

**ACTIVITY
BOOK**
3-7 YEARS

Let's do

Engineering

Stickers

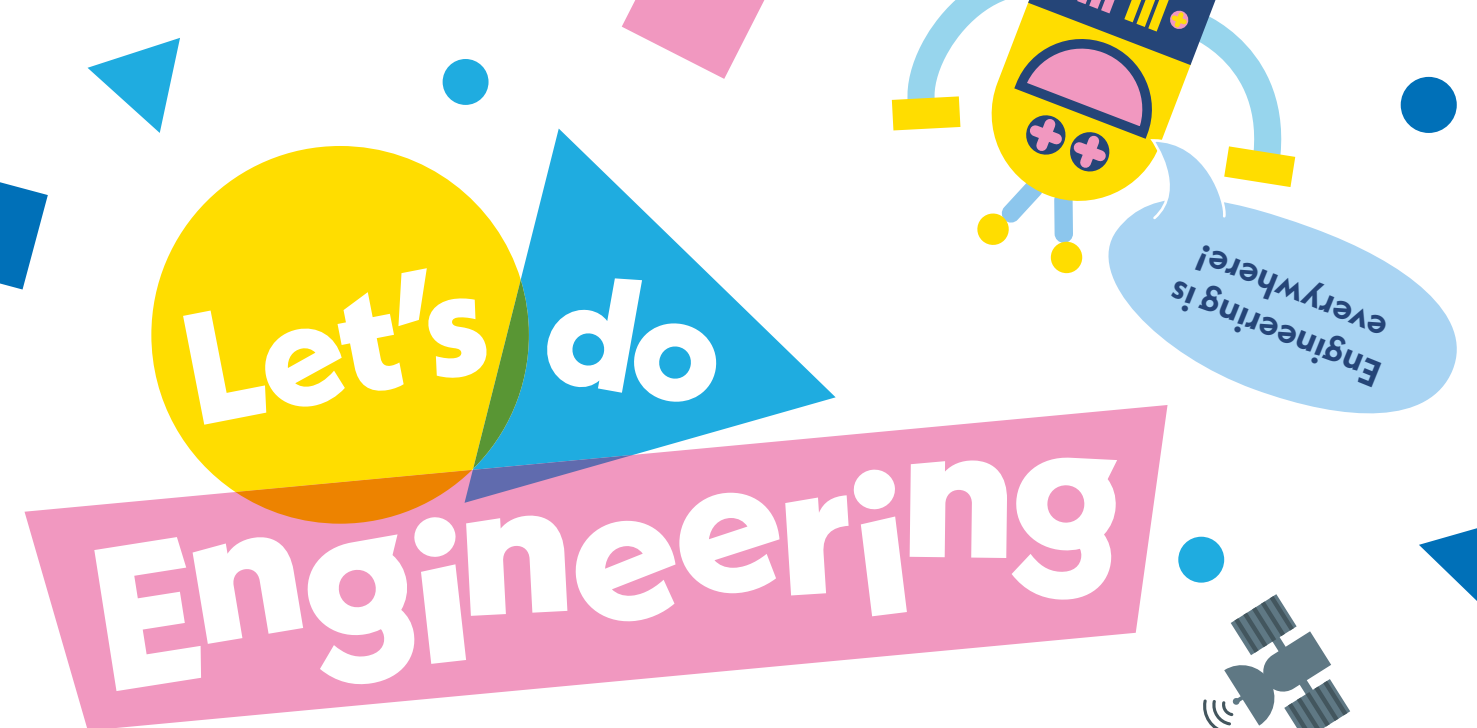
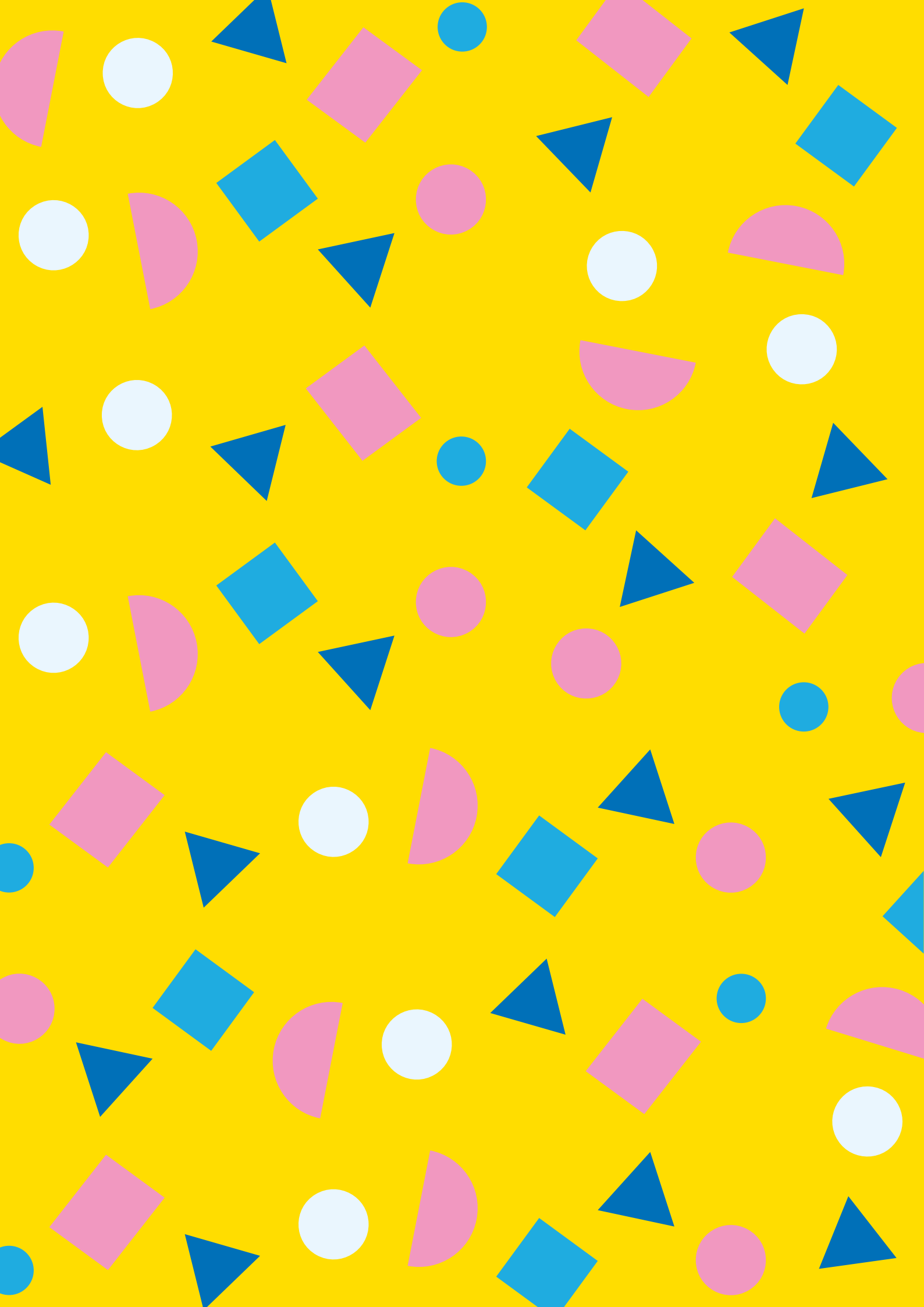
Puzzles

Drawing

Comics

Colouring

This book belongs to:



Hey Kids! In this book you'll meet 20 Amazing Engineers who all need your help.

You'll help these engineers explore the world; from the depths of the sea to outer space, from our blood to our brains, from things too small to see to gigantic constructions, like wind turbines or super tall buildings.

With your help the engineers can create a happier and healthier planet for everyone. Are you up for the challenge?

What does an Engineer do?

Engineers apply creativity and problem solving to try to improve our lives. Everything we use, from the clothes we wear, to the food we eat and the toys we play with, somewhere within the design, production or delivery an engineer has been involved.

For activity ideas and more info on our Engineers please visit: letsdoengineering.com



Editor Helen Bridle.

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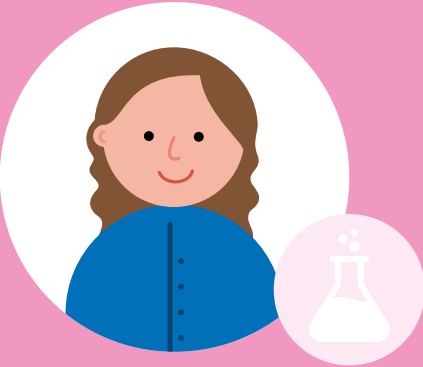


Engineering and
Physical Sciences
Research Council



nustem

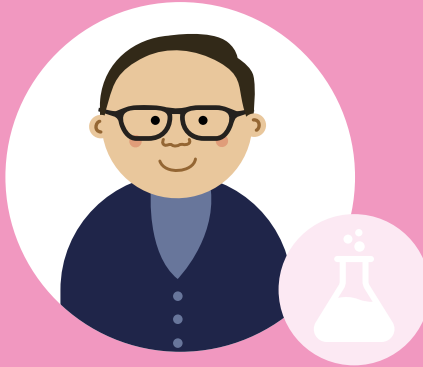
Chemical Engineers



Irene
My work focuses on making water safe to drink. I love engineering as I can help create a better world.
Page 8



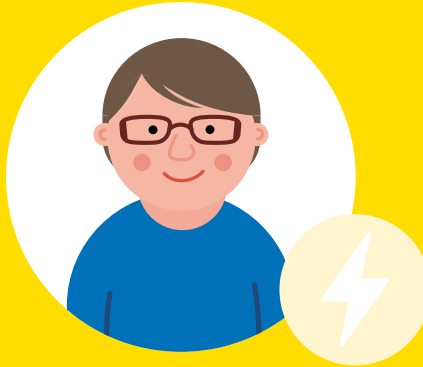
Farnaz
I use plants and algae to make different coloured chemicals. I love engineering as I enjoy solving problems and learning new things.
Page 10



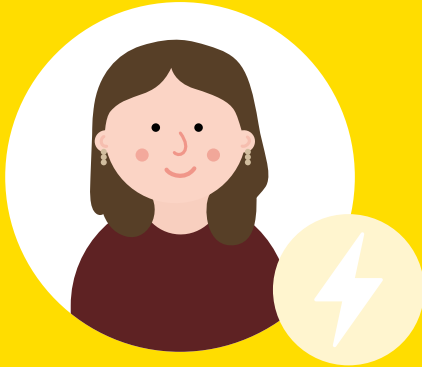
Denny
I love working with water, slime, oil and other chemicals. I love engineering as it is a way for me to apply what I know to help other people.
Page 12



Electrical Engineers



Allison
I make sure our supply of electricity is reliable. I love engineering as I get to solve tricky problems to help save the world.
Page 22



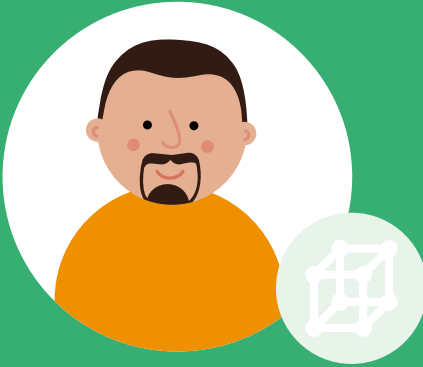
Sarah
I help keep pilots safe when flying. My enthusiasm for engineering comes from the fact that it allows me to be part of creating a more interesting future.
Page 26

Meet our Engineers

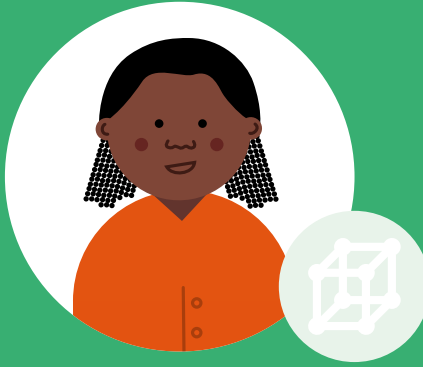
Story Time

- A Very Happy Green House**
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- Wonderful Amy**
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- Peter and the Pump**
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- Bouncer's Birthday**
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- Rose and Drop**
Page 54

Civil Engineers

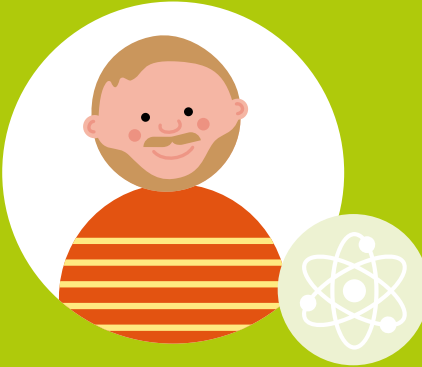


Moh
I test soil so people know how to build on top of it. There are so many different types of soil, rocks and buildings and I love the variety in engineering.
Page 14

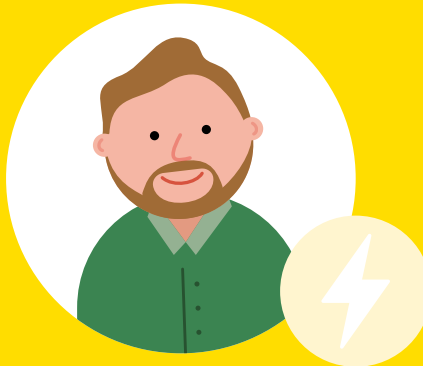


Fionah
I'm fascinated by built structures, both historical and modern. I hope to use my analytical skills to design sustainable structures, like roads, bridges, towers and dams, to last for years and years.
Page 18

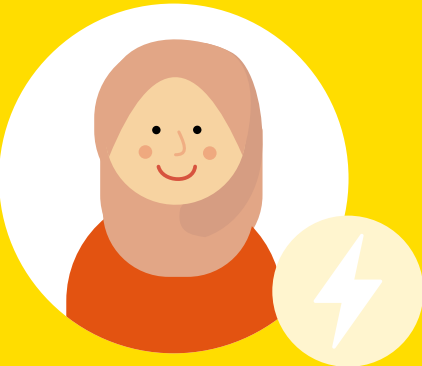
Quantum Engineer



Christiaan
I design different coloured crystals, understanding how the colour is created at a minuscule level. My ideas often fail several times but being persistent and learning from mistakes is a great way to progress.
Page 20

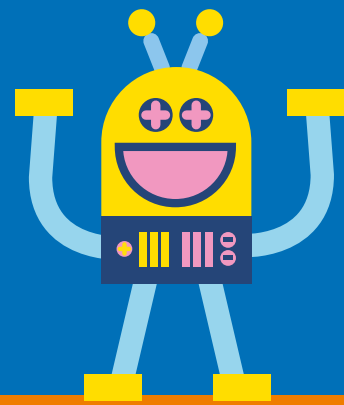


Paul
I learn from the human brain to make computers smarter. Engineering is amazing at making so much of our everyday life safer, easier and more fun.
Page 28

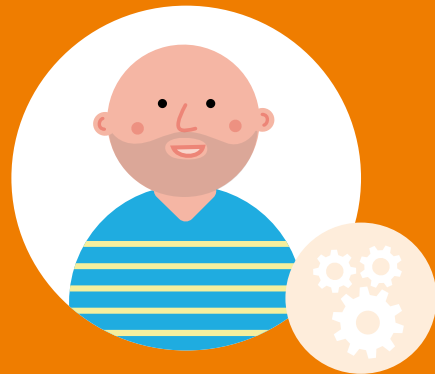


Salma
I'm really curious about new technology and I love finding out about new engineering discoveries.
Page 30





Mechanical Engineers



Uwe

I check to see how strong coral reefs and bones are, and work out how to fix them. What I love about engineering is the creation of something new.

