

1 Answer questions (1) ~ (5).

(1) Choose the sentence that best fits the blank to complete this passage.

Curling\* has generated a lot of attention since the 2014 Winter Olympics, but fans of the sport might be surprised by the complex physics at play in this unusual sport.

Every four years, around the time of the Winter Olympics, there is a surge in interest (and consequently memes\*) about curling. From players wearing two different types of shoes on each foot, to the use of brooms\*, to excessive yelling directed at an inanimate stone... curling has managed to carve out\* a niche audience\*.

To those who don't know, curling is a team sport in which a player hurls a piece of stone towards a target circle over a sheet of ice. The player's team members vigorously sweep the floor using brooms to influence the speed and path of the stone. The player who throws the stone gives it a slight twist, causing it to curl along the way, hence the name of this winter sport.

Compared to other sports, curling may seem quite straightforward, but there is much more to it than meets the eye\*. In fact, scientists around the world argue over the exact physics of the sport.

The question that puzzles experts, scientists and players alike is: \_\_\_\_\_

注) \*curling: a sport in which players slide heavy stones over the ice

\*memes: amusing images or videos that spread quickly via the internet

\*brooms: brushes that have long handles

\*carve out: create with difficulty

\*a niche audience: a group of people who are interested in a narrow topic

\*much more to it than meets the eye: more difficult than it seems

- a. Why do curling players sweep the ice?
- b. Why does a curling stone curl the way it does?
- c. Why is curling becoming less popular with its audience?
- d. Why was curling introduced into the Olympics in 2014?

- (2) Choose the sentence that best fits the blank to make the topic sentence for this paragraph.

\_\_\_\_\_ This is because they have a small core volume to generate heat, but a proportionately\* larger body surface area to lose it. Thus, their heat loss to heat production ratio is higher. This applies to not just birds, but all endotherms\*. In other words, when we compare mammals\* and birds, apart from energy-expensive metabolic\* needs, size also plays an important role. Hummingbirds, the smallest of birds, are said to have the highest core body temperature in the entire animal kingdom. It is over 37.7 degree Celsius (over 100 degrees Fahrenheit).

注) \*proportionately: relatively

\*endotherms: animals that make their own heat to keep warm

\*mammals: animals that have hair and feed their babies on milk

\*metabolic: converting food into energy in the body

- a. Hummingbirds are not only beautiful but have developed a unique way to get food.
- b. In humans, adults have a higher average body temperature than babies.
- c. Smaller birds tend to have a higher body temperature, in comparison to larger birds.
- d. The main factor that determines the body temperature of a mammal is its environment.

(3) Choose the phrase that best represents the purpose of the following passage.

The World Health Organization (WHO) has announced a shocking finding about the air we breathe. It has found that almost everyone on Earth breathes unhealthy air. The WHO made its air quality update ahead of World Health Day on April 7. The update reported that 99 per cent of the world's population breathes air that exceeds WHO air quality limits. It looked at data from over 6,000 cities in 117 countries. People living in lower- and middle-income countries breathe the poorest-quality air. Millions of people die in these countries because of pollution-related diseases. The WHO said: "After surviving a pandemic\*, it is unacceptable to still have 7 million preventable deaths...due to air pollution."

注) \*pandemic: an outbreak of a disease that spreads to a large area

- a. To explain how air pollution data is collected
- b. To introduce a serious health issue
- c. To offer solutions to improve air quality
- d. To provide details about World Health Day

(4) Choose the sentence that best fits the blank to make a topic sentence for this passage.

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注) \*emissions: gases that are released into the atmosphere

\*fossil fuels: coal, gas and oil

- a. New Zealand's government has a new plan.
- b. New Zealand's government hopes to use more gas-powered cars.
- c. New Zealand's government seeks to promote tourism.
- d. New Zealand's government will introduce a new tax.

(5) Choose the sentence that makes the best summary for the following passage.

A new report says airlines in the U.K. have missed all their climate change targets since 2000, except one. The U.K. aviation industry\* has set more than 50 climate targets in the past two decades. These included using greener fuels for airplanes and making fuel more efficient. The climate group *Possible* did research on the airline industry. It said the aviation industry has failed to reduce its carbon footprint\*. Leo Murray from *Possible* told the BBC\*: “Companies set grand-sounding\* targets with a lot of fanfare\*....They talk about them for a couple of years. Then the targets sink without trace, never to be seen again.”

注) \*aviation industry: companies that design, build and fly aircraft

\*carbon footprint: 二酸化炭素排出量

\*BBC: British Broadcasting Corporation

\*grand-sounding: impressive but unrealistic

\*fanfare: loud discussion in the media

- a. Airlines in the U.K. are using greener fuels more and more.
- b. The climate achievements of airlines based in the U.K. are very poor.
- c. The climate targets set by U.K airlines were successfully met.
- d. The research group *Possible* set climate targets for U.K. airlines.

