

Starch and Sugar Testing 2

Task Information

Grade: 8th Grade

Format: Manipulative

Purpose: The students will design and carry out an experiment to determine the presence of starch and sugar in unknown solutions

Content: Physical Science - Block H - VIA, VIIIA

Skills:

Primary: Observing, Recording Data, Interpreting data.

Secondary: Classifying, Generalizing/Inferring

Time: 10 -15 minutes

Materials:

- dropper bottles labeled A, B, and C
- dropper bottle with iodine
- glucose test strip/stick
- laminated test card or transparency test card
- waste container (cup or small pail)
- wax paper
- paper towels
- safety goggles

Preparation:

- Glucose and starch solutions can be obtained from a science supply company
- Put glucose solutions in bottles A and B
- Put starch solutions in bottle C
- Glucose test strips/stick can be obtained from a science supply company or a drugstore
- Keep the glucose strips away from the iodine solution. The fumes will turn the strips black or green
- Be sure to test glucose and starch solutions before using them with the students
- The glucose and starch solutions can be diluted two or three times. They will be more effective than full strength.
- Wax paper should be cut to fit over the test card. This will keep the test card from becoming contaminated. If using transparency test card be sure to discard when each student is finished.

Modifications and Extensions:

- Glucose test tape is no longer manufactured. You may use glucose test strips/sticks found at a drugstore. These are quite expensive so a teacher demo may be more appropriate.
- To do a Teacher Demo you might use an overhead projector with a transparency sheet marked with three circles marked "A", "B", and "C". The students could then check the color on the glucose strips as well as see the iodine change when the materials were added.
- There is also Starch and Sugar 1, with a different degree of structure

Safety:

- Students must wear safety goggles when working with iodine solution.

Starch and Sugar Testing 2

Task: At this station, you will design and carry out an experiment to determine which of three solutions contain starch and sugar.

Materials:

- | | |
|-------------------------------------|------------------|
| dropper bottles A - C | wax paper sheets |
| dropper bottle with iodine solution | waste cup |
| glucose test strips | paper towels |
| test card | safety goggles |

Background:

Iodine solution turns blue-black in the presence of starch.
 Glucose test strips turn green in the presence of the sugar glucose.

Directions:

- Put your safety goggles on.
- You have been provided with three(3) unknown solutions and two (2) indicators. Using the background above and your knowledge of science, think carefully about an experiment you could do to determine if starch and/or sugar are present in any of the three solutions.
- In the space below, describe the procedures you followed in conducting your experiment.

- CARRY OUT YOUR EXPERIMENT.**
 When carrying out your experiment, place a wax paper sheet over the test card to protect it.

Please Continue on the Next Page

5. Record the **COLOR** of the test strips and the solutions in the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strips			
Iodine Solution			

6. Blot the wax paper with a paper towel and wipe off the test card. Throw any garbage into the waste cup.

7. Using the data you have collected and the background information, which solutions contain sugar?

In the space below, explain the reason for your answer.

8. Using the data you have collected and the background information, which solutions contain starch?

In the space below, explain the reason for your answer.

Starch and Sugar Testing 2 - Scoring Rubric

Maximum Score - 11 points

Question 3. Experimental procedures. 2 points total

Point Criteria:

- Allow 1 point for a correct testing method for a sugar.
- Allow 1 point for correct testing method for a starch.

Acceptable responses include:

- Use glucose test strips in all three solutions. (1 point)
 - Use iodine solution in all three solutions. (1 point)
 - Record and compare which are sugar and/or starch.
- or**
- Use glucose strips to test for sugar. (1 point)
 - Use iodine solution to test for starch. (1 point)

Question 5. Glucose strip and iodine solution data table 2 points total

Indicator	Solution A	Solution B	Solution C
Glucose Test Strips	<i>green</i>	<i>green</i>	<i>yellow or no change</i>
Iodine Solution	<i>orange or no change</i>	<i>orange or no change</i>	<i>blue, black or brown</i>

Point Criteria:

- Allow 1 point for correct data for sugar method according to student plan (See question #3).
- Allow 1 point for correct data for starch method according to student plan (see question #3).

Question 7. Identify sugar solutions. 3 points total

Point Criteria:

- Allow 1 point for identifying both sugar solutions as A and B.
 - Accept any student's response correctly based on his/her data
- Allow 2 points for an explanation relating student data to background information.
 - Solutions A and B turned the test strips green which indicates sugar.
 - Allow only 1 point if the student states the background information without relating it to his/her data

Question 8. Identify starch solutions. 3 points total

Point Criteria:

- Allow 1 point for identifying starch solution as C.
 - Accept any student's response correctly based on his/her data
- Allow 2 points for an explanation relating student data to background information.
 - Solution C turned the iodine solution black which indicates starch.
 - Allow only 1 point if the student states the background information without relating it to his/her data.

