

問3 Which best completes the draft schedule? 27

- A : Cathy's house B : The conference room
C : The park D : The recycling center
× : Nothing

Draft schedule for making the presentation

Mon	Tue	Wed	Thu	Fri	Sat	Sun
___	→	___	→	___	→	___
			×			

- ① B → A → B → × → B → D → C
② B → B → B → × → A → D → C
③ B → D → B → × → A → C → B
④ B → D → B → × → B → C → A

問4 When you go to Momiji Green Park, you will probably 28

- ① ask questions of city officers
② practice making a speech in public
③ take part in a tree-planting campaign
④ talk to people relaxing in the park

問5 After you have an interview with Cathy's father, you will probably 29
on the same day.

- ① go to school to write a report
② have a chance to see his office
③ have dinner with Cathy's family
④ prepare a presentation in Cathy's room

第5問 (配点 15)

You are a member of the English club at Sakura High School. You are preparing to give a presentation in English. Read the following passage.

Eunice Foote was a female scientist in the U.S. who discovered that the proportion of carbon dioxide (CO₂) in the air affects the Earth's temperature. She was born in Goshen, Connecticut, in 1819. From 1836 to 1838, she went to the Troy Female Seminary (the Emma Willard School as it is known today). The school encouraged students to study science at a local college, where Foote learned the foundation of science, especially chemistry.

By the 19th century, science had made great progress in the West. However, few scientists studied climate change. Foote conducted an experiment on the relationships between the Sun's rays and various gases. As she did not belong to a university or any research institution, she carried out her research at home.

Foote conducted the experiment, using simple instruments: an air pump, two thermometers, and two cylinders. She set a thermometer in each of the cylinders. With the pump, she put one kind of gas into one cylinder and another kind into the other. After bringing them to the same temperature, she left them in sunlight and recorded the temperature changes in the cylinders. She tried this experiment with gases such as air, hydrogen, oxygen, and carbon dioxide. For example, she compared the common air cylinder with the CO₂ gas cylinder, and found that the latter reached a higher temperature. Finally, her discovery was that the CO₂ gas cylinder reached the highest temperature, around 52°C. From this experiment, she concluded that CO₂ gas increases atmospheric temperature and inferred that if the proportion of CO₂ in the air increased, the Earth's temperature would be higher.

Foote put the results and her conclusion together in the paper *Circumstances affecting the heat of the sun's rays* (1856). However, she did not present her findings herself for some unknown reason. Instead, Prof. Josef Henry, who belonged to a leading research institution, made a presentation on Foote's

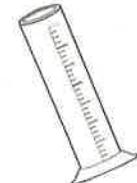
experiment at an academic conference in Albany, New York. Three years later, in 1859, John Tyndall, a British scientist, discovered that gases absorb infrared (invisible heat) rays rather than the Sun's rays. He presented this in a paper in an academic journal. In the paper, he did not refer to Foote's study, probably because he did not know about her findings. He has been regarded as a pioneer of climate science.

Unfortunately, Foote was not known as a great scientist until she died in 1888. You may wonder why she was and is not well known. It is said that it was because she was an amateur scientist and did not have the latest experimental instruments or enough connections with other professional scientists. Some scholars, however, consider her an excellent scientist in the 19th century and she is now becoming famous. Progress in science requires talents and abilities, regardless of career, country, and gender.

Your Presentation Slides

30



Sakura High School
English Club

Who Was Eunice Foote?

Foote:

- was a female American scientist in the 19th century.

• 31 .

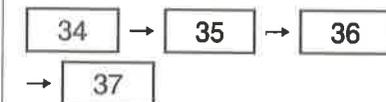
• 32 .

Foote's Simple Experiment

- Foote conducted the experiment, using simple experimental instruments: 33 .
- Foote conducted the experiment at home.

Foote's Experimental Procedure

■ Procedure



■ Results & Conclusion

- The CO₂ gas cylinder reached the highest temperature.
- The amount of CO₂ in the air influences the Earth's temperature.

How People Evaluate Foote's Work

- 38 .

