

# 1 Design

## DISCUSSION POINT

Discuss with a partner.

- 1 Why is work done by hand slower than work done by machine?  
*Machines can work faster because ...*
- 2 Are there any tasks that can be done faster by hand than by machine?  
*One such task could be ...*
- 3 Are there any tasks that cannot be done by machine at all?  
*I think / I don't think there are ...*

## What would it take to do these jobs *by hand*?



Harvest all the corn grown in the United States in one year:

7.8 million people working **24 hours** a day for **60 days**.



Make all of the blue jeans sold in the United States in one year:

10,000 people working **24 hours** a day, **365 days** a year ... for **33 years**.



Make a Persian rug for 1% of the households in the United States:

10,000 people working **12 hours** a day, **365 days** a year ... for **610 years!**

## VIDEO



HERITAGE CRAFTS

## BEFORE YOU WATCH

Match the words in bold with the correct definitions.

- |                         |  |
|-------------------------|--|
| 1 <b>obsolete</b> (adj) | a to receive something, such as money or land, from someone who has died                   |
| 2 <b>artisan</b> (n)    | b a person who is skilled at making something by hand                                      |
| 3 <b>inherit</b> (v)    | c not used or made anymore   |
| 4 <b>fabric</b> (n)     | d arts, traditions, and beliefs from a society's history that are important to its culture |
| 5 <b>heritage</b> (n)   | e cloth; material made from knitting or weaving  |



Potter sculpting a teapot

## WHILE YOU WATCH

Watch the video. Choose the correct answers.

- 1 Weaver Hana Fayad says that **she / her father** inherited the craft of weaving from her grandfather.
- 2 Hana feels that artisans in Lebanon **were not given enough rights / could not earn a living**.
- 3 New generations of people in Lebanon are **continuing / forgetting** traditional crafts.
- 4 Hana thinks that weaving is **a part of her heritage / purely practical skill**.

## AFTER YOU WATCH

Work with a partner. Discuss the questions.

- 1 What are some traditional crafts from your country? Are they popular with artisans today?  
*One traditional craft from my country is ...*
- 2 Do you agree that your country's crafts are part of your heritage? Why / why not? How important are they to future generations?  
*Crafts are / aren't an important part of our heritage because ...*

## BEAUTIFULLY BROKEN

### A VOCABULARY PREVIEW

Match the words in bold with the correct definitions.

- |                       |  |
|-----------------------|--|
| 1 <b>flaw</b> (n)     | a to break something with force, and into many pieces                  |
| 2 <b>imitate</b> (v)  | b a characteristic of not talking about your achievements or successes |
| 3 <b>incident</b> (n) | c to copy something; to do something in the same way                   |
| 4 <b>modest</b> (adj) | d to consider something as important                                   |
| 5 <b>piece</b> (n)    | e a method or way of doing something                                   |
| 6 <b>practice</b> (n) | f a complete artwork, such as a painting or sculpture                  |
| 7 <b>smash</b> (v)    | g a mistake or imperfection  |
| 8 <b>value</b> (v)    | h one event or occurrence  |

### B BEFORE YOU READ

Discuss these questions with a partner or group.

- 1 What do you usually do with dishes that break? Do you repair them or throw them away? Why?
- 2 Do you have any household objects that you have repaired? If so, why did you choose to keep them and repair them instead of replacing them?
- 3 What are some advantages and disadvantages to throwing away broken items?

### C GLOBAL READING

How is the reading organized? Scan the text, and then choose your answer.

- 1 ☐ From past events to present events to future events
- 2 ☐ From definitions to examples to applications
- 3 ☐ From explanations to advantages to disadvantages
- 4 ☐ From definitions to comparisons to contrasts
- 5 ☐ From problems to solutions to advantages

Preparing to read

Understanding organization



# Beautifully Broken

1 Oh, no! You dropped the cup, and it smashed! Time to throw it away and buy a new one.

2 Unless, perhaps, you are a fan of the Japanese art of *kintsugi* or *kintsukuroi*—roughly translated, “to mend with gold.” This is the practice among certain craftsmen of mending the broken pieces of pottery, such as a plate, cup, or a bowl, with gold (or similar) lacquer. The gold is used to glue the pieces back together. If small pieces are missing, they can be created out of gold, or a piece from a different bowl or plate can be used instead. The repaired product’s value is not reduced, though—it is actually enhanced. It is believed to become more beautiful because it was broken. Pieces of *kintsugi* pottery can be enormously expensive and are featured in museum exhibits in Japan and overseas.



Kintsugi bowl

3 These days you can even see machine-made ceramics with gold designs on them that look as if they are *kintsugi*, even though the original was actually never broken. But the mended patterns have become so trendy that people want to imitate them.

4 There’s a story or legend behind the practice—which may or may not be historically accurate, but beautifully illustrates the concept. Back in the 1500s, there lived a military ruler in Japan, who owned a bowl he especially loved. One day while he was entertaining some guests, his servant dropped the bowl, and it broke into five pieces. Knowing the leader’s bad temper, his guests worried that he would punish the servant. However, one of the guests made up an amusing poem about the incident. Everybody laughed, including the ruler. When he relaxed, he was able to see that the bowl’s beauty had not been destroyed by the accident. Instead, because the vessel could be repaired, the ruler now had a new appreciation for its strength and ability to survive. In fact, according to the story, the true life of the bowl began the moment it was dropped.

5 If this seems a hard notion to understand, then consider it in light of another Japanese philosophy, that of *wabi-sabi*. This is harder to translate into English, but it refers to the combination of three beliefs; that nothing is permanent, nothing is finished, and nothing is perfect. Applied to arts and crafts, it explains why the Japanese traditionally value handmade objects. Even though they look less perfect than those made by machine, it is actually this imperfection that makes them beautiful. In fact, artists who value the *wabi-sabi* aesthetic create works that are deliberately imperfect, such as a bowl that isn’t entirely round or a vase with a thumbprint visible in the clay. Rough surfaces, instead of ones smoothed by machines, are common in *wabi-sabi* ceramics, and often the pieces are not glazed or colored.

6 It’s not just Japan that has such a tradition, however. A similar idea can be found in Iran, among the makers of Persian rugs. Tradition has it that those who weave carpets will deliberately include one small flaw, as recognition of the fact that nothing can be perfect. The intentional mistake reminds them to be modest about their work. Similarly, some early American settlers known as the Puritans included a “humility square” when they sewed a quilt—one square that didn’t match the rest of the blanket. Some Native American bead workers would include an intentional “mistake bead” for the same reason.

7 Such practices have also been reported among Amish furniture makers in the United States and some forms of Islamic art—although careful work by sociologists and historians suggest that these stories are actually not true, but rather a romanticized version of their art or a misunderstanding of a tradition.

8 True or not, however, these cultural practices teach us not only about art but about life, and the importance of not only accepting, but actually celebrating, our imperfections. That doesn’t mean we shouldn’t care about making mistakes; but for many people, worrying about small imperfections keeps them from finishing a project or appreciating one they have finished. People who are “perfectionists” can feel insecure and anxious about the art they create, which makes it harder for them to enjoy what they do.

9 The concept can even be applied more broadly than just to art, however. Consider yourself, for example. Do you have any imperfections—anything from physical scars to personal habits? What if, instead of considering these to be flaws, you could appreciate them as part of what makes you a beautiful person? That’s easier said than done, but if you can understand and apply the concepts of *kintsugi* and *wabi-sabi* to your own life, you may be able to consider yourself with more kindness and humility, and to see yourself, flaws and all, as a true work of art.



“Wabi-sabi” bowl

## GLOSSARY

**aesthetic (n)** the beauty of something; how it looks

**humility (n)** having a modest view of your own importance; being humble

Recognizing internal  
paraphrasing**D CLOSE READING**

Writers use paraphrasing to avoid repetition, which makes their texts more interesting and sophisticated. One way to do this is with a synonym:

*It's my family's **habit** to begin each dinner by talking about our day. We began this **custom** when I was in high school.*

Another way is to use a different word form:

*Jin Su **broke** the cup when she dropped it. However, she was able to repair the **break**, and so she could still use the broken cup.*

- 1 Read these sentence excerpts and find them in *Beautifully broken*. Then choose the correct synonym for the underlined word, according to the context. The first one is done for you.**

- 1 This is the practice among certain craftsmen of mending the broken pieces of pottery.  
 a art                                      b ritual                                      **c habit**
- 2 Knowing the leader's bad temper...  
 a president                                      b premier                                      c ruler
- 3 ... because the vessel could be repaired ...  
 a bowl                                      b ship                                      c accident
- 4 The intentional mistake reminds them ...  
 a error                                      b flaw                                      c tradition
- 5 ... one square that didn't match the rest of the blanket.  
 a humility square                                      b quilt                                      c settlers

- 2 Read the text and the sentences. Write T (True), F (False), or NG (Not Given).**

- 1 A dish that has been mended with the *kintsugi* technique will be more expensive than the original. \_\_\_\_
- 2 *Kintsugi* is an older tradition than carpet making in Iran. \_\_\_\_
- 3 A piece of art made in the *wabi-sabi* way does not look handmade. \_\_\_\_
- 4 A humility square is a type of deliberate flaw. \_\_\_\_
- 5 If you deliberately make mistakes in your life, you will feel less anxious. \_\_\_\_

**E CRITICAL THINKING**

- 1 According to the article, the story about the Japanese ruler is probably not true nor are interpretations of some practices from other cultures. Should people still discuss those stories? Why / why not?
- 2 Do you believe it is ever possible for a work of art to be perfect?

