UNIT
01
Nature

Reading 1
Mathematics
The Secret of Honeycombs

Reading 2
Science
Living Light
The Secret of Honeycombs

Bees are amazing honey makers. But they are also impressive honeycomb builders. To build a honeycomb, bees gradually make cells from a special wax that they produce from their bodies. The wax is hard to produce, so they must use it efficiently.

Therefore, honeycomb cells must fit perfectly together. Circles are not a good shape for cells because they don’t fit together. As gaps are left between them, wax is wasted. The shapes that fit together without leaving spaces are the triangle, the square, and the hexagon. Bees choose the hexagon, but why?

The hexagon, a six-sided shape, is the most efficient one for storing honey. A hexagon fits perfectly together with other hexagons, and it is very strong. But most importantly, it stores the greatest amount of honey with the least amount of wax. That’s because compared to other shapes, the hexagon uses the smallest *perimeter to cover the same area. It seems that bees are not only good at making honey. They are also good at mathematics!

*perimeter
Reading Comprehension

1. What is the best title for the passage?
   a. Bees: Beneficial to Humans
   b. How Do Bees Produce Honey?
   c. What is the Purpose of Honeycombs?
   d. The Mathematical Shape of Honeycombs

2. What is NOT true according to the passage?
   a. The material used for honeycombs is wax.
   b. Bees can create wax with their bodies.
   c. Circles are appropriate for honeycombs as they are strong.
   d. Triangles, squares, and hexagons fit together without spaces.

3. Fill in the blanks with words from the passage.

   Bees choose _________ _________ to build honeycombs because it requires _________ _________ amount of wax to cover the same area.

4. What does the underlined sentence mean?
   a. Bees use the most efficient shape to build honeycombs.
   b. Bees make different honeycombs for different purposes.
   c. Bees know the best way to store their honey for a long time.
   d. Bees can make a variety of shapes, such as circles and triangles.

Grammar Inside

필요·의무를 나타내는 조동사 must는 ‘~해야 한다’라는 의미이며, 부정형인 must not은 ‘~해서는 안 된다’라는 의미로 금지를 나타낸다. 추측을 나타내는 must는 ‘~임이 틀림없다’라는 의미이다. ‘~일 리가 없다’는 부정의 추측을 나타낼 때는 must not이 아닌 can’t/cannot를 쓴다. 조동사 뒤에는 동사원형이 온다.

The wax is hard to produce, so they must use it efficiently. 〈필요·의무〉

Jessy has not slept for two days. She must be tired. 〈추측〉

Keira slept all day. She cannot be tired. 〈부정의 추측〉

Check up: 다음 괄호 안에서 알맞은 말을 고르시오.

Jenny is absent today. She (must / cannot) be sick.
Living Light

Imagine an ocean filled with millions of tiny lights. It may sound like a fantasy, but it is reality! Deep in our oceans, many sea creatures make their own light. There are still a lot of unknown creatures in the deep sea. This ability to create light is called "bioluminescence."

Bioluminescence is caused by a special substance inside a creature's body. This substance produces light when it is exposed to oxygen. Bioluminescent creatures can control when they produce the light, and they use it for many different purposes.

**Anglerfish, for example, use a bulb on their head that lights up to attract prey. Smaller fish don't see the danger behind this light and swim toward it. Attracting mates and frightening away bigger fish are other uses of bioluminescence.**

Ostracods, small shrimplike creatures, attract mates by lighting up their upper lip. Some deep-sea worms also shoot bioluminescent bullets to confuse attackers.

The bioluminescence of sea creatures also benefits us: We can look upon our oceans and see the beautiful lights deep below the surface.

1. Imagine an ocean filled with millions of tiny lights.
2. It may sound like a fantasy, but it is reality!
3. Deep in our oceans, many sea creatures make their own light.
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The bioluminescence of sea creatures also benefits us: We can look upon our oceans and see the beautiful lights deep below the surface.

*luceferin 루시페린(생물체 발광에 관여하는 물질)
**anglerfish 아귀
***ostracod 오스트라코다(갑각 동물의 일종)
Reading Comprehension

1 What is the passage mainly about?
   a. how different animals attract their prey or mates
   b. how smaller fish protect themselves from attackers
   c. sea creatures’ ability to give off light from their bodies
   d. what chemical reactions happen inside of sea creatures

2 Which sentence is NOT needed in the passage?
   a. ① b. ② c. ③ d. ④

3 Complete the chart with words from the passage.

<table>
<thead>
<tr>
<th>Name</th>
<th>Method</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anglerfish</td>
<td>light up a bulb on their head</td>
<td>to catch [1] ____________</td>
</tr>
<tr>
<td>Ostracods</td>
<td>brighten their [2] ___________</td>
<td>to attract mates</td>
</tr>
<tr>
<td>Deep-sea worms</td>
<td>shoot bioluminescent bullets</td>
<td>to frighten away [3] __________</td>
</tr>
</tbody>
</table>

4 What does the underlined “the danger” describe?
   a. the fish that is trying to hide itself
   b. the fish that is trying to eat smaller fish
   c. the fish that is trying to protect smaller fish
   d. the fish that is trying to scare smaller fish away

Grammar Inside

동명사는 ‘v-ing’의 형태로 문장 안에서 주어, 목적어, 보어 역할을 하며 ‘~하는 것’으로 해석한다.

Attracting mates and frightening away bigger fish are other uses … . 〈주어〉
Ostracods, …, attract mates by lighting up their upper lip. 〈전치사의 목적어〉
My job is checking the products’ condition before delivery. 〈보어〉

Check up: 다음 칸에 알맞은 말들을 고르시오.
   _______ all around the world is my biggest dream.
   a. Travel      b. Traveling
### Vocabulary Inside

- **produce (v.)**
  - to make or grow something
  - Humans **produce** heat to maintain their body temperature.
  - **product** 
  - **production**

- **efficiently (ad.)**
  - in a good way, without wasting time, money, or energy
  - This car uses gasoline **efficiently**.
  - **efficient** 
  - **efficiency**
  - **inefficiently**

- **creature (n.)**
  - any living thing that is not a plant
  - It seems there is a dangerous **creature** in this forest.

- **expose (v.)**
  - to cause to experience something
  - The scientists were **exposed** to toxic gases.
  - **exposure**

- **attract (v.)**
  - to draw someone or something toward you
  - The street lamps are **attracting** a lot of bugs.
  - **attractive**

- **confuse (v.)**
  - to make someone feel that something is unclear
  - The complicated map of the Paris subway **confused** me.
  - **confusion**
  - **puzzle**

### Check up

Fill in the blanks with the words from the box. Change the form if necessary.

<table>
<thead>
<tr>
<th>confuse</th>
<th>produce</th>
<th>creature</th>
<th>attract</th>
</tr>
</thead>
</table>

1. Some ______ live in the water, and others live on land.
2. Male birds often have colorful feathers to ______ females.
3. When you get stressed, a hormone called cortisol is ________.