

Released Items
Provincial
Achievement Test
2010 and 2011

Knowledge
and Employability
Science

GRADE

9

Alberta  Government

This document contains released items from the 2010 and 2011 Grade 9 Knowledge and Employability Science Achievement Tests.

A test blueprint and an answer key that includes the difficulty, reporting category, curricular content area, and item description for each test item are also included. These materials, along with the program of studies and subject bulletin, provide information that can be used to inform instructional practice.

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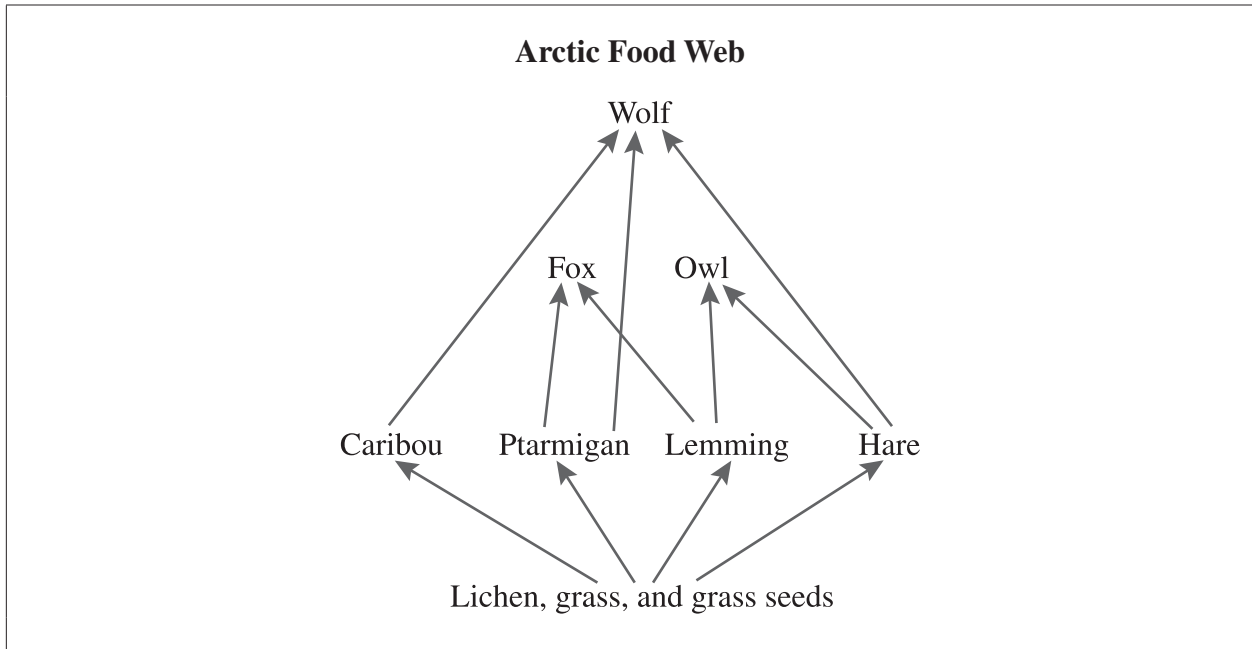
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2010 and 2011 Achievement Test Released Items

The items presented in this document are from the secured 2010 and 2011 Grade 9 Knowledge and Employability Science Achievement Tests. These items are released by Alberta Education.

Grade 9 Knowledge and Employability Science Achievement Test Released Items 2010 and 2011

Use the following diagram to answer question 1.



1. In the food web above, which of the following animals would be **directly affected** by a decrease in the amount of grass available?

- A. Caribou
- B. Wolf
- C. Owl
- D. Fox

2. Eye colour is an example of

- A. a heritable trait
- B. a non-heritable trait
- C. a physical adaptation
- D. an environmental adaptation

Use the following information to answer question 3.

Gardeners often use pesticides to control populations of bugs that harm their plants.

