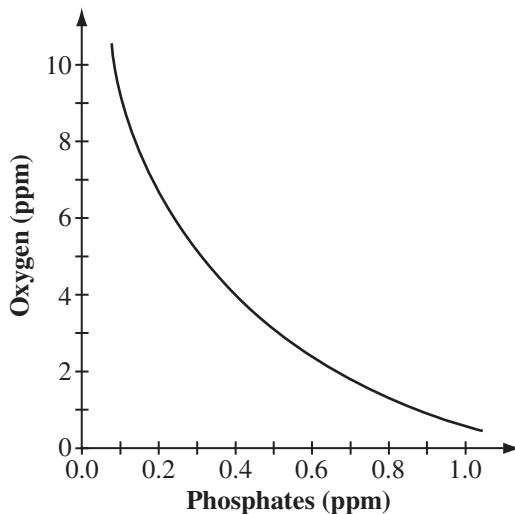
Use the following graph to answer question 25.



25. According to the graph above, an increase in the concentration of road salt in pond water from zero to 0.10 ppm results in a decrease in the number of
- A. organism 1
 - B. organism 2
 - C. organisms 1 and 3
 - D. organisms 2 and 3
-
26. Water in a particular lake has a pH of 5.2. Calcium carbonate is added to the lake water. The purpose of treating the lake water with calcium carbonate is to
- A. decrease the basic nature of the lake water
 - B. increase the acidic nature of the lake water
 - C. bring the pH of the lake water closer to 7.0
 - D. bring the pH of the lake water closer to zero

Use the following information to answer questions 27 and 28.

The Relationship Between the Concentrations of Oxygen and Phosphates in a Particular Pond



Minimum O₂ Concentrations Within Which Invertebrates Can Survive

O ₂ Concentration (ppm)	Invertebrates
8–10	Stonefly nymph
4–8	Dragonfly nymph
0–4	Midge larvae

27. Which of the following statements describes the relationship between oxygen concentration and phosphate concentration that is illustrated in the graph?
- A. As oxygen levels increase, phosphate levels increase.
 - B. As oxygen levels increase, phosphate levels stay the same.
 - C. As phosphate levels increase, oxygen levels decrease.
 - D. As phosphate levels increase, oxygen levels stay the same.

- 28.** If a sample of water contains an abundance of dragonfly nymphs and no stonefly nymphs, then the phosphate level of the water **most likely** falls within which of the following phosphate ranges?

- A. 0.1–0.2 ppm
 - B. 0.2–0.4 ppm
 - C. 0.4–0.6 ppm
 - D. 0.8–1.0 ppm
-

- 29.** A dissolved oxygen concentration of 6 ppm indicates that 6 mL of oxygen is dissolved in

- A. 100 mL of water
- B. 1 000 mL of water
- C. 10 000 mL of water
- D. 1 000 000 mL of water

Use the following information to answer question 30.

Opinions Related to the Issue of Non-Renewable Resources

- I “Companies must reduce the price of gasoline.”
- II “Citizens must be encouraged to use public transportation.”
- III “Tax incentives must be given to individuals to buy houses.”
- IV “Government must create incentives to develop alternative energy sources.”
- V “Legislation that requires energy-efficient cars must be put in place.”

- 30.** Which of the opinions given above refer to actions that promote long-term energy conservation?
- A. I, II, and III
 - B. I, III, and IV
 - C. II, III, and V
 - D. II, IV, and V

Numerical Response

3. For each of the substances listed below, indicate whether it is organic or inorganic using the following code.

1 = Organic

2 = Inorganic

Potassium

Magnesium

Carbohydrate

Salt

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

31. The most common type of energy loss in electrical devices is

- A. thermal
- B. potential
- C. chemical
- D. mechanical

Use the following information to answer question 32.

A ride in an amusement park is controlled by an operator who turns a dial to make the seats rotate faster. As the operator turns the dial, more current flows to the motors.

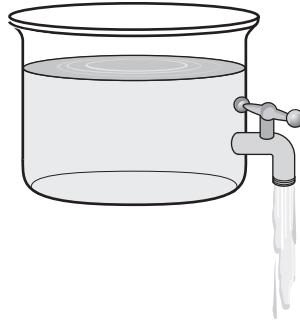
32. Which of the following electrical devices causes the seats on the amusement park ride to rotate faster?

