ALLIANCE JOINT EXAMINATIONS BOARD (AJEB)

SENIOR ONE PHYSICS SCENARIO ITEMS, 2025

1. Introduction to Physics

Scenario: You are part of a team organizing a science fair at your school. Your task is to explain to younger students what Physics is and why it is important in daily life.

Task:

- Define Physics in your own words.
- List three examples of how Physics is used in everyday activities (e.g., cooking, playing football).
- Explain why understanding Physics is useful for careers like engineering or medicine.

2. Measurements in Physics

Scenario: Your teacher asks you to measure the length of the classroom using a meter ruler, but you notice the ruler is slightly worn at the edges.

Task:

- Describe how you would ensure an accurate measurement despite the worn edges.
- Convert the length of the classroom (e.g., 8 meters) into centimeters and millimeters.
- Explain why standard units (like meters) are important in scientific measurements.

3. Density

Scenario: During a lab experiment, you are given three blocks of the same size but different masses (wood, aluminum, and plastic).

Task:

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- Define density and write its formula.
- Predict which block has the highest density and justify your answer.
- Describe how you would experimentally determine the density of the aluminum block.

4. States of Matter

Scenario: You observe ice melting into water and water boiling into steam during a cooking lesson.

Task:

- Name the three states of matter involved in this observation.
- Explain the changes in particle arrangement during melting and boiling.
- Give one example of how understanding states of matter is useful in preserving food.

5. Practical Measurements

Scenario: Your school's rainwater harvesting tank has no volume markings, and you need to estimate its capacity.

Task:

- Suggest a method to measure the tank's volume using a calibrated jug.
- Calculate the volume if the tank holds 50 jugs of 2 liters each.
- Explain why measuring volume accurately is important for water conservation.

6. Density in Real Life

Scenario: A fisherman tells you his boat floats because it is made of wood, while a metal spoon sinks in water.

Task:

- Relate this observation to the concept of density.
- Calculate the density of a 200 g wooden block with a volume of 400 cm^3.
- Explain why ships made of steel can float despite steel being denser than water.

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7. Errors in Measurement

Scenario: You and your friend measure the width of a table but get slightly different results (e.g., 75.2 cm and 75.5 cm).

Task:

- Identify one possible source of error in your measurements.
- Suggest how to minimize such errors in future experiments.
- Calculate the average width from the two measurements.

8. States of Matter in Nature

Scenario: You notice dew forming on grass early in the morning and disappearing later in the day.

Task:

- Identify the processes responsible for this observation.
- Compare the energy changes during these processes.
- Explain how this phenomenon relates to the water cycle.

9. Comparing Densities

Scenario: In a science competition, you are given oil, water, and honey to layer in a glass.

Task:

- Predict the order of the layers from bottom to top and justify your answer.
- Calculate the density of honey if 50 cm^3 has a mass of 70 g.
- Explain why density is a useful property for identifying substances.

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