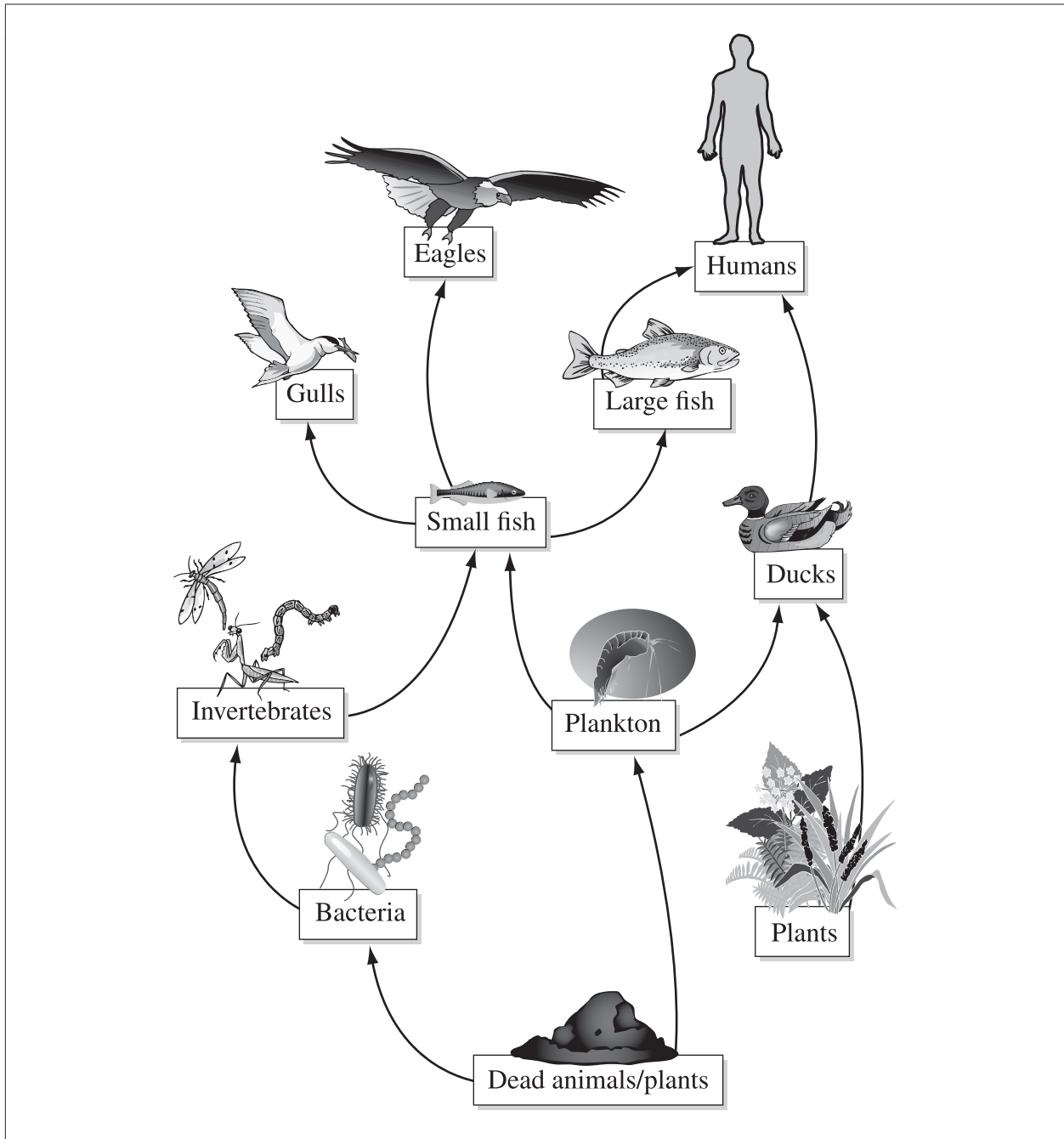
3. Instead of using pesticides, a gardener could
- A. provide the plants with more light
 - B. provide the plants with more water
 - C. place natural predators of the bugs on the plants
 - D. grow the plants indoors where the bugs cannot survive
-

Use the following information to answer question 4.

Strawberry plants grow runners. New plants are produced along the runners.

4. The information above describes
- A. asexual reproduction
 - B. sexual reproduction
 - C. artificial selection
 - D. natural selection

Use the following information to answer question 5.



5. Overfishing of both large and small fish by humans in the food web above would directly result in
- A. greater plant diversity
 - B. a reduced food supply for eagles
 - C. greater life expectancy for ducks
 - D. a reduced amount of dead animals and plants

Use the following information to answer questions 6 and 7.