Page 32



Doug

I think of myself as a doctor for pumps, fixing them up so they keep working. I love how I have been able to work all around the world on an exciting variety of different projects.

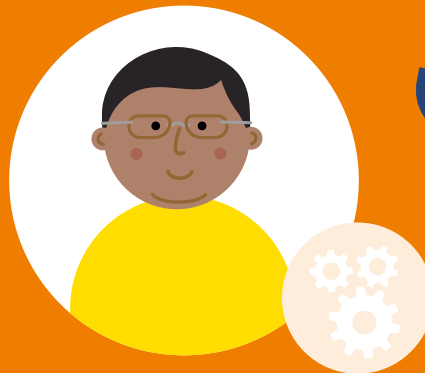
Page 34



Jinglang

I clean up rubbish in space. This requires me to be very precise, picking out the space debris from working satellites. I love engineering because I like making new things.

Page 36



Faisal

I like to explore different materials. I love working with others and testing different ideas to come up with the best solutions to engineering challenges.

Page 38

Aerospace Engineer



Adah

I love flying and I love engineering for the creativity involved to come up with new designs.

Page 42

Software Engineers



Sara

I'm on a mission to see if anybody lives on other planets. Being part of a space mission is amazing and that is why I love engineering.

Page 44

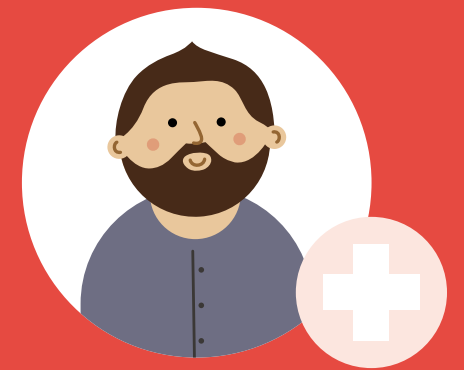


Emilyann

I design robots to help people stay healthy. I love engineering as I get to help people and play with robots!

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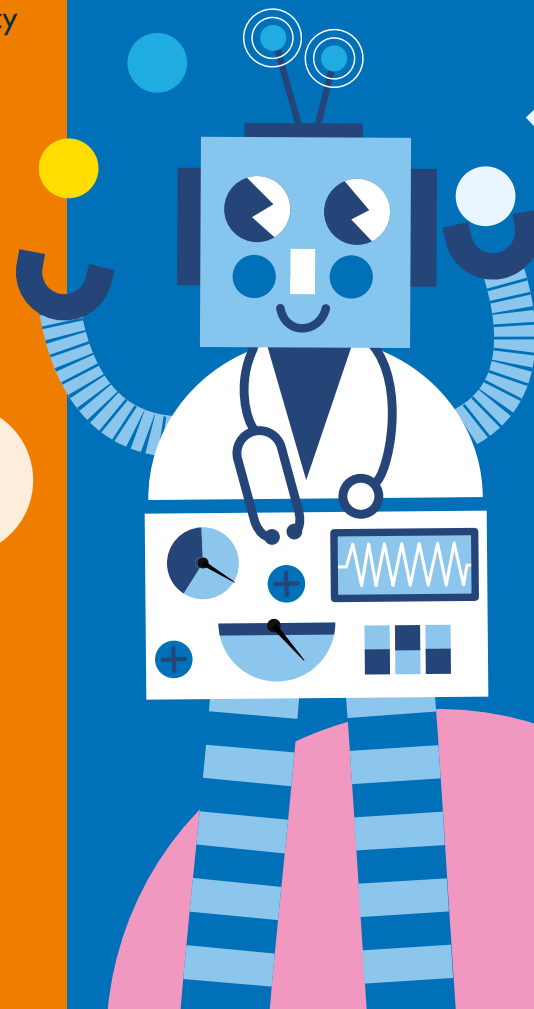
Biomedical Engineer



Ameya

I help people stay healthy. I design blood tests to see if people are ill. I love engineering as I like to solve problems and make a difference to the people around me.

Page 48



Quality Engineer



Diane

I love solving problems. I love engineering as everyday at work is different and it is so satisfying to solve problems.

Page 50

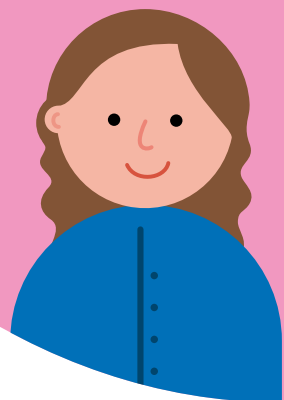
Acoustical Engineer



Antonio

I make drones sound less noisy. I love engineering because it allows me to improve people's lives. Making less noise is tricky so we need lots of different skills and I enjoy working in a team with different engineers.

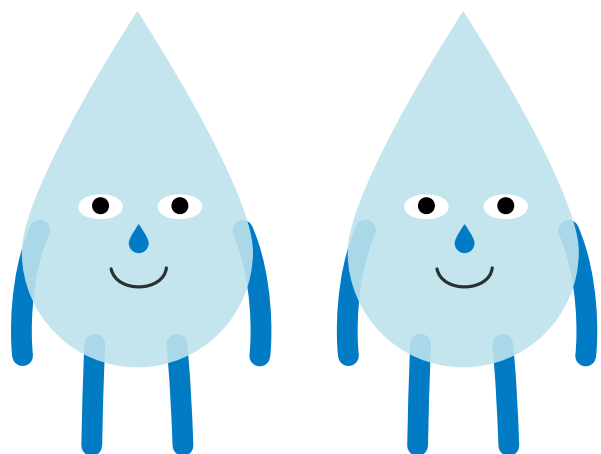
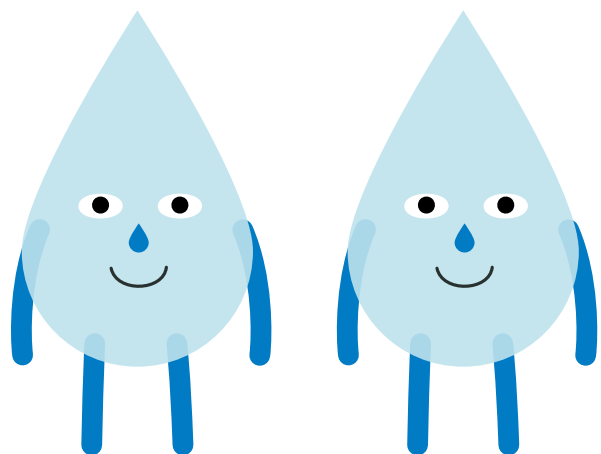
Page 52



Irene
Chemical
Engineer

Drop's new hairstyle

Rose helped Drop get all clean and fresh.
Can you help drop by drawing him some
new hairstyles?



Go to page 54 to see the
story of Rose and Drop



Clean drinking water

Help Irene find the tap that is safe
to drink from. Write the number
of the tap below.

Tap =



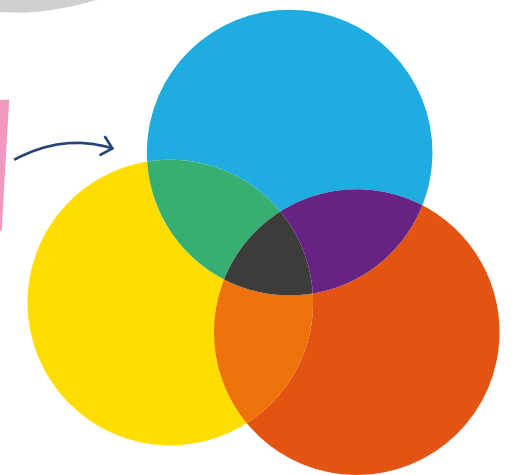
Farnaz
Chemical
Engineer

Algae colours!

- Farnaz uses algae to make different colours.
• The colours can be used to colour shampoo, vitamins and even ice cream.



Tip: use this colour chart to help!



Mixing colours

Farnaz wants to mix some new colours, but can't remember how. Fill in the blanks to show what colours she can make.

blue	+	yellow	=	
blue	+	red	=	
yellow	+	red	=	

Counting algae

Help Farnaz count how many algae plants she has of each colour.
Can you write how many there are?



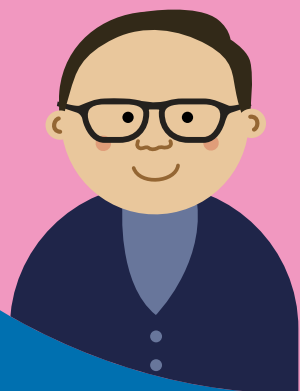
Red algae



Blue algae



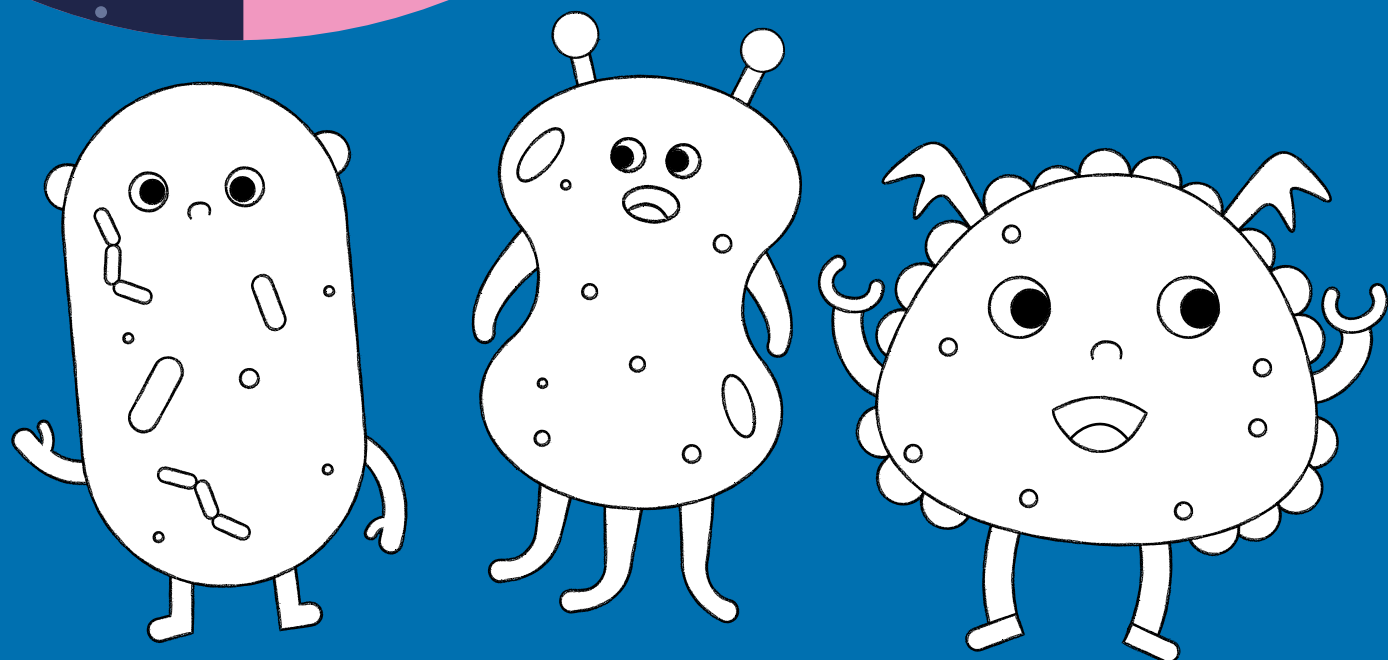
Yellow algae



Denny
Chemical
Engineer

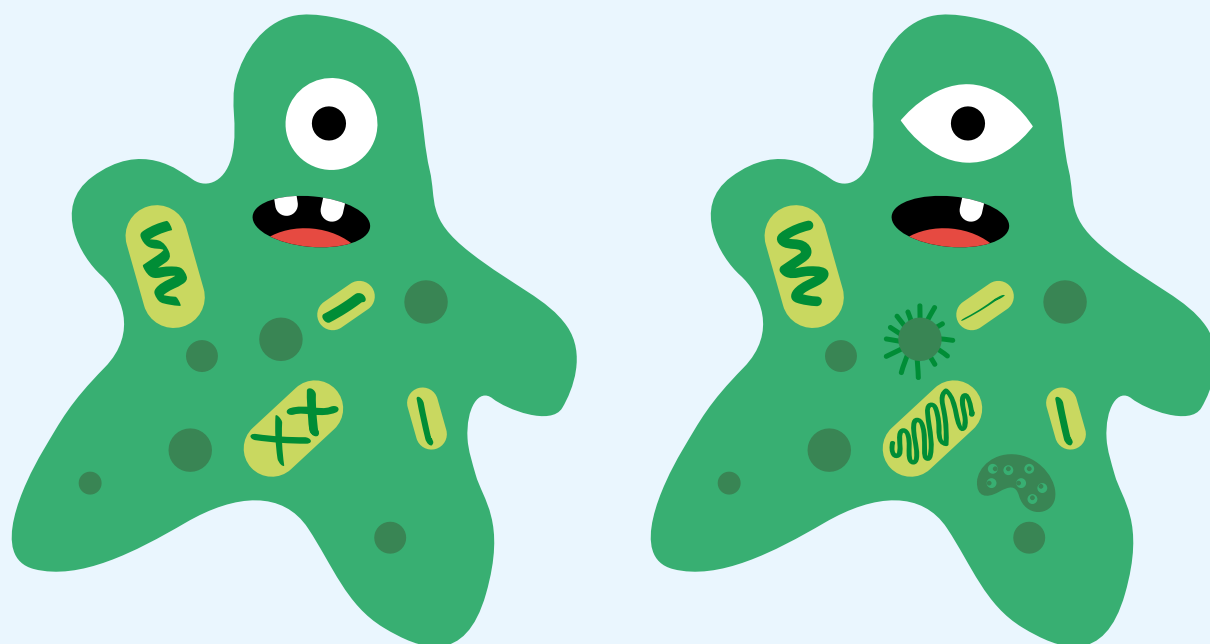
Colour me in

Denny's filter catches bacteria and germs and removes them from the water. Can you help Denny colour these germs in?



Spot the difference

Spot and circle the 6 differences between these bacteria.



Filter fun

Guide the water through the filter to remove all the germs and bacteria.



