

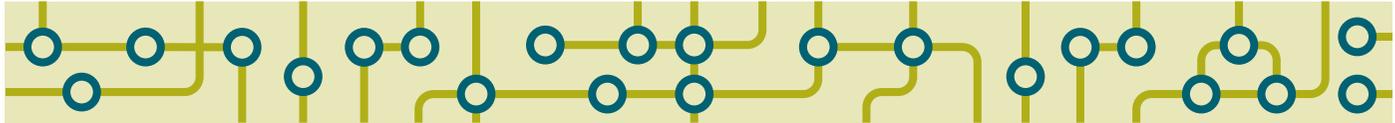


Engineering Challenge

for lower secondary



Name: _____



Discover how everything around you has been developed, designed and made.

Start on Level 5 – Energise

Find the wind turbine blade.

Scotland aims to produce 100% of its electricity from renewable sources by 2020. We need people to work in engineering to make this happen.

What country did the inventor of the first electricity generating wind turbine come from?

How many bulbs did his turbine power?

How many homes can a modern wind turbine power?

Engineers make things more efficient.

Find the Energy at Home display.

Choose one of the objects.

How has it been engineered to be more efficient?

Name two ways of getting power to where it is needed.

1 _____

2 _____

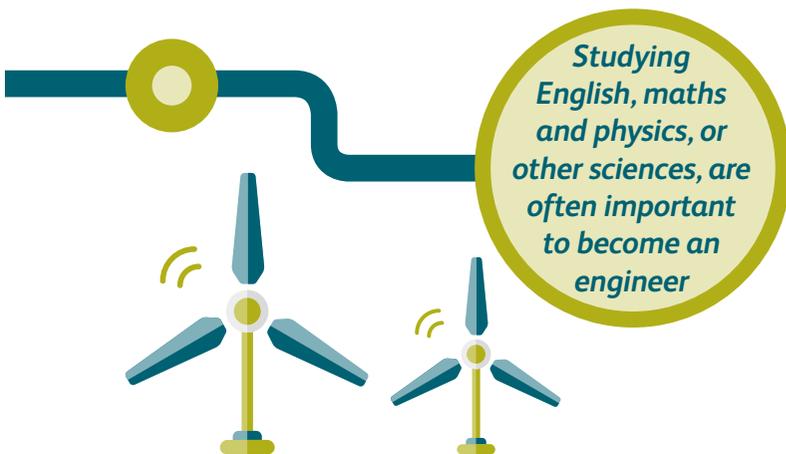
Name one type of engineer involved in this process.

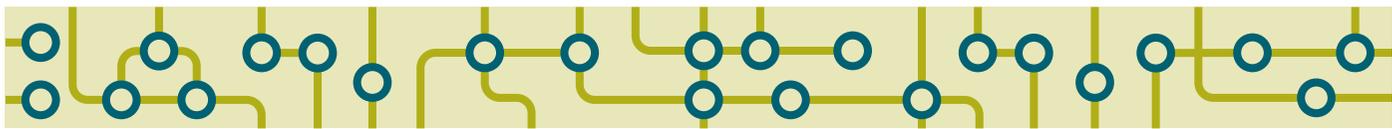
Describe two challenges in generating enough energy for our everyday lives.

1 _____

2 _____

Engineers work to find solutions to these challenges.



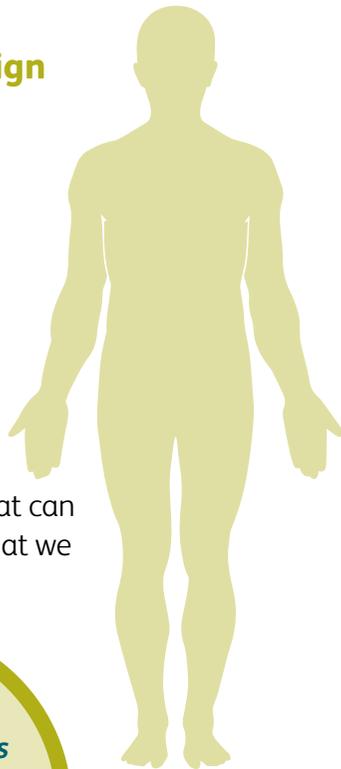


Go to Level 3 – Technology by Design

Find the Engineering humans section

We have been able to engineer replacement parts of the body for centuries.

Look at the exhibits in this section. Highlight four parts of the body that can be replaced by objects that we design and make.



