

Student Name: _____

Ohio Achievement Assessments



Science

Student Test Booklet

Spring 2011

This test was originally administered to students in Spring 2011.

Not all items from the Spring 2011 administration will be released in this document. According to Ohio Revised Code (ORC) 3301.07.11:4(b) . . . not less than forty percent of the questions on the test that are used to compute a student's score shall be a public record. The department (of education) shall determine which questions will be needed for reuse on a future test and those questions shall not be public records and shall be redacted from the test prior to its release as public record.

This publicly released material is appropriate for use by Ohio teachers in instructional settings. This test is aligned with Ohio's Academic Content Standards for Science.

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Directions:

Today you will be taking the Ohio Grade 5 Science Achievement Assessment. Three different types of questions appear on this test: multiple choice, short answer and extended response.

There are several important things to remember:

1. Read each question carefully. Think about what is being asked. Look carefully at graphs or diagrams because they will help you understand the question. Then, choose or write the answer you think is best.
2. Use only a #2 pencil to answer questions on this test.
3. For multiple-choice questions, fill in the circle next to your answer choice. Mark only one answer for each question. If you change your answer, make sure you erase your old answer completely. Do not cross out or make any marks on the other choices.
4. For constructed-response questions, write your answer neatly, clearly and only in the space provided in your Answer Document. Any responses written in your Student Test Booklet will not be scored.
5. Short-answer questions are worth two points. Extended-response questions are worth four points. Point values are printed near each question in your Student Test Booklet. The amount of space provided for your answers is the same for all two- and four-point questions.
6. If you do not know the answer to a question, skip it and go on to the next question. If you have time, go back to the questions you skipped and try to answer them before turning in your Student Test Booklet and Answer Document.
7. Check over your work when you are finished.
8. When you finish this section of the test, you may **NOT** go back to the reading or mathematics sections in the Student Test Booklet.

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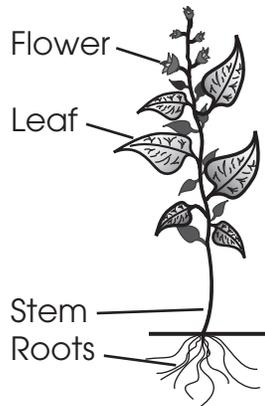
Science

Items 1–3 have not been slated for public release
in 2011.



Use the following picture to answer question 4.

4. **Soybean Plant**



What structure on this plant makes seeds so that the plant can reproduce?

- A. leaf
- B. root
- C. stem
- D. flower

Item 5 has not been slated for public release in 2011.

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Science

6. Two students perform an investigation to test the effects of sugar water on plant growth. The observations of both students are shown in the table.

Plant Growth Observations

	Student 1		Student 2	
	Plain Water	Sugar Water	Plain Water	Sugar Water
Final Height of Plant	Very Tall	Short	15 cm	10 cm
Number of Leaves	More	Less	18	7
Number of Flowers	A Lot	A Few	3	1

Both students conclude that the plant given plain water is healthier than the plant given sugar water.

In your **Answer Document**, explain why Student 2's conclusion is more scientific than Student 1's conclusion. Support your response with evidence from the investigation. (2 points)

Items 7–8 have not been slated for public release in 2011.

On the Spring 2011 Grade 5 Science Achievement Assessment, items 9–14 are field-test items, which are not released.

Use the information below to answer question 15.

**Property of Four Substances
at Room Temperature**

Property	Substance			
	W	X	Y	Z
State of Matter	Gas	Solid	Liquid	Solid
Takes the Shape of Its Container	Yes	No	Yes	No
Conducts Electricity	No	Yes	No	No
Can Be Stretched Into Thin Wires	No	Yes	No	No

15. According to this information, which substance is a metal?
- A. substance W
 - B. substance X
 - C. substance Y
 - D. substance Z

Item 16 has not been slated for public release in 2011.