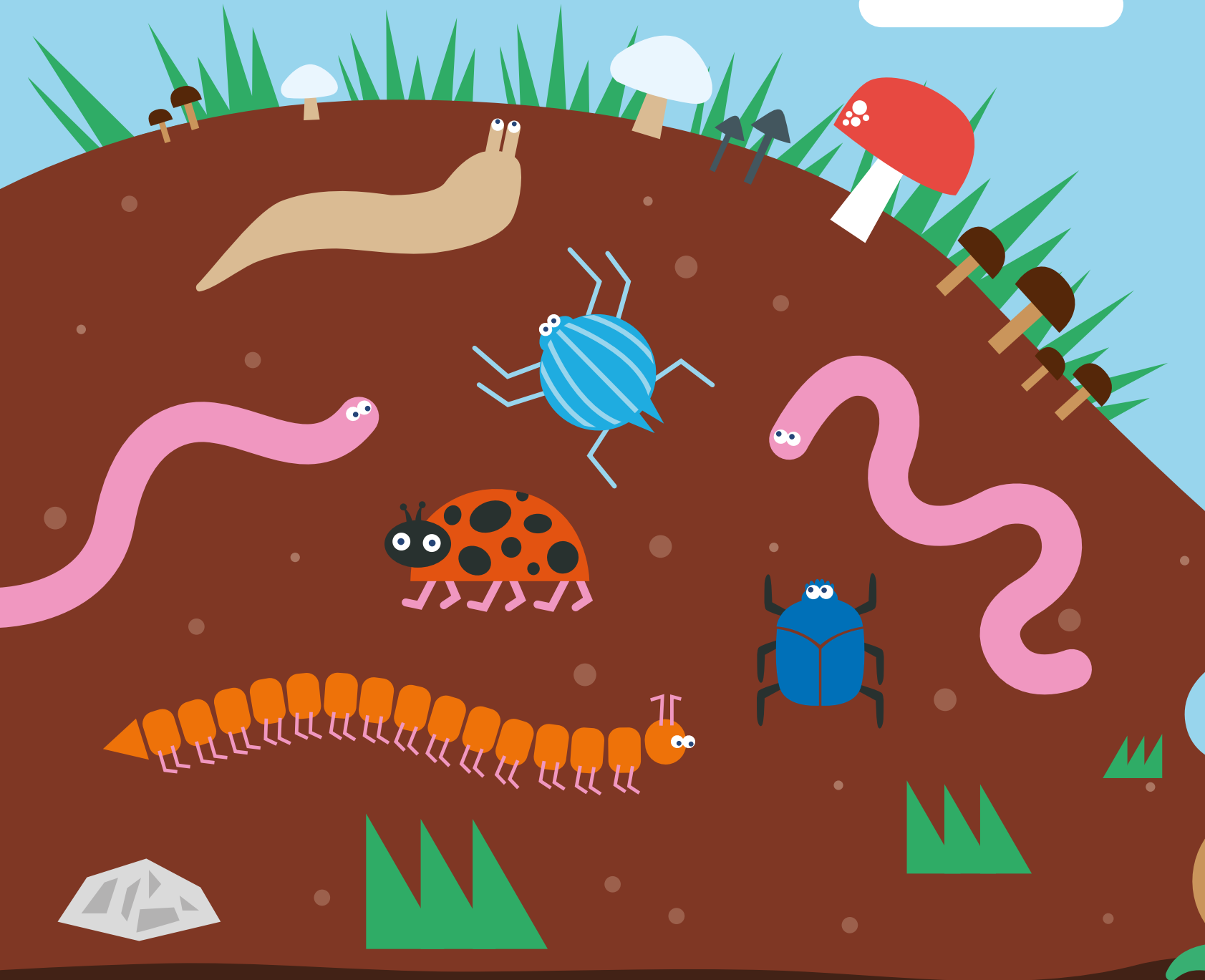


Moh

Civil Engineer

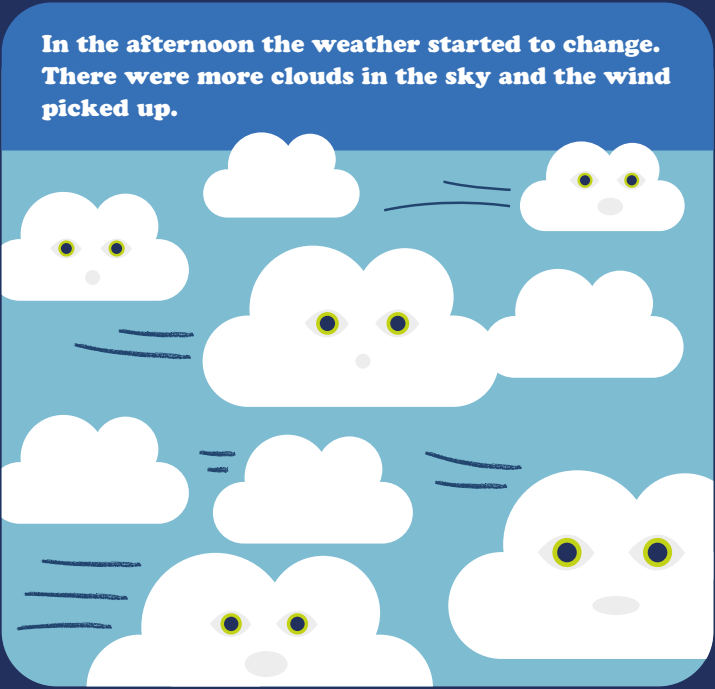
Soil
friends!

Moh has tested the soil and the area below is safe to build on.
Draw in the space below something you would love to build!



Can't think?
What about a bridge,
a castle or a sculpture?







Fionah
Civil Engineer

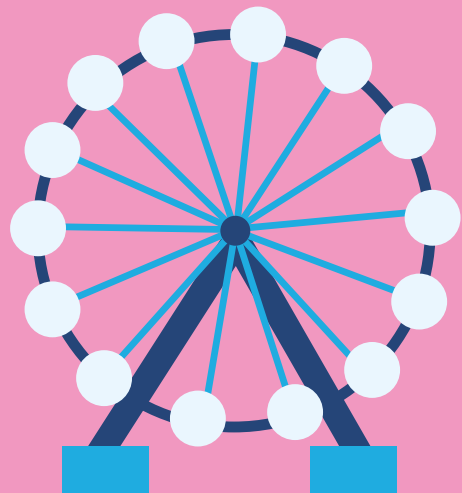
Amazing buildings

How many windows and doors can you count on these houses?

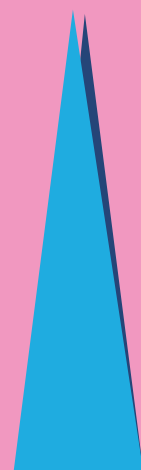
doors =

windows =

What shapes can you spot on these famous London buildings?



London Eye

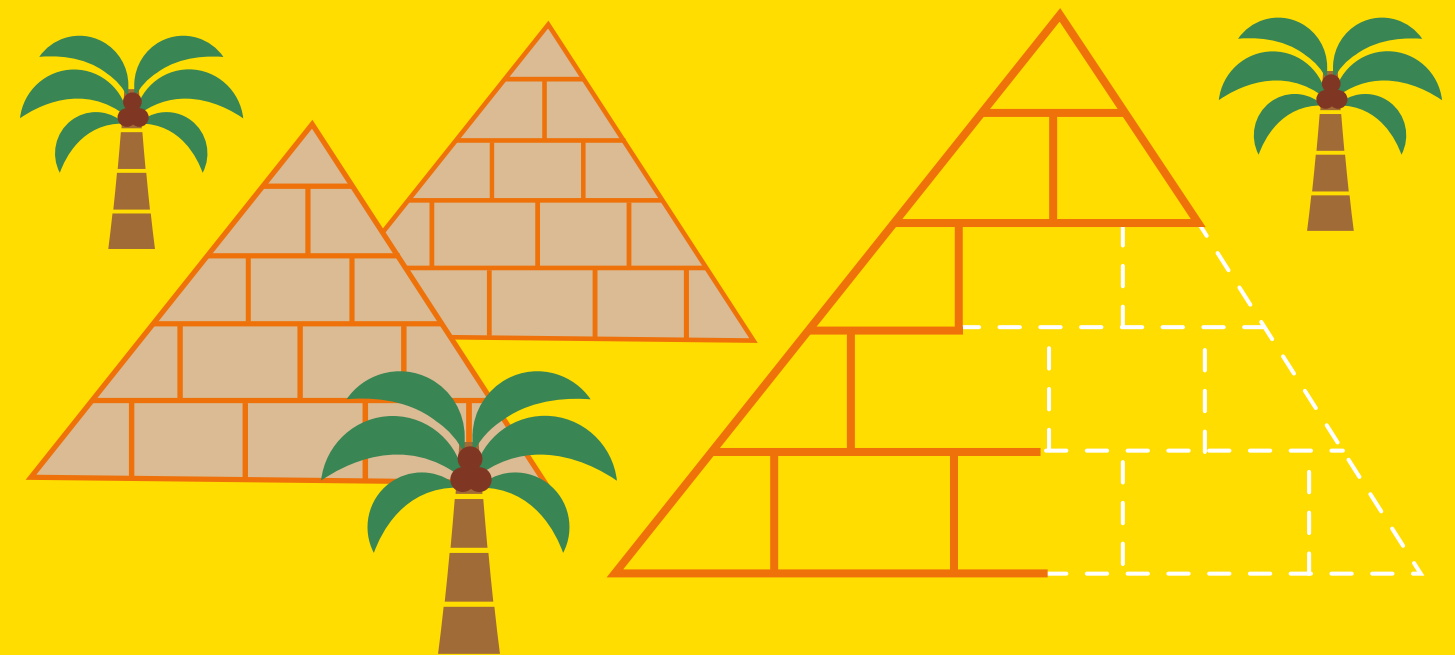


The Shard



St Paul's Cathedral

The pyramids of Egypt need finishing off.
Draw over the dashed lines to complete the blocks!



Can you draw a bridge so the walkers can cross the river?





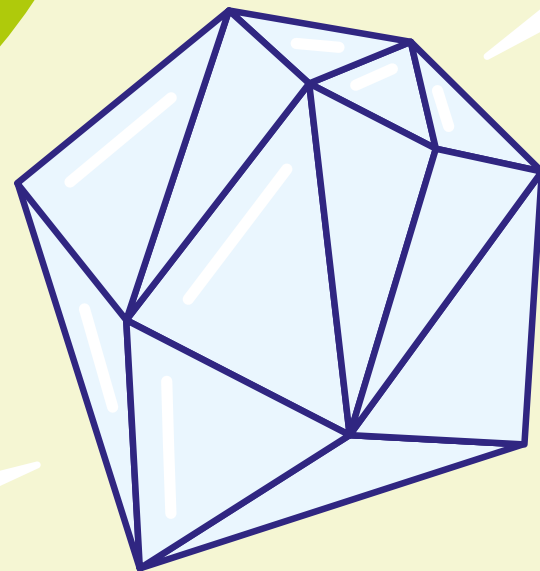
Christiaan

Quantum
Engineer

Count the triangles

How many triangles can you
count in this shiny crystal?

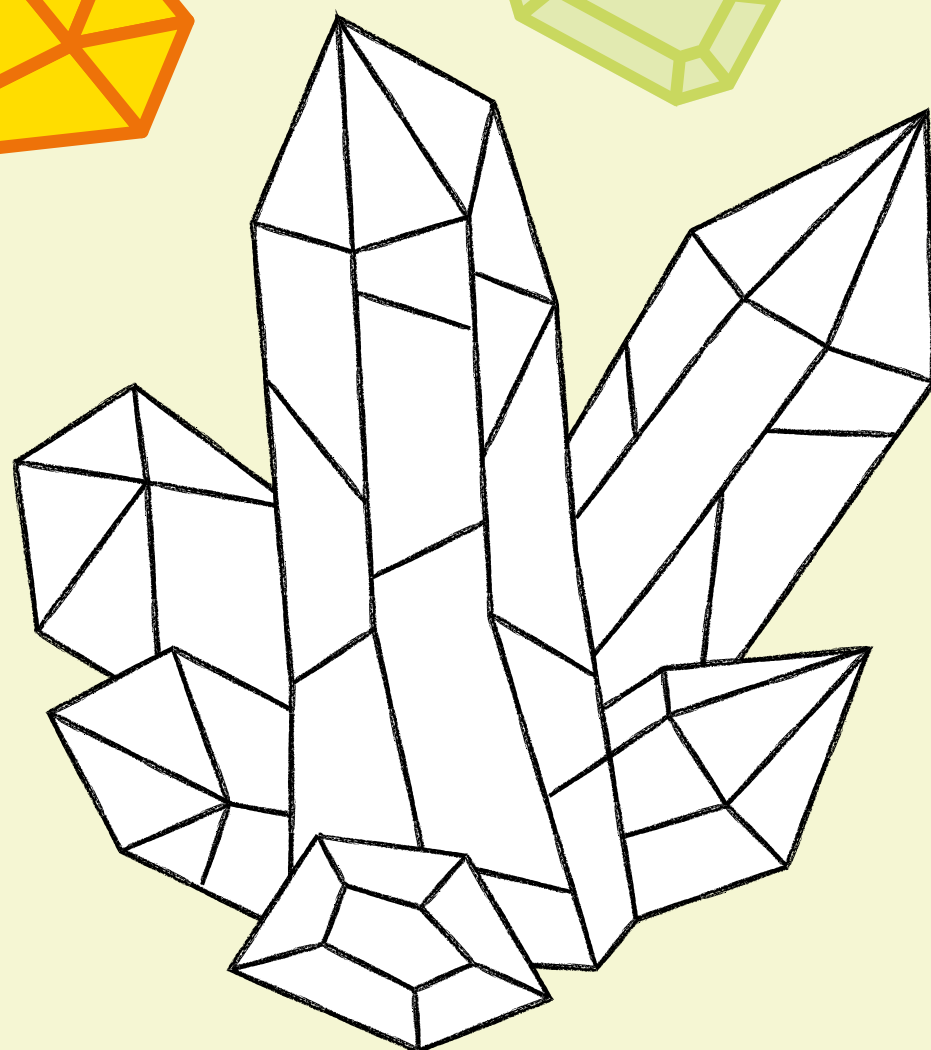
Triangles =



DID YOU KNOW?
Snowflakes are made
of lots of ice crystals.

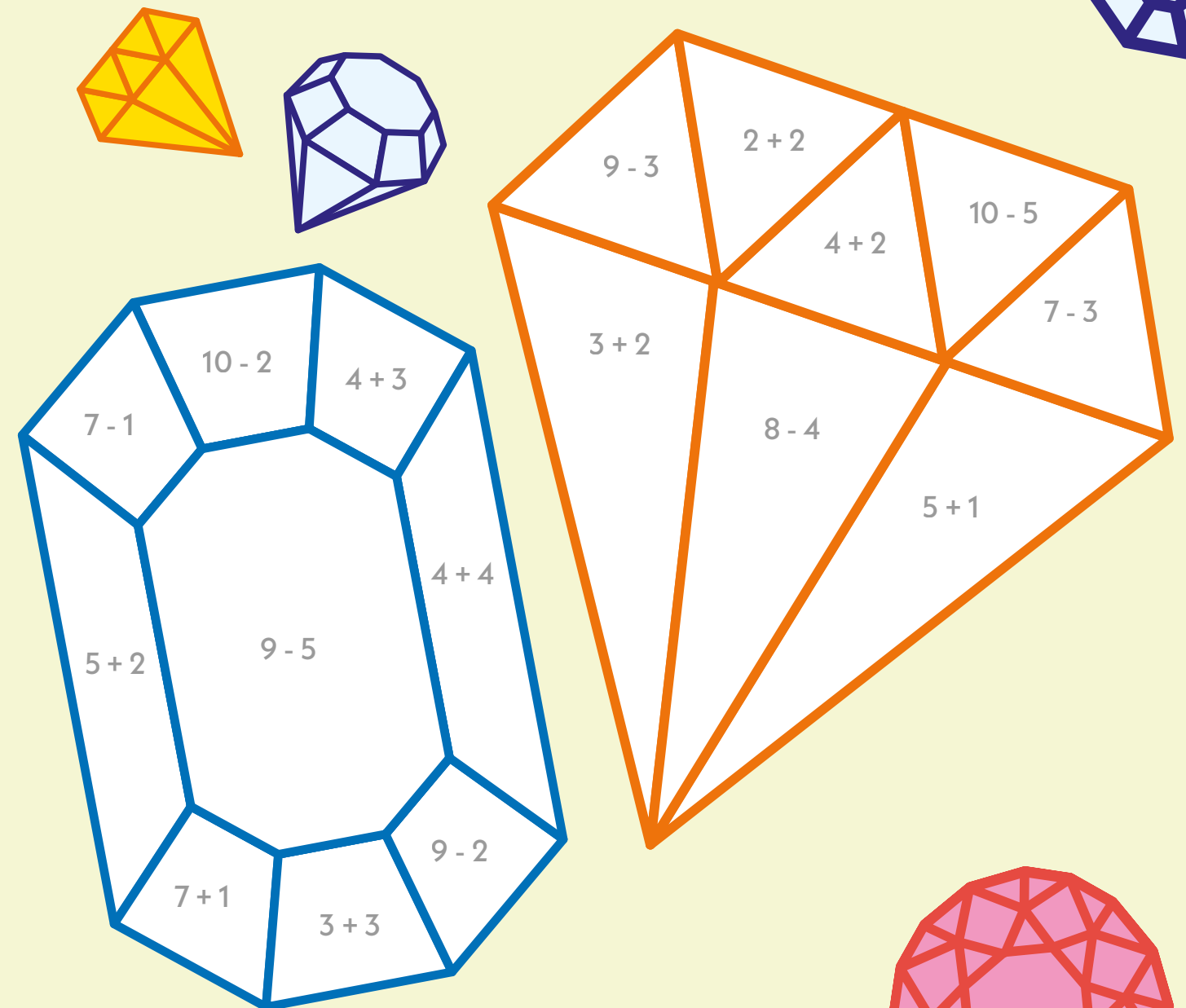
Colour the crystal

Crystals come in all different
shapes, sizes and colours.
Can you colour in this crystal
using your favourite colours?



