

第7問 (配点 16)

You are preparing a presentation for a science project on animal habits. You found some interesting information in the article below and are now making your outline.

Animal Sleep Patterns

If you ever spend all day at home, you might notice that your pet cat sleeps a lot during the day and is quite active in the evening and early morning. Humans, on the other hand, are awake during most of the daylight and evening hours and then sleep for a long time at night.

Sleep is essential for animals' physical and mental health, and for their bodies to function efficiently. For animals with brains and central nervous systems, sleep is generally defined as an altered state of consciousness characterized by specific body positions, closed eyes, a general decrease in physical activity, and slower response rates. Sleep also gives the brain neurons a chance to reset, and the body becomes energized. Most creatures experience states of sleep, but the types and patterns differ from species to species.

Different sleep patterns over a 24-hour cycle have been identified in various types of animals. Three common patterns are called *monophasic*, *biphasic*, and *polyphasic*. Monophasic sleep, experienced by humans and many larger animals, happens when one is awake and active for many hours, and then one sleeps for an extended period. Some birds, insects, and mammals utilize a kind of biphasic sleep, where the animal has two waking and sleeping times, with one sleep being long and the other like a nap. Dogs and cats are polyphasic, meaning they have four to six sleeping and waking periods throughout the day.

There are variations in sleep patterns depending on the animal's size, physical needs, and diet. Smaller animals such as squirrels or mice tend to use up their energy by moving quickly and frequently. This results in the need to sleep more often but for shorter periods of time. Lions are carnivorous

animals and have longer sleeping times because their food sources satisfy their hunger for longer periods. Large herbivores like wild horses, on the other hand, sleep less than meat-eating animals because their plant-based diet has relatively few calories, resulting in the need to spend most of their time searching for food.

Safety is another variable in sleep patterns. Animals that can create safe spaces tend to enjoy longer periods of sleep, but those that might need to stay alert sleep less. Apes sleep on platforms, high above the jungle floor, which keep them away from attackers. Some smaller animals such as rabbits create shelters by digging into the ground where it is difficult for predators to find them. As a result, they feel safer and sleep longer. In contrast, elephants often travel long distances and may feel exposed to danger from hunters or other animals, contributing to their short sleeping times.

The animal sleep patterns discussed so far tend to be typical. A pattern that may be less easily noticed in our daily lives is called *unihemispheric* sleep. In this type of sleep, some animals traveling in a group keep one eye open. While one side of the animal's brain sleeps, the other side stays awake and alert to its surroundings. In this way, the animal can experience the reviving effects of sleep while also watching out for threats. This unihemispheric sleep occurs in some bird species when they are flying long distances in groups. Birds flying at the outer edge of the group use this type of sleep to help protect the other members that sleep with both eyes closed.

Besides the types of sleep explained above, there are patterns that can be considered to be sleep-like activities. *Hibernation*, which can be observed in black bears, is a long, inactive period when food is scarce or the weather is severe. During this time, the animal's body temperature drops, its heart rate and breathing slow down, and it may appear dead. Creatures such as jellyfish that have no central nervous system also experience times of extreme relaxation where they remain in a less responsive state.

As shown above, sleep plays an important role in the lives of animals and it is much more complex than simply closing the eyes.

How Animals Sleep

Importance of Sleep

32

- A. To alter body temperature
- B. To maintain overall health
- C. To refresh the animal's body
- D. To reset the brain neurons

Biphasic Sleep Pattern (in each 24-hour cycle)

33

Some Conditions Affecting Sleep Patterns

- Animals 34 .
- Animals 35 .

Unihemispheric Sleep

- Some birds 36 .

37

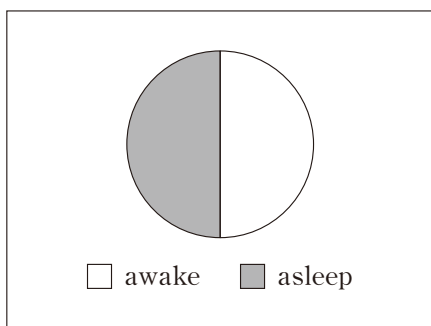
- Black bear hibernation
- Jellyfish relaxation

問 1 Under the heading, “Importance of Sleep,” you spotted an error in your presentation outline. Which of the following should you remove? 32

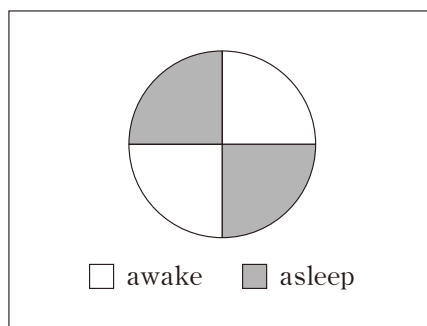
- ① A
- ② B
- ③ C
- ④ D

問 2 You want to use a figure for the biphasic sleep pattern mentioned in the article. Choose the best option for 33.

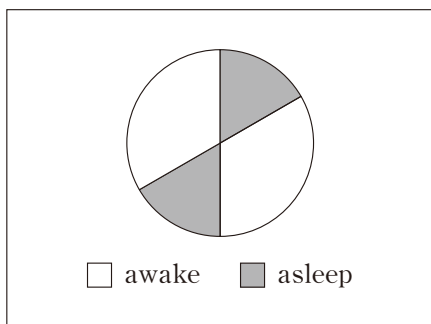
①



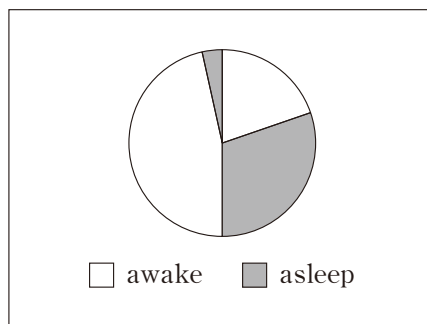
②



③



④



問 3 Choose the best options for 34 and 35. (The order does not matter.)

- ① which burn up energy rapidly tend to sleep more often
- ② which continually search for food need longer sleep
- ③ whose diet has fewer calories can sleep more easily
- ④ whose food keeps their stomachs full usually sleep longer
- ⑤ whose homes are difficult to get to typically sleep less

問 4 Choose the best option for 36.

- ① can be partially asleep and partially awake while in flight
- ② can have half of their brain sleep, leading to increased heart rate
- ③ can keep both eyes open constantly to watch out for enemies
- ④ can protect the outside members from inside the group

問 5 Choose the best heading for 37.

- ① Common Patterns of Sleep
- ② Natural Sleep Methods
- ③ Reasons for Sleep
- ④ States Similar to Sleep