Highest possible score - 11 points

Student ID _____ Scoring Form - Starch and Sugar Testing 2
 Male or Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

Question	Circle Point Breakdown	Points earned
3. Experimental Procedures Sugar Testing method Starch Testing Method	0 1 0 1	_____
5. Glucose Strips and Iodine Solution data table Solution A Solution B Solution C	0 1 0 1 0 1	_____
7. Sugar Solution(s) Solution(s) named Explain choice	0 1 0 1 2	_____
8. Starch solution(s) Solution(s) named Explain choice	0 1 0 1 2	_____

Total Score _____
Total Possible Score - 11 points

Student ID GMS-3 Scoring Form - Starch and Sugar Testing 2

Male or Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

Question	Circle Point Breakdown	Points earned
3. Experimental Procedures Sugar Testing method Starch Testing Method	<u>0</u> 1 0 <u>1</u>	<u>1</u>
5. Glucose Strips and Iodine Solution data table Solution A Solution B Solution C	<u>0</u> 1 0 <u>1</u> <u>0</u> 1	<u>1</u>
7. Sugar Solution(s) Solution(s) named Explain choice	0 <u>1</u> 0 1 <u>2</u>	<u>3</u>
8. Starch solution(s) Solution(s) named Explain choice	<u>0</u> 1 <u>0</u> 1 2	<u>0</u>

Total Score 5
Total Possible Score - 11 points

Starch and Sugar Testing 2

Task: At this station, you will design and carry out an experiment to determine which of three solutions contain starch and sugar.

MATERIALS:

- | | |
|-------------------------------------|------------------|
| dropper bottles A - C | wax paper sheets |
| dropper bottle with iodine solution | waste cup |
| glucose test strips | paper towels |
| test card | safety goggles |

BACKGROUND:

Iodine solution turns blue-black in the presence of starch.

Glucose test strips turn green in the presence of the sugar glucose.

DIRECTIONS:

- Put your safety goggles on.
- You have been provided with three(3) unknown solutions and two (2) indicators. Using the background above and your knowledge of science, think carefully about an experiment you could do to determine if starch and/or sugar are present in any of the three solutions.
- CARRY OUT YOUR EXPERIMENT.**
 When carrying out your experiment, place a wax paper sheet over the test card to protect it.
- Record the **COLOR** of the test strips and the solutions in the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strips	Turned green	Turned green Turned black	Turned green
Iodine Solution	Turned Black	Turned Black	Turned Black

- Blot the wax paper with a paper towel and wipe off the test card. Throw any garbage into the waste cup.

PLEASE CONTINUE THIS TASK
ON THE NEXT PAGE

6. In the space below, describe the procedures you followed in conducting your experiment.

I put Solution ABC and the Iodine on different
strips.

7. Using the data you have collected and the background information, which solutions contain sugar?

A.B.C

In the space below, explain the reason for your answer.

They all turned green.

8. Using the data you have collected and the background information, which solutions contain starch?

ABC

In the space below, explain the reason for your answer.

All three strips turned green.

Student ID GMS-1 Scoring Form - Starch and Sugar Testing 2

Male or Female (circle one)

Circle the student's score for each question. Add the points for each question and write the total score at the bottom of the scoring form.

Question	Circle Point Breakdown	Points earned
3. Experimental Procedures Sugar Testing method Starch Testing Method	0 (1) 0 (1)	<u>2</u>
5. Glucose Strips and Iodine Solution data table Solution A Solution B Solution C	(0) 1 0 (1) 0 (1)	<u>2</u>
7. Sugar Solution(s) Solution(s) named Explain choice	0 (1) 0 1 (2)	<u>3</u>
8. Starch solution(s) Solution(s) named Explain choice	0 (1) 0 (1) 2	<u>2</u>

Total Score 9
Total Possible Score - 11 points

Starch and Sugar Testing 2

Task: At this station, you will design and carry out an experiment to determine which of three solutions contain starch and sugar.

MATERIALS:

- | | |
|-------------------------------------|------------------|
| dropper bottles A - C | wax paper sheets |
| dropper bottle with iodine solution | waste cup |
| glucose test strips | paper towels |
| test card | safety goggles |

BACKGROUND:

Iodine solution turns blue-black in the presence of starch.

Glucose test strips turn green in the presence of the sugar glucose.

DIRECTIONS:

1. Put your safety goggles on.
2. You have been provided with three(3) unknown solutions and two (2) indicators. Using the background above and your knowledge of science, think carefully about an experiment you could do to determine if starch and/or sugar are present in any of the three solutions.
3. **CARRY OUT YOUR EXPERIMENT.**
 When carrying out your experiment, place a wax paper sheet over the test card to protect it.
4. Record the **COLOR** of the test strips and the solutions in the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strips	green	green	yellow
Iodine Solution	black	black	black

2

5. Blot the wax paper with a paper towel and wipe off the test card. Throw any garbage into the waste cup.

**PLEASE CONTINUE THIS TASK
ON THE NEXT PAGE**

6. In the space below, describe the procedures you followed in conducting your experiment.

I put drops of Solution A, B, C under the columns on the test card and then dipped the Glucose test paper in. I did the same for the Iodine.

2

7. Using the data you have collected and the background information, which solutions contain sugar?

A & B

In the space below, explain the reason for your answer.

Because when I dipped the strips in them - they turned green.

3

8. Using the data you have collected and the background information, which solutions contain starch?

A, B & C

In the space below, explain the reason for your answer.

When I dipped the strip in Iodine it turned black.

2

6. In the space below, describe the procedures you followed in conducting your experiment.

1. On wax paper - place 4 drops of sugar + starch on each letter (A, B, C) with that letter bottle.
 2. I tested the drops with 1 piece of glucose test tape on each and record my observations
 3. I made another drop of sugar starch separate from the others and dropped iodine

7. Using the data you have collected and the background information, which solutions contain sugar?

A, B, C

In the space below, explain the reason for your answer.

There were 3 ~~rotions~~ which contained sugar because the glucose test ~~strip~~ strips turned green

8. Using the data you have collected and the background information, which solutions contain starch?

B, C.

In the space below, explain the reason for your answer.

In letter A, the iodine did not change to blue-black when iodine was dropped onto it.