Maryland School Assessment

Science

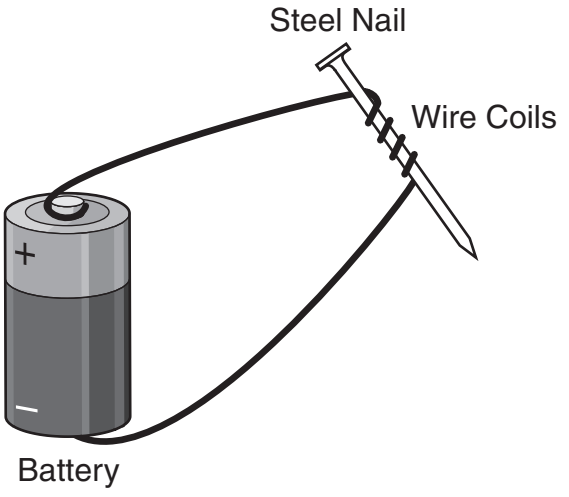
2008 Public Release

Grade 8

Part 1

Part 1

1 **An electromagnet is shown below.**



Which change would <u>decrease</u> the strength of the electromagnet?

- ○ **A** using an iron nail
- ○ **B** using an additional battery
- ○ **C** using more wire coils around the nail
- ○ **D** using fewer wire coils around the nail

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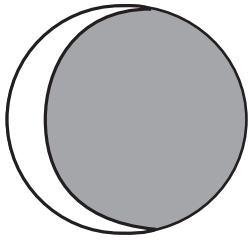
2 **The diagram below shows the moon in one of its crescent phases.**



Which statement best explains the cause of the phases of the moon?

- ○ **A** The sun hides part of the surface of the moon.
- ○ **B** The sun, the moon, and Earth are in a straight line in space.
- ○ **C** Only part of the illuminated moon is visible from Earth.
- ○ **D** Only the light from the back side of the sun is reflected by the moon.

3 **A student pushed a large rubber ball on a flat, frictionless surface. The ball rolled at a speed of 1 meter per second.**

Which statement best describes the motion of the ball when the student stopped pushing the ball?

- ○ **A** The ball accelerated.
- ○ **B** The ball did not move.
- ○ **C** The ball changed direction.
- ○ **D** The ball continued to move in the same direction.

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Directions

Use the technical passage below to answer Numbers 4 through 6.

Fill 'Er Up . . . With Soybeans and Corn

I'm sure you've heard someone complain about rising gas prices. Well, someday they might not have to worry so much about it. Agricultural Research Service scientists are studying other fuel sources that could eventually replace petroleum fuel.

At ARS's Beltsville Agricultural Research Center in Beltsville, Maryland, scientists are testing to see if government vehicles can use fuel made from soybeans, corn, animal fats, waste greases–like used frying oil–or other crops.

These tests are part of an effort to cut back on petroleum products–and to create more uses for U.S. crops. If the project works, more soybeans or corn will be needed to make crop-based fuel, or biofuel. This could be good for U.S. farmers because the more corn and soybeans people need, the more farmers are able to sell.

Another good thing about crop-based fuel is that it burns cleaner and produces less soot, the black smoke that comes from cars and trucks. Crop-based fuels may help engines run cleaner, decreasing vehicle repairs.

The Beltsville center is ARS's largest research facility. A total of 140 tractors, trucks, and other vehicles, including snowplows, are gassed up with "B20," a mix of 20 percent modified soybean oil and 80 percent regular diesel fuel.

The ARS National Visitor Center bus, which is used for Beltsville farm tours, runs on crop-based fuel. This bus was the first ARS vehicle to fill up on soybean-based fuel.

One disadvantage to using crop-based fuel is that it costs more than regular diesel fuel. However, the price may drop if people use it more.