## ACADEMIC SKILLS

### IDENTIFYING THE AUDIENCE

When you write, you are almost always writing for someone. Who your audience is will influence the style you use and what information you include. If your audience does not know much about your topic, they need more background information to help them understand your main points. If your audience is knowledgeable about your topic, that same background information might bore them.

You also need to consider your purpose in writing for a certain audience. Do you want to persuade someone to believe something or take some action? If so, you need arguments supported by evidence. Is your purpose to inform your audience about something they do not know? If so, you should explain new concepts clearly and support them with examples.

**1 Work with a partner and choose the appropriate audience for each language feature. Write G (general), A (academic), or B (both).**

- 1 Use the personal pronouns *I*, *you*, and *we* \_\_\_\_
- 2 Use contractions \_\_\_\_
- 3 Begin some sentences with *And*, *But*, or *So* \_\_\_\_
- 4 Include references to scientific studies \_\_\_\_
- 5 Include personal stories \_\_\_\_
- 6 Include specific examples \_\_\_\_
- 7 Include references to popular culture, such as movies or music \_\_\_\_
- 8 Include questions \_\_\_\_

**2 Imagine you are a car designer who does not believe electric cars can be made cheaply enough for most people to buy. What kind of information in an article might help persuade you to change your opinion? Choose all that apply. Then discuss your answers with a partner or group.**

- |   |  |
|---|--|
| 1 ____ a definition of “electric vehicle”       | 4 ____ statistics about the amount of pollution caused by gas-powered vehicles |
| 2 ____ a diagram of a new type of EV engine     | 5 ____ a timeline of EV development  |
| 3 ____ interviews with engineers who design EVs | 6 ____ a chart that shows costs of EVs and gas-powered vehicles                |

**3 Skim the article *Beautifully broken*. Who do you think the intended audience is? Why do you think so?**

- 1 People who are interested in psychology, philosophy, and self-improvement
- 2 Art students and professors of art
- 3 People who know a lot about Japanese culture and values
- 4 People studying how to repair broken dishes



A plant's burr stuck on a dog's fur

Preparing to read

Reading for tone

## BIOMIMICRY AND BIOMIMETIC DESIGN

### A VOCABULARY PREVIEW

- 1 Complete the paragraph with the words and phrases from below. Two are not used.

delicate entirely functional harm objection  
on good terms with romantic thick

In 1941, after Swiss engineer Georges de Mestral and his dog had been walking in the woods, he noticed that there were lots of little burrs in his dog's <sup>1</sup> \_\_\_\_\_ fur that were almost <sup>2</sup> \_\_\_\_\_ covering his dog's body. His dog didn't have any <sup>3</sup> \_\_\_\_\_ to them being on him and they did not <sup>4</sup> \_\_\_\_\_ him, but they were very difficult to get off. The burrs were small and <sup>5</sup> \_\_\_\_\_ but very strong. De Mestral put them under a microscope and saw that they were covered with tiny hooks. He thought that a similar product made out of cloth, would serve a <sup>6</sup> \_\_\_\_\_ purpose. This led to his creating Velcro™.

- 2 Complete the sentences with words and phrases from Exercise 1.

- 1 I'm not \_\_\_\_\_ my neighbors. We have a lot of disagreements.
- 2 My boots are not made \_\_\_\_\_ of leather. The bottoms are rubber.
- 3 My dad has a \_\_\_\_\_ view of the past, but was it really any better?
- 4 Driving cars is one of the many ways we \_\_\_\_\_ the environment.
- 5 If you have no \_\_\_\_\_, I'm going to buy this handmade chair.
- 6 Wool sweaters can be very \_\_\_\_\_, so they're warm in winter.
- 7 This desk isn't very attractive, but it's \_\_\_\_\_, so I think I'll keep it.
- 8 Careful you don't break that vase! It's very \_\_\_\_\_.

### B BEFORE YOU READ

In a small group, think of three different animals and discuss these questions.

- What do their homes look like?
- What are these homes made out of?
- Do they have any special features?
- How are their homes similar to or different from human homes?

### C GLOBAL READING

- 1 Skim the article. What kind of audience was it written for? How do you know?

*I think it's written for a general / expert audience, because ...*

- 2 What is the main function of the second paragraph? What does this function tell you about whether it is for a general audience or academic experts?

- a It offers a definition.    b It profiles an expert.    c It makes a prediction.





# BIOMIMICRY AND BIOMIMETIC DESIGN

<sup>1</sup> You may already be familiar with the popular expression “Art imitates life.” We often associate this with the romantic notion that, say, a painter goes for a walk in the woods and then comes home and creates a work of art inspired by the shapes and colors they saw. But this process can be a lot more deliberate, too. For hundreds of years, inventors and designers have used ideas from nature to create works that are not only appealing, but functional, such as sewing thread, based on the delicate silk made by silkworms in Asia, or umbrellas modeled after the leaf of the lotus plant, to name just a few.

<sup>2</sup> Even though the practice itself is far older, the word *biomimicry* was made popular in 1997 by biologist Janine Benyus in her book, *Biomimicry: Innovation Inspired by Nature*. You can probably guess just from looking at the word that it means to mimic life—that is, to imitate the shapes, materials, or animals in nature. Benyus teaches that imitating the designs and processes found in nature, such as constructing a solar cell that generates energy in the same way as a plant’s leaves, is vital for sustainability. Rather than damaging the planet by using up natural resources and creating pollution, human constructions could operate in harmony with their environments—and nature can show the way.



<sup>3</sup> A perfect illustration of this comes from Japan. In the 1990s, the Japanese bullet trains were famous for their speed and efficiency, but caused some problems with noise pollution, too. When a bullet train entered a tunnel, the air would compress around the front of the train, and then cause a loud sound like an explosion when the train came out the other side. As the railroad company wanted to be on good terms with residents living near the tracks, engineers tried to solve the problem. The chief engineer, whose hobby was bird-watching, used the kingfisher as model. A kingfisher is a bird that dives into the water to catch fish. The shape of its beak—long and pointed—allows it to enter the water at high speeds without making a lot of noise, which would scare away the fish. The bullet trains were re-designed with fronts more like the shape of a kingfisher’s beak, so they could cut through air quickly and quietly.

<sup>4</sup> Architecture in particular is a field that increasingly makes use of biomimicry. These days, architects have to think of more than just how good a building looks or how durable it is. It’s also important for it not to harm the local environment and to be inexpensive to heat or cool. Biomimetic designs for buildings copy ideas found in natural structures, like the structure of a tree trunk and branches, the shape of a seashell, or the design of a bird nest.



## GLOSSARY

**beak (n)** the hard curved or pointed part of a bird's mouth

<sup>5</sup> One such example is the Eastgate Centre, a shopping center and office building complex in Harare, Zimbabwe. The architects drew their inspiration from a surprising source: termites. These insects live in large mounds (some as tall as five meters high!) that they make from dirt and other natural materials. Inside their mounds, they live, grow their food, and lay their eggs. The outside conditions are harsh, and temperatures range from 35.5°F (2°C) at night to 105°F (40°C) during the day. The sides of a termite mound look thick, but they actually contain a number of vents, or holes, that let air in and out. Throughout the day, the termites constantly open and close these vents, which keeps the temperature of the mound at a steady 86°F (30°C).

<sup>6</sup> The Eastgate Centre doesn't use traditional air conditioners or heaters, but still maintains a pleasant, even temperature thanks to biomimicry. Although it is made of concrete, it features a ventilation system based on the termites' design that draws in air from the outside, which is then either warmed or cooled, depending on whether the concrete is hotter or colder than the air outside. After it is sent into the different interior spaces to heat or cool them, it is sent back outside through tall chimneys, and the process begins again.

<sup>7</sup> And the biomimicry has delivered the goods. For instance, the Eastgate Centre uses less than 10% of the energy needed by a typical building of its size. Because they didn't have to install conventional air conditioners, the center's owners saved \$3.5 million, and the people who rent offices there pay 20% less than people in neighboring buildings.

<sup>8</sup> Given the challenges of climate change, an expanding world population, diminishing resources, and rising costs, proponents of biomimicry hope it will become the gold standard for contemporary architectural plans. Even if a building cannot be made entirely energy self-sufficient, it can certainly be made more efficient and less damaging than buildings of the past. Objections to new ways of doing things and unconventional looks disappear when people realize the savings—both environmental and financial.

<sup>9</sup> The next time you're out walking, look at your natural surroundings with another purpose. What design elements do you see that humans might be able to use? What designs do you see that are in use already?



Exemplification

## D CLOSE READING

Giving examples is a common way to explain points or to offer support for an opinion or argument. Examples can be as short as one word or as long as a story. Here are some common ways of signaling examples:

*As one example,*

*A (good / perfect) illustration of this ...*

*That is,*

*To illustrate (this),*

*Namely,*

*such as / like*

Writers don't always use these signal phrases for examples. However, when they do, you know that the example is particularly important.

