

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.

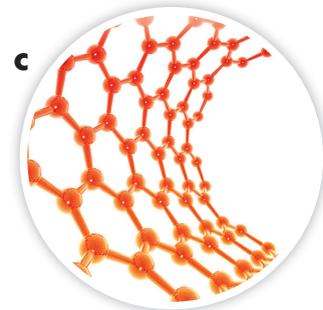
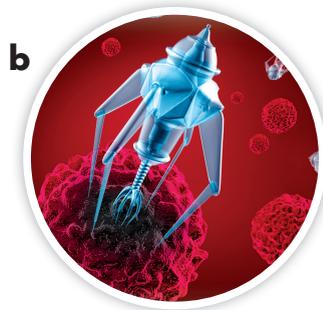
5 Look at 4. Circle the pronouns. Write the word they replaced.

- 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
 prosthetic 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 100 km 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.



3 Imagine you are an engineer designing a new technology. Complete the answers. Write the missing letters.



- 1 Q:** What will you do to test if your design works?
A: I'll build a p r o t o t y p e .
- 2 Q:** How will you remember later what you did at the various stages of the design process?
A: I'll d _ _ _ _ _ my work.
- 3 Q:** What will you create to show other people how the parts of your design are put together?
A: I'll create a g _ _ _ _ _ organizer.
- 4 Q:** How will you evaluate how well the prototype works when you test it?
A: I'll take careful m _ _ _ _ _ .
- 5 Q:** Why will you have to measure everything more than once?
A: To e _ _ _ _ _ that the measurements are c _ _ _ _ _ .

4 Look at 3. Circle the question words.

5 Write *Who*, *What*, *Where*, *Why*, or *How*.

- 1 Q:** where do you test a prototype?
A: In a lab.
- 2 Q:** _____ designs new technologies?
A: A design engineer.
- 3 Q:** _____ do design engineers need to build a prototype?
A: To ensure that their idea works.
- 4 Q:** _____ was the name of the first factory robot?
A: It was called the *Unimate*.
- 5 Q:** _____ did the *Unimate* help in the factory?
A: It picked up and stacked hot metal parts.

Grammar Tip

Who designs new technologies?
How can technology affect our lives?
What is the design process?



6 The design process. Write questions for these answers.

1 Q: develop / new technologies?

Who develops new technologies?

A: Design engineers.

2 Q: design engineers / use / develop robotic arms?

A: A design process.

3 Q: design engineers / sometimes / stop / the development of a prototype?

A: Because the results of the tests are not good.

4 Q: design engineers / learn / from testing the prototype?

A: They learn if the new technology works.

5 Q: design engineers / communicate / results?

A: They send a report of their invention to groups of people.

7 A friend has emailed you about new robots that are going to change the way we think about robots. Write six questions to ask your friend about the robots.

Hi,

Yesterday, I read about some new robots that are made in China. The article was amazing, but also scary! The robots look really odd! They can do amazing things. They will be in the robotics show. Would you like to go and see them?

Bye for now!

Sue

Where _____ ?

Why _____ ?

How _____ ?

What _____ ?

Who _____ ?

When _____ ?