問 1 Which is the best title for your presentation? 30

- ① A Famous Activist against Global Warming : Eunice Foote
- ② A Leading Researcher : Josef Henry
- ③ A Pioneer of Climate Science : John Tyndall
- ④ A Great but Unknown Female Scientist : Eunice Foote

問2 Choose the two best items for the **Who Was Eunice Foote?** slide. (The order does not matter.) ·

- ① did an experiment on the relationships between sunlight and gases
- ② did collaborative research on climate change with John Tyndall
- ③ made a presentation on her study at an academic conference in 1856
- ④ was a non-professional scientist who did not belong to a university
- ⑤ went to Europe to study chemistry and climate science

問3 Which is the best item for the **Foote's Simple Experiment** slide?

- ① an air pump, a thermometer, and two cylinders
- ② an air pump, two thermometers, and two cylinders
- ③ two air pumps, a thermometer, and two cylinders
- ④ two air pumps, two thermometers, and two cylinders

問4 Put the four steps in the correct order for the **Foote's Experimental Procedure** slide. ~

- ① Heat or cool the cylinders to the same temperature.
- ② Keep the cylinders in the sun.
- ③ Place a thermometer inside and pump gas into each of the cylinders.
- ④ Write down how the temperatures in the cylinders change.

問5 Which is the best item for the **How People Evaluate Foote's Work** slide?

- ① Few scholars today regard Foote as an excellent scientist
- ② Some experts today say that Foote was a great scientist
- ③ Some historians think that Foote was the first female scientist in the world
- ④ Some scientists do not agree with Foote's idea

第6問 (配点 25)

A You are working on a class project about the characteristics of young people and have found the following article. You are reading it and making a poster to present your findings to your classmates.

Peer Groups

During adolescence, the period between childhood and adulthood, people become increasingly involved with their *peer group*, a group whose members are about the same age and have similar interests. The peer group — along with the family and the school — is one of the three main agents of socialization. However, the peer group is very different from the family and the school. Whereas parents and teachers have more power than children and students, the peer group is made up of equals.

Peer groups develop among all age groups, but they are particularly important for adolescents' development. The adolescent peer group teaches its members several important things. First, it teaches social skills — how to get along with other people. Second, the peer group teaches its members the values of friendship among equals. Third, and perhaps most important, it teaches them to be independent from adult authorities. Sometimes this means that a peer group encourages its members to go against authorities and adults — to ignore home and school rules and even to break the law. Most teenagers, though, rebel only by making fun of older people in a harmless way.

These traits are typical of adolescents in modern, Western societies, but it is important to remember that this kind of rebellious behavior is partly cultural and it is not universal. Adolescence is actually a relatively new concept. One hundred years ago, teenagers were expected to work and help their families. In other words, they had to act like adults; there was no time for adolescence. In addition, the role that the peer group plays in helping adolescents break away from adult authority is based on fundamental Western values of individualism

and independence. There may be differences across cultures in how adolescents behave. They may depend less on their peer group and they may not seek independence from their families.

Peer groups often develop subcultures with their own distinct values, language, music, dress, and heroes. Members of these groups often believe in the same things, talk the same way, dress the same way, listen to the same music, and like and dislike the same celebrities.

Adolescent peer groups frequently differ from parents and teachers in what they value. Whereas parents and teachers tend to place great importance on success in school and careers, adolescent peer groups are likely to think that popularity, social leadership, and athletic achievement are more important. These differences do not necessarily mean that parents and teenagers always fight and argue. They simply engage in different types of activities — work and task activities with parents, but social activities and recreation with peers. They are inclined to seek advice from parents on financial, educational, career, and other serious matters. With their peers, they are more likely to discuss social activities such as which boy or girl to date and which clubs to join.

Peer group members often look to each other for approval instead of relying on their own personal beliefs. Doing what everyone else is doing is more important than being independent and individual. Although young people can learn valuable lessons from peer, sometimes the pressure from peers can also have a negative effect. First, peers may pressure members of the group to do things that they know are wrong or dangerous. Second, strong *peer group conformity* may result in *ingroups* and *outgroups*. Ingroups have common interests and shared attitudes, but they also may try to exclude those who have different interests or beliefs or who behave differently. These groups are sometimes called *cliques*. People who are excluded from the cliques are in outgroups. Unfortunately, sometimes individuals in outgroups receive strong negative attention, called *bullying*. Bullying may be continuous teasing, but it may become more serious and include harassment and physical abuse as well. All kinds of

bullying are harmful.

