I am an Engineer!

Curiosity

Imagination

Open-mindedness

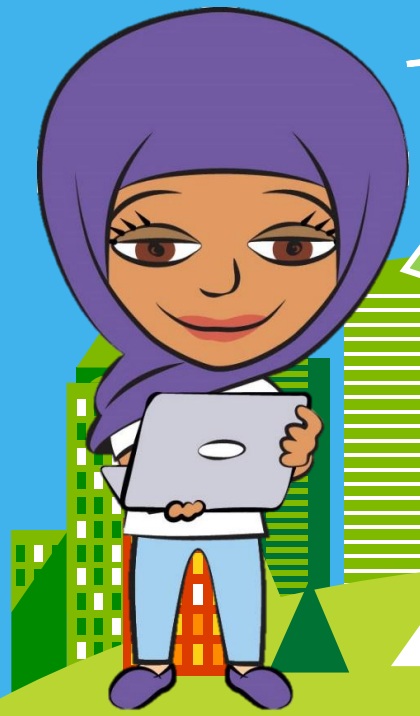
Problem solving

Let's explore engineering together!

What is engineering?

Engineering is an important part of Scotland's heritage and happens all around us. We use its applications every day in our lives, at work, leisure and at home.

Engineers produce creative solutions to real world problems. They are imaginative and curious about how things work and how to make them better for us.



Learning about engineering as a family is fun! If you would like to share your experiences or photos of you having fun as engineers, you can contact us at parentzone@educationscotland.gov.scot

There are many exciting engineering jobs in Scotland and around the world!

Engineering

is

Fun

Hi, I'm Eiliyah and I became an engineer because I want to solve big, real world problems caused by our impact on the environment.

Hello, I'm Mike and I became an engineer because I want to help people in their everyday lives by creating new, useful objects.

Contents

Fun with younger children

Older and Bolder

Amaze your friends!

The workbook is split into sections depending on the age and stage of your child. So look around, find out, ask questions and try things out together and see what happens. Engineering is fun for all the family!

Hello, my name is Bruce and I work in a shipyard in Glasgow.

I am an electronics engineer. That means I work with electronic circuits. You have these circuits in everything electrical in your home from a kettle to a television or smart phone. They are in cars, trains, aeroplanes and ships to make them work too!

I became an engineer because I liked science and technology when I was at school. I was quite good at understanding how things worked and how to make them work better. Do you ever wonder how things work?

My role is dealing with ships navigation and communication equipment. Navigation means making sure ships know where they are going and what is near them. Communication equipment is used to let other ships know where you are.

I need to make sure that the ships know the weather and sea conditions over a wide area. Why do you think this is important?

The ships I am working on are for the Royal Navy. They can be used for defence of our coast and country but they spend most of the time helping with aid and rescue in areas that have been affected by natural disaster. What do you think they will take to people that need aid?

Once the ships I work on are finished my next role will be in finding new engineers to work on future projects.

This is really important as we will always need engineers to make things work and to create new things. Maybe you could be one of these engineers in future!

If you want to watch a video to find out more about this type of engineering go to: The History of Electrical Engineering: Crash Course Engineering #4 on YouTube (https://www.youtube.com/watch?v=3nB1Ntku06w)

Fun with younger children

Make a boat that floats!

Can you help Bruce make a boat that floats?

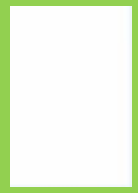
Why not design your own, what would it look like?

What you'll need

- Paper
- Pens/pencils (to decorate)
- Pennies

Instructions:

1. Lay out a rectangular piece of paper. If you have decorated your paper begin with this side facing up. That way it will show on the outside of the boat!