### 1 Match the examples from the reading (1–5) with the idea they are supporting or explaining (a–e).

- |  |  |
|--|--|
| 1 sewing thread and umbrellas                            | a something with a problem that biomimicry was able to solve |
| 2 to imitate the shapes, materials, or animals in nature | b a definition of biomimicry                                 |
| 3 Japanese bullet trains                                 | c objects that are both beautiful and functional             |
| 4 the shape of a seashell                                | d a biometrically designed building                          |
| 5 the Eastgate Centre                                    | e a shape in nature that architects copied                   |

### 2 Look at the text again and select the word or phrase that the author used to signal the examples (1–5) in Exercise 1.

## E CRITICAL THINKING

Discuss these questions with a partner.

- Which examples of biomimicry does the author think readers already know about? Which ones does the author think readers are not familiar with? How do you know?
- The article discusses advantages of biomimicry, but not disadvantages. What are some possible reasons for this?

## VOCABULARY DEVELOPMENT

## ADJECTIVES FOR DESCRIBING PRODUCTS

- 1 Put the words below into the correct categories. Then discuss your choices with a partner. If you made any different choices, discuss why.

appealing contemporary durable fake generic  
innovative mass-produced multifunctional

Positive	Negative	Neutral

- 2 Write an example of each type of product that you own or have seen. Then share your answers with a partner.

1 Something you're wearing that was mass-produced:

---

2 Something in your home that is multifunctional:

---

3 Something in the room you are in now that's durable:

---

4 Something you bought in the last year that's versatile:

---

5 Something you've seen that is fake:

---

6 Something you like that is generic:

---

7 Something in your school that is contemporary:

---

8 Something you wish to buy that is innovative:

---



## ACADEMIC WORDS AND IDIOMS

## 1 Match the words in bold with the correct definitions.

- |                                 |  |
|---------------------------------|--|
| 1 <b>deliver the goods</b> (id) | a to live, endure, or continue, especially in the face of a threat or difficulty |
| 2 <b>enhance</b> (v)            | b a way of thinking; a belief or attitude to life                                |
| 3 <b>journal</b> (n)            | c an ideal or perfect example of something which others often try to copy        |
| 4 <b>notion</b> (n)             | d to make something better by adding something to it                             |
| 5 <b>overseas</b> (adv)         | e in another country   |
| 6 <b>philosophy</b> (n)         | f to do something that you have promised to do or are expected to do             |
| 7 <b>survive</b> (v)            | g an activity or custom that has continued over time                             |
| 8 <b>gold standard</b> (id)     | h an idea; a concept   |
| 9 <b>tradition</b> (n)          | i a person who participates in an activity without being paid                    |
| 10 <b>volunteer</b> (n)         | j a professional magazine that covers research about one topic                   |

## 2 Complete the sentences with words and phrases from Exercise 1. Change the form if necessary.

- Some people consider the Model T to be the \_\_\_\_\_ of cars.
- The \_\_\_\_\_ that architecture should borrow ideas from nature is not one that everyone agrees with.
- Fortunately, the pottery in the museum \_\_\_\_\_ the earthquake.
- The engineers really \_\_\_\_\_, and the new subway system was fast, efficient, and affordable.
- The furniture maker \_\_\_\_\_ the chair by carving birds and flowers into the back of it.
- Some people travel \_\_\_\_\_ to find special handcrafted items.
- My personal \_\_\_\_\_ is that buildings should be both beautiful and practical.
- The Indonesian \_\_\_\_\_ of making *batik* is a way of dyeing fabric.
- The process has been written about in several academic \_\_\_\_\_.
- Because the Crafts Center doesn't have a large budget, they have to depend on \_\_\_\_\_ to teach children's classes after school.

## 3 Work in a group. Discuss these questions using vocabulary from Exercise 1.

- Think of some of the things that you own. Do you think their value will increase or decrease over time? Why?
- Is there a particular artistic tradition in your country? Do you think it is important to protect and maintain such traditions?

## ACADEMIC IDIOMS

## THE GOLD STANDARD

*The gold standard* used to refer specifically to gold. The value of money in some countries was related to how much gold the money could be exchanged for. There are no countries that still use the gold standard as a measure of what their currency is worth.

## CRITICAL THINKING

### Flawed arguments

When a writer presents an argument, it is important to always assess the strength of their reasoning. Sometimes arguments can appear convincing, but on closer examination, they lack the evidence needed to persuade the reader.

Some common examples of flawed arguments are:

- repeatedly restating the claim, without providing supporting evidence
- attacking the opposing view, rather than supporting your own
- using irrelevant evidence, which may be interesting, but does not support the argument.

### 1 Read the following texts and match a type of flawed argument to each one.

Attacking the opposing view    Repeatedly restating the claim  
Using irrelevant evidence

- Handmade products are far more important to our culture than manufactured products because they have a link to our past and our ancestors. This is why handmade products are so vital to our culture and more valuable than those products made in a factory. These kinds of products made by hand are so important we have to make sure we keep making them to protect our culture in the long term.
- In my opinion, manufactured goods are far preferable to those made by hand. Handmade products are expensive and time-consuming to produce and quality can vary enormously from product to product. This is why you could not make a computer or mobile phone by hand. The parts would cost too much and quality issues would make these devices unreliable. This is why manufactured products are better.
- Making products by hand is extremely important. For example, in my country many people like to use handmade tea cups for tea ceremonies. Tea ceremonies are an ancient tradition dating back hundreds of years. We use powdered green tea and a number of other objects to enjoy a tea ceremony. They can be held indoors or outdoors and there are two main seasons for them; tea ceremonies in the warmer months and in the months of winter.

### 2 Work with a partner. Choose one of the texts and discuss ways to improve it.

## WRITING MODEL

You are going to learn about using *can* to express general truths and how to organize and edit your ideas. You are then going to use these skills to write an essay expressing advantages and disadvantages.

### A MODEL

- 1 Read the essay task. Identify the key words that indicate what must be included in the answer.

*“Discuss some advantages of machine-made products over handmade products. Use specific reasons and examples in your answer.”*

- 2 Read the student model. How many advantages did the writer discuss? Which was the most important one, do you think?

People can often have romantic notions of the value of handmade items. They might even consider handmade items to be the gold standard and far better than those made by machine. While it’s true that handmade pieces can be very beautiful, there are three important advantages to machine-made items.

First, machine-made items are inexpensive. This means that more people can afford to buy them, and that everyone who buys them can save money. For example, in my town, there is a shop that sells handmade shirts and dresses. One shirt can cost \$200 or more. A shirt that looks almost exactly the same in a store, however, can cost \$50, or even less if it is on sale.

Another important advantage is that machine-made items are high quality. Machines do not make mistakes like people do, so products usually do not have flaws or imperfections such as rough surfaces or broken pieces.

Finally, machines can make many products that are identical, such as chairs that are all the same size and shape, or pianos that are all of the same quality. This means that many different people can enjoy the same product in the same way. People have an equal opportunity to own a product if there are many of them that are the same. This is both useful and fair.

Even if we like to watch one master woodcarver creating a unique product, we should remember that it is machines that can reliably deliver the goods. They can produce pieces that are affordable, safe, durable, and available to everybody.

### B ANALYZE

- 1 Which sentence is the thesis statement? How many sentences come before the thesis statement, and what is their purpose?
- 2 How did the writer signal the reasons and examples? Identify the phrases.
- 3 The writer mentioned handmade products a few times. Why?



## GRAMMAR

Using **can** for universal truths

*Can* is used to talk about things that are often true or that are possible.  
(*Be able to* cannot be used as a synonym for *can* in this sense.)

*Handmade items **can** be very beautiful.*

Writers often **hedge** their use of *can* with adverbs such as *sometimes*, *often*, and *usually*, and phrases such as *in some cases*, *in some circumstances*, and *in some situations*. This shows that the situation is not necessarily always true.

*Handmade items **can** sometimes be very expensive.*

*Handmade items **can** be very expensive in some cases.*

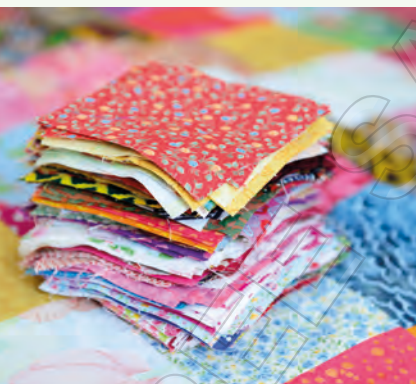
*In some cases, handmade items **can** be very expensive.*

## 1 Reorder the words to make sentences.

- 1 very / it / sew a quilt / take a / long / can / time to  
It \_\_\_\_\_
- 2 tell if / machine or / it can / difficult to / a scarf / be / was / by hand /  
knitted by  
It \_\_\_\_\_
- 3 well as / found in / people's homes as / can / works of art / in museums /  
usually be  
Works \_\_\_\_\_
- 4 be understood through / the culture of / can often / its traditions / a country  
The \_\_\_\_\_
- 5 a piece of / identify / at it / the maker of / some people can / just by looking  
/ furniture  
Some \_\_\_\_\_
- 6 art / many / perfect / craftsmen / believe that no / piece of / can be  
Many \_\_\_\_\_

2 Rewrite the sentences with **can** to express a universal truth. The first one has been done for you.

- 1 It is relaxing to create art by hand.  
*It can be relaxing to create art by hand.*
- 2 People are sometimes reluctant to pay more for imperfect items.
- 3 Machinery is used to create things more quickly.
- 4 Factories are located in both cities and small towns.
- 5 Quilts are made by machine as well as by hand.
- 6 People usually understand why handmade items cost more.