- A. Variable resistor
- B. Circuit breaker
- C. Generator
- D. Ammeter

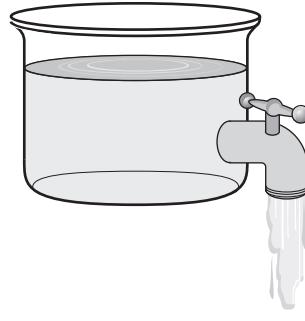
Use the following information to answer questions 33 and 34.

Models That Represent Current, Voltage, and Resistance in Two Electrical Circuits

Model 1



Model 2



Components in the Models

I	The amount of water that flows from the spout
II	The force of gravity acting on the water
III	The amount of water in the jug
IV	The diameter of the spout

33. Which of the components in the models represents resistance in a DC circuit?
- A. I
B. II
C. III
D. IV
34. Which of the components in the models represents current in a DC circuit?
- A. I
B. II
C. III
D. IV

Use the following information to answer question 35.

Four Electrical Circuits

Circuit 1	1 battery, 3 light bulbs wired in series
Circuit 2	1 battery, 5 light bulbs wired in series
Circuit 3	1 battery, 3 light bulbs wired in parallel
Circuit 4	1 battery, 5 light bulbs wired in parallel

All of the light bulbs and batteries are identical.

- 35.** When connected, which of the electrical circuits described above will result in the dimmest light?

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

- 36.** Which of the following rows identifies the correct circuit distance, amperage, resistance, and control device of a working microelectronic circuit?

Row	Circuit Distance	Amperage	Resistance	Control Device
A.	Short	Low	Low	Transistor
B.	Short	High	High	Transistor
C.	Long	Low	Low	Switch
D.	Long	High	High	Switch

- 37.** Which of the following parts of a lead storage car battery is acidic?

- A. Electrode
- B. Electrolyte
- C. Positive terminal
- D. Negative terminal

Use the following information to answer question 38.

Description of a Circuit

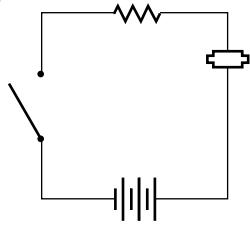
An electric pump is connected to a car battery. The speed of the pump is controlled by a dial.

Legend

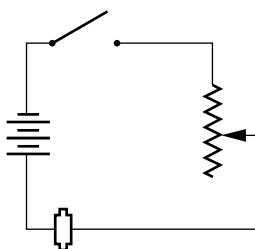
-  Car battery
-  Electric pump
-  Resistor
-  Variable resistor
-  Ignition switch for car

38. Which of the following schematic diagrams **best** illustrates the circuit described above?

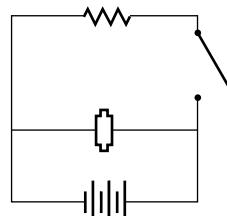
A.



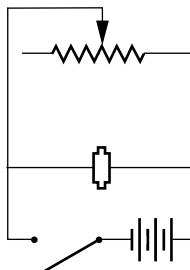
B.



C.



D.



39. QUESTION 39 IS STILL SECURED AND WILL NOT BE RELEASED.

40. Which of the following actions will **not** reduce the energy used?

- A. Adding a layer of insulation to your refrigerator
- B. Replacing incandescent bulbs with fluorescent bulbs
- C. Washing clothes in cold water rather than in hot water
- D. Watching television in the afternoon rather than in the early evening

Use the following information to answer numerical-response question 4.

Types of Power Generation

- 1** Coal-fired
- 2** Hydroelectric
- 3** Nuclear
- 4** Solar

Numerical Response

- 4.** Match each type of power generation listed above with one of its disadvantages, given below.

Disrupts the movement of aquatic organisms _____

(Record in the **first** column)

Emits carbon dioxide and sulfur dioxide into the air _____

(Record in the **second** column)

Is an inconsistent method of power generation _____

(Record in the **third** column)

Requires the long-term storage of hazardous waste products _____

(Record in the **fourth** column)

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

- 41.** Models of the universe that place Earth at the centre are described as

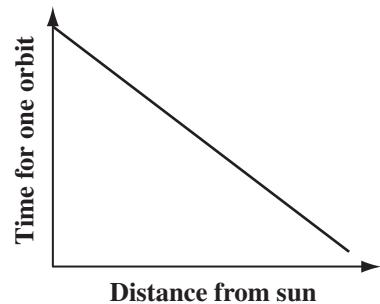
- A.** heliocentric models
- B.** astronomic models
- C.** geocentric models
- D.** galactic models