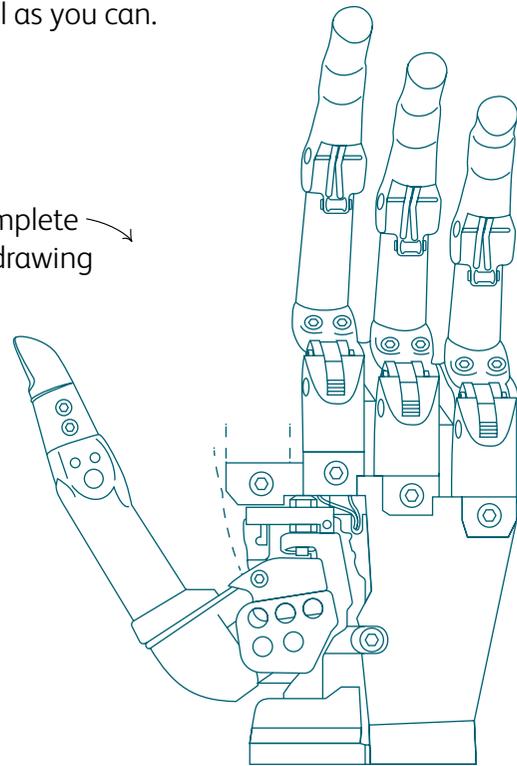
Engineering offers careers in range of sectors including space, aviation, transport, medicine, technology, food, fashion and construction

Find the display of prosthetic arms and hands.

One of the prosthetics, the i-limb, was developed by Touch Bionics, in Livingston near Edinburgh.

Draw the missing finger. Include as much detail as you can.

Complete the drawing



Circle the job titles of the people you think were involved in the design and creation of the i-limb.

Find the display of wheelchairs and watch the film.

What does this display tell you about how engineers have changed the design of the wheelchair?

What inspired Alex to design his own wheelchair?

What skills does he have?

Software Developer

Electrical Engineer

Physiotherapist

Designer

Finance

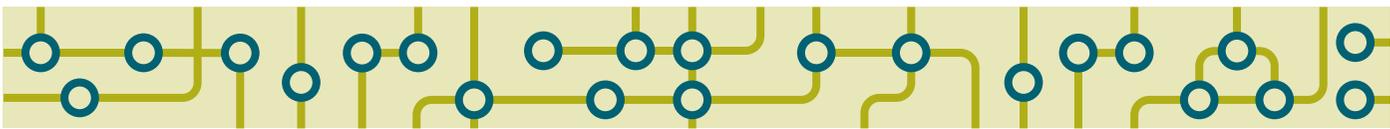
Sales and Marketing

Administrator

Mechanical Engineer

Technician





Go to the Transport section

Find the bicycles.

New technologies developed by engineers have allowed us to travel faster, further and cheaper.

What is the name of the oldest bicycle on the wall?

What is the name of the newest bicycle on the wall?

Can you identify three differences in the ways these two bicycles have been designed?

1

2

3

Find three bicycles suspended above the balcony.

Engineers often learn from mistakes.

Find the Itera bicycle.

What was wrong with the choice of material for this bicycle?

Engineers use new materials developed by scientists in many different ways.

Find the Giant MCR bicycle.

What material is it made from?

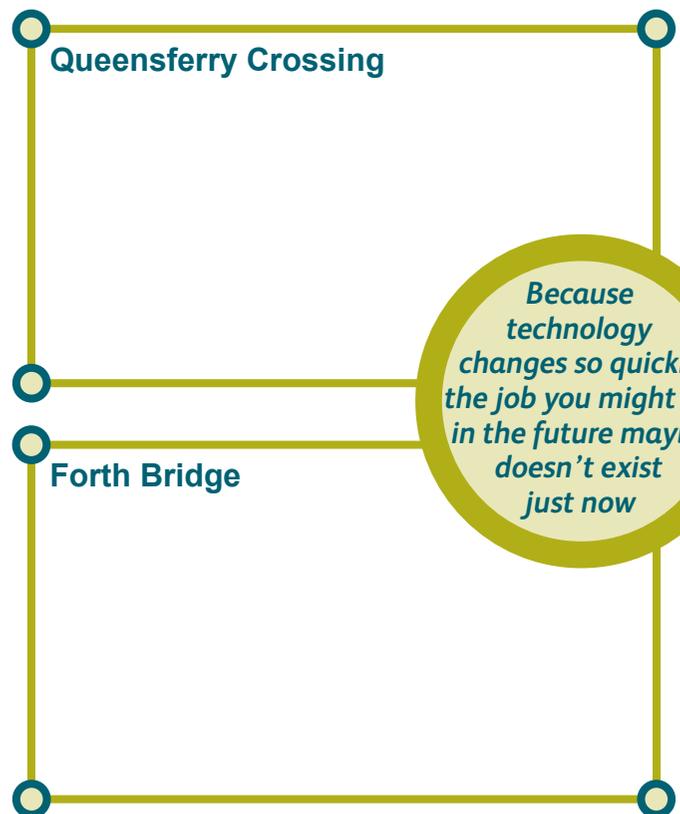
C _____ F _____

Go to the Crossing the Forth section

Engineers design bridges for different purposes and using different techniques.