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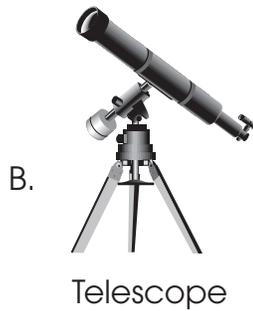
Science

Use the following information and picture of a beetle to answer question 17.

17. A student is sitting at a desk. A beetle lands on the desk.



The use of which tool allows the student to easily observe the beetle's legs as it is walking across the desk?



Item 18 has not been slated for public release in 2011.

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19. The sun is a star of average size and brightness. From Earth, the sun appears as a round, yellow object in the daytime sky. At night, we see other stars. They appear as tiny points of light.

Why does the sun appear larger than stars that we see at night?

- A. Daylight brightens the sun, making it appear larger.
- B. Starlight bends as it passes planets, making the stars appear smaller.
- C. The sun is closer to Earth than other stars, making the sun appear larger.
- D. Earth's atmosphere filters out light from other stars, making them appear smaller.



20. A student stands outside on a cold winter day. His hands become cold and he rubs them together to make them warmer.

Which statement explains why rubbing his hands together makes them warmer?

- A. This action produces thermal energy through friction.
- B. This action conducts thermal energy away from the body.
- C. This action captures thermal energy from the environment.
- D. This action reduces the amount of thermal energy transferred to the air.

Use the following information to answer question 21.

Some cups are better than others for serving hot liquids. Characteristics of these cups include the following:

- Safety: reduces the risk of spilling hot liquid due to the cup bending, cracking, leaking, or falling over
- Insulation: slows the transfer of thermal energy to help keep the liquid at the same temperature
- Reusable/Recyclable: can be reused after washing or can be recycled

The table below shows characteristics of five different cups. All cups will hold 150 mL. The same amount of hot cocoa at 70°C is put in each cup.

Properties of Five Cups

Cup Material	Is the Material Sturdy?	How Heavy Is a Cup?	Can a Cup Be Reused or Recycled?	What Is the Final Temperature of Hot Cocoa After 15 Minutes?
Aluminum Metal	Does Not Bend or Break	50 grams	Yes Yes	27°C
Clear Glass	Does Not Bend but Can Crack or Break	180 grams	Yes Yes	29°C
Coated Paper	Easily Bends or Tears	5 grams	No No	35°C
Glazed Clay	Does Not Bend but Can Crack or Break	350 grams	Yes No	37°C
Plastic Foam	Could Bend, Can Crack or Break	5 grams	No Yes	39°C

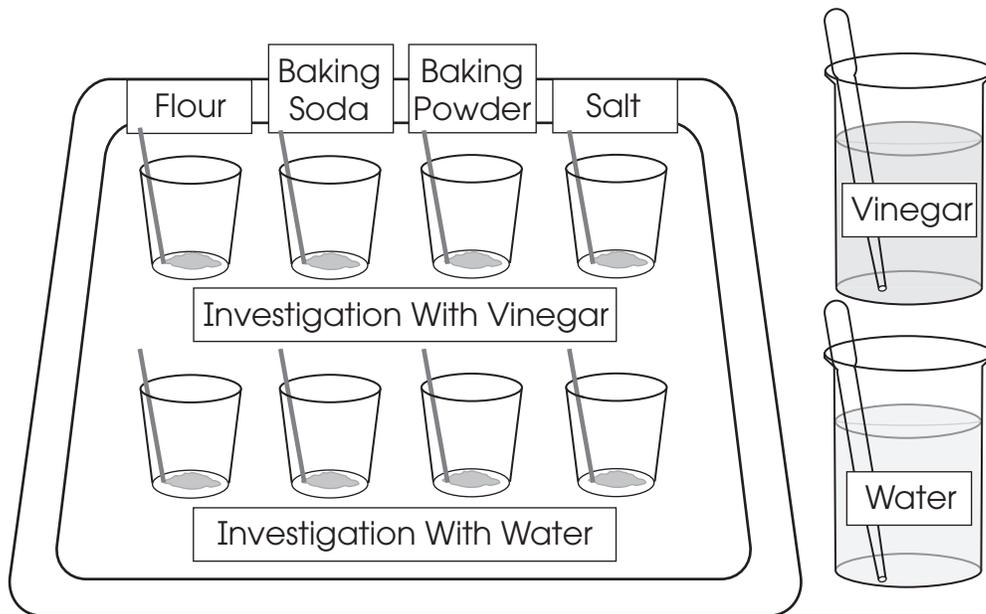
21. Choose two of the materials from the table. In your **Answer Document**, describe one advantage and one disadvantage of using each of these two materials for cups used to serve hot cocoa. (4 points)

