

# BIG

# SCIENCE

6



WORKBOOK

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# Unit 1

## Design and function



**How can technology  
make our lives easier?**

**1** How does technology help us? Match and write. Also think of your own ideas.



- 1 d Technology helps us travel far.
- 2 \_\_\_ It helps people keep in touch.
- 3 \_\_\_ It helps us do school research.
- 4 \_\_\_ It improves the way our bodies work.
- 5 \_\_\_ Inventions find solutions to problems.

- a Solar batteries make it possible to use electric machines where there is no electricity.
- b Doctors can use special machines to help people who have heart problems.
- c The Internet is a fast source of information.
- d Trains and airplanes take us from one place to another in very little time.
- e Cell phones, tablets, and apps help us keep in contact with friends and family.

**2** Unscramble the words. Use the words to complete the sentences.

1 utcfonin

The function of an object is the job that it has been designed to do.

2 ovtneinin

A new \_\_\_\_\_ is a product that has been made for the first time.

3 nisdeg sorpecs

The \_\_\_\_\_ helps us develop new technologies.

4 pettyroop

A \_\_\_\_\_ is the first model of a product that uses new technology.

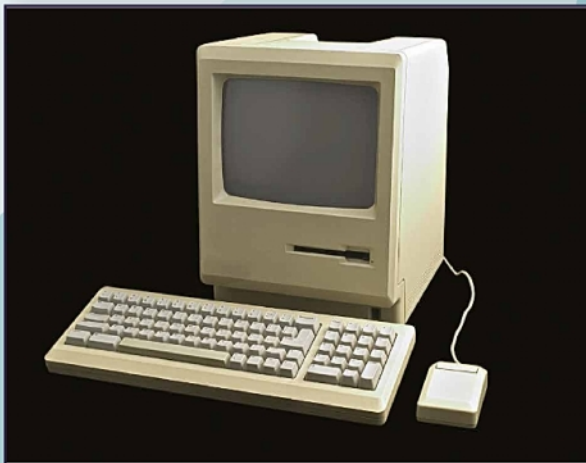
- 3 How do you think computers have changed over the last 30 years? Write.
- 

- 4 Read and write.

design    invention    technology  
 research    solution    function  
~~design process~~

### Reading Tip

To avoid repeating the same words in a text, we can replace nouns with pronouns:  
 the doctor → he/she  
 the scientists → they/them



Over the years, the (1) design process for developing new computers hasn't changed, but the (2) \_\_\_\_\_ has. Thirty years ago, computers were not as easy to use as they are today because people didn't have the technology we have now. The first computers were very big and slow, and they could not do many things. Design engineers did a lot of (3) \_\_\_\_\_ to find new technologies to make them better. The results of their research improved the computers' (4) \_\_\_\_\_ and (5) \_\_\_\_\_. Computers became smaller and faster and could do a lot more things. Still, there was one big problem that needed a (6) \_\_\_\_\_. People had to use their computers at home or at work because they needed electricity. The (7) \_\_\_\_\_ of rechargeable batteries changed all that because now we can take our laptops with us everywhere we go.

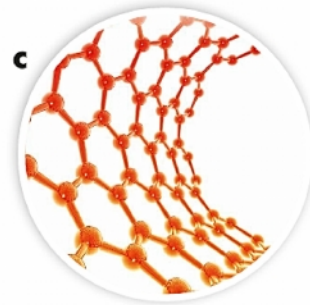
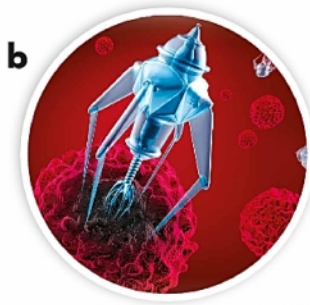
- 5 Look at 4. Circle the pronouns. Write the word they replaced.

1 computers                      2 \_\_\_\_\_  
 3 \_\_\_\_\_                         4 \_\_\_\_\_

## Lesson 1 • How does technology mimic living things?

### 1 Robotic technology mimics living things. Read and circle.

- Which is not a prosthetic limb?  
**a** an artificial arm      **b** an artificial eye      **c** an artificial leg
- What does a sensor system do?  
**a** It helps to control movement in robots.  
**b** It makes robots have feelings.  
**c** It does tasks that are too dangerous for people.
- What is nanotechnology based on?  
**a** Copying the human body.  
**b** Making everything smaller.  
**c** Moving one atom at a time.
- Which is a nanobot?



