

令和5年度入学試験問題

英語

(教員養成課程)

注意事項

- 1 試験開始の合図があるまでは、この問題冊子を開かないこと。
- 2 問題冊子は表紙を含むページ番号1から8です。
- 3 解答用紙は5枚です。
- 4 解答は指定された解答用紙に記入すること。
- 5 受験番号は解答用紙の指定欄に記入すること。
- 6 解答は横書きとし、指定された字数にまとめること。
- 7 解答用紙のみを提出し、問題冊子は試験終了後、持ち帰ること。なお、いかなる理由があっても解答用紙以外は受理しません。
- 8 試験中に問題冊子の印刷不鮮明、ページの落丁・乱丁および解答用紙の汚れ等により交換を必要とする場合は、手を挙げて監督者に知らせること。

1 Read the following passage and answer the questions below. (50 点)

[1] Scientists had known for years that chemicals can leach¹ out of plastic into water. Some of those chemicals can be toxic. Manufacturers have removed some of the more worrisome chemicals, such as bisphenol A (BPA), from plastic products, such as water bottles. But little is known about what other chemicals might leave these products.

[2] What's more, until recently, scientists lacked the tools to detect many of the compounds that plastics may release. New tools now make it possible to detect some of these unknown pollutants. Two chemists, Selina Tisler and Jan Christensen, at the University of Copenhagen in Denmark have now used those new analytical tools to study water from sports bottles.

[3] Christensen, a soccer coach, noticed that players on his team regularly drank water from reusable plastic sports bottles. Sometimes the players complained that their water smelled or tasted a bit like plastic. This was usually after the water had been sitting in the bottles for hours. Christensen decided to see if he could (a)figure out why.

[4] He got the help of Selina Tisler, a scientist in his lab. At the time, she recalls, "We didn't know what we were looking for."

[5] They let water sit for 24 hours in new bottles, in used bottles and in bottles that had just come out of a dishwashing machine. Afterward, they used mass spectrometer to test the water. That device can essentially weigh (get the mass of) various chemicals in a sample to identify them. Tisler and Christensen compared what they found in the water from plastic bottles to substances present in water that had been stored in glass. And they found a big difference.

[6] More than 400 different compounds had moved from new plastic bottles into the water. Many were linked to "plasticizers." These chemicals make the bottles squeezable. Other compounds were slip agents. Manufacturers add these to make plastic products slide easily out of the molds used to shape them. "It's like how you would oil a baking pan so the cake doesn't stick to the sides," explains Tisler. Some chemicals were related to inks. These can give the bottles color or make them look shiny.

[7] Water stored in older plastic bottles contained the highest levels of plastic-related chemicals. (b)Running the bottles through a dishwasher made it worse. After a single wash cycle, more than 3,500 different compounds ended up in a bottle's water. Many of these came from the dishwasher soap itself and might remain even after a second rinse. The pollutants appeared to stick more to the plastic bottles than they did to glass ones.

Dishwashing also appeared to boost the release of a plastic's chemicals.

[8] The Danish team identified some chemicals that are potentially harmful. Future studies could determine how much of each chemical is there, says Kurunthachalam Kannan, a chemist at New York University. And that's important, he adds. Just because a chemical is in water doesn't mean it will cause problems. Much of the risk will depend on how much of a chemical actually gets into the body, he explains.

[9] Pat Hunt, a biologist at Washington State University, agrees. “This study represents a starting point.” she says. It gives researchers clues about what chemicals may be present in water from reusable bottles. But it doesn't reveal what risks the now-polluted water may pose. Indeed, very little is known about many of the chemicals that were detected in the study. More research is needed to learn what these chemicals may do in the body, says Hunt.

Neabore, L. K. *Science News for Students*. “Reusable plastic bottles release hundreds of pollutants into water.”
<https://www.snexplores.org/> 一部改変

注

leach: 浸出する

1. Select the best answer for each of the following items.

(1) According to paragraphs [1] and [2], what has changed in recent years?

- A. Scientists are able to find more chemicals than before.
- B. Scientists found that chemicals can be toxic.
- C. Scientists have removed dangerous chemicals from plastic.
- D. Scientists now know that BPA is dangerous.

(2) According to paragraphs [5] and [6], they found a big difference in:

- A. The amount of chemicals in the water from bottles of different materials
- B. The temperature of the water stored in bottles of different materials
- C. The types of plasticizers added by manufacturers to bottles of different materials
- D. The weight of the water from bottles of different materials

(3) According to paragraph [6], which of the following is one of the reasons for adding compounds to plastic?