2. Fold the sheet of paper in half from top to bottom to create a horizontal crease in the middle – the blank side of your paper should be visible

3. Fold the top corners in towards the middle so that they meet. Leave about 2 inches of space at the bottom. It should now look like this

4. Fold the flaps at the bottom of the triangle shape up on both sides

5. Pop out the middle to make a hat shape

6. Using your fingers, open the hat shape out even more until it forms a square. Tuck the corners of one flap under the other

7. Fold up the bottom flaps of the square on both sides so you are left with a triangle shape

8. Pull out the middle of the triangle to form a square

9. Pull out the middle of the square

10. Press the shape flat

11. Open out from the bottom to assemble your boat shape

Let's see how well your boat floats by testing it to see how many pennies it will hold. Put your answer here:

Build an indoor fort/den!

What you'll need

Anything you have been allowed to use in your house! This can include:

- Blankets
- Cushions
- Clothes pegs
- Comics/books

- Bed sheets
- Toys
- Friends/family (Invitation only)
- Chairs/sofa/bed to drape the sheets/covers

Instructions: Think about the structure – it needs to be safe and you will want to be able to get inside and out easily!

1. You'll need to drape your covers and sheets over something like a chair.
2. Secure sheets and covers with clothes pegs.
3. Use cushions inside to sit on.
4. Bring your toys, books and comics into the fort.
5. Why not ask your friends and family to join you?
6. Take a picture of your fort and send it to parentzone@educationscotland.gov.scot

Engineers use their imaginations to help them create things. Only using objects you have in your house, can you build a fort or den?

What you'll need

Option 1

- **Blocks, food cans**

Instructions: Build towers of different shapes – tall and thin or with a wide base (like a pyramid) and see which one you can make the tallest and strongest. With the help of an adult write or draw your findings here:

What is the strongest shape for building a tower?

Option 2

- **Jelly beans, cocktail sticks**

Instructions: First try making the following 2D shapes with your cocktail sticks and jelly beans, a square, a triangle and a pentagon. Gently squeeze each shape – which one feels the strongest? Put your answer here:

Now try creating 3D shapes by putting together some of your 2D shapes.
How tall can you build a tower of shapes? Put your answer here:

Try leaving your structure as the jelly bean will solidify and make the structure even stronger!

As an engineer I have to think about how to make things strong. What is the strongest shape for a tower?

Make a recycled bird feeder!

Engineers are good at using everyday materials to make new things. Can you use some of your recycling to make something new?

What you'll need

- Plastic drinks bottles
- Garden wire or string
- Yoghurt pots or milk cartons (make sure they're clean)
- **Bird seed**
- **Scissors**

Instructions:

1. Ask an adult to help you cut a hole in the side of the drinks bottle – this needs to be far enough up the bottle that you can still half fill it with seeds and big enough that a bird can reach inside.
2. Just below the feeding hole make another small hole to push a stick into the bottle – this gives the bird a perch!
3. Ask an adult to help you poke some holes in the bottom of the bottle to let rain out.
4. Use string or wire to make a loop so you can attach your birdfeeder to a tree or washing line.

Note: If the bottle goes mouldy over time, you will need to make a new one!

Want to learn more?
Go to: https://www.rspb.org.uk/fun-and-learning/for-kids/games-and-activities/

What you'll need

Shark infested water game!

Objects that can be safely stood on! This can include:

- Hula hoops (safe area for children to jump into).
- Ropes on the ground in a curve that they have to walk across.
- Long piece of wood that they have to walk across.
- Open cardboard box that they have to crawl through.
- Why not go in teams to pass water balloons or eggs and race to the finish!

Instructions: Adults - Set up an obstacle course with a variety of ways to get across without touching the ground and set the challenge. For added drama – pretend the ground is shark infested waters!

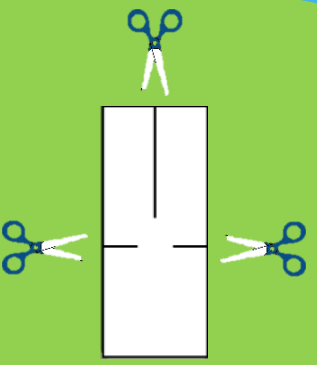
Engineers are good at problem solving – can you work out a way across the obstacles without touching the ground?