- 42.** The orbit that Earth makes around the sun is **best** described as

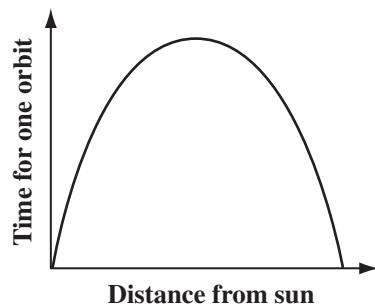
- A.** circular
- B.** celestial
- C.** elliptical
- D.** gravitational

43. Which of the following graphs correctly represents the relationship between the orbit times of planets and their distance from the sun?

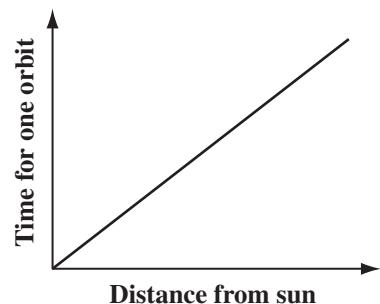
A.



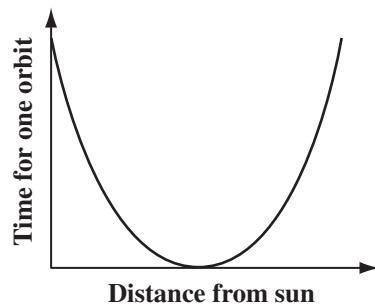
B.



C.



D.



44. Mars is visible on a clear night because it

- A. reflects light
- B. refracts light
- C. absorbs light
- D. produces light

45. Triangulation is the measurement process that astronomers use to estimate the

- A. size of a celestial body
- B. orbit of a celestial body
- C. distance to a celestial body from Earth
- D. angle between a celestial body and Earth

Use the following information to answer question 46.

True and False Statements About Refracting Telescopes

- Statement 1** Refracting telescopes use mirrors.
- Statement 2** Refracting telescopes were the first type to be designed.
- Statement 3** The image from a refracting telescope is not distorted by atmospheric interference.
- Statement 4** A refracting telescope has an eyepiece and an objective lens.

46. Which of the statements above are **true**?

- A. Statements 1 and 3
 - B. Statements 1 and 4
 - C. Statements 2 and 3
 - D. Statements 2 and 4
-

47. A celestial object that is located 10° above the horizon in the northeast part of the sky has an

- A. azimuth of 45° and an altitude of 10°
- B. azimuth of 10° and an altitude of 45°
- C. azimuth of 315° and an altitude of 10°
- D. azimuth of 10° and an altitude of 315°

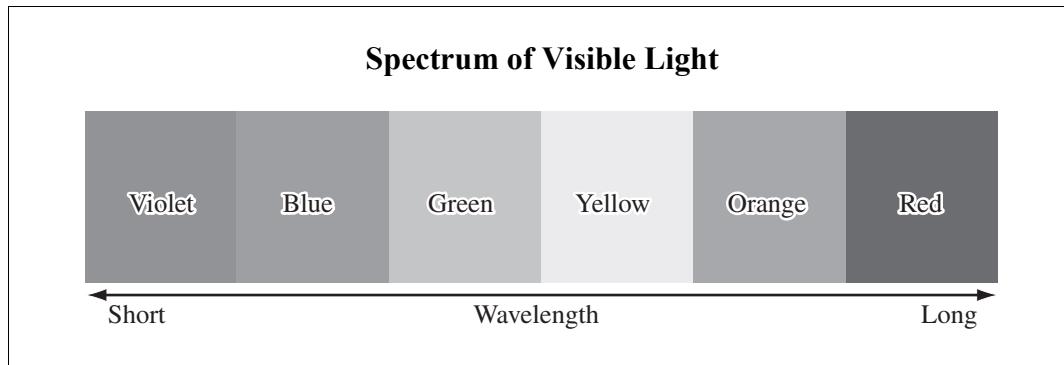
- 48.** For a particular satellite to provide an uninterrupted television signal to a particular viewer 24 hours a day and seven days a week, it must

- A. travel in a low Earth orbit
- B. travel in a geosynchronous orbit
- C. be a remote-sensing satellite
- D. be a Global Positioning System satellite

- 49.** Most of the outer planets of our solar system are

- A. gaseous, small, and have few moons
- B. gaseous, large, and have many moons
- C. terrestrial, small, and have few moons
- D. terrestrial, large, and have many moons

Use the following diagram to answer question 50.



