

科學教育概論

說明：本卷共五題，每題各佔二十分，請依題號順序分頁作答。

一、說明性別議題在當今科學教育領域中存在的問題與身為科學教師在教學應有認知與態度。(20%)

二、解釋名詞：(20%)

1. 另有概念 (Alternative concept)
2. 真實評量 (Authentic assessment)
3. 情境認知 (Situated cognition)
4. 學習環 (Learning cycle)

三、「全民科學素養」的內涵及重要性為何？並請從學習策略、資源途徑、師資養成及整體情境營造等面向說明如何達成此目標。(20%)

四、(一) 閱讀下面敘述及 6 個問題，請用中文寫出主要的意思。

(二) 根據 6 個問題，請分別詳細擬出你的作法，說明你的理由。(20%)

Marie is a girl who has a pet fish. She knows that fish need to live in water, and she also knows that water left in an open container will dry up, or evaporate. Marie has to go away for a few days and leave her fish at home. She wants to make sure that all her fish's water will not evaporate while she is gone. She has two containers that hold the same amount of water but have openings of different sizes. She wonders whether the size of the opening would affect the evaporation of the water in the containers. She wants to find this out, so she can decide which container would be best for her fish while she is gone.

1. Pose a question—What does Marie want to find out?
2. Make a hypothesis—What do you think the answer to the question might be?
3. How could Marie find out? How could she set up an experiment to get the answer?
4. What materials will you need to do the experiment?
5. How will you record your results?
6. How will you make your conclusion about the answer to your question?

五、九年一貫課程大綱自然與生活科技學習領域中，強調培養學生哪些方面的能力(5%)？請選擇一項能力詳細說明，如何在課室中培養學生此方面的能力(15%)？