Items 22–26 have not been slated for public release
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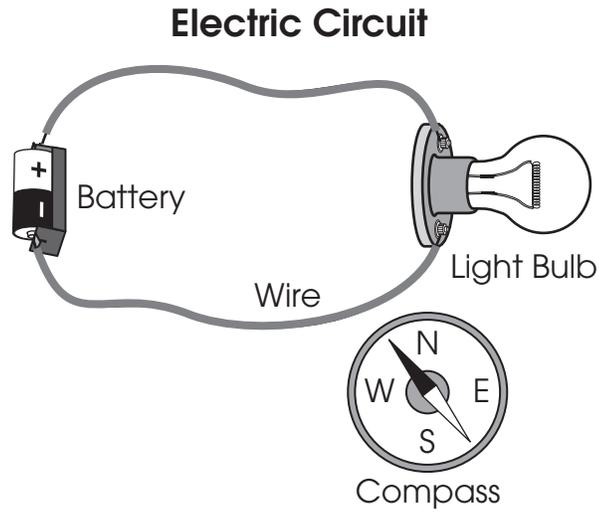
27. Students plan to observe the effects of mixing liquids with flour, baking soda, baking powder, and salt. A liquid dropper helps students control the amount of water or vinegar used. Students must mix one of these liquids with the contents of each container.



In your **Answer Document**, describe one possible safety hazard in this investigation.

Then describe one way to make sure that this investigation is safe from this hazard. (2 points)

28. An electric circuit is shown.



Why does the compass needle move when the compass is placed near the wire?

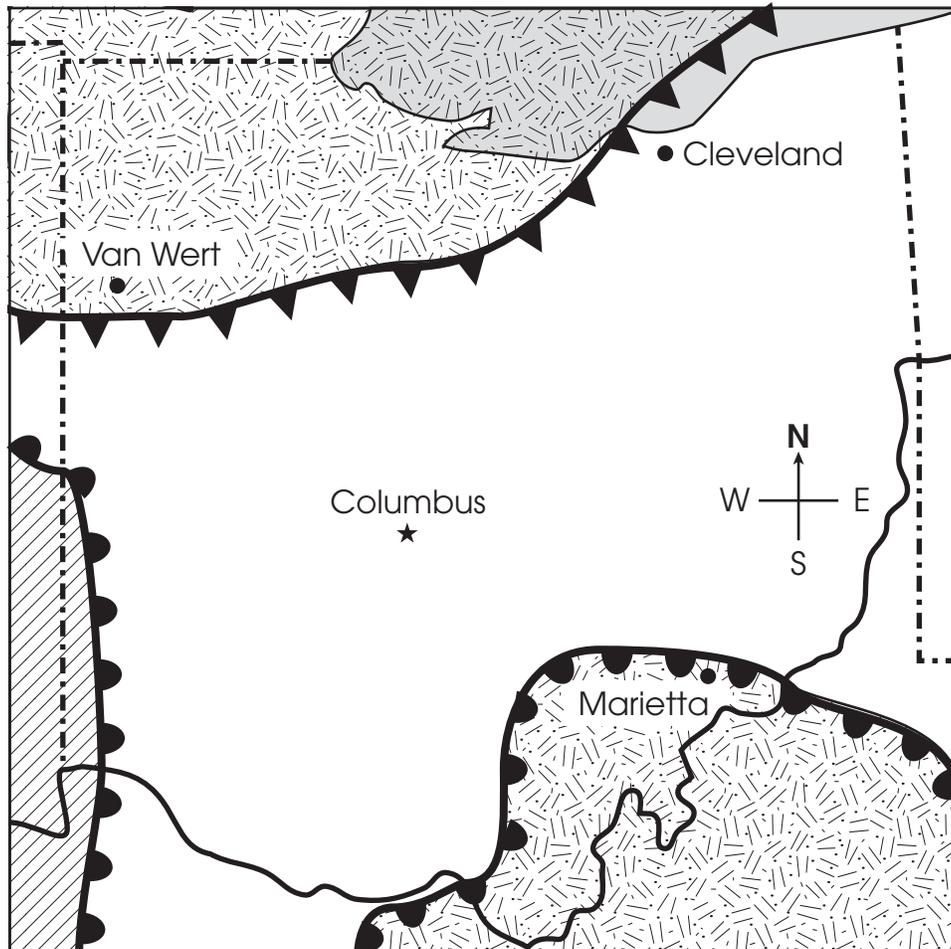
- A. because electric current makes the light bulb give off thermal energy
- B. because electric current produces magnetic forces
- C. because of the plastic coating on the wires
- D. because of the light of the bulb