- A. To help compounds migrate into the water in the bottles
- B. To improve the appearance of bottles
- C. To make the bottles stronger
- D. To prevent food from sticking to the bottles

(4) In paragraph [9], why does Pat Hunt say, "This study represents a starting point"?

- A. Researchers don't know if the chemicals are dangerous to humans.
- B. Researchers don't know what kinds of chemicals were found in the water.
- C. Researchers now know how the chemicals in the water affect human bodies.
- D. Researchers now know that the chemicals in the water are safe.

(5) According to the article, which of the following should you do to reduce risks to your health?

- A. Leave water in plastic bottles for a long time.
- B. Reuse plastic bottles for a long period of time.
- C. Use glass bottles instead of plastic bottles.
- D. Wash plastic bottles carefully using a machine.

2. What did Christensen want to (a)figure out? Answer in under 50 Japanese characters.

3. According to paragraph [7], what are reasons why (b)running the bottles through a dishwasher made it worse? Write two reasons in Japanese in under 40 Japanese characters each.

2 次の英文を読み、設問に答えなさい。(60点)

Road-traffic noise significantly slows the development of crucial (A) and (B) skills in primary school children, research has found.

The study of almost 2,700 children aged between 7 and 10 in 38 schools in Barcelona, Spain, is the first to assess (a)the impact of traffic noise on child cognitive development over time and to determine the impact of peaks in noise.

The children in the study are in a critical stage for the development of memory and attention skills, which are essential to learning. The research found that children exposed to about three times more traffic in the street than other pupils had memory development that was 23% slower and attention ability development 5% slower over a year.

Noise is the second most damaging environmental factor to health, after air pollution, and, for example, was already known to increase heart attacks and diabetes¹ in adults. The UN said in February that urban noise pollution was growing into a “global public health menace²,” leading to 12,000 early deaths a year in the EU alone, and affecting many cities from Bangkok to New York.

But research on the impact of road noise on children was limited until now. The scientists said many schools suffered noise pollution and that measures such as rerouting traffic away from schools could help reduce noise and air pollution.

According to (b)Dr. Maria Foraster, from the Barcelona Institute for Global Health, who led the study, people do not fully recognize that noise can be physically harmful. She explains, “We think that we adapt to it, but research has shown that we don’t completely—we still have a physiological response.”

The research revealed that peaks of noise heard inside the classroom, such as the passing of loud trucks or vehicles accelerating away from traffic lights, had more impact than a higher average level of noise. (c)This may be because the peaks divert attention more, said Foraster, and is important because current policies are based solely on average decibels.

The scientists also found higher noise levels at school were more damaging than at home. “This could be because it affects vulnerable windows of concentration and learning processes,” she said.

Prof. Iroise Dumontheil, at Birkbeck, University of London, UK, said: “This carefully designed study provides convincing evidence. Considering that many European children living in large cities are exposed to high road-traffic noise levels, this study has implications for public policy to reduce road-traffic noise near schools.”

The study, published in the journal PLOS Medicine, tested the children four times across a year and measured noise levels outside the school and in classrooms. The tests assessed attention—the ability to focus on a specific task—and working memory, which is the ability to hold information in the mind and use it.

(d)These two functions are important for learning and develop very rapidly during the primary school

years,” said Foraster. They support problem solving, reasoning, mathematics and language comprehension.

The scientists concluded: “Policies to reduce road-traffic noise at schools—outside and inside classrooms—could substantially benefit cognitive development and future health.”

Noise affects large numbers of people, with at least 20% of the EU population suffering traffic noise levels that are harmful to health. The proportion is much higher in cities.

The scientists did not have data on the noise exposure of the children before the study started, but nearly all of them had attended the same school for at least a year. The study took into account the effects of air pollution, unlike most previous studies, and levels of family income and education.

The research follows previous work that showed higher levels of aircraft noise at school affected reading comprehension and cognitive development. Rat experiments have also shown that exposure to moderate-to-high noise levels leads to changes in the brain. But the scientists said they would like to see their findings replicated in different cities and towns, where schools may be built differently and windows opened more or less often.

(e) The rise of electric cars will reduce noise traveling at lower speeds, when the engine noise of petrol and diesel cars dominates, Foraster said. But at speeds above 40-50km/h, the noise generated by tires on the roads is high for all types of car.