Colour by numbers

Christiaan needs help colouring the crystals.
Can you work out the sums and use your answer
to find out what colour that section should be?



Colour chart

4 = yellow 5 = red 6 = pink 7 = blue 8 = green



Allison

Electrical
Engineer

Power the house

Help Allison find the wind turbine that powers the house? Draw a line to connect the correct one!



WONDERFUL AMY!

Story by Sarah



At work, Amy saw a plane
out of the window.



She imagined what it
would be like to fly.



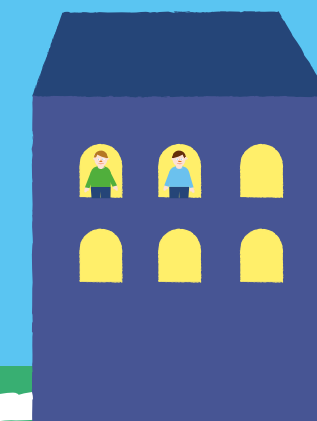
**AMY
HAD AN
IDEA!**

She wanted to
learn to fly!

Her friends thought she
would never be able to fly.

Amy said
to them:

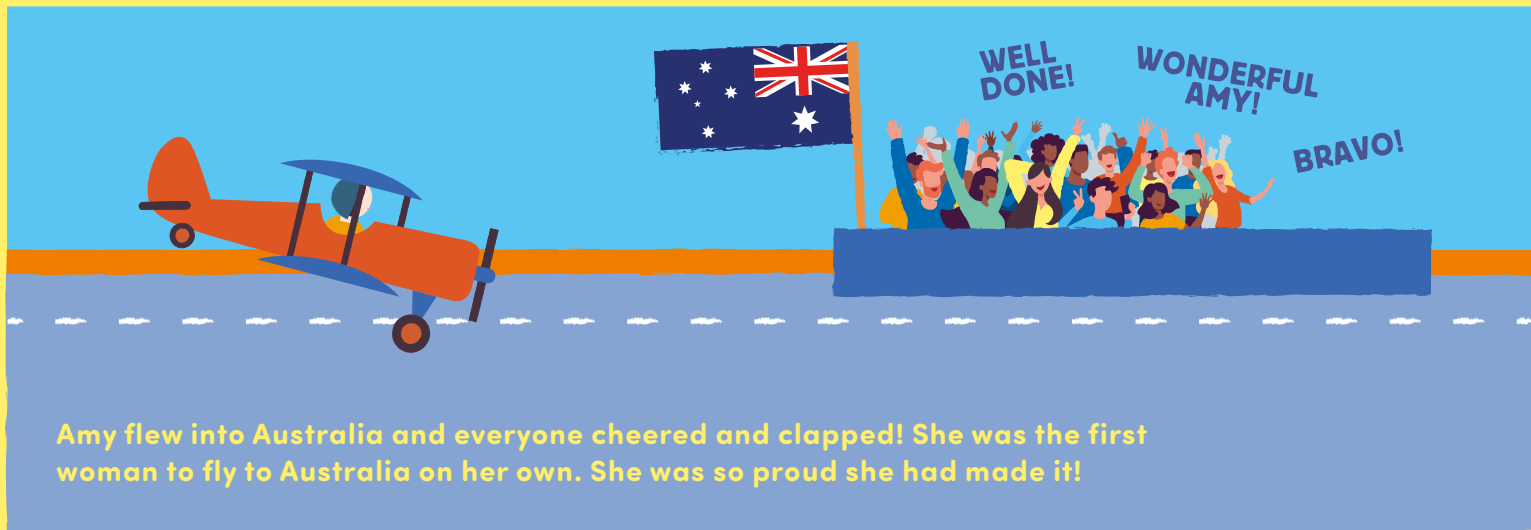
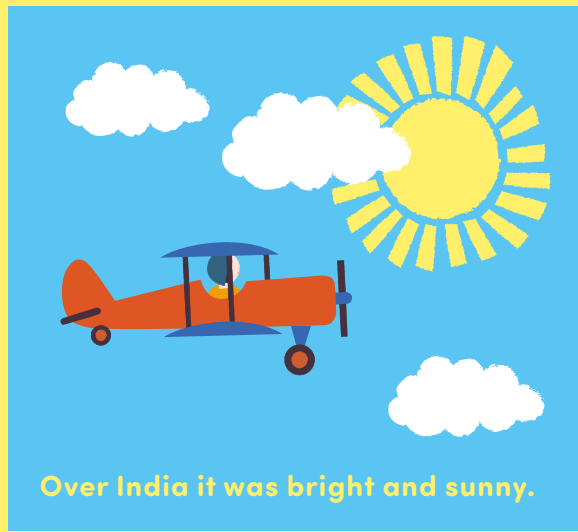
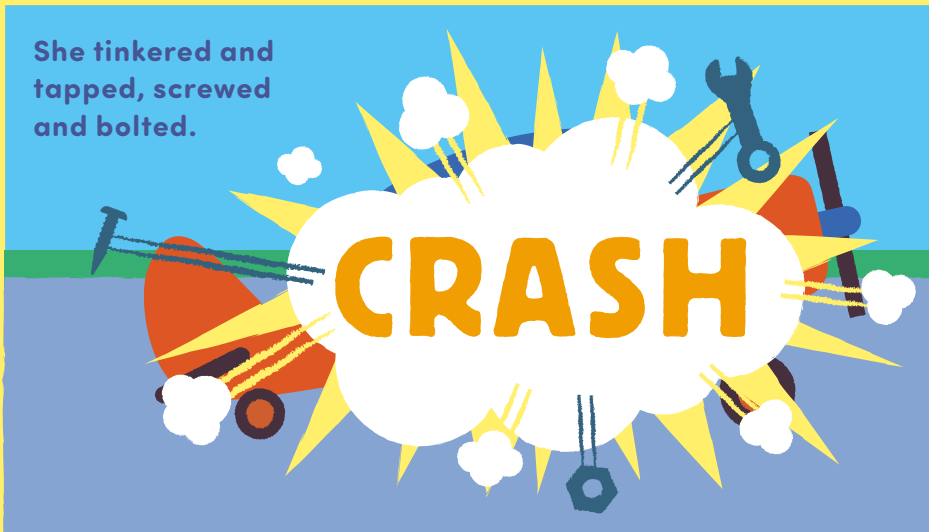
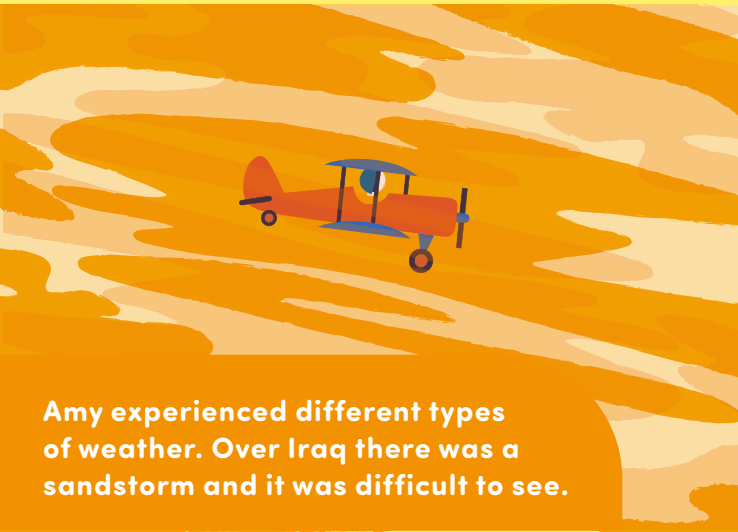
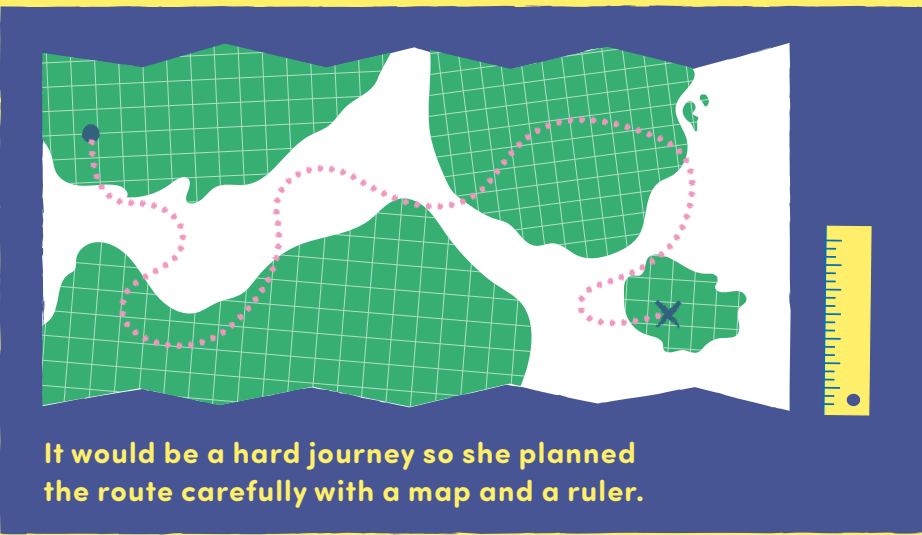
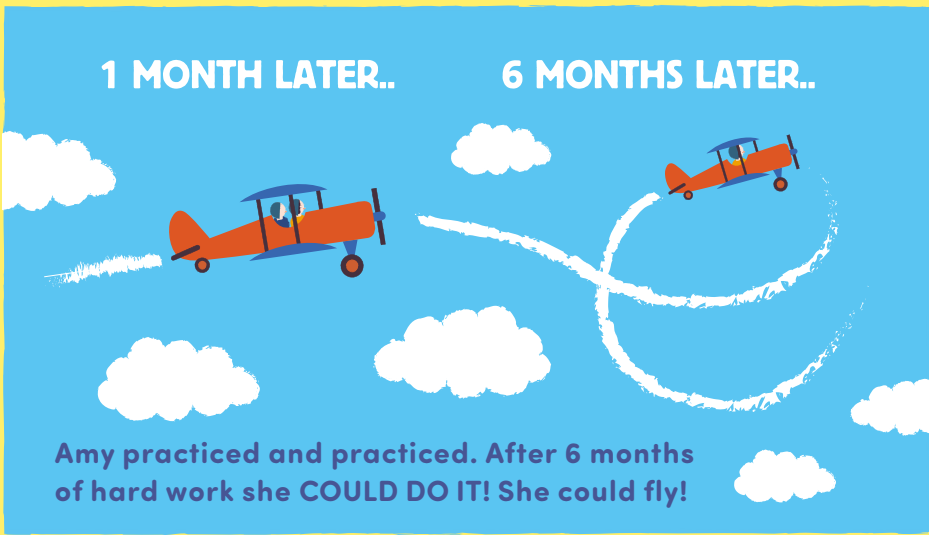
**YES I
WILL!**



At flying school Amy met a Pilot called Jack.



He said it's not easy to fly, but if you are up for the
challenge I can teach you. Amy said, Yes I am!





 **Sarah**
Electrical
Engineer

 →  =cm

 →  =cm

 →  =cm

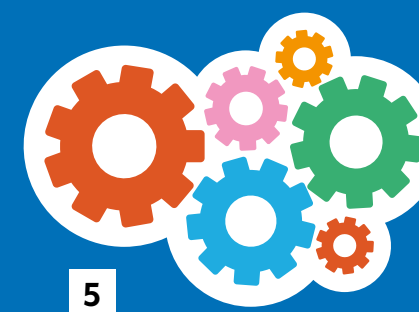
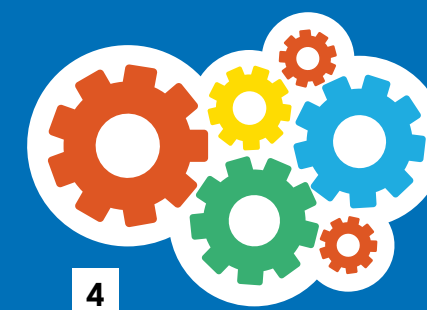
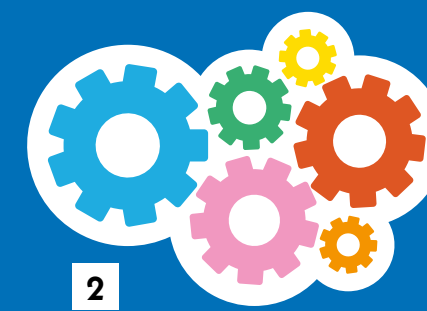
 →  =cm

Planning your route

Amy planned her route to Australia with a ruler. Can you have a go at measuring a route? Use a ruler find the distance between the points shown.

Can you fix it?

Amy had to learn to fix her plane, so why don't you give it a go? Can you find the matching engine to the one highlighted below? Circle the correct one.