What other things could you use in the obstacle course? Put your answer here:

Engineers are often inspired by nature – once you have made this helicopter, have a think about what natural object it is like!

What you'll need

- A4 sheet of paper
- Scissors (with adult supervision)
- Paper clips



Instructions:

1. Take a piece of paper and make three cuts as shown in the illustration. Then fold the paper in on itself at the bottom half – use a paper clip to keep the sides together.
2. Fold the two halves of the remaining paper away from each other, to form the helicopter blades.
3. Stand carefully on a chair and drop your helicopter!

For images and ideas see:
https://www.jamesdysonfoundation.co.uk/content/dam/pdf/JDF_with%20cover%20challenge-cards_DIGITAL.pdf

What natural objects did you come up with? Put your answers here:

Make a paper helicopter!

Imagine if....

If you were an engineer what would you make?

Engineers create things to help solve problems. Step 1 in your design might be to think of a real life problem you want to solve...then step 2 requires imagination and ideas!

Why not share what you create with your family, friends and school? We would also love to see what you have done:

parentzone@educationscotland.gov.scot

Hello, my name is Eilidh and I work for a company that has offices in Scotland and Northern Europe.

I am a civil engineer. Civil engineering is everything you see that's been built around us - roads and railways, schools, offices, hospitals, water and power supply and much more. Have you seen examples of civil engineering projects near you? You might have seen a new road, be in a new school or seen the new Queensferry Crossing.

My role in the company is Team Manager for flooding and water management, this means I lead a team of lots of different people to work on projects to protect homes and towns from flooding.

Some of the people in my team include other civil engineers, geomorphologists who look at rocks in rivers and understand how rivers flow and hydrologists who look at flood risk. We also do different projects with lots of other people in the company including:

- environmental specialists – who look at the impact of our work on animals and plants in their habitats
- landscape architects – who make sure the development is in keeping with the land around it

At the moment I am working on a project to protect people's homes in Glasgow from the risk of flooding from lots of rain. We do this by managing surface water (rain water when it hits the ground). Surface water needs to be able to drain away but our existing pipes can overflow. So we need to design a system to slow down the water by storing it and letting it out slowly into the pipes.

My next projects include: a coastal management study; looking at water pipes that are old and collapsing - how will be build round those to make sure they work in the future? Also in one town; they want the stream that flows through the town centre in a pipe to be turned into an open stream for everyone to enjoy when they visit!

As a civil engineer I have worked on lots of different projects in Scotland and also in Ireland, Australia and United Arab Emirates! I really like that I am always learning and developing new skills in my job! My top tip is always to follow the projects you like and that use your skills and that allow you to develop new skills! I am also a STEM Ambassador which is great as it means I get to share my learning with pupils in school – have you had a STEM Ambassador visit your school?

If you want to watch a video to find out more about this type of engineering go to: Civil Engineering: Crash Course Engineering #2 on You Tube (https://www.youtube.com/watch?v=-xbtnz4wdaA)

Older and bolder

Stop the Floods!

Red Town is in danger of flooding as the Blue River burst its banks!

Can you help by making a structure to divert the water?

What you'll need

- A4 sheet of paper
- Scissors (with adult supervision)
- Items from recycling like paper
- Plastic bottles etc.
- Cardboard tubes/boxes

Instructions:

1. You might want to look at the materials you have and design/sketch out your idea first.
2. Then make a structure using your materials that would carry some of the water away from the river and town. Let's think – to get water to run along this structure it will need to slope…
3. Once you have created your structure you can test it either by using marbles to see if they run down it or take it outside or into the bath and try using water.

If your design does not work first time, try tinkering with it. Engineers do this all the time, they make a prototype and test it and then make improvements and retest!

