

## Starch and Sugar Testing 1 Task Information

**Grade:** 8th Grade

**Format:** Manipulative

**Purpose:** The students will 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 2, with a different degree of structure

**Safety:**

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

## Starch and Sugar Testing 1

**Task:** At this station, you will 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. Place a wax paper sheet over the test card.
3. Place two drops of each solution on the wax paper over the circle on the test card with the same letter.
4. Dip the end of a glucose test strip in each of the three solutions. Use a new strip for each solution.
5. Record the **COLOR** of the glucose test strips on the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strip			

6. Add one drop of iodine solution to each solution.
7. Record the **COLOR** of the solutions on the data table below.

Indicator	Solution A	Solution B	Solution C
Iodine Solution			

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

Please Continue on the Next Page

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

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

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

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

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# Starch and Sugar Testing - Scoring Rubric

Maximum Score - 10 points

**Question 5. Glucose strip data table. 2 points total**

Indicator	Solution A	Solution B	Solution C
Glucose Test Strip	<i>green</i>	<i>green</i>	<i>yellow or no change</i>

Point Criteria:

- Allow 1 point if both Solutions A and B are correct.
- Allow 1 point if Solution C is correct.

**Question 7. Iodine solution data table. 2 points total**

Indicator	Solution A	Solution B	Solution C
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 if both solutions A & B are correct.
- Allow 1 point if solution C is correct.

**Question 9. Identify sugar solutions 3 points total**

Point Criteria:

- Allow 1 point for identifying both solutions A and B as containing sugar.
  - 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 10. 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 - 10 points**

Student ID \_\_\_\_\_ Scoring Form - Starch & Sugar Testing 1

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
5. Glucose strip data table Solutions A & B Solution C	0 1 0 1	_____
7. Iodine solution data table Solutions A & B Solution C	0 1 0 1	_____
9. Sugar solutions Solutions named Explain choice	0 1 0 1 2	_____
10. Starch solution Solution named Explain choice	0 1 0 1 2	_____

Total Score \_\_\_\_\_  
Total possible score - 10 points

Student ID G-01

Scoring Form - Starch & Sugar Testing 1

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
5. Glucose strip data table Solutions A & B Solution C	0    ① ①    1	<u>1</u>
7. Iodine solution data table Solutions A & B Solution C	0    ① 0    ①	<u>2</u>
9. Sugar solutions Solutions named Explain choice	①    1 ①    1    2	<u>0</u>
10. Starch solution Solution named Explain choice	①    1 ①    1    2	<u>0</u>

Total Score 3  
Total possible score - 10 points

# Starch and Sugar Testing 1

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

**MATERIALS:**

- |  |   |
|--|---|
| dropper bottles A - C<br>dropper bottle with iodine solution<br>glucose test strips<br>test card | wax paper sheets<br>waste cup<br>paper towels<br>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. Place a wax paper sheet over the test card.
3. Place two drops of each solution on the wax paper over the circle on the test card with the same letter.
4. Dip the end of a glucose test strip in each of the three solutions. Use a new strip for each solution.
5. Record the **COLOR** of the glucose test strips on the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strip	<del>Blue</del> green	<del>Blue</del> green	<del>Blue</del> green

6. Add one drop of iodine solution to each solution.
7. Record the **COLOR** of the solutions on the data table below.

Indicator	Solution A	Solution B	Solution C
Iodine Solution	<del>Blue</del> Blue-Black	<del>Blue</del> Blue-Black	<del>Blue</del> Blue-Black

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

9. Using the data you have collected and the background information, which solutions contain sugar? 3 #1

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

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10. Using the data you have collected and the background information, which solutions contain starch? 3

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

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Student ID G-07

Scoring Form - Starch & Sugar Testing 1

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
5. Glucose strip data table Solutions A & B Solution C	0 (1) 0 (1)	<u>2</u>
7. Iodine solution data table Solutions A & B Solution C	(0) 1 0 (1)	<u>1</u>
9. Sugar solutions Solutions named Explain choice	0 (1) 0 (1) 2	<u>2</u>
10. Starch solution Solution named Explain choice	0 (1) (0) 1 2	<u>1</u>

Total Score 6  
Total possible score - 10 points

# Starch and Sugar Testing 1

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

## MATERIALS:

dropper bottles A - C  
dropper bottle with iodine solution  
glucose test strips  
test card

wax paper sheets  
waste cup  
paper towels  
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. Place a wax paper sheet over the test card.
3. Place two drops of each solution on the wax paper over the circle on the test card with the same letter.
4. Dip the end of a glucose test strip in each of the three solutions. Use a new strip for each solution.
5. Record the **COLOR** of the glucose test strips on the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strip	green	<del>yellow</del> green	yellow

6. Add one drop of iodine solution to each solution.
7. Record the **COLOR** of the solutions on the data table below.

Indicator	Solution A	Solution B	Solution C
Iodine Solution	Black	Black	Black

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

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

AB

#2

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

~~It~~ ~~change~~ It change

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- 10. 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.

It change

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Student ID G-15

Scoring Form - Starch & Sugar Testing 1

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
5. Glucose strip data table Solutions A & B Solution C	0 (1) 0 (1)	<u>2</u>
7. Iodine solution data table Solutions A & B Solution C	0 (1) (0) 1	<u>1</u>
9. Sugar solutions Solutions named Explain choice	0 (1) 0 1 (2)	<u>3</u>
10. Starch solution Solution named Explain choice	0 (1) 0 1 (2)	<u>3</u>

Total Score 9  
Total possible score - 10 points

G-15-F  
#3

# Starch and Sugar Testing 1

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

## MATERIALS:

dropper bottles A - C  
dropper bottle with iodine solution  
glucose test strips  
test card

wax paper sheets  
waste cup  
paper towels  
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.
- Place a wax paper sheet over the test card.
- Place two drops of each solution on the wax paper over the circle on the test card with the same letter.
- Dip the end of a glucose test strip in each of the three solutions. Use a new strip for each solution.
- Record the **COLOR** of the glucose test strips on the data table below.

Indicator	Solution A	Solution B	Solution C
Glucose Test Strip	green	yellow/ light green	yellow/ light green

- Add one drop of iodine solution to each solution.
- Record the **COLOR** of the solutions on the data table below.

Indicator	Solution A	Solution B	Solution C
Iodine Solution	red orange	red orange	black

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

9. Using the data you have collected and the background information, which solutions contain sugar? #3

Solution A solution B+C have a little

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

The test strip used for solution A turned all green which  
meant it contained sugar. The test strips I used for solutions B+C  
turned light green.

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

Solution C

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

The solution in bottle C turned black which meant it  
contained starch.