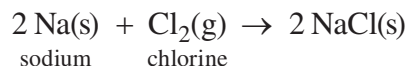
A student forgets to put a title on her poster. The poster consists of the following facts:

- Using road salt reduces ice and makes driving safer.
- When road salt melts the ice on roads, the road salt is absorbed into the ground and enters ponds and rivers in the spring.
- Road salt is toxic to vegetation and aquatic organisms.

6. Which of the following poster titles would **best** represent all of the information in the poster?
- A. The Good and Bad Effects of Using Road Salt
 - B. Road Salt! An Environmental Nightmare!
 - C. Ponds and Rivers Don't Need Road Salt!
 - D. Road Salt Saves Lives
7. Which of the following questions is **not** directly answered by the information above?
- A. How does the salt affect the environment?
 - B. Which organisms are harmed by salt?
 - C. Does salt reduce ice on roads?
 - D. Will salt harm human beings?

Use the following information to answer question 8.

Two elements were combined to form a compound.



8. The common name of this compound is
- A. salt
 - B. bleach
 - C. baking soda
 - D. white vinegar

9. Which of the following statements describes the present model of the atom?
- A. Protons and electrons are arranged together in an alternating pattern.
 - B. Protons and electrons are arranged together in a random pattern.
 - C. A nucleus of protons and neutrons is surrounded by electrons.
 - D. A nucleus of electrons and neutrons is surrounded by protons.

Use the following information to answer question 10.

A solution is tested with blue litmus paper. The blue litmus paper changes to red.

10. Which of the following conclusions can be drawn?
- A. The pH is 6.5.
 - B. The pH is 7.5.
 - C. The solution is basic.
 - D. The solution is acidic.
-
11. Which food group helps build healthy teeth and bones?
- A. Grain products
 - B. Vegetables and fruit
 - C. Milk and alternatives
 - D. Meat and alternatives

Use the following information to answer question 12.

Kim prepares a meal with the following foods:

- Spaghetti and meatballs
- Tossed salad
- Garlic toast

- 12.** In order to complete the meal so that it contains **all four** food groups from Canada's Food Guide to Healthy Eating, Kim should serve
- A.** chocolate cake
 - B.** orange juice
 - C.** milk
 - D.** corn

Use the following information to answer question 13.

Water Requirements for Rainbow Trout Survival

- pH from 6.7 to 8.0
- Water appearance must be clear
- Water temperature of 17 °C or lower

Measurements were taken at four different ponds to determine which pond would be most suitable for rainbow trout. The results are shown in the chart below.

Pond Water Quality

Pond Number	pH	Water Appearance	Water Temperature
1	6.9	Clear	18 °C to 20 °C
2	6.4	Murky	12 °C to 25 °C
3	7.2	Clear	3 °C to 13 °C
4	8.3	Murky	1 °C to 16 °C

13. Which pond would be **most suitable** for rainbow trout?

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

Use the following information to answer question 14.

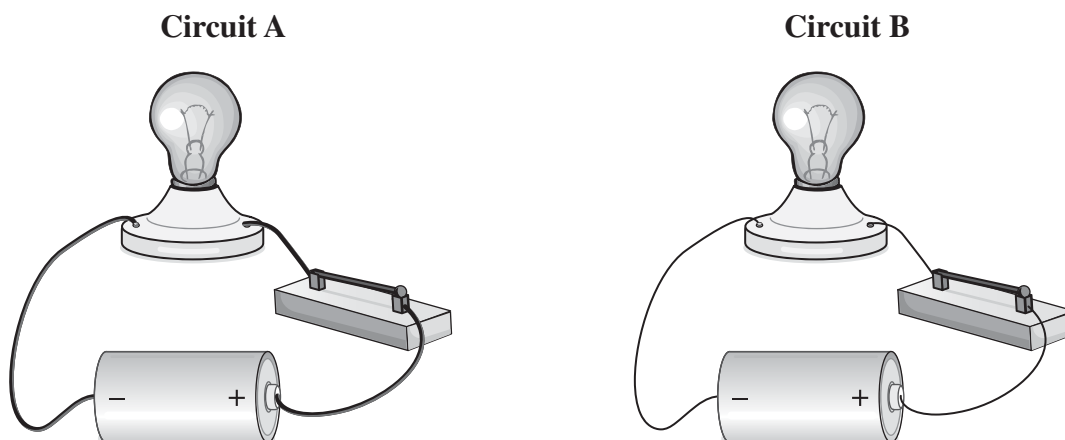
Some Environmentally Friendly Actions

- 1 Using compost in a garden
- 2 Buying a second-hand lawn mower
- 3 Turning used paper into roofing shingles
- 4 Buying products with the least amount of packaging
- 5 Buying one 4 L container of juice instead of eight 500 mL containers