What you'll need

- Card
- Paint/brush
- Two cocktail sticks
- Scissors
- Basin of water (or bath!)
- Washing up Liquid

Soap Powered Boat!

Instructions:

Step 1: Make the boat

1. Cut a square of card approximately 4x4 cm.
2. Cut a point at one end to make the front of the boat and a small notch out of the back/stern end (this could be a small square or a V-shape – try both out and see what works best).
3. Paint the card to make it waterproof.

The boat is now ready but you can also try adding a sail by taking another square of card and putting a cocktail stick through it and securing it to the boat.

Step 2: Test the boat

1. Float the boat in the water keeping it close to one corner of the basin/bath and pointing it towards the middle.
2. Dip a cocktail stick into the washing up liquid and touch the water's surface in the notch at the back/stern.

This experiment makes use of something called surface tension which is due to invisible forces pulling water molecules together. You can see the effects of surface tension when an insect walks on water…

Engineers are interested in how things work. What do you think has happened? Put your answers here:

What you'll need

- Stick
- Measuring tape

Tallest structure near you!

Engineers need to be able to estimate size of objects. Try these methods to estimate the height of a tree or building

Instructions:

Stick method

1. Use the stick to measure your arm from your shoulder to the tips of your fingers.
2. Hold the stick upright so that the length of stick above your hand is the same as the length of your arm.
3. Turn so that you can see the stick and the tree/building that you want to measure.
4. Close one eye and check to see if the length of stick above your hand looks like it is the same size as the tree/building.
5. If not, move backwards or forwards (carefully) until the length of stick above your hand appears to be the same size as the tree/building.
6. Measure the distance from you to the tree/building. Measure your height.
7. At this spot, the distance from you to the tree/building plus your height equals the height of the tree.

'Upside-down' method

1. Walk away from the tree/building until you estimate that the distance from you to the tree is approximately the same as the height of the tree.
2. To check this, turn so that you are facing away from the tree/building and place your feet about 50cm apart. Then bend down to put your head as close to the ground as you can – it's ok to bend your knees a bit to make this easier.
3. If you are at the right distance from the tree/building you should just be able to see the top of the tree from this angle. If not, carefully shuffle forwards or backwards until the whole tree/building height is just visible.
4. At this point, the distance from you to the tree/building is equal to the height of the tree/building. This distance can then be measured using a tape measure.

Which method was easier? Did they give the same result? Put your answers here:

Survey of Electrical Appliances!

Engineers make lots of things that run on electricity – Can you count how many things you have in your room/home that run on electricity? Put your answer here:

What you'll need

- Paper
- Pencil to record your information

Instructions:

1. Either sketch a plan of your house or put a heading for every room to make lists.
2. Go around and survey each room and note down every electrical item. How many do you have? What are they used for?

I'm very interested in saving energy and electricity. What things in your home could be switched off when not in use to save energy? Are there things you would not want to switch off?

I've been thinking about swings in the park - What affects the height the swing moves to? How can you keep a swing moving? As an engineer I think we need to investigate this!

What you'll need

- String
- Scissors
- mass to put on pendulum (playdough, modelling clay etc. (would all be suitable)
- Ruler or measuring tape

Instructions:

1. Attach the mass to a piece of string.
2. One person holds the mass at the chosen angle making sure the string is taut. The other end of the string should be fixed throughout the investigation (try a door handle).
3. The mass is released and the height it swings to is measured.
4. Repeat using various angles and see if there is a pattern in your results!

Do you think it makes a difference if the mass attached to the pendulum is heavier?

Let's investigate: What might affect how high a swing goes?

Paper Aeroplanes!

Engineers like to adapt and improve designs. Let's try this out!