## WRITING SKILL

After you've brainstormed ideas for your paper, it's important to organize them. This step includes:

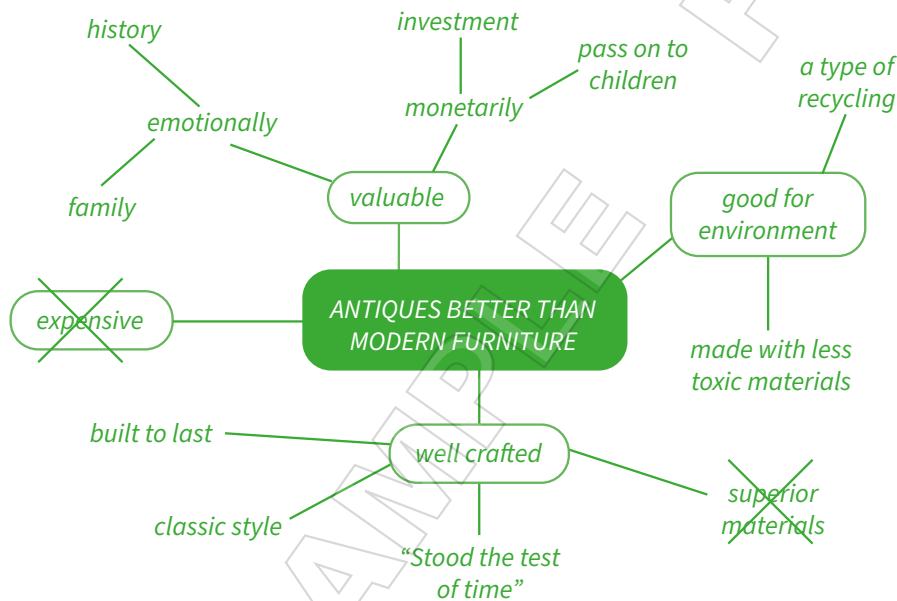
- deleting ideas you don't want to use
- adding ideas you didn't think of before
- choosing an order for your ideas

Typically, when you have two or more supporting examples or arguments, put the strongest or most convincing one last, where your reader will remember it best.

When you have selected which ideas to use for your body paragraphs, write a topic sentence for each one. If you are taking a timed essay exam, write your outline onto the paper or screen, and then fill it in with the time remaining. If you run out of time, you may still get credit for organization (which you would not otherwise).

Organizing your brainstorm

### 1 Work with a partner. Discuss why the writer crossed out some ideas.



- 2 Read the brainstorm again. Number the supporting points from 1 (least interesting or important) to 3 (most interesting or important). Discuss your decisions with a partner. Did you agree?
- 3 Write a topic sentence for each supporting point. Then share your sentences with a partner or group.

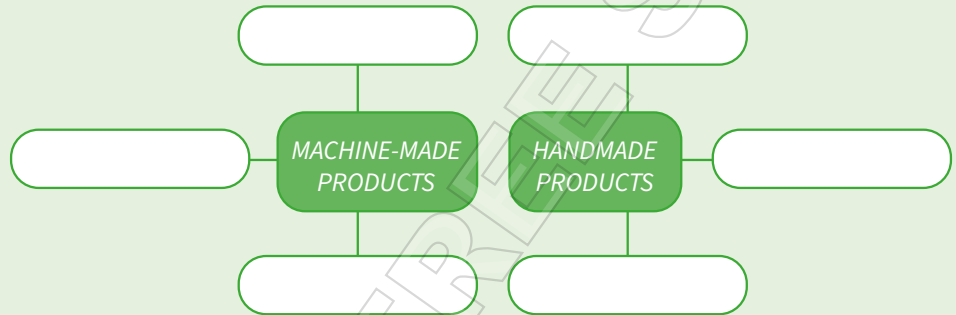
## WRITING TASK

You are going to write an essay in response to the following:

*“Discuss some advantages of handmade products over machine-made products. Use specific reasons and examples in your answer.”*

### Brainstorm

Complete the brainstorm with your own ideas.



### Plan

Look at your brainstorming notes. Write your thesis statement. Then cross out any ideas that don't support your thesis or that you don't want to use.

### Write

Use your brainstorm to help you write your essay. Remember to use *can* to express general truths where appropriate. Your text should be about 250 words long.

### Review

Exchange your essay with a partner. Review the following together:

- Did you consider the audience for your essay? Who was it?
- Did your brainstorming give you useful ideas for your essay? Did you cross out any ideas?
- Did you use specific reasons and examples in your answer?

### Rewrite and edit

Consider your partner's comments. Before writing the final draft of your essay, check whether your essay:

- uses *can* to express universal truths.
- adds hedges to sentences with *can* when appropriate.
- uses the correct adverbs or phrases to add hedges to sentences with *can*.



## WORDLIST

\*\*\* very frequent \*\* frequent \* not frequent

### Vocabulary preview

delicate (adj) **	imitate (v) *	piece (n) ***	smash (v) **
entirely (adv) ***	incident (n) ***	practice (n) ***	thick (adj) ***
functional (adj) **	modest (adj) **	romantic (adj) **	value (v) **
harm (v) *	objection (n) **		

### Vocabulary development

appealing (adj) *	durable (adj)	fake (adj)	mass-produced (adj)
contemporary (adj) ***	generic (adj) *	innovative (adj) *	multifunctional (adj)

### Academic words and idioms

deliver the goods (id)	journal (n) **	philosophy (n) ***	tradition (n) ***
enhance (v) **	notion (n) ***	survive (v) ***	volunteer (n) **
gold standard (id)	overseas (adv) **		

## ACADEMIC WORDS AND IDIOMS REVIEW

Complete the sentences with the words below.

deliver the goods enhance journal philosophy  
survive the gold standard tradition

- Some of the oldest practices have shown an impressive ability to \_\_\_\_\_.
- They have promised a lot, but let's see if they can \_\_\_\_\_.
- Some believe that an object's imperfections can actually \_\_\_\_\_ its beauty.
- I first learned about *wabi-sabi* in a \_\_\_\_\_ on Japanese culture.
- Her handmade furniture has become \_\_\_\_\_ for contemporary tables and chairs.
- Our company \_\_\_\_\_ is to use the finest materials possible.
- Quilt-making is an important \_\_\_\_\_ in my community.

## UNIT REVIEW

Reading 1	<input type="checkbox"/>	I can recognize paraphrases.
Reading 2	<input type="checkbox"/>	I can recognize examples.
Academic skill	<input type="checkbox"/>	I can identify and consider the audience.
Vocabulary	<input type="checkbox"/>	I can use adjectives to describe products.
Grammar	<input type="checkbox"/>	I can use <i>can</i> to express universal truths.
Writing	<input type="checkbox"/>	I can organize my brainstorm.

# WHAT BIRDS really listen for in BIRDSONG

(It's not what you think.)

When researchers analyze birdsong, we usually break it down into smaller units, termed notes or syllables. We then group the syllables into sequences called phrases or motifs that have characteristic rhythms and tempos. In this way, we can measure potentially important aspects of song, such as the number of syllable types or the patterns in which phrases are arranged.

But what do the birds think about all these features? Recent research has revealed that birds appear to listen most closely not to the melodies that catch our ears but rather to fine acoustic details that lie beyond the range of human perception.

You can break a sound waveform down into two levels of description: envelope and fine structure. The envelope is made up of slow fluctuations in amplitude, whereas the fine structure is how it changes at the millisecond level. Historically, many birdsong researchers overlooked fine structure. But zooming in on the waveform of an individual song syllable can reveal these fine acoustic details. I came to realize that the key to understanding what birds are communicating in song may lie in these fine acoustic details rather than the sequences in which they occur.

We tested that notion in a 2018 study that examined how well Zebra Finches hear the difference between natural song motifs and motifs where syllables are either reversed or shuffled in sequence. Interestingly, the Zebra Finches performed nearly perfectly at discriminating reversed syllables, which can be difficult for our human ears to detect, but they did poorly at discriminating shuffled syllables, which are easy for humans to hear.

Zebra Finch song bouts consist of a single motif repeated over and over—or at least researchers think of them as the same. In truth, there are small differences in each rendition of the motif. We tested the finches' ability to discriminate between different renditions of motif syllables and found that the birds can hear the differences easily.

This result means that although to us the Zebra Finch song sounds like the same motif on repeat, to the birds it does not. Instead they could be perceiving information in the fine structure of song beyond what our ears can detect. It is reasonable to expect that other birds with songs that sound repetitive to human ears share the Zebra Finch's powers of perception.

## Sound Discrimination

The same motif. In the spectrograms shown, the natural motif is repeated as the “background sound” (top). The same motif but with the second syllable reversed in structure was one of the “novel sounds” (middle) presented to the birds. The same motif but with the syllables shuffled around in order served as another novel sound. The white circles mark syllables that have either been reversed or shuffled.