- 50.** Which of the following descriptions identifies a red-shifted star?

- A. A star that is larger than Earth
- B. A star that is smaller than Earth
- C. A star that is moving toward Earth
- D. A star that is moving away from Earth

Use the following information to answer numerical-response question 5.

Four Parts of the Universe

- 1** Solar system
- 2** Milky Way
- 3** Jupiter
- 4** The moon

Numerical Response

- 5.** List the parts of the universe given above in order from the part with the smallest mass to the part with the greatest mass.

Smallest mass, _____, _____, and _____.
_____ **Greatest mass**

(Record all **four digits** of your answer in the numerical-response section on the answer sheet.)

*You have now completed the test.
If you have time, you may wish to check your answers.*

2006 Test Blueprint and Item Descriptions

The following blueprint shows the reporting categories and topics by which questions were classified on the 2006 Grade 9 Science Achievement Test.

Topics	Question Distribution by Reporting Category		Number and Proportion of Questions
	Knowledge	Skills	
	Fundamental understanding of both the concepts and the processes of science	Application of science processes and the use of higher-level thinking to solve problems	
Biological Diversity	1, 2, 5, 9	3, 4, 6, 8, 10, NR1	10 Questions (18.4% of Total Test)
Matter and Chemical Change	12, 15, 19, NR2	11, 13, 14, 16, 17, 18, 20	11 Questions (20.4% of Total Test)
Environmental Chemistry	22, 24, 26, NR3	21, 23, 25, 27, 28, 29, 30	11 Questions (20.4% of Total Test)
Electrical Principles and Technologies	31, 37, 40, NR4	32, 33, 34, 35, 36, 38, 39	11 Questions (20.4% of Total Test)
Space Exploration	41, 42, 44, 45, 49, NR5	43, 46, 47, 48, 50	11 Questions (20.4% of Total Test)
Number and Proportion of Questions	22 Questions (41% of Total Test)	32 Questions (59% of Total Test)	Total Test 54 Questions (100%)

***Note:** Question 7 from the 2006 Grade 9 Science Achievement Test was deleted.

The table below provides information about each question on the 2006 test: the keyed response, the difficulty of the item (the percentage of students who answered the question correctly), the reporting category, the topic, and the item description.

Question	Key	Diff. %	Reporting Category	Topic	Item Description
1	A	74.9	Knowledge	Biological Diversity	Identify an egg cell as having the same number of chromosomes as a sperm cell
2	D	69.9	Knowledge	Biological Diversity	Know that a specified agricultural procedure is an example of genetic engineering
3	C	55.7	Skills	Biological Diversity	Identify the biological process depicted in a diagram
4	A	57.4	Skills	Biological Diversity	Interpret information to identify the niche of a particular species
5	B	70.2	Knowledge	Biological Diversity	Analyze characteristics of a given species to determine the method by which it reproduces
6	A	72.3	Skills	Biological Diversity	Given a number of biotechnology practices, identify the practice that has the longest historical roots
7	This item was deleted in 2006.				
8	A	79.0	Skills	Biological Diversity	Read and interpret an informational passage to identify the role of variation in species survival under changing environmental conditions
9	B	71.3	Knowledge	Biological Diversity	Recognize a species that has undergone extirpation
10	D	62.5	Skills	Biological Diversity	Identify common non-heritable traits presented in a table
11	C	82.7	Skills	Matter & Chemical Change	Restate a chemical equation using words
12	B	73.8	Knowledge	Matter & Chemical Change	Use simple models and chemical names to determine a chemical formula
13	C	41.6	Skills	Matter & Chemical Change	Using given information, identify two processes that caused physical changes to occur
14	C	53.3	Skills	Matter & Chemical Change	Determine the number of atoms present in a compound
15	D	80.4	Knowledge	Matter & Chemical Change	Identify the correct statement about an element given an excerpt from the periodic table
16	C	42.7	Skills	Matter & Chemical Change	Identify the element that has a particular given property, based on its grouping in the periodic table