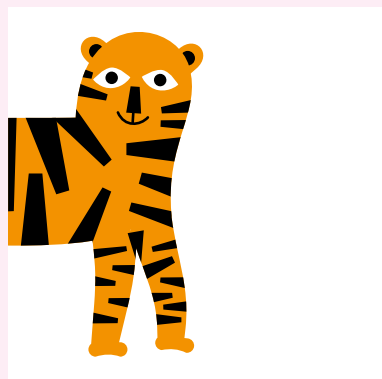
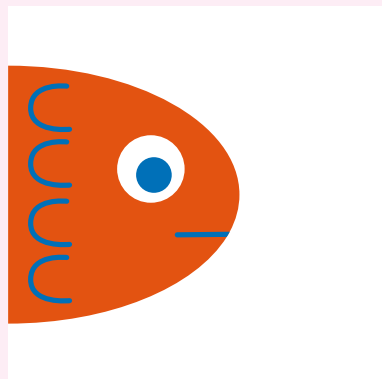
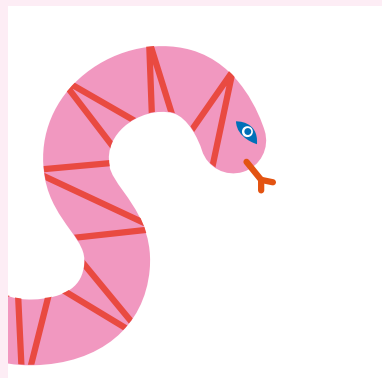
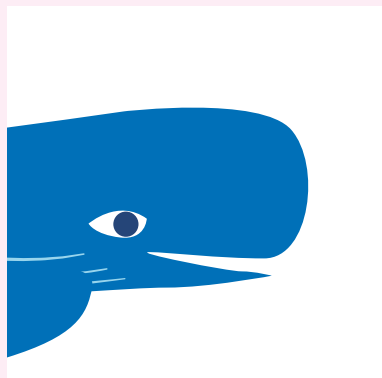
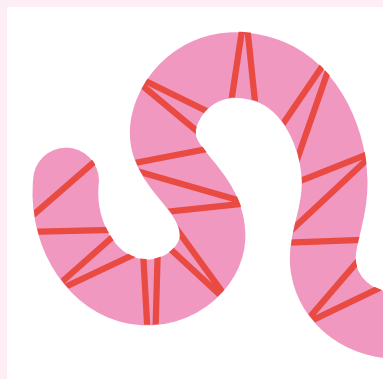
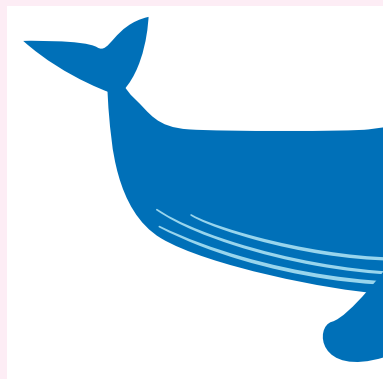
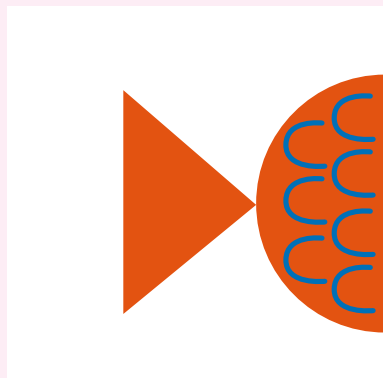
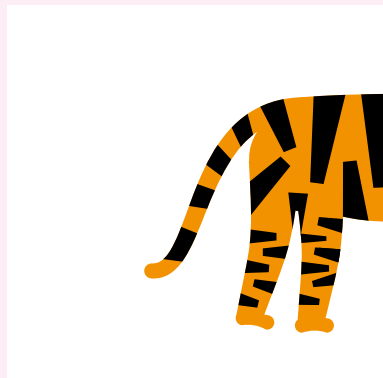




Paul
Electrical
Engineer

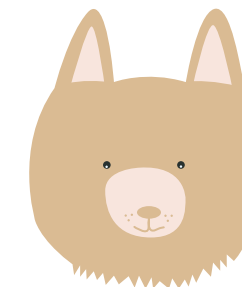
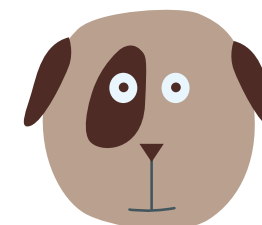
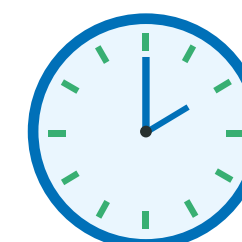
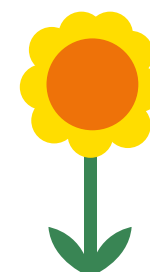
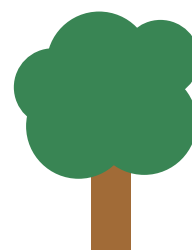
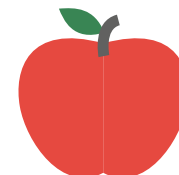
Mix 'n' match

Paul's computer needs your help sorting these images of animals. Draw a line to match the parts of the animal back together. Do you know what these animals are called?



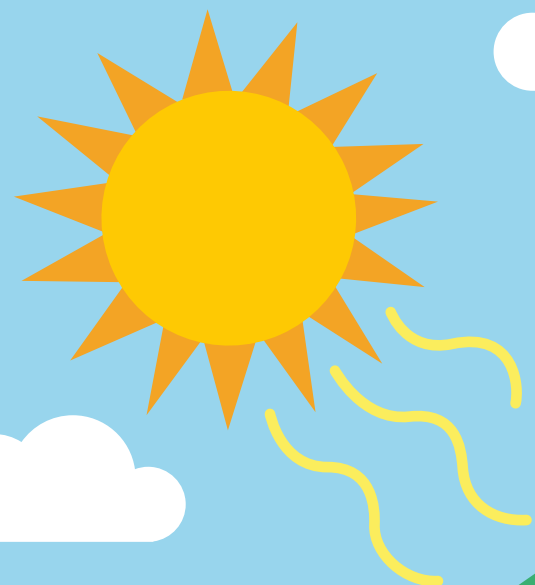
Odd one out

Help Paul's computer learn about categories by circling the odd one out in each of the groups.



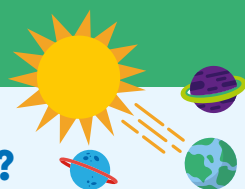
 **Salma**
Electrical
Engineer

**Good
energy!**



Sun

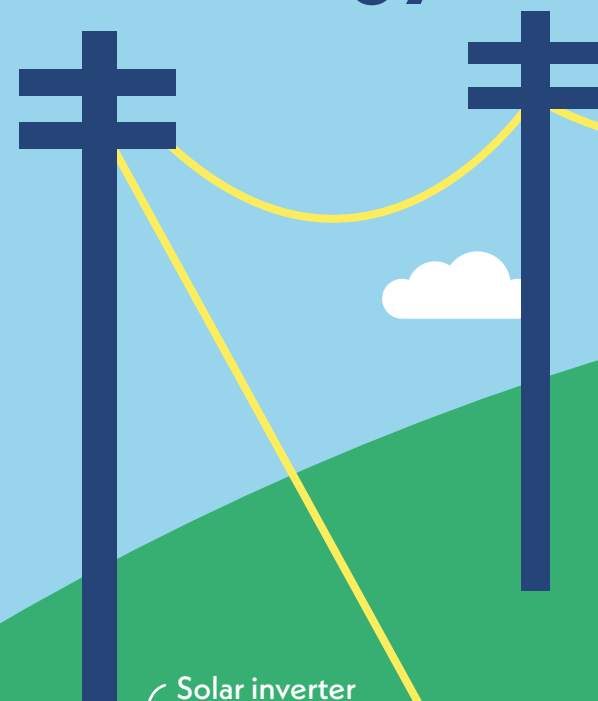
The sun shines down on the solar panels, absorbing lots of its energy. This creates electricity, but before it can be used at home the electricity travels through a solar inverter!



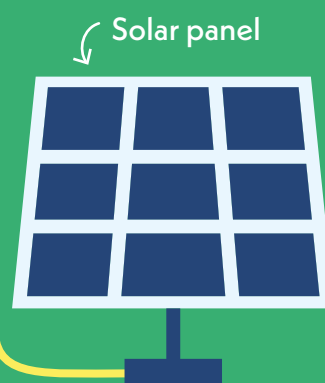
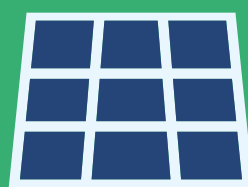
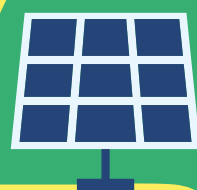
DID YOU KNOW?

*It takes **less than 10 minutes** for the light of the Sun to reach the Earth? That is seriously quick.*

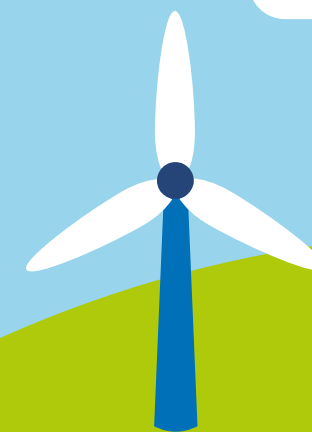
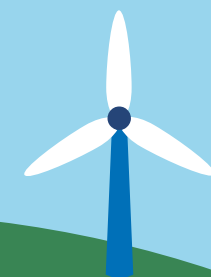
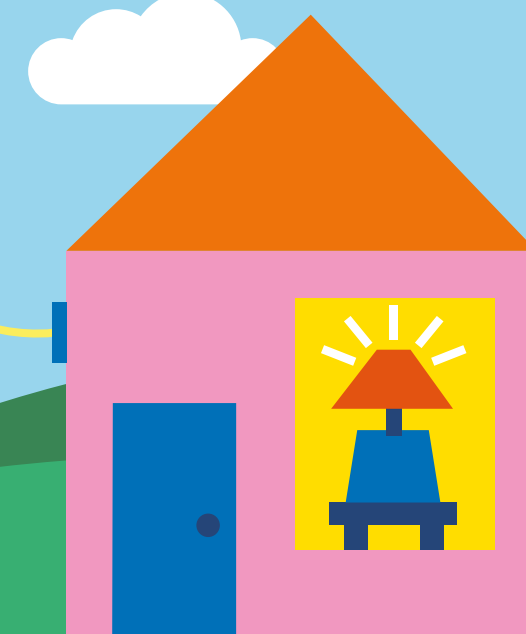
*The biggest solar panel farm is in California in the USA, which has **9 million** solar panels! That is an incredible amount!*



Solar inverter



Solar panel



renewable
energy
light
power

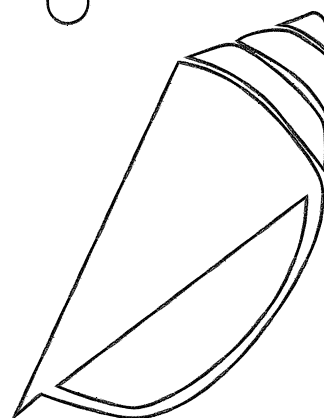
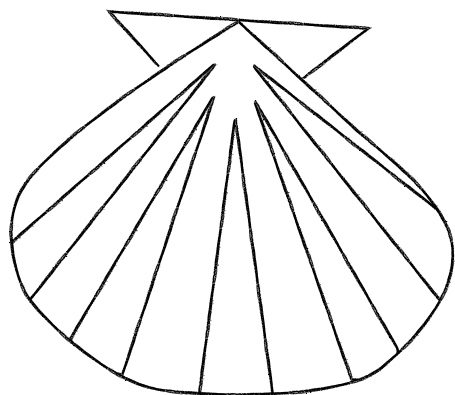
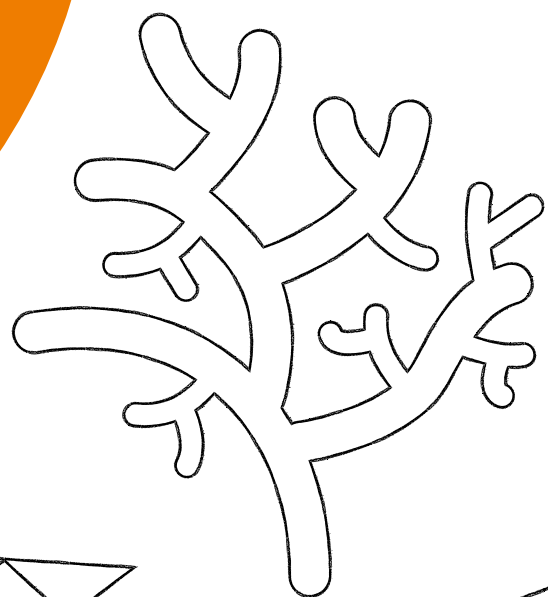
electric
solar
sun
charge

Complete the word search by putting a ring around each of the words in the list.

a	r	e	n	e	w	a	b	l	e	k	t
x	b	p	h	u	t	s	v	i	m	e	o
l	e	v	c	f	r	a	s	g	e	l	u
m	f	n	b	d	o	h	u	h	t	e	e
k	y	r	e	a	u	r	n	t	y	c	x
p	o	w	e	r	i	b	a	z	l	t	f
w	c	h	a	r	g	e	c	m	d	r	q
j	r	p	h	n	k	y	r	p	i	i	a
s	o	l	a	r	f	m	s	i	l	c	n

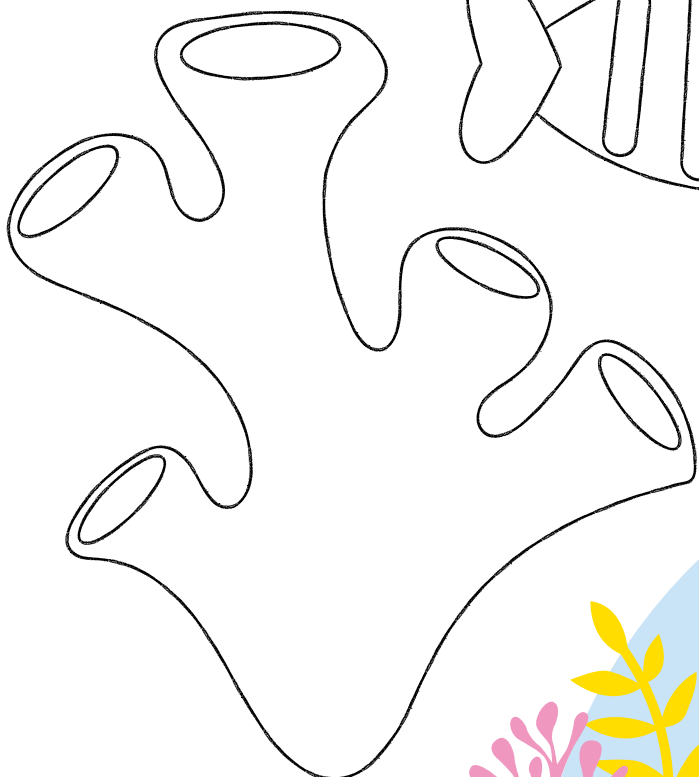
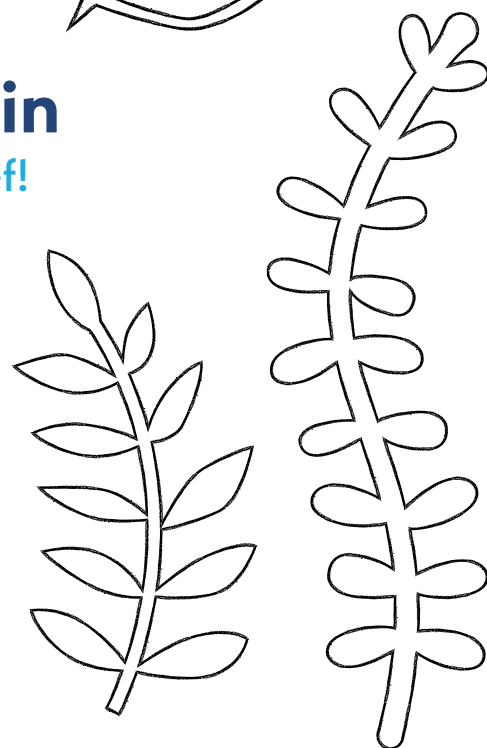
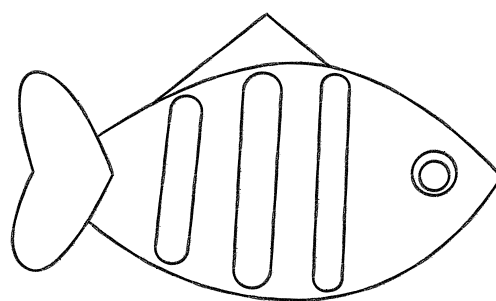
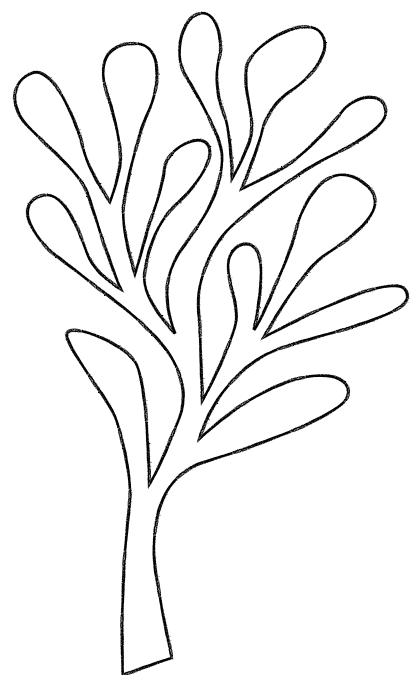


Uwe
Mechanical
Engineer



Coral colouring in

Create your own coral reef!