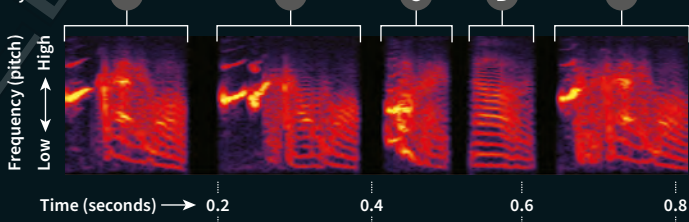


Zebra Finch

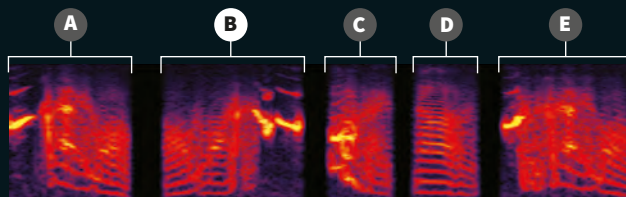
### Zebra Finch Song

#### Natural Motif

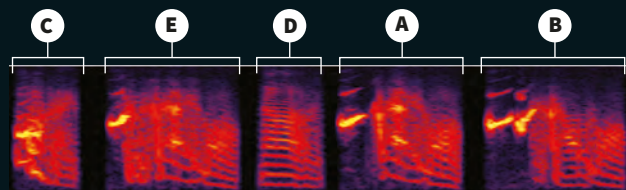
Syllables:



#### Syllable B Reversed



#### Shuffled Sequence



## GLOSSARY

**discriminate (v)** identify differences between two or more things

**fluctuations in amplitude (phr)** changes in loudness over time

**melody (n)** a tune or song, especially a simple one

**perception (n)** the ability to see / hear / smell / taste / feel something

**rendition (n)** a particular performance (e.g., of a complete song or a motif)

**zoom in (phr v)** look at the details of something not just the general characteristics, e.g., not just looking at how loud a sound is over time but also the individual frequencies inside that sound



Regent Honeyeater

## INTEGRATED SKILLS

You will read a text about birdsong and analyze a diagram. You will then hear a short audio related to the topic. There are some questions to help you with language and the main ideas. Finally, you will summarize the points in both texts.

### A CLOSE READING

Read the *Scientific American* text about birdsong and look at the diagram. Complete the summary with a word in each blank.


- 1 Birdsong researchers analyze \_\_\_\_\_ (individual notes) and \_\_\_\_\_ (phrases).
- 2 Research shows that birds don't listen closely to melodies but to \_\_\_\_\_ —in other words, the changes in structure at the \_\_\_\_\_ level.
- 3 The diagram shows three examples of motifs: a \_\_\_\_\_ motif, a motif with one syllable \_\_\_\_\_, and one with all the syllables \_\_\_\_\_.
- 4 Although Zebra Finch song sounds like the same motif repeated over and over, in fact the birds can easily \_\_\_\_\_ between different \_\_\_\_\_.

### B READING ANALYSIS

Work with a partner. How does a bird's perception of birdsong differ from a human's? Think about ...

- 1 the difference between envelope and fine detail.
- 2 how syllables are reversed or shuffled.
- 3 repetitions of "the same" motif.

### C CLOSE LISTENING

 **1 Listen to a podcast about endangered birds. Complete the notes with a word or number in each blank.**

- 1 The Difficult Bird Research Group studies birds that are hard to study, e.g., because they're very \_\_\_\_\_ or \_\_\_\_\_.
- 2 The Regent Honeyeater is critically endangered: there are fewer than \_\_\_\_\_ in the wild today.
- 3 About \_\_\_\_\_% of male honeyeaters sang a variation on their traditional song, and \_\_\_\_\_% sang the songs of different species.
- 4 There are fewer and fewer males that can teach the traditional songs to the next \_\_\_\_\_.
- 5 Ross Crates compares the loss of the honeyeaters' songs to a loss of \_\_\_\_\_ in humans.

### D LISTENING ANALYSIS

Work with a partner. Discuss the questions.

- 1 Why is it a problem if the birds forget their traditional songs?
- 2 What does Ross Crates mean by "a positive feedback toward extinction"?

### E INTEGRATED WRITING

Work with a partner. Summarize the points made in the podcast and the reading text to explain why birdsong is important, how birds perceive it compared to humans, and how birds learn their song. Write between 200 and 275 words.



# 2 Thought

## DISCUSSION POINT

Discuss with a partner.

- 1 Give some examples of things you have already done today that were controlled by different parts of the brain.  
*I cooked breakfast, so the cerebellum controlled my arms while I was cooking. Then ...*
- 2 Do you think your right-brain hemisphere or your left-brain hemisphere is more dominant? Why do you think so?  
*I think I'm more right-brained, because I love music and art, but I'm not so good at math.*



## The Brain's Control Center

**Cerebrum:** controls the five senses, thinking, and emotions

**Cerebellum:** controls muscle movements

**Brainstem:** controls automatic body functions such as breathing, heart rate, and digestion

## The Cerebrum

### Left hemisphere

controls **speech**, **writing**, **comprehension**, and **math**



### Right hemisphere

controls **emotions**, **creativity**, and **the arts**



VIDEO

VIRTUAL REALITY TREATMENT

## BEFORE YOU WATCH

Match the words in bold with the correct definitions.

- |                              |  |
|------------------------------|--|
| 1 <b>compassion</b> (n)      | a a computer-generated environment that is similar to a real environment |
| 2 <b>psychologist</b> (n)    | b a feeling of concern and sympathy for others                           |
| 3 <b>treatment</b> (n)       | c medical care given to a patient  |
| 4 <b>virtual reality</b> (n) | d someone who studies the human mind                                     |

# UNIT AIMS


**READING 1** Understanding ellipsis  
**READING 2** The function of questions  
**ACADEMIC SKILL** Using analogies

**VOCABULARY** Language for comparing and contrasting  
**GRAMMAR** Language for hedging  
**WRITING** Organizing a comparison-contrast essay



An artist's idea of the two sides of your brain

## WHILE YOU WATCH

 Watch the video and choose the correct option for each sentence.

- 1 When you wear the virtual reality suit, **cameras track your movements** / **you cry like a child**.
- 2 You see yourself **becoming** / **comforting** a child.
- 3 Studies show that increased self-compassion can **help prevent** / **cause** mental health problems.
- 4 The virtual reality suit could enable people to **get their treatment at home** / **play more video games at home**.

## AFTER YOU WATCH

Work with a partner. Discuss the questions.

- 1 Why do you think virtual reality treatment works?  
*I think it works because ...*
- 2 Would you like to try the treatment?
- 3 Have you ever tried virtual reality?
- 4 Would you like to learn English using virtual reality?  
*Yes, I think I would because ...*  
*No, I wouldn't because ...*



## CAN MACHINES THINK?

### A VOCABULARY PREVIEW

Choose the correct definition of the words in bold.

- It's easier to translate **concrete** words such as *table* or *tree* than abstract concepts such as *patience* or *happiness*.  
 a something you can see or touch      b a building material
- The other people are **constantly** talking. It's hard for me to get a word in!  
 a quietly      b all the time
- I have a **fascination** with science fiction. I can't stop thinking about machines of the future.  
 a a strong interest      b an extreme difficulty
- The technician didn't know why my laptop stopped working, but she **hypothesized** that it got too hot when I left it in my car all day.  
 a guessed from evidence      b promised a certain result
- Not getting enough sleep can **lead to** poor decision making the next day.  
 a change      b cause
- If you put an ice cube in the sun, the **logical** conclusion is that it will melt.  
 a possible      b reasonable
- I don't think it's a good idea to work and study at the same time, but my brother has a different **point of view**, and always had a part-time job when he was a student.  
 a opinion      b experience
- Before you start working, you need to **sort** all these papers. Put important ones in this folder and throw away any that you don't need.  
 a clean      b organize

### B BEFORE YOU READ

Making predictions

Which of the following can think? Discuss your answers with a partner or group.

- |          |          |              |
|----------|----------|--------------|
| an adult | a dog    | a tree       |
| a baby   | a shrimp | a smartphone |

### C GLOBAL READING

Skimming and scanning

- Scan *Can machines think?* Who were these people or things?  
 Alan Turing      Garry Kasparov      Deep Blue
- The title of the article is a question. Skim the article. Do you think that the author gives the answer to this question?

# Can machines think?

**1** Recent years have seen an explosion in the use of artificial intelligence, or AI, in everything, from self-driving cars to automated customer-service phone calls to facial recognition that unlocks your phone. But our fascination with AI raises some difficult questions. What does “intelligence” really mean? Does it mean our devices and products are thinking? What does it actually mean to *think*?

**2** A dictionary gives us a definition like “to carefully consider facts in order to understand something, make a decision, or solve a problem.” However, this definition only leads to more questions—what does it mean to *consider*? to *solve a problem*? and so on. We already know a computer is able to solve complex mathematical problems, and in fact, faster and with higher accuracy than humans do. But humans and computers don’t arrive at those answers in the same way.