14. The 3Rs are reduce, reuse, and recycle.
Which **two** of the actions listed above are the **best** examples of reducing?
- A. 1 and 2
 - B. 2 and 3
 - C. 3 and 4
 - D. 4 and 5

Use the following information to answer question 15.

Circuit A has thicker wires than circuit B.



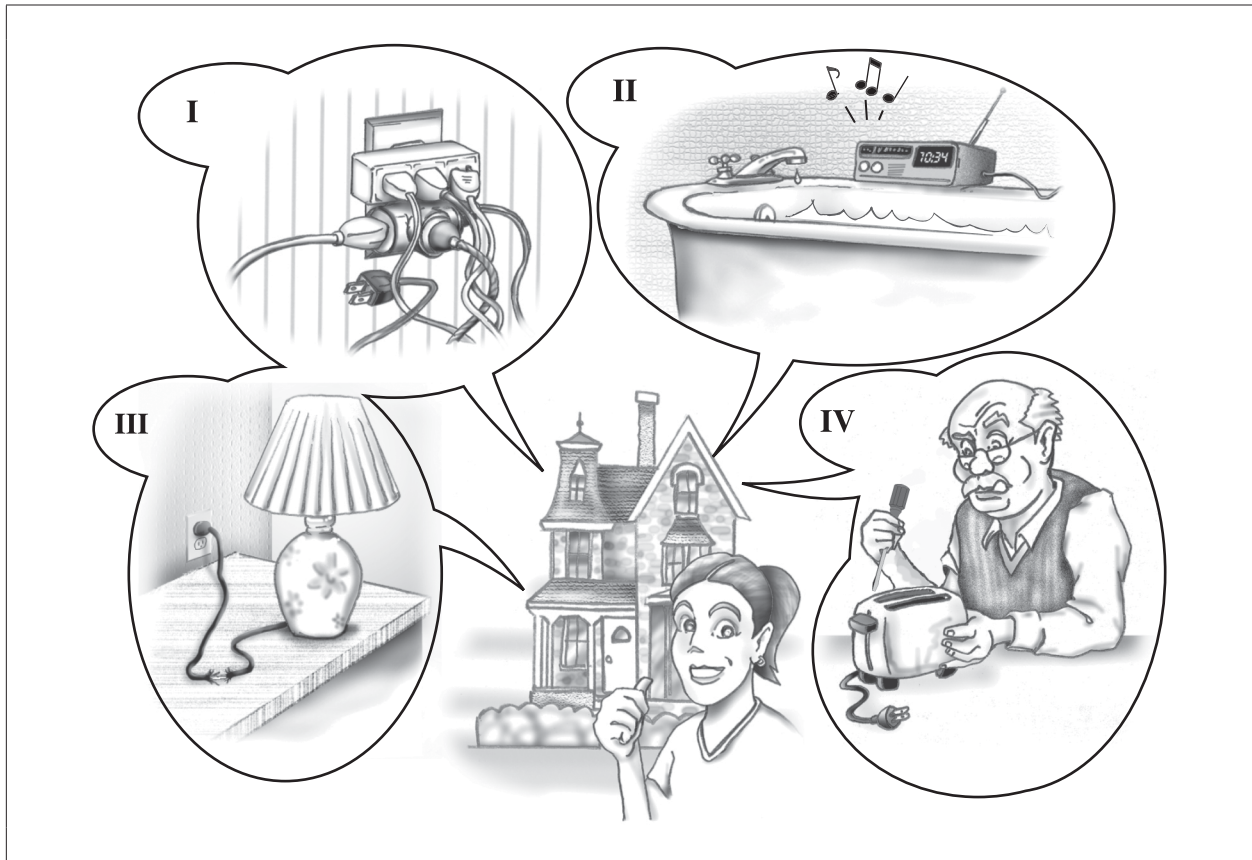
15. The light bulb in circuit A will burn brighter than the light bulb in circuit B because as resistance decreases,
- A. voltage decreases
 - B. voltage increases
 - C. current decreases
 - D. current increases

Use the following information to answer question 16.

