

**Ohio Achievement Assessment
Grade 5 Science**

Spring 2011

**Answer Key
and
Scoring Guidelines**

**Grade 5 Science
Answer Key
Spring 2011**

Item No.	Type	Content Standard	Content Standard Benchmark	Key
1	Multiple Choice	Earth and Space Science	B	Not for public release
2	Multiple Choice	Physical Sciences	B	Not for public release
3	Multiple Choice	Scientific Inquiry	C	Not for public release
4	Multiple Choice	Life Sciences	B	D
5	Multiple Choice	Physical Sciences	A	Not for public release
6	Short Answer	Scientific ways of Knowing	C	2 pt rubric
7	Multiple Choice	Physical Sciences	E	Not for public release
8	Multiple Choice	Science and Technology	A	Not for public release
9 - 14	Field Test questions not used for student score			
15	Multiple Choice	Physical Sciences	B	B
16	Short Answer	Earth and Space Science	B	Not for public release
17	Multiple Choice	Scientific Inquiry	A	C
18	Multiple Choice	Physical Sciences	E	Not for public release
19	Multiple Choice	Earth and Space Science	A	C
20	Multiple Choice	Physical Sciences	D	A
21	Extended Response	Science and Technology	A	4 pt rubric
22	Multiple Choice	Life Sciences	C	Not for public release
23	Multiple Choice	Earth and Space Science	B	Not for public release
24	Multiple Choice	Life Sciences	B	Not for public release
25	Multiple Choice	Scientific ways of Knowing	C	Not for public release
26	Multiple Choice	Life Sciences	B	Not for public release
27	Short Answer	Scientific Inquiry	C	2 pt rubric
28	Multiple Choice	Physical Sciences	E	B
29	Multiple Choice	Earth and Space Science	D	B
30	Multiple Choice	Life Sciences	A	Not for public release
31	Multiple Choice	Physical Sciences	C	Not for public release
32	Short Answer	Physical Sciences	C	Not for public release
33	Multiple Choice	Earth and Space Science	A	B
34	Multiple Choice	Scientific ways of Knowing	C	D
35	Multiple Choice	Life Sciences	B	A
36	Multiple Choice	Scientific Inquiry	B	Not for public release
37	Multiple Choice	Life Sciences	B	A
38	Extended Response	Life Sciences	C	Not for public release
39	Multiple Choice	Earth and Space Science	C	Not for public release
40	Multiple Choice	Physical Sciences	F	Not for public release
41	Multiple Choice	Earth and Space Science	D	Not for public release
42	Multiple Choice	Physical Sciences	F	B
43	Multiple Choice	Life Sciences	A	Not for public release
44	Multiple Choice	Earth and Space Science	D	A

Limited = 0-12; Basic = 13-23; Proficient = 24-29; Accelerated = 30-38; Advanced = 39-48
Multiple Choice = 1 point; Short Answer = 2 points; Extended Response = 4 points

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.

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)

Scoring Guidelines

Points	Student Response
2 point	Sample Response: Student 2's conclusion is more scientific because that student's observations are measurements that can be checked by others. Measurements that can be checked by others and reproduced are facts. Student 2 measured the height of the plants with a ruler to get real data. Other Response: Correct responses for why Student 2's conclusion is more scientific may include: • Student 2 relied on facts which can be measured and reproduced by others. • Student 2 did not rely on opinions that will be different person-to-person to make the conclusion. • Student 2's data is more exact (accurate or specific). Correct responses for evidence that supports that Student 2's conclusion is more scientific may include: • Student 2 used a ruler to measure the height of the plants. • Student 2 counted the number of leaves. Student 2 counted the number of flowers. The response provides: • A correct explanation of why Student 2's conclusion is more scientific; • AND • Evidence from the investigation that supports why Student 2's conclusion is more scientific.
1 point	The response provides a correct explanation of why Student 2's conclusion is more scientific. Sample Response: Student 2's conclusion relies on facts, not opinions.

0 point	The response fails to demonstrate any understanding of the difference between fact and opinion or an understanding that conclusions based on facts and actual data are more scientific than conclusions based on opinion. The response does not meet the criteria required to earn one point. The response indicates inadequate or no understanding of the task and/or the idea or concept needed to answer the item. It may only repeat information given in the test item. The response may provide an incorrect solution/response and the provided supportive information may be irrelevant to the item, or possibly, no other information is shown. The student may have written on a different topic or written, "I don't know." Sample Response: Both of the students have scientific conclusions because they got the same conclusion.
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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.

