**LAB 5-1A: REFLECTED LIGHT NAME:**

**DATE:**

**BLOCK:**

**PURPOSE:** To observe how light behaves when it reflects off a flat mirror.

**HYPOTHESIS:**

If the angle of reflection is related to the angle of incidence, then if you \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the angle of incidence the angle of reflection will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* Independent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Dependent variable: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Controlled variables: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**MATERIALS:**

* ray box
* single-slit baffle
* flat mirror
* ruler
* pencil

**PROCEDURE:**

1. Label the normal line on the diagram in the Data/Observations section.
2. Stand up and hold your flat mirror on the mirror line provided in the Data/Observations section so that when you shine a light ray at it, it will reflect onto your paper.
3. Insert a single slit baffle into the ray box.
4. Plug in the ray box.
5. Shine the single light ray from the ray box along the line set up for you at a 45° angle. Make sure it hits the mirror at the normal.
6. Label this incident ray as “incident ray A”.
7. Using a ruler, trace the reflected ray. Label it as “reflected ray A” on your diagram.
8. Using a protractor, measure and then label the angle of reflection.
9. Repeat steps 5-8 for an incident ray at a 60° angle. Make sure to label the angles! Label the incident and reflected rays B.
10. Repeat steps 5-8 for an incident ray at a 30° angle. Make sure to label the angles! Label the incident and reflected rays C.
11. Unplug the ray box when you are finished.

**DATA/OBSERVATIONS:**

mirror line

 45°

**DISCUSSION:**

1. What did you notice about the angle of the reflected ray compared to the angle of the incident ray?

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1. What happens to the reflected ray of light as you move the incidence ray?

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1. What happens to the angle of reflection as you increase the angle of incidence?

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1. What happens to the angle of reflection as you decrease the angle of incidence?

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**CONCLUSION**:

Was your hypothesis supported or not? How does light behave when it reflects off a flat mirror? What happens to the angle of reflection as you increase and decrease the angle of incidence? Explain, using your results and referring to the purpose.

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**CRITICAL THINKING**:

1. You measure the angle of incidence from a ray of light and it measures 15°, what would the angle of reflection be? Explain why.

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1. You measure the angle of reflection from a ray of light and it measures 75°, what would the angle of incidence be? Explain why.

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**LAB 5-1A: REFLECTED LIGHT** NAME:\_\_\_\_\_\_\_\_\_\_\_\_

**SELF ASSESSMENT RUBRIC** BLOCK:\_\_\_\_\_

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|   | **3** | **2** | **1** |
| **PAGE SET-UP/ PURPOSE /** **HYPOTHESIS/****MATERIALS/****PROCEDURE** | All present, (name, date and block), neat, using dark, blue or black ink or pencil. Hypothesis is written in the accurate format. Variables are listed and accurate. | All/ most present, using dark, blue or black ink/or pencil. Hypothesis is written. Variables are listed. | Some filled in, using dark, blue or black ink/or pencil or missing. Hypothesis is incomplete or Variables are incomplete or missing. |
| **DATA/****OBSERVATIONS/RESULTS:**  | Diagrams are accurate, neat, and complete in pencil with a ruler. Rays and angles are labeled | Diagrams are complete.  | Diagrams are incomplete.  |
| **SAFETY, SKILL & CLEAN-UP** | Student is on task and follows procedures safely. Materials are cleaned up as teacher instructed. | Some reminders needed to be on task and follow procedures safely. Materials are cleaned with some reminders.  | Many reminders needed to be on task and follow procedures safely. Materials are cleaned up with many reminders.  |
| **DISCUSSION** **QUESTIONS** | All questions are answered neatly and accurately in full, complete sentences using dark, blue or black ink or pencil. Results are included.  | Most questions are answered accurately, using dark, blue or black ink/or pencil. | Many inaccurate/missing answers.  |
| **CONCLUSION** | Conclusion neatly and accurately answers the questions in full, complete sentences using dark, blue or black ink or pencil. Results are included. | Conclusion answers the questions, using dark, blue or black ink/or pencil. | Conclusion is incomplete or inaccurate.  |
|  | **5** | **3-4** | **1-2** |
| **Critical Thought****Weigh evidence and draw reasoned conclusions** | The student accurately draws conclusions based on evidence with a well-developed explanation, using full, complete sentences using dark, blue or black ink, or pencil. | The student draws conclusions, may be well developed but inaccurate or a brief summary. Reference is made to evidence.  | The student does not explain or draw a conclusion based on the evidence.  |

 TOTAL: /20 = /10

**TEACHER ASSESSMENT RUBRIC**

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| --- | --- | --- | --- |
|   | **3** | **2** | **1** |
| **PAGE SET-UP/ PURPOSE /** **HYPOTHESIS/****MATERIALS/****PROCEDURE** | All present, (name, date and block), neat, using dark, blue or black ink or pencil. Hypothesis is written in the accurate format. Variables are listed and accurate. | All/ most present, using dark, blue or black ink/or pencil. Hypothesis is written. Variables are listed. | Some filled in, using dark, blue or black ink/or pencil or missing. Hypothesis is incomplete or Variables are incomplete or missing. |
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