**3** Speed and accuracy of answers do not show the presence of intelligence. A three-year-old child might answer “What is five times six?” slowly or incorrectly, but children certainly possess intelligence. They can very easily get their thoughts together to answer a simple question like, “Do you like apples?” which a machine cannot—at least not truthfully, as a machine cannot taste.

**4** Generally, we consider that machines are not capable of abstract reason, despite how good they are at concrete tasks. That is, a machine cannot answer “What does it mean to be a loyal friend?” or “What is time?” in the same way a human can. A machine is able, however, to access thousands or millions of books and speeches about loyalty, friendship, and time, and create a paragraph that answers those questions. Is this, then, thinking?

**5** In 1950, British mathematician and computer scientist Alan Turing proposed a test to answer this question. According to the Turing Test, if a machine can have a conversation with a human being who cannot tell that it is a machine, then that machine is intelligent. The original Turing Test was set up with two humans and one machine, each in a different location. One human would ask questions, and both the other human and the machine would answer them. Over time, if the questioner could tell that the latter was not alive, then that machine had failed the test.

**6** You have probably experienced something similar if you have ever chatted online with customer service or used a phone menu. As long as you give predictable answers, the machine can answer your questions and give you advice. But if you say or type something simple yet unexpected, the machine cannot handle this in the way a human could. People seeking help are constantly having to ask the machine to find a “representative” or an “agent”—a live human being.

**7** What machines are very good at is quickly sorting through huge amounts of data and finding patterns. It may seem like AI is hypothesizing when in fact it is really calculating percentages and the odds that something might happen. For example, if you often type that you are feeling “pretty good,” eventually your phone will predict the word “good” if you type “pretty,” just because this happens a lot—not because the machine is really thinking. It’s just counting. Logically we know this, yet at the back of our minds is the feeling that the phone possesses some kind of intelligence.

**8** Has a machine ever succeeded at the Turing Test? The answer is “yes,” or “no,” depending on your point of view. Turing himself thought that the game of chess would be a good way to test a machine’s intelligence. The game contains so many possible moves that even a very fast computer would not be able to perform every possible calculation and therefore, to beat a human it would have to be able to think. In 1996, the world chess champion Garry Kasparov played six chess games against Deep Blue, a computer. Kasparov won four out of the six, but in 1997 they played again, and this time Deep Blue succeeded.

**9** Did Deep Blue think? Or did it just process mathematical possibilities very quickly? Some people felt Kasparov had simply played poorly. Still others thought that chess itself was not a good test of intelligence. Despite beating Kasparov at a game, there were far more things Kasparov could do with his intelligence than Deep Blue ever could. Linguist Noam Chomsky famously said that watching a computer beat a human at chess was like watching a bulldozer beat an Olympic athlete at weightlifting.

**10** There have been other reports of machines beating the Turing Test. For example, at a competition at the University of Reading in the UK to mark the 60th anniversary of Turing’s death, a chatbot was able to fool 33% of the judges. Similarly, a crowd of 7,000 people observed a program called Google Duplex make an appointment with a hairdresser by phone, who never guessed they weren’t chatting with a real human. Had they spoken with Google Duplex for an hour or two, though, on a variety of topics, they would undoubtedly have been able to figure it out.

**11** People are working on tests of machine intelligence that are more sophisticated than the Turing Test, and AI itself is getting more sophisticated every year. Whether machines can truly think or not, it is clear that humans will need to develop ways to work with and benefit from their capabilities.





## Understanding ellipsis

**D CLOSE READING**

We use ellipsis to avoid using any unnecessary words within a sentence:

*But if you say or type something simple yet unexpected, the machine cannot handle this in the way a human could.* (the writer uses *could* instead of repeating: *could handle this*).

An ellipsis can also refer back to a previous sentence.

*My parents didn't take many photographs of me when I was a baby. Neither even owned a camera.* (*Neither* instead of: *Neither of my parents*).

Common words and phrases used for ellipsis include *so, too, neither, the former, the latter*, modal verbs, and forms of auxiliary verbs such as *do, have*, and *be*.

If you find ellipsis difficult while reading, check back a few sentences. When you use ellipsis as a writer, be sure that your sentence is still clear, and there aren't other ideas that a reader might think you were referring to.

**Read these sentences from the text. Choose what the underlined ellipsis is referring to.**

- We already know a computer is able to solve complex mathematical problems, and in fact, faster and with higher accuracy than humans do.  
 a know what a computer can do                      b solve complex problems  
 c compute fast and accurately
- They can very easily get their thoughts together to answer simple questions like "Do you like apples?" which a machine cannot—at least not truthfully, as a machine cannot taste.  
 a answer questions      b like apples                      c taste apples
- One human would ask questions, and both the other human and the machine would answer them. Over time, if the questioner could tell that the latter was not alive, then that machine had failed the test.  
 a the questioner      b the other human      c the machine
- Despite beating Kasparov at a game, there were far more things Kasparov could do with his intelligence than Deep Blue ever could.  
 a lose at chess                      b defeat Kasparov      c achieve using intelligence

**E CRITICAL THINKING**

**Work in a group. Discuss the questions.**

- Many people regularly use "smart" devices such as a smartphone. The definition of a smart device is one that "connects to the Internet, a local network, an app, or another device using a wireless connection." Why was the word "smart" used for this function?
- What smart devices have you heard of? Describe their functions. Do you consider those devices to be intelligent?

## ACADEMIC SKILLS

### USING ANALOGIES

An analogy is a kind of comparison. Its goal is to help you understand one idea or situation by comparing it to another one that you are more familiar with.

Some analogies are as simple as a single word. A *web* is a network of threads made by a spider. We make an analogy to this when we talk about the *World Wide Web*. It is not a real web like a spider's web, but we understand that it means a different type of network.

Longer analogies draw comparisons between two different situations. Often they include phrases such as *That's like*, *is like*, or *as ... as*.

*Learning a foreign language is like playing a video game. You can never win, but you can keep losing at a higher level.*

*Trying to explain anything to him is as useless as yelling into the wind.*

Whether an analogy is successful depends on how easy it is to understand, and whether the comparison is really accurate.

**1 Work with a partner. Scan *Can machines think?* and answer the questions.**

- 1 What analogy does the author quote?
- 2 What does it mean?
- 3 How can you say the same thing without using an analogy?

**2 Match the sentence halves to create analogies. One of the sentence halves is not used. Then discuss with a partner what you think the analogies mean.**

- |                                   |   |
|-----------------------------------|---|
| 1 She was as nervous as           | a a car without a steering wheel.         |
| 2 A person without a goal is like | b a computer.                             |
| 3 A smile to a person is like     | c a cat in a room full of rocking chairs. |
| 4 The brain is like               | d a rainy day in the summer.              |
|                                   | e sunshine to a flower.                   |

**3 Work with a partner. Think of analogies to explain the following concepts. Then share your analogies with another pair.**

- 1 the moon
- 2 exercising
- 3 using social media

## EMOTIONAL THINKING

### A VOCABULARY PREVIEW

#### 1 Match the words in bold with the correct definitions.

- |                              |   |
|------------------------------|---|
| 1 <b>anxiety</b> (n)         | a the feeling you experience when you are worried about something         |
| 2 <b>deadline</b> (n)        | b to meet someone or something unexpectedly                               |
| 3 <b>emotions</b> (n)        | c a time by which something has to be done or finished                    |
| 4 <b>encounter</b> (v)       | d a strong feeling that you have done something wrong; a feeling of shame |
| 5 <b>guilt</b> (n)           | e strong feelings   |
| 6 <b>inappropriate</b> (adj) | f not suitable; not proper  |
| 7 <b>rational</b> (adj)      | g based on reasons and facts  |
| 8 <b>strengthen</b> (v)      | h to make something stronger  |

#### 2 Complete the sentences with words from Exercise 1. Change the form if necessary.

- I often feel \_\_\_\_\_ before an important presentation.
- Please don't wear shorts to the office. It's \_\_\_\_\_ for business.
- When you feel angry, it's difficult to make a \_\_\_\_\_ decision.
- It's important to stay calm when you \_\_\_\_\_ problems at work.
- Many interviews now include questions that test candidates' \_\_\_\_\_ intelligence.
- It takes great \_\_\_\_\_ not to take some criticisms personally.
- There's no need to feel \_\_\_\_\_. It wasn't your fault.
- Some people do their best work when faced with tight \_\_\_\_\_.

### B BEFORE YOU READ

Preparing to read

Work in a group. Discuss the questions.

- Do you make decisions more from your head or from your heart?
- Do you trust your "gut feelings"? That is, your instincts? Have you ever had a gut feeling that turned out to be right? How about one that was wrong?

### C GLOBAL READING

Identifying text type

Read *Emotional thinking* and answer the questions.

- Who is the audience for this text, and what is the tone?
- What does the writer use bullets (●) to show? And why?



