

KEY DIFFERENCES:

Lower Secondary and Primary Science

How is Lower Secondary Science different from Primary Science?

Primary Science and Lower Secondary Science (LSS) both require the basic understanding of concepts, skills in reading charts and evaluating whether experiments are fair, as well as practices in answering techniques. However, LSS requires a deeper understanding of what science is and the scientific approach to seeking answers to problems. Below are six pointers that delineate the more complex skills students would require in LSS as compared to primary science.

1. Understand precision (reliability), accuracy (validity), and errors in experiments.

Example: A large number of volunteers is needed to test a newly developed vaccine for reliable results before it can be approved for use by the public.



2. Draw experimental set-ups and label the key parts neatly.

Example: Label 'condenser' and 'distillate' in a distillation diagram.

3. Use basic mathematical skills to solve problems. Show working and include units in final answers.

Example: Calculate the base area of

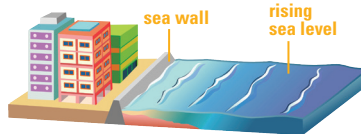
a block given that its height is 5.0 cm, mass is 450 g, and density is 5.0 g/cm³.

Answer:

$$\begin{aligned} \text{Base area} &= \frac{450 \text{ g}}{5.0 \text{ g/cm}^3} \div 5.0 \text{ cm} && [1\text{m}] \\ &= 18 \text{ cm}^2 \text{ (2 significant figures)} && [1\text{m}] \end{aligned}$$

4. The problems in LSS are more complex, with a focus on application and data analysis.

Example: Students will analyse graphs of carbon dioxide level, global temperature, and sea level over the past 100 years. The rise in sea level is linked to the melting of ice caps and the thermal expansion of water.



5. Instead of two-mark questions to explain phenomena like in primary science, LSS questions may carry significantly more marks, especially in the free-response section of weighted assessments.

Example: Drug X is sold in tablets or capsules with a digestible covering. With the aid of a diagram, describe an experiment to compare the rates of dissolving of both forms of drug X. [10m]

6. Use scientific knowledge to appreciate how science and technology advance hand in hand, understand social and environmental

issues, and suggest ways to live sustainably.

Example: Discuss the sustainability of cotton bags and plastic bags. People are encouraged to bring cotton bags to reduce single-use plastic bags which pollute the environment. However, it is unsustainable to accumulate cotton bags as insecticides used in cotton plantations pollute rivers.



Lower Secondary Science Essential Concepts is a new series of books carefully developed, based on the new 2021 Lower Secondary Science syllabus, by Teo-Gwan Wai Lan. She is a former secondary school teacher and an experienced author of MOE-approved science textbooks.

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