Compare the model of the Queensferry Crossing with the pictures of the Forth Bridge (Railway).

What shapes can you see in each bridge? Draw three in each box.

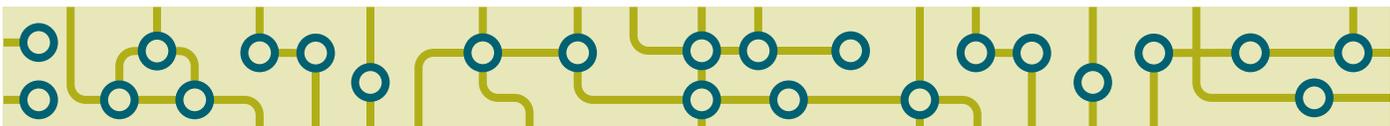


What differences can you see in each bridge design?

Engineering is all about improvement.

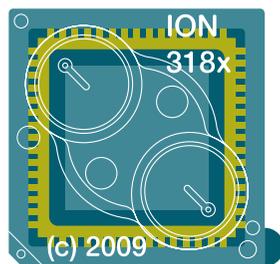
What did engineers of the Forth Bridge (Railway) learn from the Tay Rail Bridge disaster?





Go to Level 1 – Explore

Find the ION chip in the square glass case near Dolly the sheep.



What are they for?

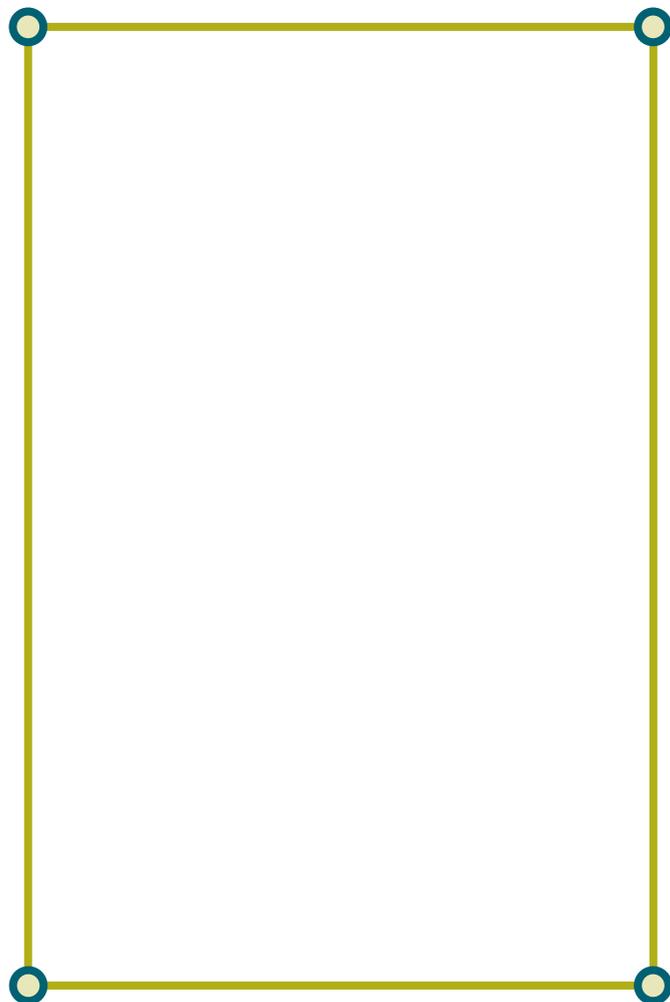
When were they invented?

DNA chips have been engineered to be smaller and smaller.

Think of two other inventions that have been made smaller over the years.

Think of your favourite object you've seen today.

How might you redesign the object to improve it? Illustrate and describe below.



So now you know more about: **Engineering**

Would you like to improve something that exists already or invent something new in the future. There are lots of different types of engineer including civil, chemical, mechanical and electrical.

Find out more at www.myworldofwork.co.uk.

Find out what subjects you need to study at school, what skills you need, how many different jobs there may be in the future and lots more.

An engineering job could suit you if you are a creative problem solver who likes a challenge