Carrington, D. *The Guardian*. June 2nd, 2022. 一部改変

注

1. diabetes: 糖尿病 2. menace: 脅威

問 1. (A)と(B)に当てはまる 1 語をそれぞれ本文中から選び、書き入れなさい。

問 2. 下線部(a)について、この研究から明らかとなった具体的な影響はどのようなものか、80 字以内の日本語で答えなさい。

問 3. 下線部(b)は、騒音と人間の身体の関係についてどのように述べているか、本文に即して 80 字以内の日本語で説明しなさい。

問 4. 下線部(c)の指す内容を 60 字以内の日本語で説明しなさい。

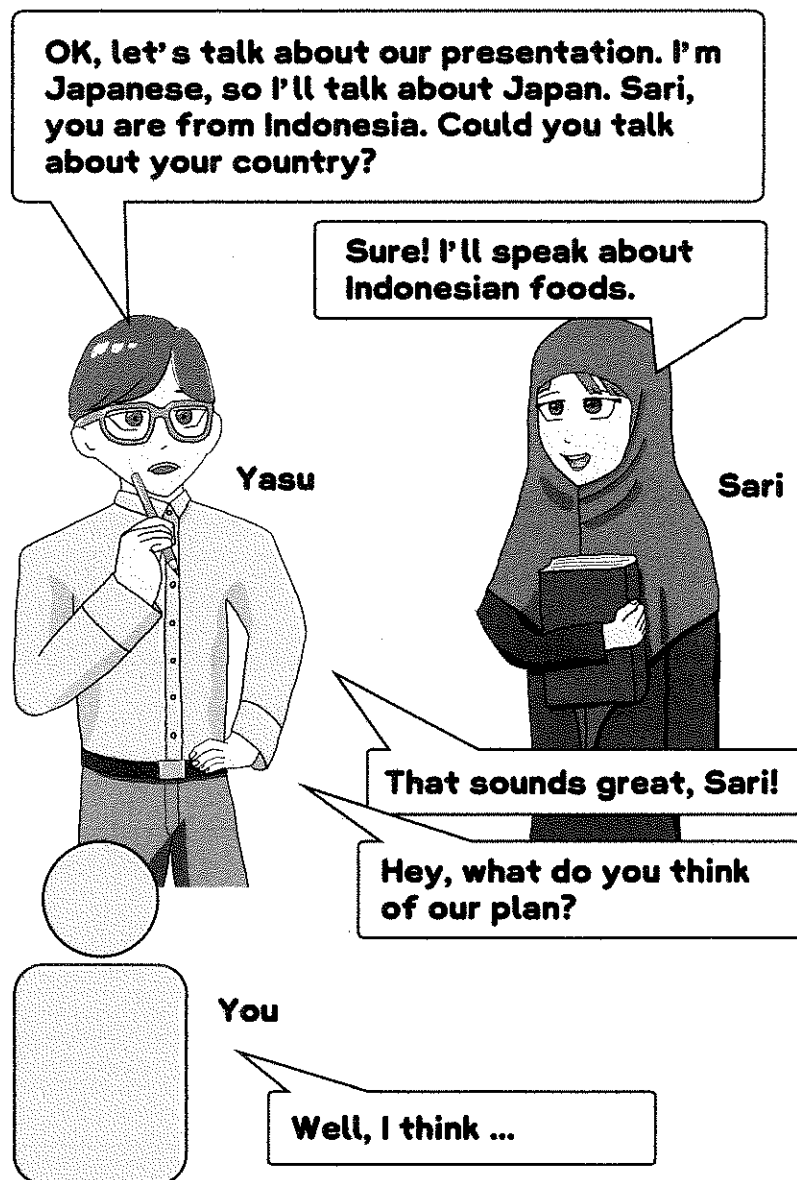
問 5. 下線部(d)とあるが、なぜ重要なのか。40 字以内の日本語で答えなさい。

問 6. 下線部(e)について、電気自動車の増加が完全には騒音問題の解決へと導かないのはなぜか。60 字以内の日本語で答えなさい。

3 あなたは北海道教育大学の学生です。「異文化理解」の授業で「各国の家族構成」というテーマについてグループでプレゼンテーションを行うことになりました。以下の指示をよく読んで設問に答えなさい。(50点)

プレゼンテーションの指示
概要：各国と日本の家族構成を説明し、比較する。
方法：以下のように分担すること。
(1) <u>日本在住の学生</u> は他国の家族構成を説明する。
(2) <u>交換留学生</u> は自国と日本の家族構成を比較する。

あなたは、日本人学生のヤスとインドネシア人留学生のサリと同じグループです。以下は、プレゼンテーションの準備をはじめる際の会話です。指示に合うプレゼンテーションを行うために、相手の話に対して50～70語の応答を考え、英語で書きなさい。



4 Using the information in the text and diagram, fill in each blank with two to six words. (40 点)

The diagram outlines the [A]. After people [B] a recycling bin, they are transported to the recycling center for sorting. The recyclable material is then [C] blocks of crushed plastics before being ground up and washed. Next, plastic pellets are produced, which [D] to create the raw material. This is then used to [E].