DID YOU KNOW?

Different corals like different temperatures of water.

Lophelia loves cold water and grows in the UK. It can be white, yellow or pink.

Tropical corals love warm water and are bright colours like orange, red and green.



Spot the difference!

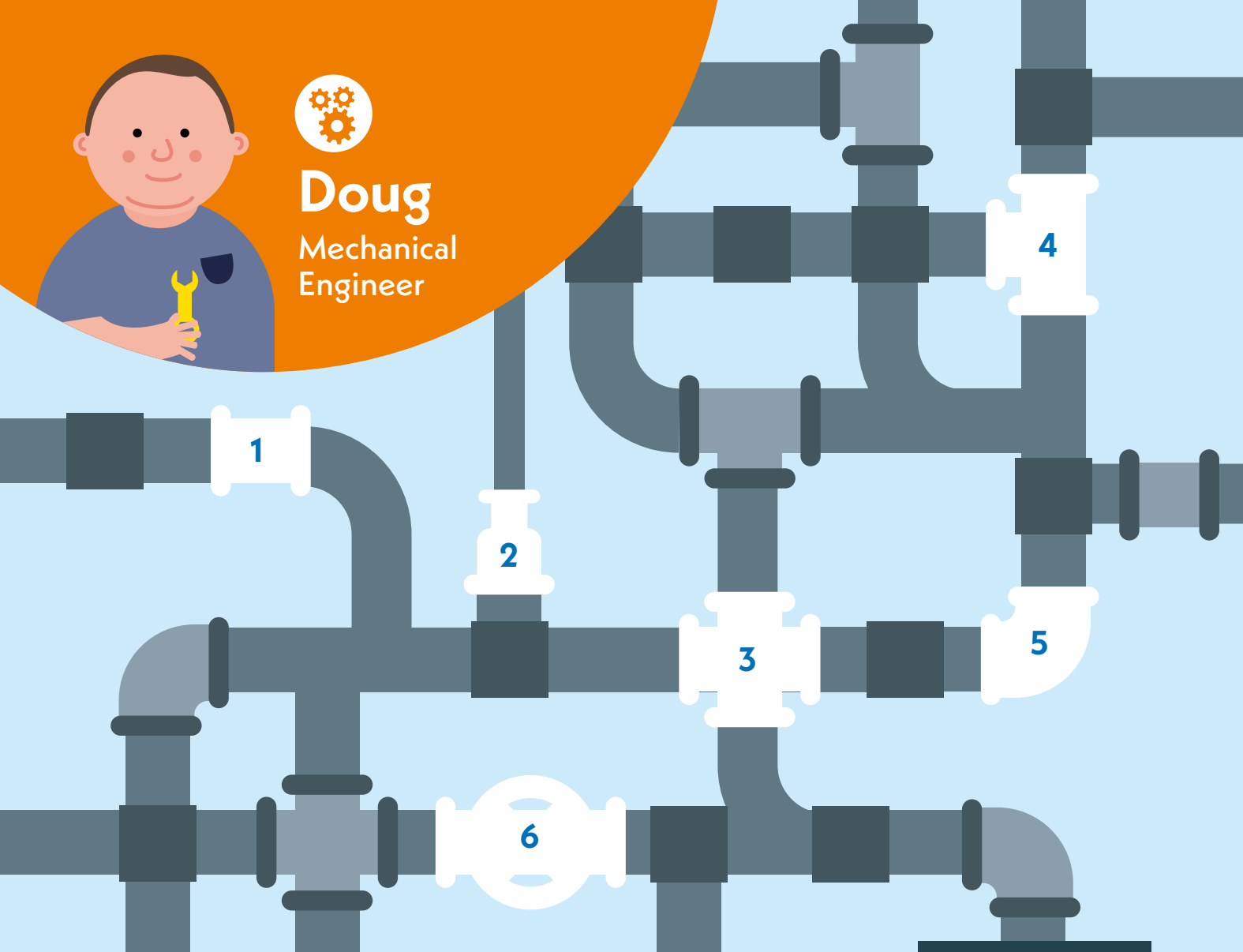
Can you spot the differences between these 2 coral reefs?
Circle the differences and discuss why one reef is healthy and one isn't.*



*Count the number of animals, consider if there is anything in the reef that shouldn't be there and the colour of the coral. Coral that's gone pale means the coral has been bleached and has lost the algae they use to make food for them.




Doug
Mechanical
Engineer



The missing pieces

Help Doug find the missing pieces to fix the pump?
Write the number below the piece it matches.

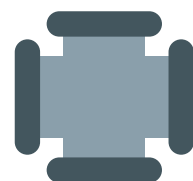


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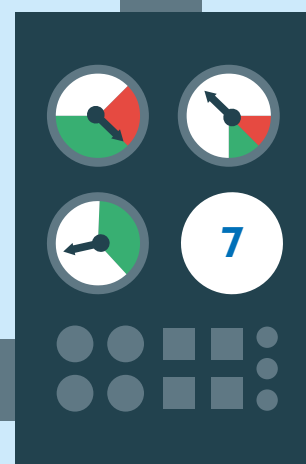


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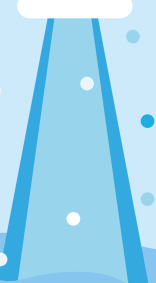
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8

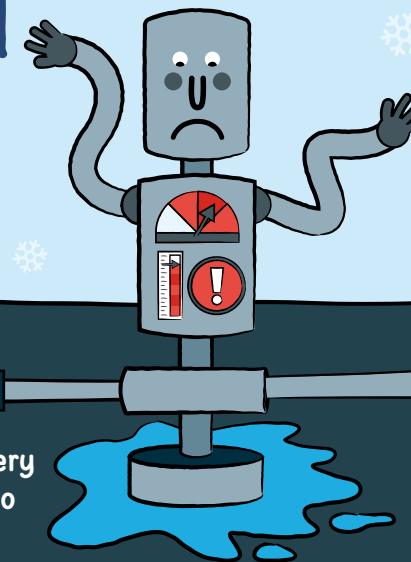


Peter The Pump

Story by Doug

In the boiler house today...

Peter the Pump is not feeling very well. He can't pump the water to keep the building warm.

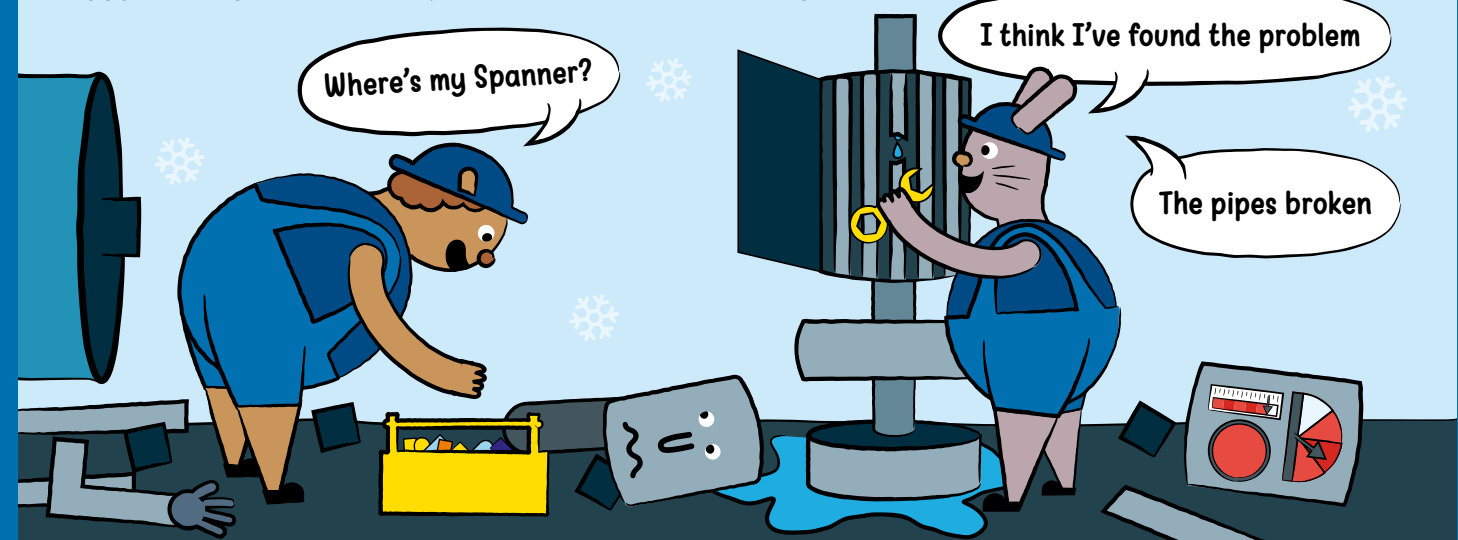


Don't worry Peter



Peter's friend Panda is going to send for Huggy and her apprentice Bugs to repair Peter.

Huggy and Bugs take Peter apart to find out what's wrong.



Where's my Spanner?

I think I've found the problem

The pipes broken

Huggy and Bugs put Peter back together again.



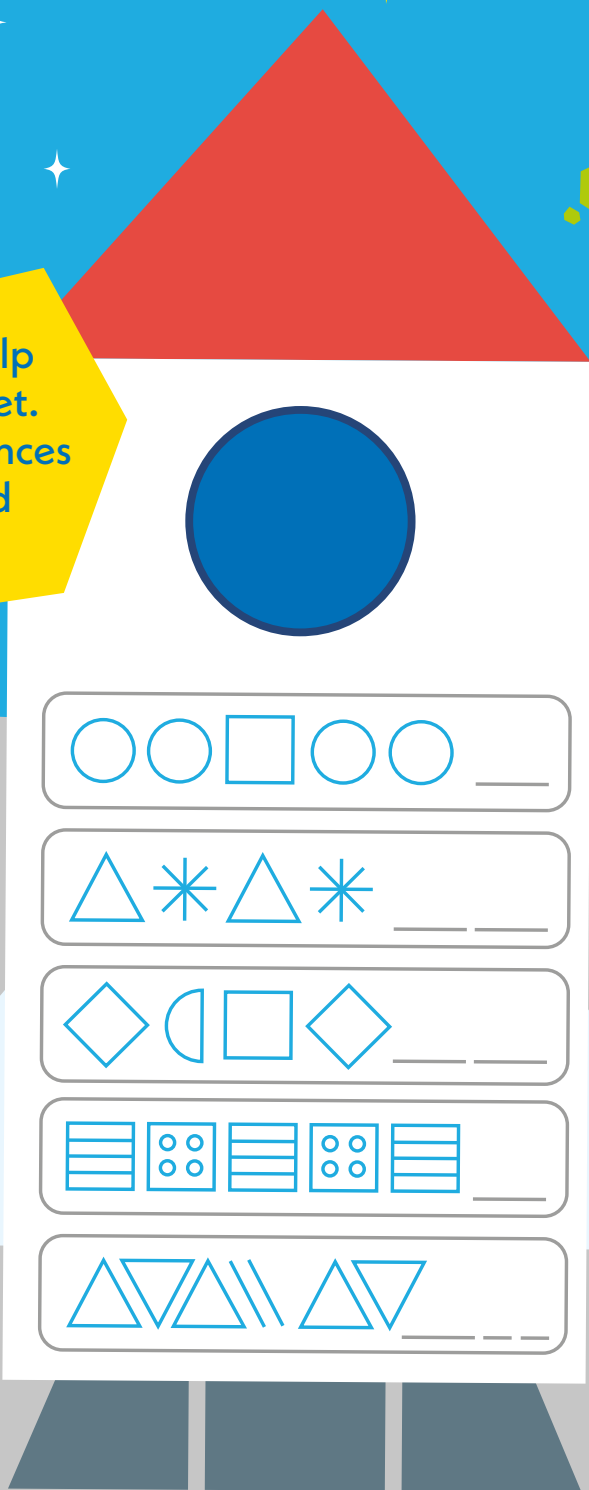
Thank you!!!

Peter can now pump the water to the boiler and make the building warm again.

Yay Peter!



Space Kitty needs some help maintaining the space rocket. Continue these shape sequences to keep the rocket in good working order.





Faisal
Mechanical
Engineer



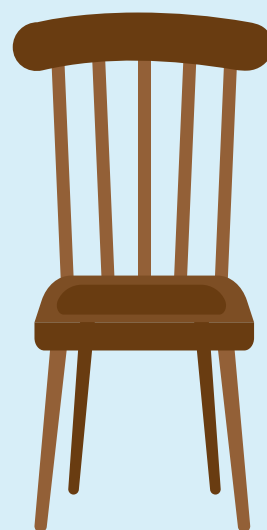
Plastic



Fabric



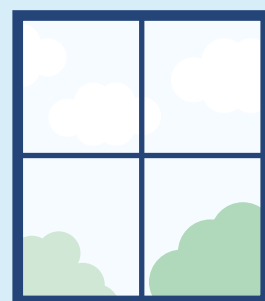
Ceramics



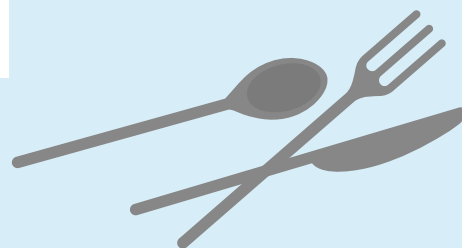
Wood



Paper



Glass



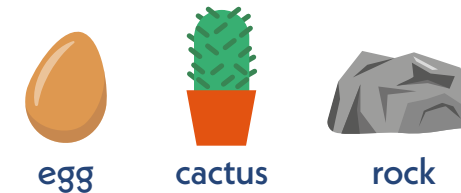
Metal

What's it made of?

Help Faisal identify what these objects are made of by writing over the letters.

What does it feel like?

Sort the objects into the correct boxes by how they feel to touch.
You can draw a line or draw the object in the box.



egg

cactus

rock

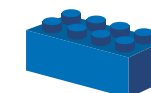
Smooth

Spiky

Rough



Rabbit



Lego



Bear



Apple

Soft

Hard



Dog



Balloon



Feather



Car

Light

Heavy

BOUNCER'S BIRTHDAY

Story by Adah

Snowy was busy making her friend Bouncer a birthday gift. She didn't have much time as it was his birthday tomorrow and he lived all the way in Australia. She had to send it quickly.