### 2 Read and match.

- The sensor system in a robot has
  - Prosthetic limbs can be controlled by
  - Scientists want to create tiny robots
  - Some robots are made to mimic
  - Using nanotechnology, scientists hope to design
- called nanobots that can go inside the human body.
  - machines that are only a few atoms big.
  - a similar function as the brain and nervous system in the human body.
  - the muscular and skeletal systems of humans or animals.
  - electrical signals from the brain.

3 What do you think the text in 5 is about? Look at the title and picture.

4 Who has superhuman powers? Scan the text in 5 and circle.

a the police detective

b the scientist

5 A film review. Read and write.

atoms    mimic    sensor system    nanotechnology  
prosthesis limbs    ~~nanobots~~

### FILM REVIEW: Super Cop

*Super Cop* is a science fiction film. A scientist wants to make (1) nanobots that will help sick people. When his best friend, a police detective, gets injured in a car accident, the scientist uses (2) \_\_\_\_\_ to make him well again. He makes nanobots that are only a few (3) \_\_\_\_\_ big. These nanobots have a (4) \_\_\_\_\_ that helps them group together and change function. They can (5) \_\_\_\_\_ any function of the detective's body, and they give him superhuman powers. He can see through objects and is very strong. Also, the detective lost both his legs in the accident. The scientist makes him two (6) \_\_\_\_\_ that help him run at 100km per hour!



6 True or false? Circle T (true) or F (false).

1 The scientist wants to use nanotechnology to help people.

T / F

2 The nanobots can only do one thing.

T / F

3 The police detective has superhuman powers because of the nanobots.

T / F

4 The police detective has prosthetic legs.

T / F

5 The scientist can run at 100 km per hour.

T / F

7 If you could have one superhuman power, what would it be?

8 Underline all the sentences that are joined with *that* in 5 on the previous page.

9 Read and match.

- |   |  |
|---|--|
| 1 Robots can have arms and legs         | a that are sick.                                 |
| 2 Nanotechnology is a science           | b that studies how to create very small objects. |
| 3 Robotic arms can have a sensor system | c that helps them swim fast.                     |
| 4 Nanobots can help people              | d that mimic the function of human limbs.        |
| 5 Fish have a skeletal system           | e that controls the movements of the fingers.    |

10 Prosthetic limbs use robotic technology. Write sentences with *that*.



**Grammar Tip**

Some technologies do tasks **that** are too dangerous for people. Airplanes have parts **that** mimic the tails and wings of birds.

1 These days, there are prosthetic arms and legs. They look like real limbs.

These days, there are prosthetic arms and legs that look like real limbs.

2 Designers use materials. These materials are very light.

\_\_\_\_\_

3 There are a lot of types of prosthetic limbs. They are designed to do different things.

\_\_\_\_\_

4 Modern technology has created prosthetic limbs. People can move them with their brains.

\_\_\_\_\_

5 Some prosthetic legs have mechanisms. They help people walk and run.

\_\_\_\_\_

## Lesson 2 • What is the design process?

1 People use the design process to develop new technologies. Read and match.

- |                      |  |
|----------------------|--|
| 1 design process (n) | a the first model of a product that a designer creates to test if a new technology works |
| 2 prototype (n)      | b the parts of a toothbrush that clean the teeth   |
| 3 plaque (n)         | c a set of steps for developing new products   |
| 4 document (v)       | d to record the details of a process   |
| 5 ensure (v)         | e something that is part of or has to do with a robot                                    |
| 6 bristles (n)       | f a thin, colorless film that can cover teeth  |
| 7 robotic (adj)      | g to make certain  |

2 Read and order from 1–8. Then complete the heading.

The \_\_\_\_\_ process

- a Design and construct a prototype.
- b Communicate results.
- 1 c Do research.
- d Choose one solution.
- e Identify the problem.
- f Evaluate and redesign.
- g Test the prototype.
- h Develop possible solutions.