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)**

Scoring Guidelines

Points	Student Response
4 point	Sample Response: A cup made of glazed clay would keep the cocoa hot but can break easily. A cup made of aluminum wouldn't break but lets the liquid cool too quickly. Other Response: Acceptable responses include: • Aluminum: • Advantages: doesn't break or bend, reusable and recyclable • Disadvantages: not a good insulator so cocoa cools off and outside of cup gets hot, lightweight so can fall over easily • Clear glass: • Advantages: doesn't bend, reusable and recyclable, heavy enough not to fall over easily • Disadvantages: breaks, not a good insulator so cocoa cools off • Coated paper: • Advantages: relatively good insulator (although not as good as clay or foam) • Disadvantages: lightweight so can fall over easily, not reusable or recyclable, easily bends or tears • Glazed clay: • Advantages: good insulator so cocoa stays hot, heavyweight so it doesn't fall over easily; reusable, does not bend • Disadvantages: breaks • Plastic foam: • Advantages: good insulator so cocoa stays hot, recyclable • Disadvantages: not reusable, lightweight so can fall over easily, could bend, break or crack. NOTE: Student responses that include correct prior knowledge about the tendency of the cup to feel or not to feel hot to the touch should be given credit for a correct disadvantage or advantage, respectively.

	NOTE: Student responses may include a comparison or an implied comparison between the weights of the cups for credit. The response must make a comparison between the cups not just list the values in the table.] The response provides a correct description of an advantage and a disadvantage of using each of two materials for making cups for serving hot cocoa.
3 point	The response provides a correct description of one advantage and one disadvantage for one material and either a correct description of an advantage or a disadvantage for another material. Sample Response: A cup made of glazed clay would keep the cocoa hot, but can break or chip easily. A cup made out of plastic foam wouldn't break if it fell over.
2 point	The response provides a correct description of one advantage and one disadvantage of one material OR descriptions of advantages of two different materials OR descriptions of disadvantages of two different materials OR a correct description of an advantage of one material and a disadvantage of another when the materials are used to make cups for serving hot cocoa. Sample Response: A cup made of glazed clay would keep the cocoa hot. Cocoa in a paper cup would cool off too quickly.
1 point	The response provides a correct description of one advantage OR one disadvantage for one material when using the material to make cups for serving hot cocoa. Sample Response: A cup made of aluminum doesn't break easily.
0 point	The response fails to indicate any understanding of how the properties of different materials make them suitable for different uses. The response does not meet the criteria required to earn one point. The response indicates inadequate or no understanding of the task and/or the idea or concept needed to answer the item. It may only repeat information given in the test item. The response may provide an incorrect solution/response and the provided supportive information may be very irrelevant to the item, or possibly, no other information is shown. The student may have written on a different topic or written, "I don't know." Sample Response: Cups can be made from aluminum, plastic foam or coated paper.

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

Scoring Guidelines

Points	Student Response
2 point	Sample Response: The vinegar could get in their eyes. Students should wear goggles. Other Response: Possible dangers to students include: • Water or vinegar splashing into students' eyes • Vinegar or baking soda reacting and going into students' eyes • Vinegar spilling on clothes or hands Possible safety prevention measures associated with the identified hazard include: • Wear goggles. • Hold chemicals away from face. • Wear an apron or lab coat. • Wash hands if/when vinegar is touched. • Point dropper and cups away from face. • Avoid touching face (eyes, ears, nose, mouth). The response provides a description of one possible hazard to students conducting the investigation AND a description of one method to prevent an accident from occurring due to the identified hazard.
1 point	The response provides a description of one possible hazard to students conducting the investigation OR a description of one method to prevent an accident from occurring in this investigation. Sample Response: Students should wear goggles to protect their eyes.
0 point	The response indicates no understanding of possible safety hazards in the investigation and does not provide an appropriate safety prevention measure. The response does not meet the criteria required to earn one point. The response indicates inadequate or no understanding of the task and/or the idea or concept needed to answer the item. It may only repeat information given in the test item. The response may provide an incorrect solution/response and the provided supportive information may be very irrelevant to the item, or possibly, no other information is shown. The student may have written on a different topic or written, "I don't know." Sample Response: Students could get hurt.