Snowy quickly wrapped Bouncer's gift and rushed to the post office.

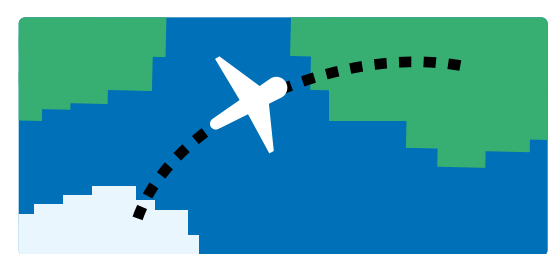


The penguin post officer put the gift on the aeroplane and told Snowy that they would do their very best to get it delivered on time.

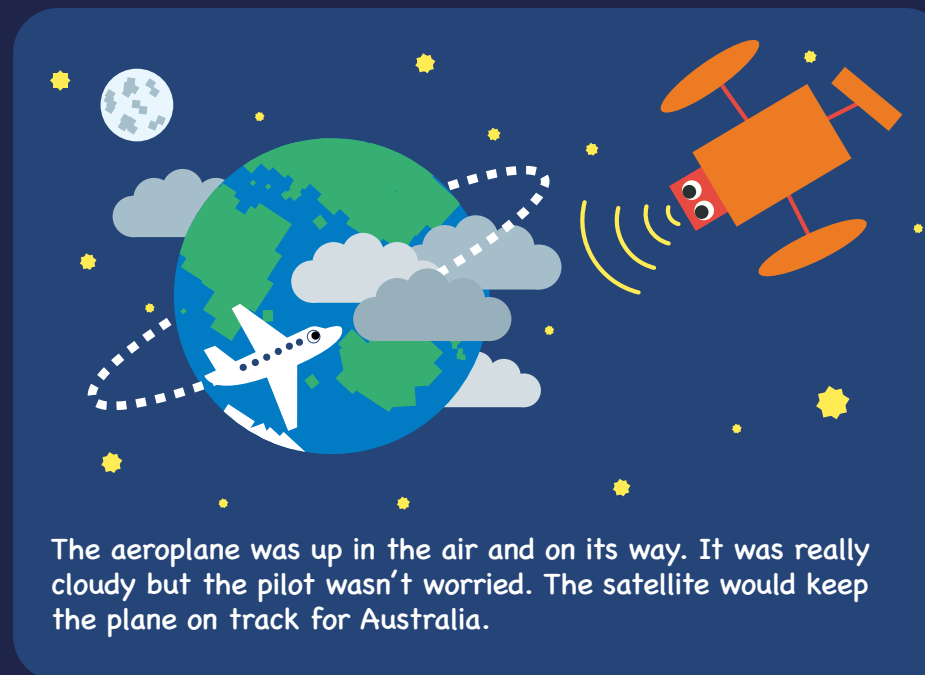
With Bouncer's gift safely on the aeroplane the pilot asked the satellite for the quickest way to Australia.



GPS
AUSTRALIA = 9½ HOURS



The satellite showed the pilot which way to go and how long it would take. Hopefully Bouncer's gift would arrive on time.

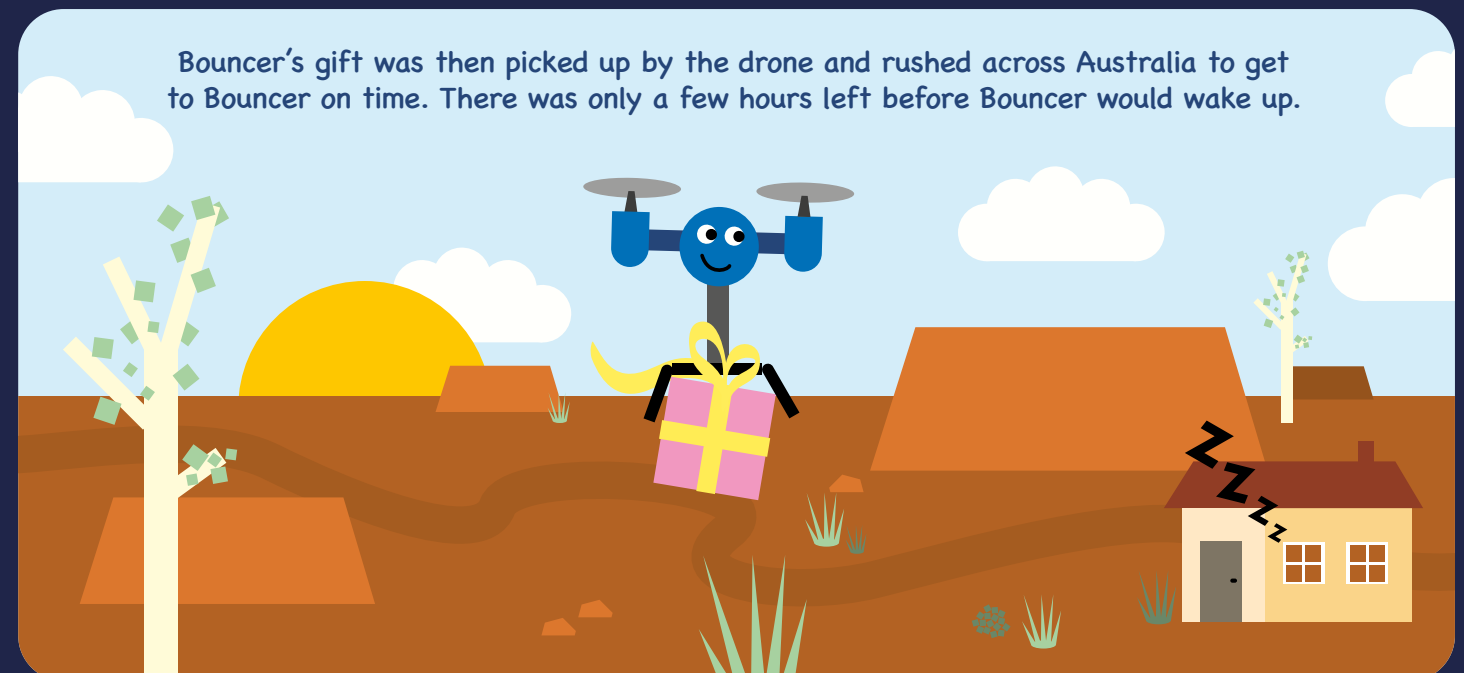


The aeroplane was up in the air and on its way. It was really cloudy but the pilot wasn't worried. The satellite would keep the plane on track for Australia.



As the plane landed the next day, the pilot thanked the satellite for its hard work.

Bouncer's gift was then picked up by the drone and rushed across Australia to get to Bouncer on time. There was only a few hours left before Bouncer would wake up.



As Bouncer woke up he heard a knock at the door.



HAPPY BIRTHDAY

Bouncer quickly opened the gift and to his surprise Snowy had made him his favourite: a carrot cake.





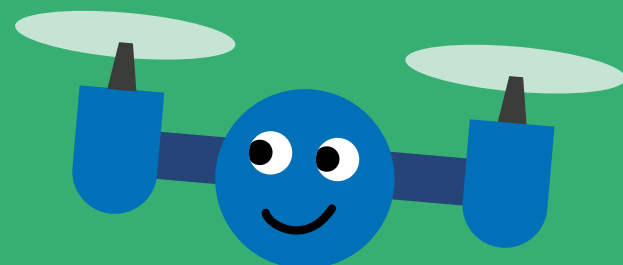
Adah

Aerospace
Engineer



Help Adah find the drone that delivered Bouncer's gift?

When you've found Adah's drone, get creative
and colour in the scene.



Can you find and count these objects?

Aeroplanes =

Satellites =

Birds =

Helicopters =



Sara
Software Engineer



something beginning with a...
something beginning with h...
something beginning with m...
something beginning with p...
something beginning with r...
something beginning with s...

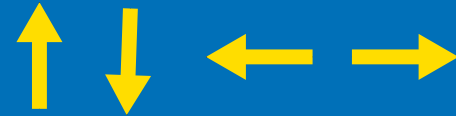


Emilyann

Software
Engineer

Robot code

Help Emilyann's robot pick up
the items to give to the patient.
Code the robot's path by using arrows.
The first one has been done as an example.



 →  → → ↓ ↓	 → 				
 → 	 → 				
					
					
					
					
					

Giggle time!

What is a robot's favourite food?
Computer chips!

Why do robots go on holiday?
To recharge their batteries!

Hehe!

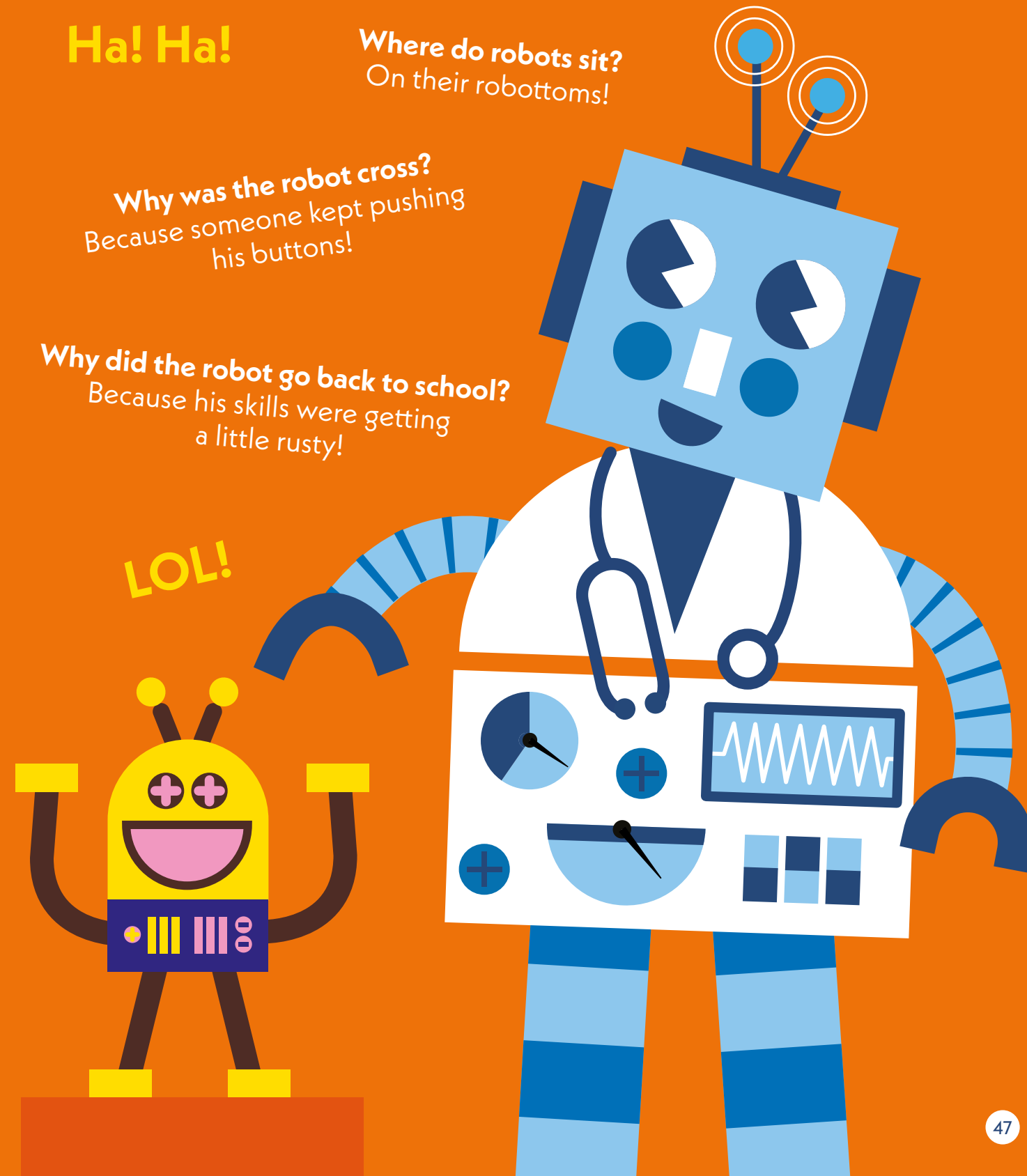
Ha! Ha!

Where do robots sit?
On their robotbottoms!

Why was the robot cross?
Because someone kept pushing
his buttons!

Why did the robot go back to school?
Because his skills were getting
a little rusty!

LOL!

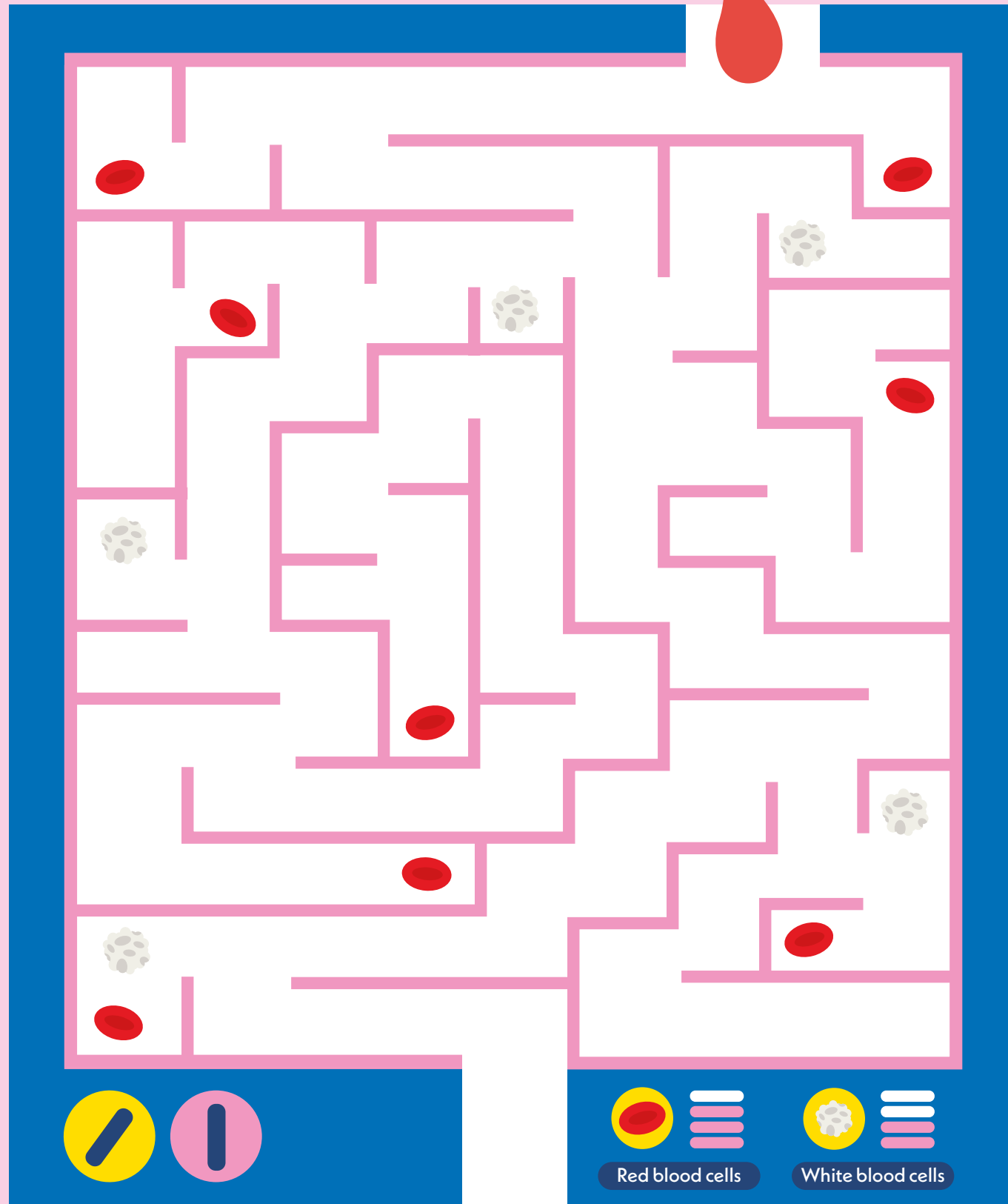
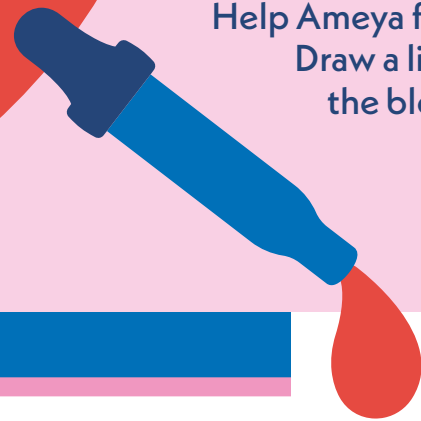