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4 **Which human activity has the most positive impact on the environment?**

- ○ **A** using cropland to feed cattle
- ○ **B** selling soybeans at a high price
- ○ **C** recycling cooking oils to produce biofuels
- ○ **D** reducing the number of acres of corn planted

5 **If the demand for biofuels increases, how might the environment be positively affected?**

- ○ **A** There would be less air pollution.
- ○ **B** Farming equipment would produce more pollution.
- ○ **C** Carbon dioxide levels in the air would increase.
- ○ **D** Natural habitats would be converted to cropland.

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6 **A city might switch from buses that burn fossil fuel to buses that burn B20 diesel fuel. The data table below shows the average kilometers per liter (kpL) of a bus burning B20 diesel and of a bus burning fossil fuel for a seven-month period. The B20 diesel fuel costs more than the fossil fuel.**

Fuel Type	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
B20	2.0 kpL	1.8 kpL	1.9 kpL	1.9 kpL	1.9 kpL	2.0 kpL	1.9 kpL
Fossil	2.0 kpL	2.0 kpL	1.9 kpL	2.0 kpL	1.9 kpL	2.0 kpL	1.9 kpL

Evaluate the best type of fuel to use in the city buses. In your evaluation, be sure to include

- **advantages and disadvantages for each fuel**
- **supporting evidence from the data table and the technical passage**

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Write your answer in the space provided.

B20 fuel

Fossil Fuel

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Directions

Use The Periodic Table of the Elements and the information below to answer Numbers 7 through 9.

In class, students investigated patterns of elements in The Periodic Table of the Elements. Their teacher pointed out a few properties of some common elements. Helium is the lightest inert gas in air. Magnesium burns with a bright white flame. Gold and silver are dense metals. Table salt (sodium chloride) is a combination of two reactive elements. Some properties of common elements are shown in the data table below.

PROPERTIES OF SOME COMMON ELEMENTS

Element	Symbol	Atomic Number	State of Matter at Room Temperature
Helium	He	2	Gas
Chlorine	Cl	17	Gas
Gold	Au	79	Solid
Magnesium	Mg	12	Solid
Silver	Ag	47	Solid
Sodium	Na	11	Solid

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7 **Which of these elements is a highly reactive metal like sodium (Na)?**

- ○ **A** silver (Ag)
- ○ **B** helium (He)
- ○ **C** chlorine (Cl)
- ○ **D** magnesium (Mg)

8 **Which statement correctly describes a pattern in the data table, based on the state of matter of the elements at room temperature?**

- ○ **A** Gases are usually nonmetals.
- ○ **B** Reactive elements are usually gases.
- ○ **C** Solids always have large atomic numbers.
- ○ **D** Metals always have large atomic numbers.

9 **Which statement best explains what happens to the atoms in gold (Au) when the temperature of the metal increases?**

- ○ **A** The atoms move more slowly.
- ○ **B** The atoms move more quickly.
- ○ **C** The motion of the atoms stays the same.
- ○ **D** The motion of the atoms becomes very orderly.

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Directions

Use the information below to answer Numbers 10 and 11.

Fossils of tree ferns as old as 400 million years have been found in rocks. These ancient ferns lived in swampy, lowland forests and reproduced asexually by producing spores. The ferns were much taller than other plants living at the same time. These extinct tree ferns have modern-day relatives that grow in the tropics.

10 **Ancient ground plants competed with ancient tree ferns for resources in swampy areas.**

For which resource were the tree ferns best able to compete?

- ○ **A** air
- ○ **B** shelter
- ○ **C** sunlight
- ○ **D** water

11 **Today, many tree ferns have a life cycle that now includes a sexual phase as well as an asexual phase. An egg and a sperm unite to form a fertilized egg.**

In a fertilized egg, what percentage of the genetic information comes from the sperm?

- ○ **A** 25%
- ○ **B** 50%
- ○ **C** 75%
- ○ **D** 100%

No Test Material on This Page

Acknowledgements

Fill ‘Er Up….With Soybeans and Corn Please.” Courtesy: United States Department of Agriculture.

“The Good, the Bad and the Algae.” Courtesy of the Maryland Department of Natural Resources - www.maryland.gov