What you'll need

- A4 paper

Instructions:

1. **Fold the paper in half, lengthwise.** This means folding the two long sides together.
2. **Fold the top corners in to the centre.** Make the fold nice and crisp, using your nail.
3. **Fold the angled edge into the centre.** Take the new angled sides and fold them both in to meet at the centre fold.
4. **Fold along the centre line.** This fold should hide all of the other folds inside.
5. **Fold down the wings. Fold down the two top flaps to make the wings.** These folds will also need to be crisp, so use a hard edge to make the fold (like your nail). Why not colour your plane or write your name on it?
6. **Test fly your airplane**. Start with a gentle throw to see how far your plane glides through the air. Experiment with harder throws to see how high and far your plane will travel.

Having made a basic paper aeroplane; how could you adapt and improve on the design?

Imagine if ....?

What world do you want in 2030? The 17 Sustainable Development Goals or Global Goals have been created to reduce inequality across all aspects of life and to create a world that is fair for everyone and where no-one is left behind.

What actions could you take to help achieve the Global Goals?

What you'll need

- Paper
- Drawing materials

Let's Think:

How old are you going to be in 2030?
What might you be doing in 2030, what job might you have, what would you like to study or how will you spend your time? What aspects of your prospective jobs would relate to the Global Goals e.g. if you wanted to be a teacher what goal would that help you to achieve?

Let's Imagine:

What might a Global Goals country look like in 2030, if the goals are achieved?

Let's Do:

Draw your own vision of what a country would be like in 2030 if the goals are achieved.

Extra Challenge: Identify which goals the images on your maps specifically relate to e.g. if you have drawn solar panels, this would be Goal 7 Affordable and Clean Energy.

Engineers will help countries achieve many of these goals such as developing sustainable cities; affordable & clean energy and clean water & sanitation.

Hello, my name is Makiah and I work for a Biomedical Engineering company in Aberdeen.

Biomedical Engineering or Clinical Engineering

As a Biomedical Engineer you might be designing amazing technology and medical implants which help injured or disabled people enjoy better health and greater independence.

You could work on the equipment used for keyhole surgery, design wheelchairs or create artificial limbs for people with disabilities.

You might develop artificial limbs that attach to a person's tissue and gives them greater control over their movement. Or you might experiment with new materials to make artificial joints, heart valves and hearing implants, which may reduce the chance that the patient's body will reject it.

Working with doctors, you could design equipment for new medical techniques, for example, optical instruments for keyhole surgery or you might also work on creating technology to research disease.

Extracted from https://www.myworldofwork.co.uk/my-career-options/job-profiles/clinical-engineer

If you want to watch a video to find out more about this type of engineering go to: Biomedical & Industrial Engineering: Crash Course Engineering #6 on You Tube (https://www.youtube.com/watch?v=O6lENrRANxY)

Amaze your friends

Invent a robotic aid or prosthetic for humans!

What you'll need

- Paper
- Pencils

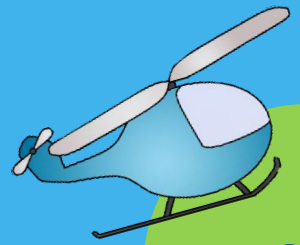
Instructions:

1. Think about your chosen animal – what skill does it have? What is its body structure like?
2. Design an aid to help humans be more like your chosen animal.

Running blades that helped Paralympian's like Jonnie Peacock become a champion runner were inspired by cheetah's legs.

Can you design an aid to help humans have the super skill of an animal?

We have to get food and medicine to a village cut off by mud slides. It will have to be dropped from a helicopter and we need to make sure it gets down safely – can you help?



What you'll need

- One egg
- Various materials for building an egg lander, for example: plastic bags, string, fabric, straws, paper/recyclables.

Instructions:

1. Design a lander for an egg to ensure it does not get broken when it hits the floor.

2. When designing your lander, think about how you can reduce the impact force when the egg lands.

3. If you are testing your lander with a raw egg it would be a good idea to test it outside!

Create and test an egg lander!

Water clocks!

What you'll need

- Plastic cups
- modelling clay (or similar)
- Drawing pins and a timer
- Sticky tape
- Straws
- String

Instructions:

1. A simple water clock is basically two plastic cups fixed one above the other with a hole (made with a drawing pin) in the top cup allowing water to drip through.