# *Emotional thinking*

- 1 Is it better to think with your head or your heart? The real question may be—do you have a choice? Even people who pride themselves on being logical, rational thinkers may be more influenced by their emotions than they realize.**
- 2** The reason for that is simple: Emotions are designed to influence behavior. Emotions evaluate a situation and then tell us how to react. When your brain experiences an emotion, it sends a signal to your nervous system, which in turn sends signals to the rest of your body. This is why people refer to a “gut feeling.” Emotions give you this type of information more quickly and with a stronger impact than using your reasoning. They’re designed to help you make decisions quickly, especially in “high stakes” situations, those that are very important or carry some element of risk.
- 3** Emotional responses are often built on past experiences. Have you ever had an unpleasant experience with a bully in school, for example? If you later encounter someone in a business meeting who reminds you of that person, perhaps because he looks similar or exhibits some of the same behavior, you might feel the same emotions you felt as a child, such as fear and anxiety, and be reluctant to interact with that person.
- 4** Popular articles encourage people to “Listen to your gut” and to “Trust your instincts.” The problem is that these emotions won’t always be correct. The person in the business meeting might not be a bully at all, but only share the same hair and eye color or tone of voice. Even though your emotions are telling you the two people are similar, it might not be true.



**5** Emotional thinking has an important impact on the workplace because it influences how people decide what to do. Researchers have found that emotions carry out four key functions in decision making:

- They provide information. Emotions tell you whether an experience or encounter is likely to be positive or negative. Pleasure and displeasure are two emotions that serve this function.
- They improve speed. Because emotions are felt more immediately than logical thought, they result in decisions being made faster. Fear, anger, and hunger are good examples of emotions that produce a rapid response.
- They assess relevance. Emotions such as regret and disappointment that are based on someone's personal history will influence how that person evaluates an event in the present.
- They strengthen commitment to others. Community and personal connection are important in social groups, and emotions such as guilt, love, and empathy guide people to help others in their group.

**6** All of these functions are important on the job; but how good are emotions at carrying them out?

**7** Studies conducted about the implication of emotional thinking in the workplace have found some interesting—and sobering—results. For example, when people feel angry, they are more likely to assume a situation is less risky than it really is, and also to be less willing to admit they have made a mistake. An angry manager might continue to support a failing project because he doesn't want to admit that he was wrong.

**8** When people experience fear, on the other hand, they tend to give up on projects too easily. While anger gives people too much confidence, fear takes too much confidence away.

People feeling sad or depressed were found to be more likely to set low prices for items they were asked to sell. However, they were also more generous toward others.



## GLOSSARY

**response (n)** a reaction

**risky (adj)** involving the possibility of danger, harm, or failure

**9** People who feel happy are less likely to take risks. But even happiness is not all good news. More than one study has found that happy people put more emphasis on the appearance of something than quality. There's a reason why job interviews, when both people laugh and feel relaxed, are more likely to result in the candidate being offered the job.

**10** If even positive feelings can lead to inappropriate decisions, what should a person do? While emotional thinking is inevitable, steps can be taken to add rational thinking as well. As emotional thoughts come more quickly, and yet might not be accurate, build extra time into your decision-making process. Give yourself enough time and opportunity to logically evaluate the situation. You can also force your brain to react impartially, for example, by making a list of advantages and disadvantages of a decision.

**11** Understanding emotional thinking will help you better understand the way other people behave. If you can tell who is approaching a task with anger or fear, you will be better able to predict how they will act.

**12** Nonetheless, the same event or circumstance can cause different emotions in different people. Almost everyone, for instance, feels anxiety or stress while working on projects with a deadline. But for some people, that anxiety begins as soon as the project is assigned. Other people only feel anxious when the deadline is very close. The first person will start working right away, in order to get rid of or lessen the sense of anxiety. But the second won't begin until the deadline is near because the anxiety hasn't been triggered yet. For managers, knowing which type of person each of their employees is will help with time management and choosing which people could work together on a team.

**13** Ideally, you will never have to choose between emotional thinking and rational thinking. To maximize your ability to make good decisions, use both. Give your brain time to interpret the signals your emotions are giving you instead of relying solely on one type of input. Use every resource your body provides, in other words, instead of just some. It's the logical thing to do, and it feels right too.

Recognizing the function of questions

## D CLOSE READING

Questions in a reading text can fulfil a number of different functions.

- **Interest:** Asking a question makes readers interested. They want to know the answer, so they read further. Sometimes a question is asked directly to the reader; this is common in introductions, for instance. The reader answers the question in his or her head, and then feels a connection to the subject.
- **Importance:** Some questions will be directly answered in the text, and it's important for the reader to learn the answer. A question then signals to the reader that this is essential information. If you see a question such as "What are the four stages of culture shock?" then you know it's important that you learn the four stages. Headings are sometimes phrased as questions for this purpose and exam tasks often refer to questions in reading texts.

### 1 Read *Emotional thinking* again. What is the purpose of these questions? Write *Interest* or *Importance*.

- 1 Is it better to think with your head or your heart? \_\_\_\_\_
- 2 The real question may be—do you have a choice? \_\_\_\_\_
- 3 Have you ever had an unpleasant experience with a bully in school, for example? \_\_\_\_\_
- 4 All of these functions are important on the job; but how good are emotions at carrying them out? \_\_\_\_\_
- 5 If even positive feelings can lead to inappropriate decisions, what should a person do? \_\_\_\_\_

### 2 For the questions in Exercise 1 that you marked as *Importance*, write the answers to the questions or discuss them with a partner.

## E CRITICAL THINKING

Work in a group. Discuss the questions.

- 1 What are some reasons that people might have evolved to make emotional decisions more quickly than intellectual decisions?
- 2 What are some examples of decisions that should be made mostly emotionally, mostly intellectually, or equally emotionally and intellectually?

## VOCABULARY DEVELOPMENT

## LANGUAGE FOR COMPARING AND CONTRASTING

## 1 Categorize the words below into the chart.

by the same token   despite   equally   in spite of  
in the same way   on the contrary   similarly   whereas

Words and phrases that compare	Words and phrases that contrast

## 2 Choose the correct word or phrase to complete the sentences.

- I'm a very left-brained person. My brother, **in the same way / on the contrary**, is more right-brained.
- Despite / Whereas** everything we know about the brain, there is still a lot to discover.
- I know I can't always trust my gut feelings. **In spite of this / By the same token**, they play a big part in my decision making.
- Love and empathy are considered positive emotions. **Equally / Despite this**, gratitude and joy enhance a person's life.
- Empathy motivates people to help others. **On the contrary / By the same token**, guilt strengthens commitment to others.
- Anger makes it harder for people to change what they are already doing, **similarly / whereas** fear makes them give up too easily.
- A fearful person is less likely to take risks. **Similarly / On the contrary**, happy people are not risk-takers.
- I sometimes jump into situations without considering all my options. **In the same way / In spite of this**, I sometimes find it hard to slow down and make intellectual decisions.

## ACADEMIC WORDS AND IDIOMS

## 1 Match the words in bold with the correct definitions.

- |  |   |
|--|---|
| 1 <b>abstract</b> (adj)                  | a including many details or aspects of something                          |
| 2 <b>at the back of your mind</b> (id)   | b to prepare to speak or write by organizing ideas in your mind           |
| 3 <b>category</b> (n)                    | c existing as an idea, but not having a physical form                     |
| 4 <b>complex</b> (adj)                   | d to explain or work out the meaning of something                         |
| 5 <b>comprehensive</b> (adj)             | e to get the most benefit from  |
| 6 <b>depressed</b> (adj)                 | f consisting of several different parts; not simple                       |
| 7 <b>device</b> (n)                      | g unwilling; not happy about doing something                              |
| 8 <b>get your thoughts together</b> (id) | h alone; not involving anything or anyone else                            |
| 9 <b>interpret</b> (v)                   | i sad; unhappy  |
| 10 <b>maximize</b> (v)                   | j not thinking about something now, but knowing that it exists or is true |
| 11 <b>reluctant</b> (adj)                | k a machine or piece of equipment that does a particular thing            |
| 12 <b>solely</b> (adv)                   | l a group of things, people, or ideas that have similar qualities         |

## 2 Complete the sentences with words from Exercise 1. Change the form if necessary.

- The rain makes me feel \_\_\_\_\_. I need some sun to cheer me up.
- Hamid is \_\_\_\_\_ responsible for the project. Nobody helps him.
- Do you need some time to \_\_\_\_\_ before you write that report?
- I can't \_\_\_\_\_ the results of the experiment. They make no sense.
- Businesses typically look for ways to \_\_\_\_\_ profits.
- I'm \_\_\_\_\_ to try again. My last attempt cost me a lot of money.
- I tried to forget what she said, but our argument was still \_\_\_\_\_.
- It's a \_\_\_\_\_ guide that tells you everything you need to know.
- Photosynthesis is a very \_\_\_\_\_ process involving multiple steps.
- It's hard to define \_\_\_\_\_ ideas like "truth" and "love."
- There are four main \_\_\_\_\_ of computers: supercomputers, mainframe computers, minicomputers, and personal computers.
- It is not clear if a dishwasher is really a time-saving \_\_\_\_\_: sometimes it is quicker to wash dishes by hand than in the dishwasher.

## 3 Work with a partner. Discuss the questions.

- What would you do if someone who worked for you seemed depressed?
- Some people are reluctant to talk about their emotions and abstract ideas, while others enjoy talking things over with other people and interpreting their feelings. Which type of person are you more like?

## ACADEMIC IDIOMS

## AT THE BACK OF YOUR MIND

We can also use the phrase *at the front of your mind* to describe something that you are thinking about right now. If something is at the front, you're more likely to see or think about it than if it is at the back.