Source of electrical energy	Percentage of energy that can be converted to electricity
Coal	22.2
Wind	30.0
Uranium	20.0
Natural gas	20.7

16. Based on the information in the chart above, which source is the **most** energy efficient?
- A. Natural gas
 - B. Uranium
 - C. Wind
 - D. Coal

Use the following diagrams to answer question 17.



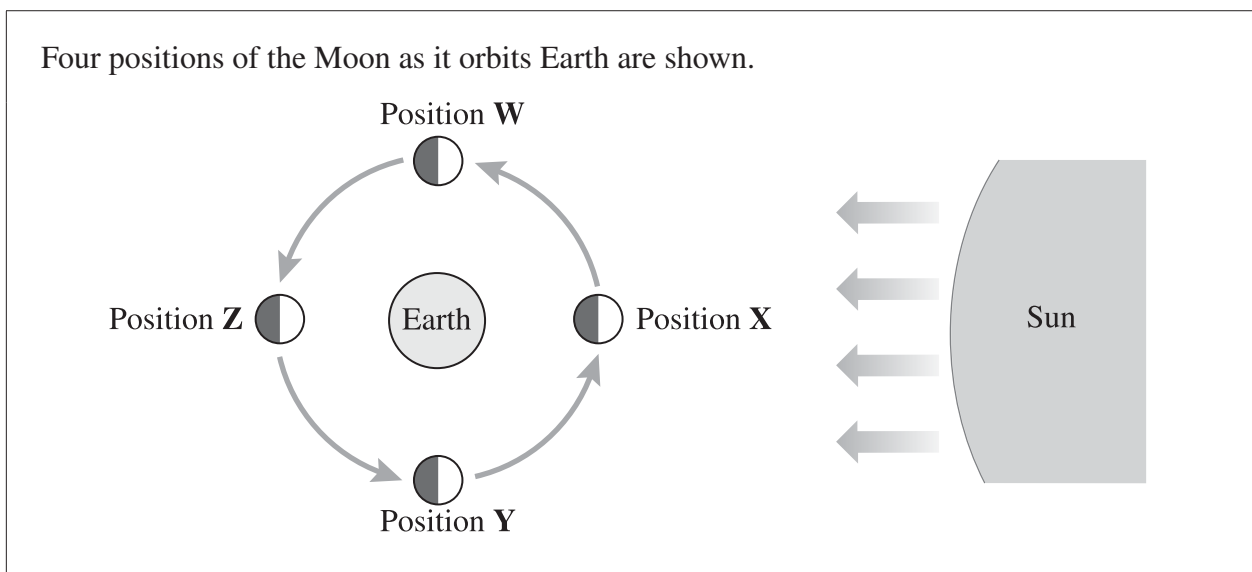
17. Which of the diagrams above represents a safe electrical practice?

- A. I
- B. II
- C. III
- D. IV

18. The length of an Earth year is the time it takes for
- A. Earth to revolve around the sun
 - B. the sun to revolve around Earth
 - C. Earth to revolve around the moon
 - D. the moon to revolve around Earth

19. The sun is an example of
- A. a star
 - B. a comet
 - C. a planet
 - D. an asteroid

Use the following information to answer question 20



20. Which position in the diagram represents a full moon viewed from Earth?
- A. Position W
 - B. Position X
 - C. Position Y
 - D. Position Z

Use the following information to answer question 21.

A student found the following information while completing a research assignment.

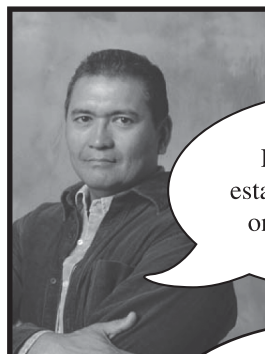
- Robots can perform tasks that human beings cannot.
- Human beings can make observations that robots cannot.
- Sending human beings into space is more expensive than sending robots, and takes money away from other projects.
- Sending human beings into space puts their lives at risk, but sending robots does not.