2. Try making one of these and adding 200ml of water to the top cup and timing how long it takes to flow through.

Challenge:

1. Create a water clock that times exactly 3 minutes.

2. You can add additional cups and use straws, string and modelling clay to change the rate at which the water flows!

Water clocks are among the most ancient ways of measuring time. Can you find examples from Egypt in the 16th Century and create an accurate water clock?

Many engineers use computers in their everyday work. I've noticed that many people are sitting for too long or not sitting well and getting sore backs. I want to find an engineering solution to help them. Can you help?

What you'll need

- Various chairs in your house
- Drawing materials
- Paper
- Measuring tape

The perfect seat!

Instructions:

1. You'll need a friend for this first bit! Ask someone to sit up straight in a hard chair and hold their arms out as if they are typing on a computer.
2. Measure the height of their hands to the ground. Now swap round – is it the same height for you?
3. Test out other chairs – what type of chair would be best for working at a computer? What height should a desk be to make sure you are sitting up straight? Or should you be standing?
4. Design a chair and desk to help people in the workplace using everything you have learned? Is there any way to add something to encourage people to move about or exercise in the workplace?

Ergonomics is the study of the design of furniture or equipment and the way this affects people's ability to work effectively. For more information about this visit: https://www.myworldofwork.co.uk/my-career-options/job-profiles/ergonomist

Straw rocket challenge!

What you'll need

- Straws
- Paper
- Scissors
- Sticky tape

How far can you make a straw rocket fly?

Instructions:

1. For a basic straw rocket cut out a small rectangle of paper and roll it round your straw so that it fits loosely. Tape the paper together,
2. Then tape one end of the paper together so it is sealed.
3. Put your paper rocket over the straw and blow hard through the straw…how far did your rocket go?

Challenge:

Experiment with some of your variables to see what effect it has on your rocket.

1. Try varying the amount and force of air you blow through the straw. What difference does that make?
2. What happens when you vary the length of the paper tube?
3. What happens when you vary the diameter of the paper tube?
4. Change the shape of your straw rocket by adding wings or a nose cone. What effects do those changes have on the flight of your rocket?
5. Try different weights of paper for your rocket, what happens?

I became interested in engineering when I was younger because I wondered how some birds like an eagle could hover in the air while others like a hummingbird had to flap their wings all the time.

To find out about hovering, let's make a diamond kite!

What you'll need

- Pencil
- Felt tip pen
- Two garden sticks
- Strong plastic carrier bags
- Sticky tape
- String
- Scissors
- Ruler

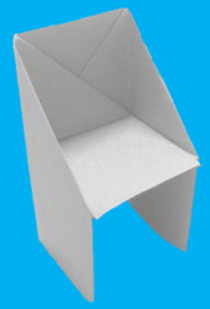
Instructions:

1. Place the two sticks at right angles to each other with the horizontal one a little more than halfway up the vertical stick.
2. Cut about 40cm of string and wind it round the crossing point of the stick a few times and tightly knot it together.
3. Cut open the carrier bags and cut off the handle section to make four sheets of plastic about the same size/shape and stick these together to make one big sheet.
4. Lay the crossed sticks onto the plastic sheet and mark the ends of the sticks using a pen. Using a ruler connect the four points you have marked to make a diamond shape and cut this out.
5. Attach the sticks to the plastic diamond shape securely at the ends using sticky tape. The rest of the plastic bag can be cut into strips to make a tail for the kite by tying them together then attaching to the vertical stick near the bottom of the kite!
6. Make two little holes in the plastic next to the vertical stick, one about halfway from the top of the kite to the crossing point and one about halfway from the bottom of the kite to the crossing point.
7. Cut a piece of string as long as the vertical stick and pass the ends through the holes in the kite, tying the string round the vertical stick (this is called a bridle). The string should be sitting on the opposite side of the plastic from the stick!
8. Now connect the remaining string to this bridle so that when you dangle the kite from the string it lies at an angle with the top pointing slightly upwards. To make a handle wind the rest of the string round a pencil so that you can hold it and let the string in/out as needed.