[出典]

- (1) “The Science Behind The Sport Of Curling”, Piyush Patel, 20 Jan 2022, ScienceABC,  
<https://www.scienceabc.com/sports/the-science-behind-the-sport-of-curling.html>
- (2) “Why Do Birds Have A Core Body Temperature Higher Than Other Animals?”, Priyasha Bagchi, 8 Jul 2022, ScienceABC,  
<https://www.scienceabc.com/nature/animals/why-do-birds-have-a-core-body-temperature-higher-than-other-animals.html>
- (3) “The Reading/Listening-Air Quality-Level 3”, Breaking News English,  
<https://breakingnewsenglish.com/2204/220407-air-quality.html>
- (4) “Going Electric”, Brian S. McGrath, May 16, 2022, TIME for Kids,  
<https://www.timeforkids.com/g56/going-electric>
- (5) “The Reading/Listening-Climate Change Targets-Level 3”, Breaking News English,  
<https://breakingnewsenglish.com/2205/220512-climate-change-targets.html>

2 Read the following article and answer questions (1) ~ (5).

- [1] In the past, scientists have shown that bees have some surprising math skills. Now, new research shows that bees can even be trained to tell the difference between odd and even numbers. Before this, humans were the only animals known to have this ability.
- [2] Bees are smarter than many people think. Through special dances, they can tell each other how far away food is and in what direction. They can count up to four. In recent years, scientists have shown that bees have even greater math abilities than they imagined.
- [3] In 2018, researchers in Australia discovered that bees could understand the idea of “zero”. That was a big surprise, since only a few animals, like dolphins, monkeys, and some birds, had shown that they understood zero. Later, the same scientists showed that bees could be trained to add and subtract.
- [4] But the idea of odd and even numbers is very different. Even numbers can be split into two equal groups. With odd numbers, one group always has one more item than the other. But except for doing math, it’s not clear how knowing the difference between odds and evens helps humans – much less bees.
- [5] Learning odds and evens is a skill that’s usually taught in elementary (primary) school. Often, students are taught to remember that numbers ending in 0, 2, 4, 6, and 8 are even, while numbers ending in 1, 3, 5, 7, and 9 are odd. Until recently, humans were the only animals known to understand this.
- [6] To train the bees, the scientists used cards with an odd or even number (from 1 to 10) of shapes. If a bee flew to the right card, it would get sugar water. If not, it got a sour liquid.
- [7] The researchers trained one group of bees to choose odd numbers. They trained another group to choose even numbers. They kept training the bees until they got it right 80% of the time.
- [8] Then they added a new challenge. They had the bees choose between cards with 11 and 12 shapes on them. The bees had never seen these numbers in their training. Even so, they were able to correctly choose the odd or even number 70% of the time.
- [9] The scientists still don’t understand what methods the bees used to get the correct answer.

- (1) In which of the following paragraphs does the author explain how some bees were trained to choose between numbers?
- Paragraph 1
  - Paragraph 3
  - Paragraph 5
  - Paragraph 6
- (2) In which of the following paragraphs does the author describe how bees tell each other the location of a food source?
- Paragraph 2
  - Paragraph 4
  - Paragraph 7
  - Paragraph 8
- (3) Which of the following paragraphs gives definitions of odd and even numbers?
- Paragraph 2
  - Paragraph 4
  - Paragraph 6
  - Paragraph 8
- (4) According to the article, what was the purpose of the “new challenge” in this research?
- To identify numbers from 1 to 10.
  - To identify numbers with 80% accuracy.
  - To identify whether a unknown number was even or not.
  - To identify whether one number was greater than another.
- (5) What is the main point of this article?
- Researchers found that bees can add and subtract.
  - Researchers found that bees can distinguish between odd and even numbers.
  - Researchers found that bees can understand the idea of “zero”.
  - Researchers found that bees do special dances to communicate information.

[出典]

“Bees Can Learn Odd and Even Numbers”, NFK EDITORS, May 26, 2022, NewsForKids.net, <https://newsforkids.net/articles/2022/05/26/bees-can-learn-odd-and-even-numbers/>, 一部改

3 次の英文の要旨を、句読点も含め 80 字以内の日本語でまとめ、解答欄に書きなさい。

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注) \*virtual reality: 仮想現実

\*autism: 自閉症

\*prepping: preparing

\*high-profile: well-known

\*unarmed: not carrying weapons

\*intimidation: threat

\*disability: a condition that damages someone's physical or mental abilities

[出典]

“Virtual reality lessons help students with autism to interact with police”, Education Week, 7 Nov 2019, Newsela,  
<https://newsela.com/read/students-autism-vr-lessons/id/2000000947/>



4 Read the passage, and explain the main point in your own words. Write your answer in English within 30 words.

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注) \*imbedded: firmly buried into something else

\*procrastination: putting off tasks until the last minute

\*willpower: strong desire

\*cohesiveness: unity

[出典] Stephen R. Covey. *The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change*. Franklin Covey Co., 2022, P.54

英 語  $\frac{10}{10}$

- 5 Describe your favorite place. Write your answer in English within 50 words.
- 6 Do you agree or disagree with the following statement? Write your answer in English within 50 words.

Social media does more harm than good.