Ameya
Biomedical
Engineer

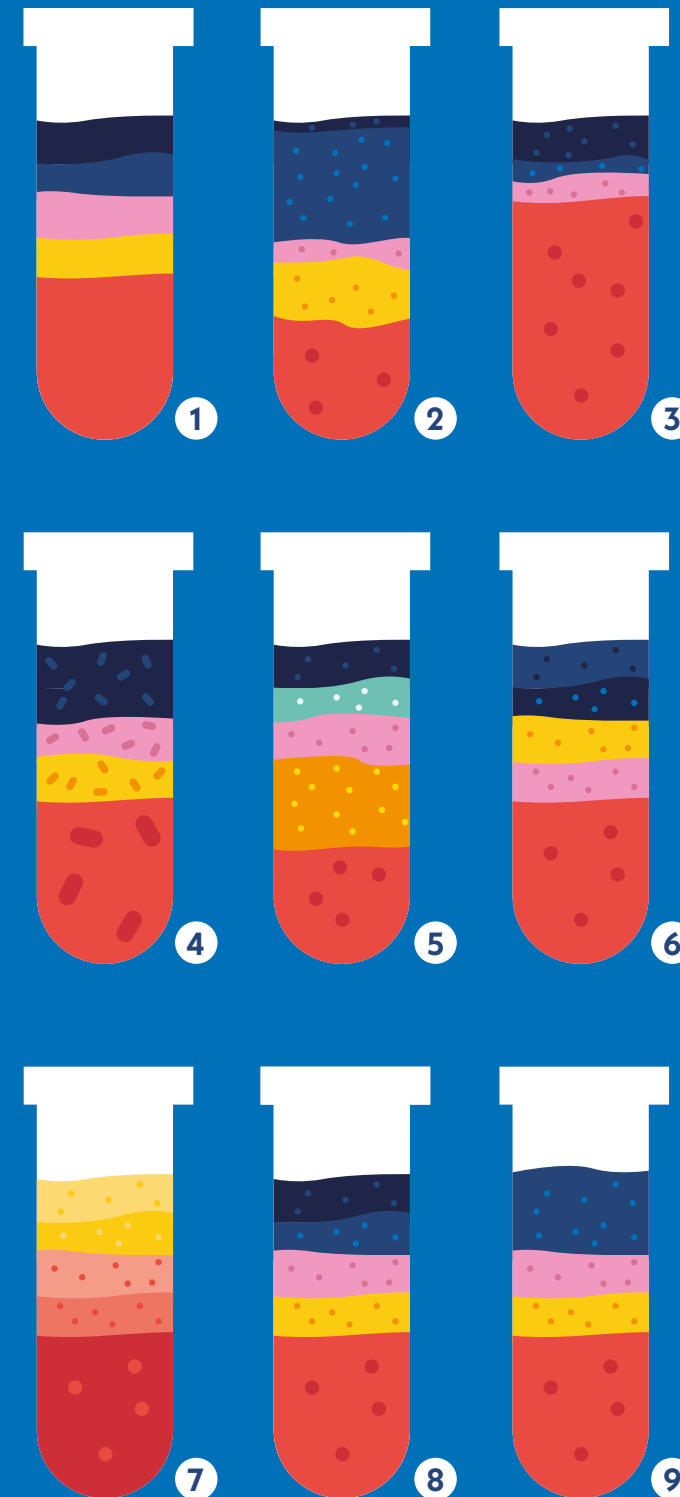
Maze machine

Help Ameya finish the blood test.
Draw a line to show the path
the blood droplet takes to
get through.



The results!

After helping Ameya with the blood test,
he now needs your help to match the result.
Circle the correct answer.



Happy cells

The test results show the blood cells
are happy! Can you draw smiling faces
on the cells to show Ameya how
happy they are.





Diane

Quality Engineer

Start

Fix the Machine

Make your way through the shape machine to find out what needs fixing.

How many shapes are missing their colours?

Colour in the blank shapes to get the machine working again. Look at the shape patterns to help work out what colour you need to fill in the shapes.

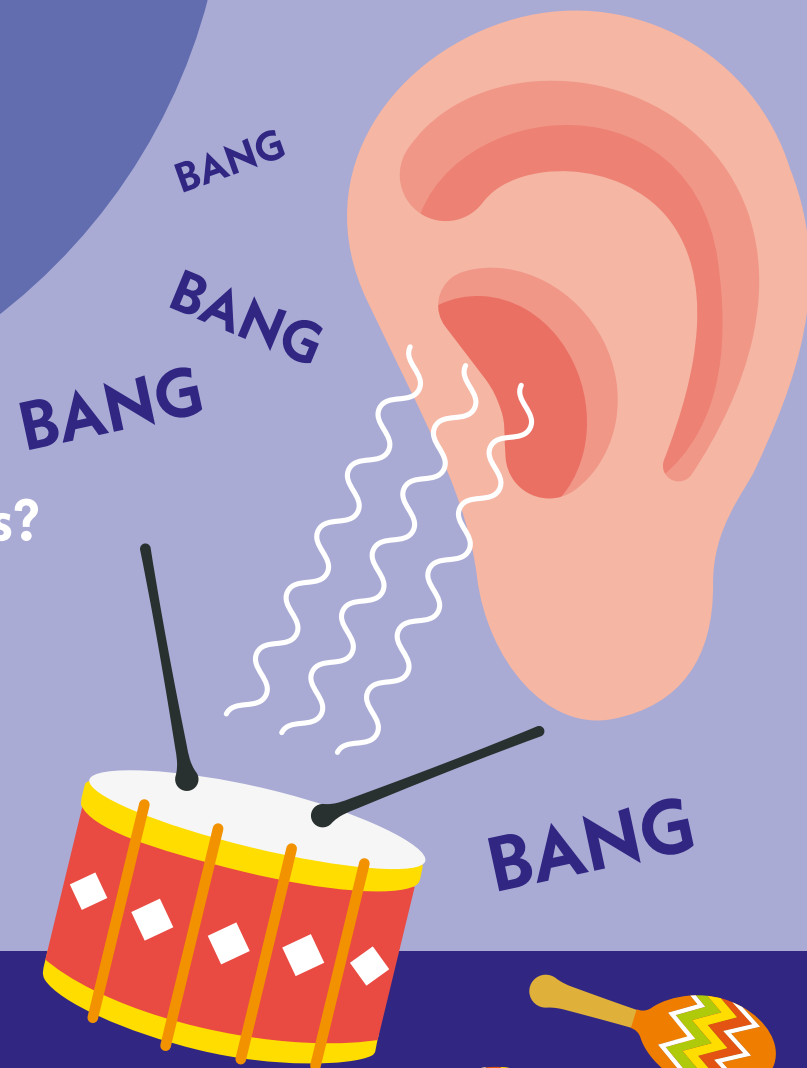


Antonio

Acoustical
Engineer

How do we hear sounds?

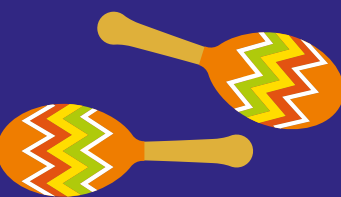
Sounds are made when something vibrates. When the drum is hit the vibrations travel through the air as sound waves. These waves reach our ears and make our eardrums vibrate, which means we can hear the sound of the drum.



Quiet and Loud

Can you help Antonio think of some quiet and loud sounds?

Can you think of 2 quiet sounds?



DID YOU KNOW?
Flies cannot hear at all.



Can you think of 2 loud sounds?

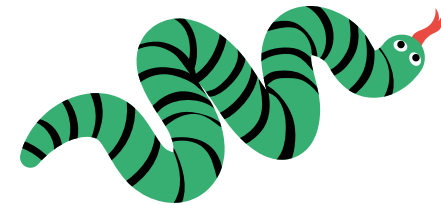
DID YOU KNOW?

The loudest natural sound on
Earth is a volcano erupting.

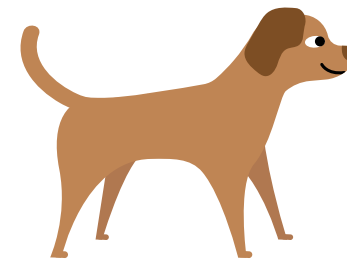


Animal sounds

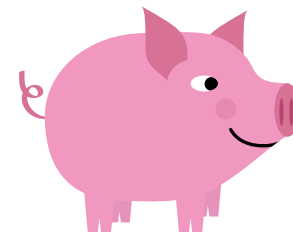
Help Antonio connect the sounds to the animals that make them.



MEOW



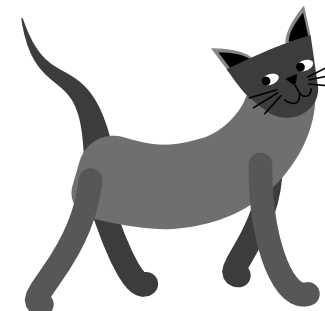
HISS



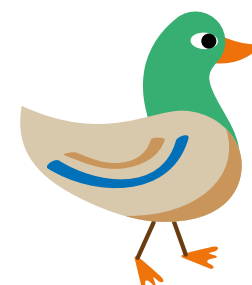
WOOF



OINK



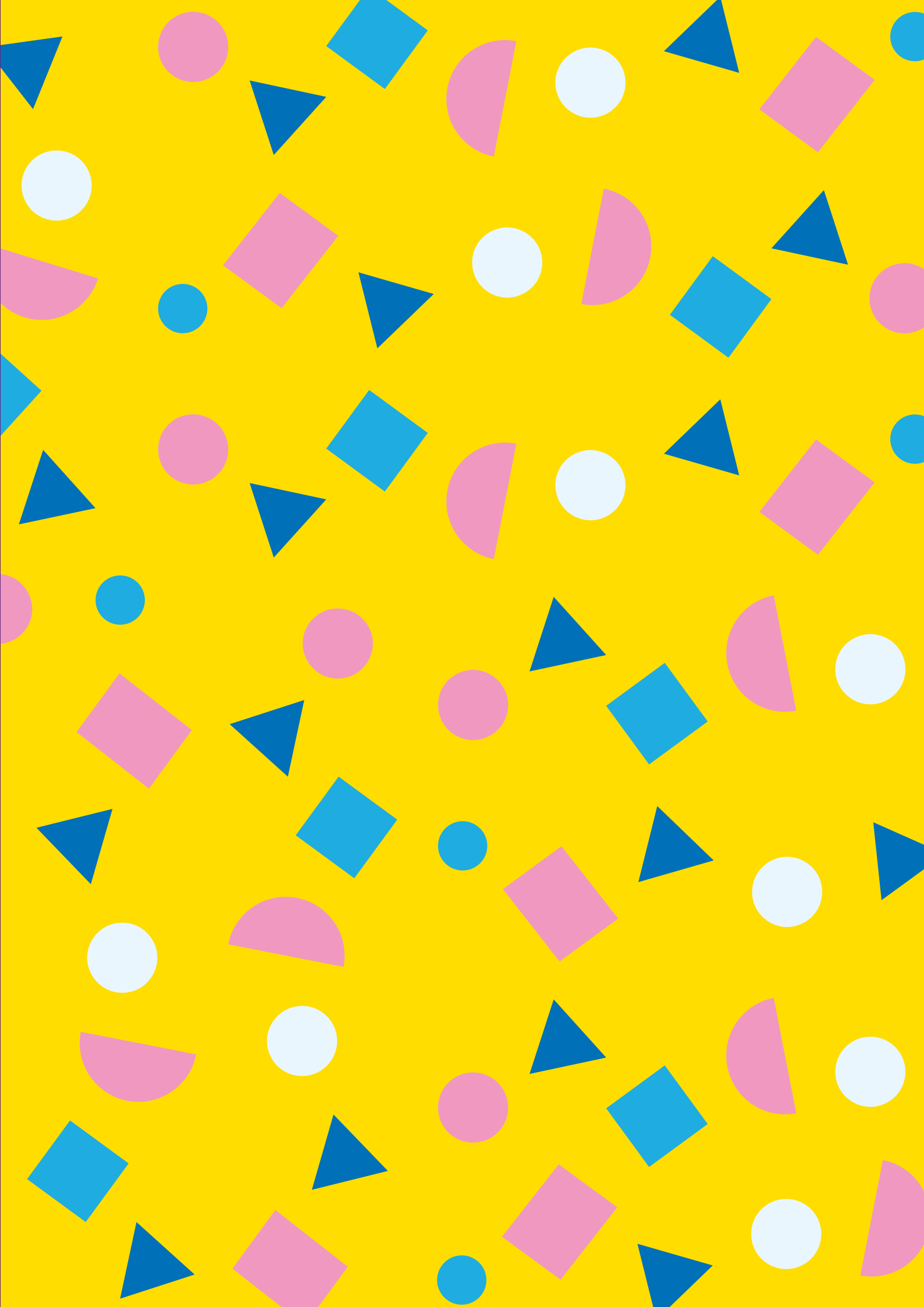
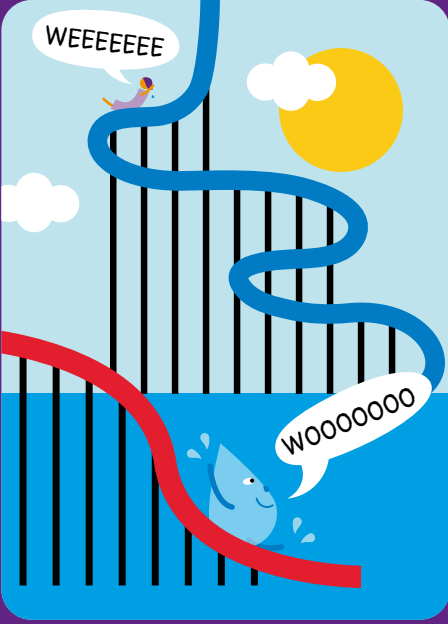
QUACK



BUZZ

ROSE & DROP

Give Drop a new hairstyle and help Irene find the clean water on page 8.





If you like to **create**, like to **explore**,
Like to make things better than before,

Build, **develop**, and **design**,
Solve problems and apply

The things you like could be your career
You might be an engineer!