Make a diamond kite!

What you'll need

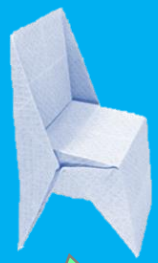
- Old newspapers
- Cardboard boxes
- Paper
- Scissors



Instructions:

1. Write down or sketch some ideas as to how you will make the chair.
2. Think about strong shapes and how you will connect the pieces to make a strong structure – could you weave pieces together?
3. Make your chair and carefully test it out…

If your first design doesn't work, evaluate what went wrong and try again!



Engineers are good at using everyday materials to make new things. Can you use some of your recycled materials to make a chair you can sit on?

Make a chair out of paper or cardboard!

STEM in the workplace

What you'll need

- Access to the Internet either at home or in your local library.

My World of Work is a website that helps you find out more about different kinds of careers. There are some videos of engineers talking about their jobs. Do you know any engineers?

Have a look at https://www.myworldofwork.co.uk/my-career-options/engineering

Instructions:

1. There are 36 different kinds of engineering job listed on this site – pick one that sounds interesting and click on it…There is a lot of information about the job including what it's like and how many people do the job!
2. Look out for the "top skills" – most of the different engineering jobs have got some skills in common…What are they?
3. Let's think about your skills…what would be your list of top skills? If you are not sure try talking to people who know you well. What do they think? Try looking at https://www.myworldofwork.co.uk/my-career-options/what-are-my-skills for help to identify your skills!
4. Ask a friend or family member: What are your top skills and how do you use them in your job?

What kind of skills would help me as an engineer?

How can we find out more about engineering as a job?

Imagine if ...

Like many parts of the world Scotland is made up of the mainland and a number of islands - some large and some small. In many places the villages and towns are built at sea level which means if the sea water level rises they are in danger of flooding.

Imagine if…the sea level rose and some of these islands disappeared. Where would all the people go? How would we build new towns that are protected from the sea?

What you'll need

- Paper
- Drawing and writing materials

Instructions:

1. Either draw a picture showing the new towns or write a story based on this idea.
2. For further inspiration you might like to borrow the book Exodus by Scottish Author Julie Bertagna from your local library.
3. You might also look up information about Kiribati - Lying just two metres above sea level at its highest points, there are predictions that many of the 32 islands in the group could be lost to the sea in the next 50 years.

Hello, my name is Aniya and I work for an aerospace engineering company in Ayrshire.

I am a Mechanical Engineer. Mechanical Engineering is one of the broadest disciplines in engineering, and covers applications that include transportation, power production, engines, space systems, materials, biomedical devices and even food and drink. Mechanical engineers often work closely with engineers from other disciplines, and any moving device has probably involved a mechanical engineer at some point during its development and production.

I became an engineer as I was interested in science and mathematics, and was keen to apply the knowledge from these subjects to real applications and understand how things work.

My role as a mechanical engineer has been to work on the development and design of jet engines for large passenger aircraft. This involved understanding how the air moves past the rotating turbine and compressor blades inside the engine, to make sure the power output from the engine is maximised and is generated as efficiently as possible. One of the big challenges is the very high temperatures the turbine is operating at, hot enough to melt the metal the turbines are made from! An important and challenging part of the design is to make sure that enough protective cooling is provided for the turbines to make sure the engine does not fail. Working successfully in this role requires good collaboration with a wide range of other engineers and experts in other subjects such as materials, structural design, aerodynamicists and stress loading.