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29. The weather systems shown below will move by September 16.

Weather in Ohio at Noon on September 15



Key	
	Warm Front
	Cold Front
	80s
	70s
	60s

Based on the weather map, which city will be next to experience cooler temperatures?

- A. Van Wert
- B. Cleveland
- C. Columbus
- D. Marietta

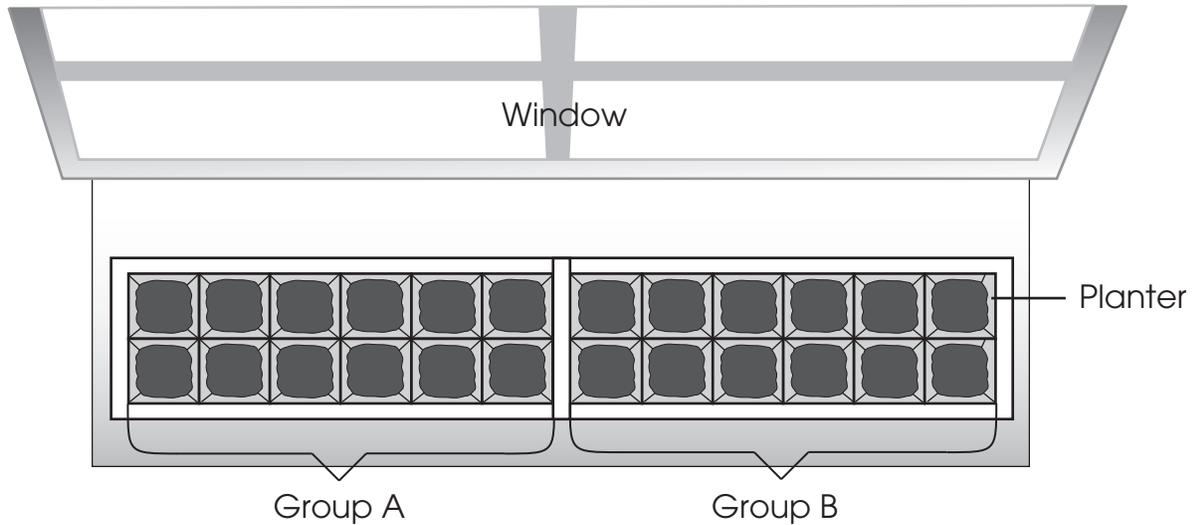
Items 30–32 have not been slated for public release
in 2011.

33. Which explains the pattern of day and night?
- A. Earth orbits the sun.
 - B. Earth spins on its axis.
 - C. The sun only transmits light energy during the daytime.
 - D. The sun only transmits light energy above the equator.

Use the following information to answer questions 34–37.

Investigating Plant Growth

Students in a class predict that if they double the amount of water given to tomatoes then the plants will grow twice as tall. The class plants a seed in each planter shown.



