

北一女中科學班甄選入學 英文科範例試題

英文科試題滿分：50 分

作答提示：請根據題組內容，在答案卷上用英文寫出正確、完整的答案
(*唯題組一第3題請以中文回答)。

題組一：15 分

What's the best way to weigh your own head? Cut it off and put it on the weighing scales? Are you sure? Once being cut off, the head has less than five seconds of consciousness left, so you wouldn't have much time to enjoy the results of your experiment.


How about resting your head on the bathroom scales? It's another idea, but the result may not be very correct: your neck would still be supporting some of the weight.

The simplest way is to stick your head in a bucket. The density of most people's heads is very close to **that** of water. Put a bucket in a large tray, fill it to the brim with water and then stick your head in it. Weigh the water that spills over into the tray and you will know how much your head roughly weighs.

Moreover, you can repeat the experiment with your whole body, using larger containers. You can then compare the amounts of water displaced by your head and your whole body. **Then, you can work out what fraction of your total body weight your head is.**

If you are not particularly bothered by accuracy and just want to get a rough number of your head weight, here is one. Research shows that the weight of an adult human head (without any hair on it) is between 4.5 and 5 kilograms.

It is said that a Greek mathematician discovered that you can measure the volume of objects by seeing how much water they displace. He found this out while he was sitting in his bath one day. He jumped out and ran to the streets without any clothes on, saying "Eureka!" loudly. (Greek for "I've found it!")

	consciousness 意識	density 密度	brim 邊緣
	displace 排出	accuracy 精確	Greek 希臘的
	volume 體積	mathematician 數學家	liquid 液體

1. The main purpose of this article is to introduce a(n) _____.
2. According to the passage, the ideal liquid to be used for measuring the weight of the head is _____.
3. Please translate the sentence into Chinese: "**Then, you can work out what fraction of your total body weight your head is.**"
4. What does **that** in the 3rd paragraph refer to?
5. We can infer from the last sentence that the mathematician may have felt very _____ at that moment.

題組二: 18 分

We waste more than a third of the food we produce. A group of Swedish graduate students wants to change that fact. They have come up with a way to use old fruits and vegetables. They are calling it FoPo Food Powder. It is made from fruits and vegetables. They are dried, powdered and shelf-stable. The powder can be dropped in relief efforts and be used after natural disasters. It can also be passed out in low-resource areas. That is where fresh food and refrigeration are hard to come by.

“We found out that one third of the food produced was going to waste while people in the world were starving. So, we could not back out,” says Kent Ngo, one of the students on the team. Ngo says they are not making something new. Powdered food has been around since the early days of astronauts. But they are rethinking the waste and distribution methods. One group of the students make up a development team. They reached out to farmers and sellers to get fruit. The other group are food scientists. They tested different ways of drying and powdering the food. They settled on spray-drying it. The process then includes grinding it up. Finally, the team looked at ways to distribute it next. That involved both commercial and government supported sites.

“Today a relief bag for disaster victims contains various foods, such as strawberry jam, peanut butter and peas in tomato sauce. We think that an easily transported pack of cheap dried food powder with high nutritional value would fit in perfectly,” Ngo says. Freeze-dried food keeps most of the nutritional benefits of raw food. It loses some vitamin and mineral mass in the drying process. But it is still a good way to get fiber and nutrients.

The team is also about to start working with the U.N.’s Initiative on Food Loss and Waste. They want to try to reach more people and countries that could benefit. They also want to widen their reach. So, they are working with commercial suppliers and also with manufacturers that want to use FoPo in their food products. Soon, customers may sprinkle it into food or drinks. Or they can use it in baking.

📖	refrigeration	冷藏	grind	研磨	victim	受難者
	starving	飢餓的	astronaut	太空人	nutrient	營養素
	distribution	分送	mineral	礦物質		

For questions 1~3, please circle true or false.


1. (T / F) FoPo Food Powder doesn't go bad easily and can be used to help disaster victims.
2. (T / F) Freeze-dried food has exactly the same nutritional values as raw food.
3. (T / F) One of the sources of the fruit the students used was from farmers.
4. How many groups did the students divide themselves into before working on the distribution method?
5. Which official organization are the students going to work with soon?
6. According to the 2nd paragraph, why didn't the Swedish students give up on developing FoPo Food Powder ?
7. Why are the Swedish graduate students working with commercial suppliers and food product manufacturers?

題組三: 17 分

Childhood obesity is a condition where too much body fat badly affects a child's health. It is one of the most serious public health problems of the 21st century. A study found that almost half of all the overweight children worldwide under five live in Asia and one quarter live in Africa. In fact, it has also become a major issue in Taiwan. Parents, teachers, and government officials are all very worried about this problem since childhood obesity can lead to many health problems. Because of the increasing number of overweight students, Department of Education of Taipei City Government decided to set up the "Sunshine Student Program." The goal of the program is to encourage students to exercise more and to eat less junk food.

One of the important parts of the program is the "6520" concept. This easy-to-remember number is used to remind students to exercise during the breaks among their six daily classes for five minutes at a time and to chew their food twenty times before they swallow it. Another important part of the program is that snacks and drinks that have 250 or more calories are banned from schools. The program recommends that schools should sell only healthy snacks to students, including one hundred percent fruit juice, sushi, and low-calorie bread.

The program is being called a success by many people, including some overweight junior high school students who have already lost weight because of it. With the help of the program, obesity may no longer be such a big problem for students in Taipei. Besides, this is good news for the rest of the students in Taiwan, since the success of the program means that similar programs might just be started in other schools around Taiwan.

 condition 情況 affect 影響 issue 議題 ban 禁止
recommend 建議 concept 觀念 mental 心理的

1. What is the purpose of the "Sunshine Student Program"?
2. What percent of the overweight children in the world under five live in Africa?
3. What does "20" in the "6520" concept mean?
4. According to the "6520" concept, how long are students encouraged to exercise during the break between classes at school?
5. Why are juice, sushi and bread mentioned in the second paragraph?
6. Write "T" for statements that are true and "F" for statements that are **NOT** true.
 - (1) Obesity is a mental problem rather than a physical problem.
 - (2) No students have got help from the "Sunshine Student Program" yet.
 - (3) "65" in the "6520" concept is used to remind students to exercise regularly.
 - (4) There are more and more children and teenagers in Taiwan getting overweight.
 - (5) Similar programs to the "Sunshine Student Program" might be seen soon in places other than Taipei.