The broad nature of mechanical engineering allows for a varied career, and expertise in particular subjects such as aerodynamics mean skills can be used for different applications. For example, as well as jet engines, I have also worked on the aerodynamic design of large suspension bridges and for tall buildings in an urban environment. One of the big positives of being a mechanical engineer is that opportunities arise to use your skills on knowledge for a wide range of applications meaning there is always the opportunity to learn something new.

Try are think when you are out and about, or even at home, how many things a Mechanical Engineer might have worked on – you will be surprised how much of everyday life it involves.

If you want to watch a video to find out more about this type of engineering go to: What Is A Mechanical Engineer? - An Introduction by the Institution of Mechanical Engineers on You Tube (https://www.youtube.com/watch?time_continue=11&v=JhzjIPvWG7Y)


Now you are an engineer!
pattern finding
!
having fun
team working
model making
?
adapting
imagining
creating
investigating
Let's keep exploring together!

Want to learn more?

Parentzone Scotland
https://education.gov.scot/parentzone/learning-in-scotland/Curriculum-areas

Royal Academy of Engineering
https://www.thisisengineering.org.uk/

You Tube
https://www.youtube.com/channel/UCX6b17PVsYBQ0ip5gyeme-Q

Civil Engineering information
https://www.theforthbridges.org/queensferry-crossing/
https://blogs.glowscotland.org.uk/glowblogs/academy9/

Institute of Civil Engineers (ICE)
https://www.ice.org.uk/about-ice/near-you/uk/scotland

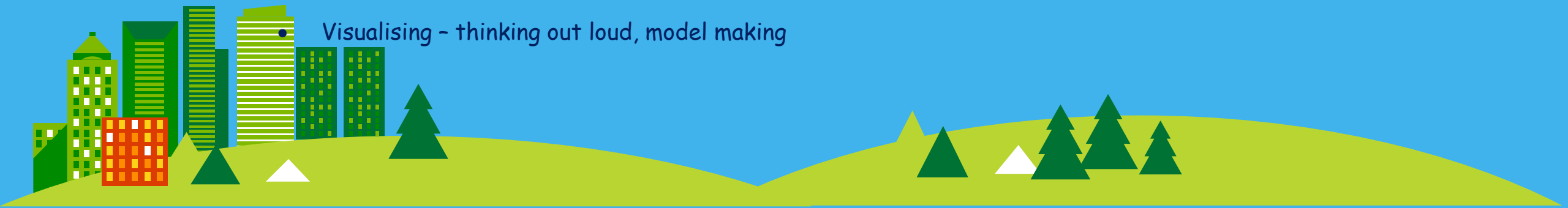
BBC Schools – Science
http://www.bbc.co.uk/schools//scienceclips/

My World of Work
https://www.myworldofwork.co.uk/
https://www.myworldofwork.co.uk/my-career-options/engineering

World's Largest Lesson
http://worldslargestlesson.globalgoals.org/the-global-goals/

Glossary

- Adapting – critical thinking, changing
- Civil, mechanical, electrical and chemical are four traditional branches of engineering. There are now many more types of engineering and the skills overlap – to find out more about these go to https://www.thisisengineering.org.uk/ and meet the engineers!
- Creative problem solving – generating ideas, team-working
- Engineers solve problems. They use their STEM skills to figure out the best way to create new things or to improve a product.
- Engineering habits of mind – the habits or skills that engineers have. The core engineering mind is all about making "things" that work and making "things" work better. The engineering habits of mind include: visualising, creative problem solving, problem-finding, adapting, systems thinking and improving.
- Improving – experimenting, evaluating and trying again
- Problem-finding – investigating, checking
- STEM - a curriculum based on the idea of educating students in four specific disciplines — science, technology, engineering and mathematics
- Systems thinking – connecting, pattern-making
- Visualising – thinking out loud, model making




Thank you to..
Family Learning Aberdeen
Families from Westpark Primary School
Families from Bramble Brae Primary School
Families from Manor Park Primary School
Engineers from across Scotland for sharing their stories
Families from Quarryhill Primary School
User Experience Architects at Microsoft UK Limited