Planters in Group A receive 5 mL of water each day. Planters in Group B receive 10 mL of water each day.

The class measures the heights of the plants every Friday. The average height for each group is recorded in the table shown.

Average Height

Week	Group A (cm)	Group B (cm)
1	0.5	0.5
2	2.0	2.0
3	3.0	3.5
4	4.0	5.5
5	4.5	7.5

34. Students continue to record data on plant height.

Why is it important to record data every Friday?

- A. to check for diseases on the plants
- B. to see whether the data are correct
- C. to see whether plants grow more on Fridays
- D. to have the same time span between measures

35. Why did the plants in group B grow taller than the plants in group A?

- A. Group B plants received more water.
- B. Group B plants received more oxygen.
- C. Group B plants received more sunlight.
- D. Group B plants received more thermal energy.

Item 36 has not been slated for public release in 2011.

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37. The class puts the planters by the window so that the plants can get more sunlight.

How do the tomato plants use sunlight?

- A. to make sugar in the leaves
- B. to use starch from the stems
- C. to move water to the flowers
- D. to get nutrients through the roots

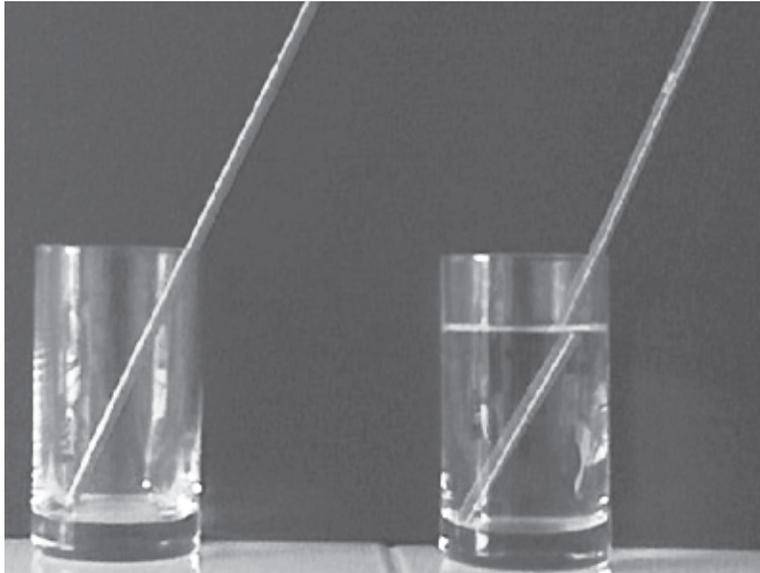
Items 38–41 have not been slated for public release
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42. A student looks at the two glasses pictured below. One of the glasses contains water.



No Water

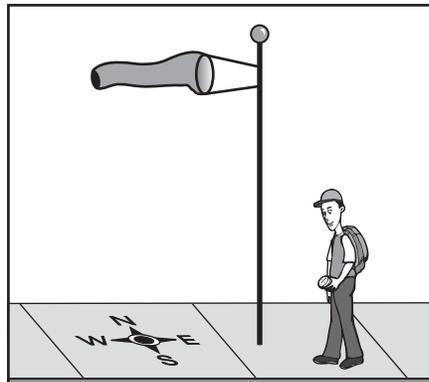
Water

Why does the straw in the glass of water appear to be split at the surface of the water?

- A. The water reflects light passing through it.
- B. The water refracts light passing through it.
- C. The water scatters light passing through it.
- D. The water absorbs light passing through it.

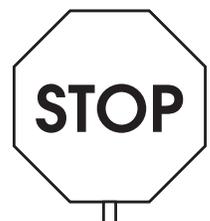
Item 43 has not been slated for public release in 2011.

44. A student is collecting data about the wind. The picture shows a windsock attached to a flagpole on a windy day.



According to the information in the picture, the wind is coming from which direction?

- A. from the east
- B. from the west
- C. from the north
- D. from the south



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