21. Which of the following statements is supported by the information above?

- A.** Using robots in space is both risky and expensive.
- B.** Using human beings in space is both risky and expensive.
- C.** Human beings make more accurate measurements than robots.
- D.** Robots make more accurate measurements than human beings.

Use the following information to answer question 22.

The year 2020 is the target date for the creation of a base on the Moon. Here are four speakers' questions related to the creation of a Moon base.



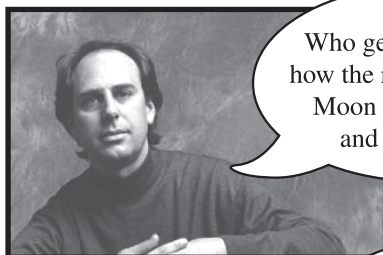
Speaker I

How much will establishing this base on the Moon cost?



Speaker II

How can we ensure that the Moon base is used for peaceful initiatives?



Speaker III

Who gets to determine how the resources on the Moon are to be used and distributed?



Speaker IV

If nuclear reactors are used for power, then how will the waste be disposed of?

22. Which speaker's question reflects an environmental perspective?

- A. Speaker I
- B. Speaker II
- C. Speaker III
- D. Speaker IV

**Knowledge and Employability Science –
Test Blueprint and Item Descriptions**

The following blueprint shows the reporting categories by which these questions were classified on the 2010 and 2011 Grade 9 Knowledge and Employability Science Achievement Tests.

General Outcomes	Reporting Category		Number (Percentage) of Questions
	Knowledge	Skills	
Biological Diversity	2 4	1 3 5	
Matter and Chemical Change	8 9 10 11	6 7	
Environmental Chemistry	12 14	13	
Electrical Principles and Technologies	17	15 16	
Space Exploration	18 19	20 21 22	
Number (Percentage) of Questions			

The table below provides information about each question: 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	Difficulty %	Reporting Category	Topic	Item Description
1	A	61.6%	S	BD	Evaluate information to identify a relationship based on a given food web.
2	A	80.7%	K	BD	Identify an example of a characteristic that can be inherited.
3	C	60.4%	S	BD	Identify the impact of human actions on a given population to determine an alternative action.
4	A	54.9%	K	BD	Identify an example of asexual reproduction.
5	B	57.1%	S	BD	Analyze information to draw a conclusion related to the impact of human actions on a given food web.
6	A	76.8%	S	MCC	Analyze information to draw a conclusion that best represents the information given on an environmental issue.
7	D	50.2%	S	MCC	Analyze information to determine what question is not addressed on a poster related to an environmental issue.
8	A	38.4%	K	MCC	Identify a product in a simple chemical reaction.
9	C	47.8%	K	MCC	Identify and recall the structure of an atom.
10	D	55.6%	K	MCC	Identify a solution as acidic based on test results with litmus paper.
11	C	89.1%	K	MCC	Identify a given food group related to Canada's Food Guide to Healthy Eating.
12	C	70.0%	K	EC	Identify a food necessary to balance a given meal according to the Canada Food Guide.
13	C	63.2%	S	EC	Analyze information to draw a conclusion related to pH and water quality and its impact on living things.

Question	Key	Difficulty %	Reporting Category	Topic	Item Description
14	D	49.5%	K	EC	Identify a favorable environmental practice of consumers based on information related to the issue.
15	D	38.6%	S	EPT	Integrate information to describe the relationship between current flow and resistance.
16	C	71.0%	S	EPT	Analyze information in a chart to determine the most energy-efficient resource given.
17	D	67.8%	K	EPT	Distinguish a safe electrical practice from a given set of diagrams.
18	A	66.4%	K	SE	Recall and identify the motion of the Earth in space relative to an Earth year.
19	A	80.6%	K	SE	Recall and identify an example of a given celestial body.
20	D	45.8%	S	SE	Analyze information in a diagram to identify the positioning and motion of objects in space.
21	B	53.5%	S	SE	Analyze information to draw a conclusion related to research information about a given (space-related) problem.
22	D	72.4%	S	SE	Interpret information to determine an environmental perspective related to space exploration.