## CRITICAL THINKING

### False analogy

An analogy is an extended comparison that tries to help you understand a new situation by comparing it to a familiar situation. However, you must analyze analogies carefully to make sure they are really comparing two similar situations.

It's crucial for managers to take the emotional intelligence of their employees into account as well as intellectual intelligence when making decisions about staffing and promotions. Ignoring emotional intelligence would be like serving dinner without dessert. Managers should get targeted training in recognizing and developing emotional intelligence.

### 1 Work with a partner. Discuss the questions.

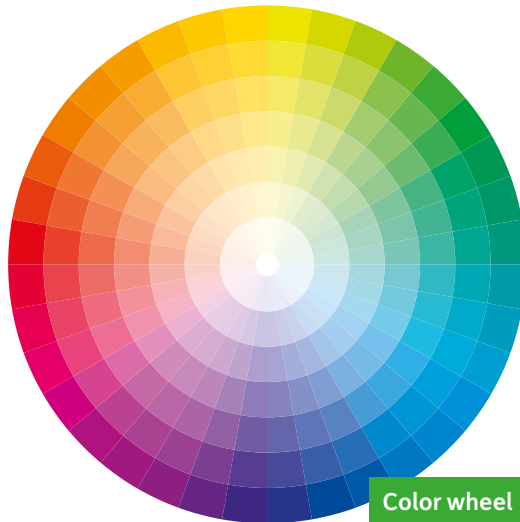
- 1 What is the analogy? That is, what two situations are being compared?
- 2 Do you think the analogy is accurate? Why / why not?

### 2 Evaluate the following analogies. Choose any that you think are sound.

Not taking emotional intelligence into consideration when promoting a worker is like ...

- 1 ☐ creating a basketball team with only short people.
- 2 ☐ making a color wheel with only blue and red, but not yellow.
- 3 ☐ making a cup of coffee, but not adding any milk or cream.
- 4 ☐ reading popular books, but not classic literature.
- 5 ☐ trying to learn how to play the violin without learning how to read music.

### 3 Write your own analogy for the situation in Exercise 2. Then share it with a partner or group. Do they think it is sound?



Color wheel

## WRITING MODEL

You are going to learn about hedging statements to make them more accurate, and organizing a compare-and-contrast essay. You are then going to use these to write an essay about emotional and intellectual intelligence.

### A ANALYZE

Read the essay task. Brainstorm ideas for the two categories.

*“Which has a greater influence on a person’s personality, nature or nurture?”*

Nature	Nurture

### B MODEL

Read the student model and answer the questions.

Is nature or nurture more important in forming someone’s personality? It is tempting to say “both,” but nevertheless I believe that of the two, nurture is more important. We can understand why by examining the areas of family influence and peer influence.

A person is born with certain physical characteristics—eye color, hair color, and height, for example. While I do believe it’s true that children are born with personality traits, like patience, stubbornness, and curiosity, it is their parents and other authority figures who reinforce or discourage these traits. A parent can encourage, discourage, or ignore a child’s behaviors, which will almost always influence how likely a child is to behave in the same way again.

Some people point to the different personalities of twins as proof that nature is more important. They offer examples of two children who were raised in the same house with the same parents, but still developed different personalities. However, in most cases, I believe this, too, is a result of nurture. After all, for the most part, even twins have different teachers, different coaches, different friends, and of course, different experiences. So these different outside influences will have different effects on children, even those who share almost all the same genes. This shows that, for the most part, outside factors have more influence on a person’s personality than what they were born with.

- 1 What was the writer’s answer to the question?
- 2 How many supporting points did the writer give? Where do you find this out?
- 3 Can you predict the order of the body paragraphs from the introduction? How?

## GRAMMAR

**Adverbs for hedging**

Especially when referring to people, it is difficult to make definite statements about what is true 100% of the time. To be more accurate, writers hedge, or modify, the strength of their statements. Here are some hedging devices:

- adverbs such as *probably, maybe, perhaps, likely*
- adverbs such as *some, most, a few, about, approximately, somewhat, predominantly*
- adverbial phrases such as *in some cases, for some people, most of the time, for the most part*

**1 Reorder the words to make sentences.**

- both walk and talk / at an earlier age / than boys / girls / most  
Most \_\_\_\_\_
- sunshine / many / somewhat depressed / the lack of / in the / people feel / winter because of  
Many \_\_\_\_\_
- that the power / people believe / any illness / almost / of thought / can cure / some  
Some \_\_\_\_\_
- the afternoon / for some / middle of / people, thinking / more difficult in the / can be  
For \_\_\_\_\_
- positive thinking / every student / teachers believe that / most / almost / get better results / can help  
Most \_\_\_\_\_
- can be / more logically / taught to / in most / think / cases, people  
In \_\_\_\_\_

**2 Add a hedging adverb or adverbial phrase to the following definite statements. Then compare with a partner.**

- People think better during the day if they eat breakfast.
- Thinking too much at night makes it difficult to sleep.
- Bilingual people have thoughts in one language they don't have in the other.
- Teens develop abstract thinking at age 12.
- Right-brained people are good at playing music.

## WRITING SKILL

You have two possibilities when writing a compare-and-contrast essay.

**Point-by-point:** You write about the first aspect of A, and compare it to B. Then you write about the second aspect of A, and compare it to B. Then you write about the third aspect of A, and compare it to B.

**Block:** You write about all aspects of A. Then you write about all aspects of B.

With either organization, remember to draw a conclusion at the end.

Organizing a compare-and-contrast essay

- 1 Read the model essay on page 41 again. Does it use point-by-point organization or block organization?
- 2 Complete the outline for the model essay.

I Introduction. Thesis statement: \_\_\_\_\_

\_\_\_\_\_

II \_\_\_\_\_

\_\_\_\_\_

A \_\_\_\_\_

\_\_\_\_\_

B \_\_\_\_\_

\_\_\_\_\_

III \_\_\_\_\_

\_\_\_\_\_

A \_\_\_\_\_

\_\_\_\_\_

B \_\_\_\_\_

\_\_\_\_\_

IV Conclusion \_\_\_\_\_

\_\_\_\_\_

## WRITING TASK

You are going to write an essay in response to the following:

*“Which is more important in the workplace: emotional intelligence or intellectual intelligence?”*

---

### Brainstorm

Use a double-columned chart to brainstorm ideas about emotional intelligence and intellectual intelligence in the workplace.

### Plan

Choose which side you support. Decide whether you will use point-by-point organization or block organization. Write a brief outline for your essay.

### Write

Use your brainstorm to help you write your essay. Remember to hedge your statements where appropriate, and to organize your ideas. Your text should be about 250 words long.

### Review

Exchange your essay with a partner. Review the following together:

- Did you clearly answer the question?
- Did you use block or point-by-point organization?
- Did you use any analogies?

### Rewrite and edit

Consider your partner’s comments. Before writing the final draft of your essay, check whether your essay:

- uses hedging devices to modify statements where necessary.
- uses the correct adverbs or adverbial phrases for hedging.
- uses language for comparing and contrasting.



## WORDLIST

\*\*\* very frequent \*\* frequent \* not frequent

### Vocabulary preview

anxiety (n) **	emotions (n) ***	inappropriate (adj) **	rational (adj) **
concrete (adj) **	encounter (v) **	logical (adj) **	sort (v) ***
constantly (adv) **	guilt (n) **	point of view (n) **	strengthen (v) **
deadline (n) *	hypothesize (v)		

### Vocabulary development

by the same token (phr)	equally (adv) ***	in the same way (phr)	similarly (adv) ***
despite (prep) ***	in spite of (phr)	on the contrary (phr)	whereas (conj) ***

### Academic words and idioms

abstract (adj) **	complex (adj) ***	get your thoughts together (id)	reluctant (adj) **
at the back of your mind (id)	comprehensive (adj) **	interpret (v) ***	solely (adv) **
category (n)	depressed (adj) **	maximize (v)	
	device (n) ***		

## ACADEMIC WORDS AND IDIOMS REVIEW

Complete the sentences with the words below.

abstract at the back of my mind complex  
get my thoughts together interpret maximize notion

- I doubt the \_\_\_\_\_ that emotional response is based on experience.
- I don't enjoy playing chess against a computer because it's too hard to \_\_\_\_\_ under pressure.
- This kind of difficult problem is too \_\_\_\_\_ for a child to solve.
- A mature person is someone who can \_\_\_\_\_ their own emotions.
- Children can't think logically about \_\_\_\_\_ or hypothetical ideas.
- I tried to forget the unpleasant experience, but it was always \_\_\_\_\_.
- Emotional thinking won't \_\_\_\_\_ a person's ability to work effectively.

## UNIT REVIEW

Reading 1	<input type="checkbox"/>	I can understand ellipsis.
Reading 2	<input type="checkbox"/>	I can understand the function of questions.
Academic skill	<input type="checkbox"/>	I can recognize and use analogies to explain ideas.
Vocabulary	<input type="checkbox"/>	I can use language for comparing and contrasting.
Grammar	<input type="checkbox"/>	I can use language for hedging.
Writing	<input type="checkbox"/>	I can organize a compare-and-contrast essay.