As young people grow into middle and late adolescence, usually their involvement with peers gradually declines because of their growing independence. As they reach the end of their adolescence, they tend to adopt more adult values, such as wanting to get good grades and good jobs. The power of the group begins to decrease.

Peer Groups

What is the peer group?

- A group of people who are about the same age and have similar interests
- Different from the family and the school in **39**

The Adolescent Peer Group

What is Adolescence?

- The period between childhood and adulthood
- The concept of adolescence **40**

What the peer group teaches to adolescents

- Social skills, values of friendship, and independence from adult authorities
- Adolescents talk about social activities with their peers, while they **41**

Negative effects of the peer group

- Wrong or dangerous activities
- Strong peer group conformity → distinction between ingroups and outgroups
- People in outgroups can be **42**

問 1 Choose the best option for **39** on your poster.

- ① the economic capacity of members
- ② the power relationship among members
- ③ the size of groups
- ④ the social importance of groups

問 2 Choose the best option for **40** on your poster.

- ① has a similar image throughout the world
- ② has caused a wide generation gap
- ③ has nothing to do with cultural factors
- ④ was developed only recently

問 3 Choose the best option for **41** on your poster.

- ① avoid talking about their personal things
- ② depend on adults for certain matters
- ③ have a strong desire to get a good job
- ④ regard their parents as friends

問 4 Choose the best option for **42** on your poster.

- ① admired for behaving differently
- ② expected to stand the pressure from peers
- ③ harmful to those in ingroups
- ④ treated in a terrible way

B You are learning about the process of animal learning. You read the following article.

Sit. Stay. Roll over! Our puppy pals can typically learn such commands with ease. Grasping the names of objects may present a tougher task for our canine companions. But there are exceptions. A new study finds that some dogs learn toys' names after hearing them only a few times.

As with young kids, "this learning doesn't happen in the context of formal training. But it happens just during play," says Claudia Fugazza. An ethologist, Fugazza studies animal behavior at Eötvös Loránd University in Budapest, Hungary.

Fugazza and her team found two dogs that already knew many words. The four-year-old border collie named Whisky and the nine-year-old Yorkshire terrier named Vicky each knew the names of around 50 objects, mostly toys. The scientists wondered how quickly the pooches could pick up new names.

The researchers tried two different ways to teach the dogs new words. In one (called the exclusion condition), the dogs had to pick out the new toy, such as a bulldog, from a group of known toys. After requesting a few known toys, the dog's owner asked the pet to bring the bulldog. If the dog returned the right toy, it received praise and a treat. The owner repeated this with the second toy. In the second approach (called the social condition), owners would introduce the two new toys' names while playing with their dog. They might toss one and say, "get the ladybug."

The team then tested each dog by placing the two new objects side by side in another room. The owner asked the dog to fetch one by its name to see if the

animal brought the correct one. The dogs weren't very successful when they had been taught the names through the exclusion condition. Though Vicky performed a little better, Whisky scored below the chance level (50%). But after playing with the new toys, the dogs were much more successful. They had only four chances to hear the words, so the dogs' quick learning was "impressive," Fugazza says.

The knowledge didn't stick for long, however. Vicky and Whisky tended to forget the new word 10 minutes after passing the toy name test. Dogs may have to hear a word many more times to make a lasting memory. And even then not all dogs may be able to do this. Using the play approach, the team tried teaching another 20 pets who didn't have experience learning words. These dogs did more poorly when tested on their new words. The researchers didn't try the exclusion condition for them, because only Vicky and Whisky already knew many objects by name.

It's not clear why Whisky and Vicky were good at picking up new vocabulary when other pets weren't. This might be a talent that only some dogs have, Fugazza says. She and her team are interested in where word-learning skills may come from. The ability may also relate to hearing words early in a pup's life, she says.

問 1 According to the article, which of the following is true? 43

- ① Dogs are usually better at learning commands than learning names.
- ② Dogs' learning processes are almost the same as those of humans.
- ③ Some dogs may be very good at remembering human faces.
- ④ The researchers chose two dogs that are similar in age and experience.

