

# 國立臺北教育大學 101 學年度博士班招生入學考試

## 自然科學教育學系博士班 科學教育專業英文 科試題

### 一、翻譯題：(請將英文短文翻譯為中文)(25分)

The *Standards* call for more than "science as process," in which students learn such skills as observing, inferring, and experimenting. Inquiry is central to science learning. When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current scientific knowledge, and communicate their ideas to others. They identify their assumptions, use critical and logical thinking, and consider alternative explanations. In this way, students actively develop their understanding of science by combining scientific knowledge with reasoning and thinking skills.

The importance of inquiry does not imply that all teachers should pursue a single approach to teaching science. Just as inquiry has many different facets, so teachers need to use many different strategies to develop the understandings and abilities described in the *Standards*.

Nor should the *Standards* be seen as requiring a specific curriculum. A curriculum is the way content is organized and presented.

(From *National Science Education Standards*, National Research Council: U.S.)

### 二、研究評析：(請閱讀以下研究論文摘要後，以中文寫出其研究重點、研究方法、及研究結果，並評析之。)(25分)

Science lessons taught via experiments motivate the students, and make them more insistent on learning science. This study aims to examine the effects of cooperative learning on students' academic achievements and their skills in identifying laboratory equipments. The sample for the study consisted of a total of 43 sophomore students in primary school education and who took a science technology laboratory applications course in the 2010 to 2011 academic year. Students took the course in two groups, one of which was selected, via cluster sampling, as the control group in which the traditional learning method was used, and the other as the experimental group, in which the cooperative learning method was used. The data were gathered using four measurement tools: The preliminary knowledge test (PKT), the science-technology

laboratory achievement test (STLAT), the identification of experimental equipment test (IEET), and the science-technology course attitude scale (STCAS). Results of the study showed that the experimental group, compared to the control group, scored higher in academic achievement, in the identification of laboratory equipment, and in the attitudes towards science, and that the differences were statistically significant. (Source: Educational Research and Reviews)

三、本測驗分 Part 1 與 Part 2 作答：Part 1 請依照文意，將 1 至 10 的空格，選出最適當的選項組成完整的文章（20 分）。Part 2 將該短文翻譯成中文（5 分）。【注意！請於答案卷上作答，並請註明題號】

Nanoscale \_\_\_ 1 \_\_\_ and engineering (NSE) is an emerging field. Although defining the nanoscale world is not without debate, \_\_\_ 2 \_\_\_ is generally defined as including any material of which at least one dimension is 1 to \_\_\_ 3 \_\_\_ nanometers. New and refined \_\_\_ 4 \_\_\_ now enable scientists to explore and understand this nanoscale world in ways \_\_\_ 5 \_\_\_ only a few short years ago. At this scale, materials exhibit \_\_\_ 6 \_\_\_, often unexpected properties that are not observed at other scales. \_\_\_ 7 \_\_\_ on the discovery of materials' properties and behaviors at this scale, NSE research is rapidly leading to strategies for \_\_\_ 8 \_\_\_ new products and technologies as well as \_\_\_ 9 \_\_\_ information likely to have broad societal implications in areas as \_\_\_ 10 \_\_\_ as healthcare; the environment; and the sustainability of agriculture, food, water, and energy.

Part 1：單選題（每題 2 分，共 20 分）

- |                    |                   |                 |                 |
|--------------------|-------------------|-----------------|-----------------|
| 1. (A) science     | (B) technology    | (C) mathematics | (D) philosophy  |
| 2. (A) humane      | (B) current       | (C) nanoscale   | (D) engineering |
| 3. (A) $10^{-9}$   | (B) $10^{-7}$     | (C) 10          | (D) 100         |
| 4. (A) food        | (B) tools         | (C) medicine    | (D) invention   |
| 5. (A) foreseeable | (B) unforeseeable | (C) foresee     | (D) unforesee   |
| 6. (A) novel       | (B) normal        | (C) traditional | (D) predictable |
| 7. (A) Starting    | (B) Depend        | (C) According   | (D) Based       |
| 8. (A) designing   | (B) applying      | (C) creating    | (D) using       |
| 9. (A) new         | (B) better        | (C) much        | (D) quick       |
| 10. (A) same       | (B) diverse       | (C) many        | (D) well        |

Part 2：中文翻譯（5 分）

四、請先閱讀本試題的問題情境（S：學生，1-4：四位學生的代號），接續回答

下列問題。(25分)

閱讀 本試題的問題情境 (S：學生，1-4：四位學生的代號)

Miss Wong begins by presenting the students with the following problem

Situation: A book on a table

Miss Wong's question: Does the table push the book?

S1: No, the table can't push.

S2: Yes, if it didn't push, the book would fall.

S3: No, the table is just in the way so the book doesn't fall.

S4: No, the book pushes on the table because gravity pulls on it (the book).

作答 可以選擇以中文或英文來回答下列問題

1. What beliefs does the learner bring with him or her (S1-S4) to the classroom? (10分)
2. How can we find out what these beliefs are? (5分)
3. Once we have determined those beliefs, what do we do with them? (10分)