國立臺中教育大學101學年度研究所碩士班招生考試

**專業語文試題**

適用學系:科學應用與推廣學系科學教育碩士班 A、B組

1. 某研究者調查國小二、四、六年級學童對於「水族箱中的氧氣供應者為何？」的科學概念，不同年級學童的選答結果統計如下表。假設您是撰寫研究報告的研究者，請寫出對於下表的研究結果之敘述。(20%)

表 水族箱氧氣供應者選答百分比

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 年級　　　選項 百分比 | **二**  N＝138 | **四**  N＝144 | **六**  N＝130 | 全體學生  N＝412 |
| 水 | 21.0 | 27.1 | 15.4 | 21.4 |
| 魚 | 18.1 | 11.1 | 6.9 | 12.1 |
| **＊**水草 | 21.7 | 47.2 | 63.8 | 43.9 |
| 泥沙 | 8.0 | 2.1 | 2.3 | 4.1 |
| 不知道 | 23.9 | 11.1 | 10.0 | 15.0 |
| 未作答 | 7.2 | 1.4 | 1.5 | 3.4 |

**＊**表正確選項

1. 翻譯以下英文(20%)
2. Alternative conception
3. Prior knowledge
4. Teaching material
5. Scientific attitude
6. Collaborative learning
7. Operational definition
8. Formative evaluation
9. Formulating hypotheses
10. Secondary school
11. Qualitative research
12. 請寫出以下短文主要希望表達的訊息以及加以摘要 (30%)

The purpose of this article is to provide an introduction to the growing body of research on the development of scientific reasoning skills. The focus is on the reasoning and problem-solving strategies involved in experimentation and evidence evaluation. Research on strategy use in science has undergone considerable development in the last decade. Early research focused on knowledge-lean tasks or on tasks in which subjects were instructed to disregard prior knowledge. Some researchers have developed an integrated model of scientific discovery that has served as a framework to study the interaction of conceptual knowledge and the set of cognitive skills used in scientific reasoning. Researchers now take a more integrated approach, examining the development and use of strategies in moderately complex domains in order to examine the conditions under which subjects’ theories (or prior knowledge) influence experimentation, evidence evaluation, and belief revision.

1. (15%)

Aluminum is the third most abundant element on Earth (after oxygen and silicon), but it is tightly locked into insoluble minerals such as kaolinite (Al2(OH)4Si2O5) and bauxite (AlOOH). Acid rain from human activities is a recent change in the history of Earth, and it is introducing soluble from of aluminum (and lead and mercury) into the environment. At a pH below 5, aluminum is mobilized from minerals and its concentration in lake water rises rapidly. At a concentration of 130 μg/L, aluminum kills fish. In humans, high concentrations of aluminum cause dementia, softening of bones, and anemia.

請說明本段大意為何？

1. (15%)

許多登山者利用碘消毒河水或湖水使之可安全飲用。碘比僅可過濾細菌但無法過濾病毒的過濾器還有效，因為病毒小到可以通過濾膜，但碘卻可以殺死水中的所有物質。登山者會攜帶一60 mL玻璃瓶內含固體碘與鐵氟龍襯裡的蓋子。此晶體可以使溶液含飽和碘。使用蓋子量取瓶中的溶液加入裝有1L的河水或湖水中，放置30分鐘，即可飲用。記住，只使用飽和碘溶液，不使用固體碘，因過多的碘對人體有害。維生素C是一種在於許多食物中的還原劑，它可快速的與碘反應。因此在消毒河水或湖水的30分鐘內，不可加入含維生素C汁飲料。

請闡述或舉例說明劑量多寡及善用科學的重要性。