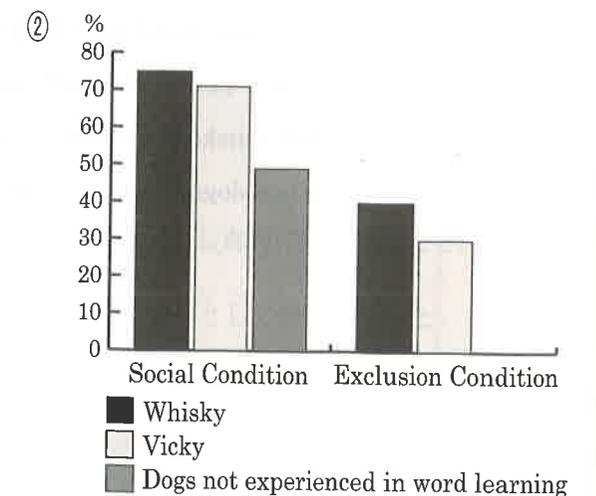
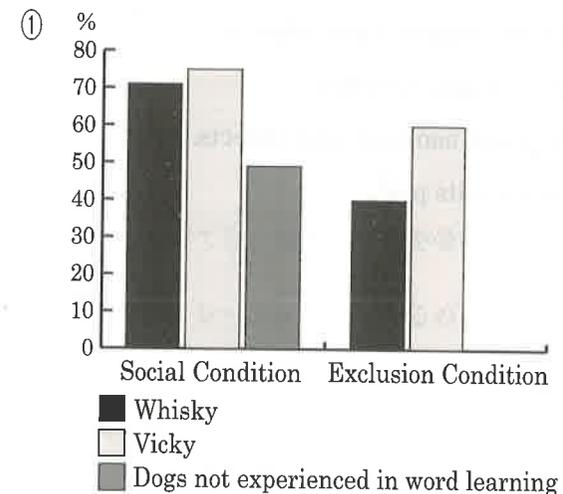
問 2 What did Vicky and Whisky do in each approach in the experiment?

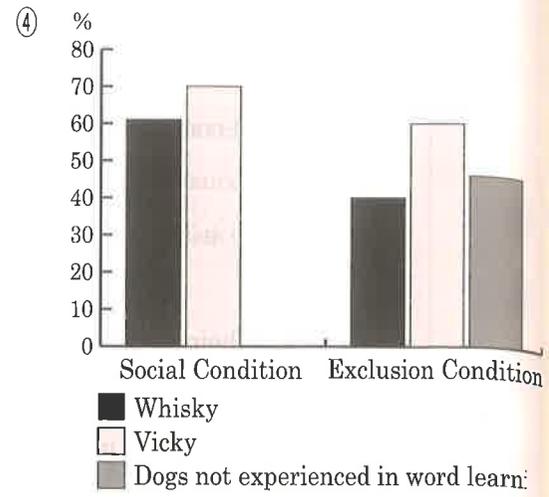
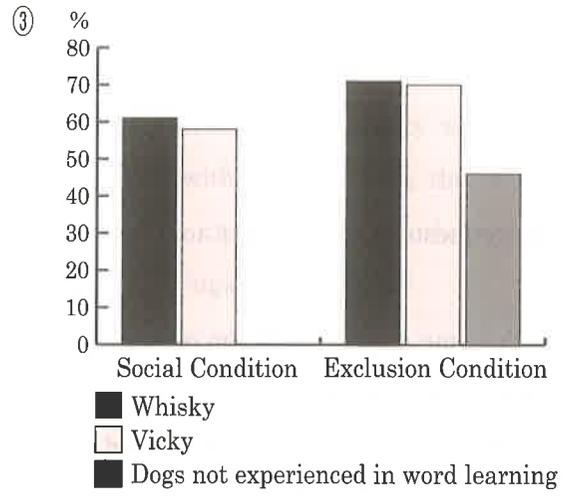
Exclusion condition: 44

Social condition: 45

- ① Choose a new toy their owner requested among other toys they already knew.
- ② Hear their owner call a new toy's name playing with him or her.
- ③ Learn a new toy's name from one of the researchers.
- ④ Listen to a new toy's name repeatedly until they remember it for sure.

問 3 Choose one graph that correctly shows how each dog and group of dogs scored in the tests. 46





問 4 What are the researchers likely going to study next? 47

- ① How long dogs can remember the names of new objects.
- ② If their new finding will apply to human learning.
- ③ What makes dogs better at learning names of new objects.
- ④ When dogs' learning ability reaches its peak.