Question	Key	Diff. %	Reporting Category	Topic	Item Description
17	D	34.4	Skills	Matter & Chemical Change	Using information from the periodic table, determine the properties of a solution made from an ionic solute
18	C	69.5	Skills	Matter & Chemical Change	Determine the missing reactant and its mass in a common chemical reaction
19	A	55.3	Knowledge	Matter & Chemical Change	Identify the type of reaction and resulting change associated with a described procedure
20	B	60.8	Skills	Matter & Chemical Change	Analyze information in a table to determine the most reactive metal given initial and final mass
21	D	69.4	Skills	Environmental Chemistry	Given the description of an experiment, identify the responding variable
22	B	79.7	Knowledge	Environmental Chemistry	Recognize which term refers to the process by which toxins are concentrated in the food chain
23	C	69.9	Skills	Environmental Chemistry	Compare the pH levels of various substances given in a bar graph in order to draw a conclusion
24	B	63.1	Knowledge	Environmental Chemistry	Identify a characteristic common to all biodegradable substances
25	B	72.0	Skills	Environmental Chemistry	Interpret a graph about the impact of specific abiotic chemical concentrations on three organisms
26	C	79.4	Knowledge	Environmental Chemistry	Select the statement that explains why calcium carbonate was added to a lake
27	C	70.3	Skills	Environmental Chemistry	Identify the relationship between the two variables presented in a line graph
28	B	37.5	Skills	Environmental Chemistry	Synthesize data from a table and information from a graph to determine the phosphate levels in a river
29	D	55.5	Skills	Environmental Chemistry	Interpret measures of concentration in parts per million
30	D	84.1	Skills	Environmental Chemistry	Identify actions that promote energy conservation
31	A	69.1	Knowledge	Electrical Principles & Technologies	Recall a basic fact about energy loss
32	A	56.3	Skills	Electrical Principles & Technologies	Determine which component of a given electric circuit serves a particular function
33	D	63.9	Skills	Electrical Principles & Technologies	Identify which component on a diagram of a hydro flow model represents a given element in an electric circuit

Question	Key	Diff. %	Reporting Category	Topic	Item Description
34	A	71.0	Skills	Electrical Principles & Technologies	Identify which component on a diagram of a hydro flow model represents a given element in an electric circuit
35	B	67.4	Skills	Electrical Principles & Technologies	Determine which circuit would provide the dimmest light, given four different series and parallel circuits
36	A	36.0	Skills	Electrical Principles & Technologies	Recognize the correct description of the characteristics of a micro electric circuit
37	B	70.6	Skills	Electrical Principles & Technologies	Recall the part of a wet cell that is acidic
38	B	52.1	Skills	Electrical Principles & Technologies	Identify the schematic diagram that illustrates a described circuit
39	This item is still secured and will not be released at this time.				
40	D	79.0	Knowledge	Electrical Principles & Technologies	Identify an action that will not reduce energy consumption in household devices
41	C	75.4	Knowledge	Space Exploration	Recall the characteristics of different models of the universe
42	C	64.1	Knowledge	Space Exploration	Recall that planets make elliptical orbits around the sun
43	C	51.5	Skills	Space Exploration	Select the graph that represents a given relationship
44	A	71.7	Knowledge	Space Exploration	Recall why planets are visible from Earth on a clear night
45	C	72.0	Knowledge	Space Exploration	Recall why astronomers use triangulation
46	D	53.9	Skills	Space Exploration	Recognize true and false statements about refracting telescopes
47	A	59.6	Skills	Space Exploration	Determine the coordinates of a celestial object given its approximate location
48	B	45.7	Skills	Space Exploration	Identify the orbit a communication satellite must follow to provide a specific service
49	B	64.9	Knowledge	Space Exploration	Select the generalization that best describes the outer planets of our solar system
50	D	63.2	Skills	Space Exploration	Apply knowledge of the Doppler effect and spectroscopy to describe a red shift in spectra
NR1	2314	79.3	Skills	Biological Diversity	Identify which variables in a description represent an organism's ecosystem, niche, species, and adaptations
NR2	3412	66.4	Knowledge	Matter & Chemical Change	Match WHMIS symbols with their descriptions

Question	Key	Diff. %	Reporting Category	Topic	Item Description
NR3	2212	15.8	Knowledge	Environmental Chemistry	Classify four substances using a given code
NR4	2143	76.1	Knowledge	Electrical Principles & Technologies	Identify disadvantages associated with different methods of power generation
NR5	4312	44.4	Knowledge	Space Exploration	Order given parts of the universe according to their masses