

SUSTAINABLE DEVELOPMENT GOALS

In association with



INTER-SCHOOL STEM CHALLENGE



This document is designed at an aspect ratio for on-screen presentation, not printing.

**TOMORROW
PROJECTS**



What is an invention?

An invention is a new object or way of doing things which didn't exist before; an idea thought up by someone.

Anyone can create an invention, the main thing needed to invent things is lots of ideas. They can be helpful, useful, big or small!

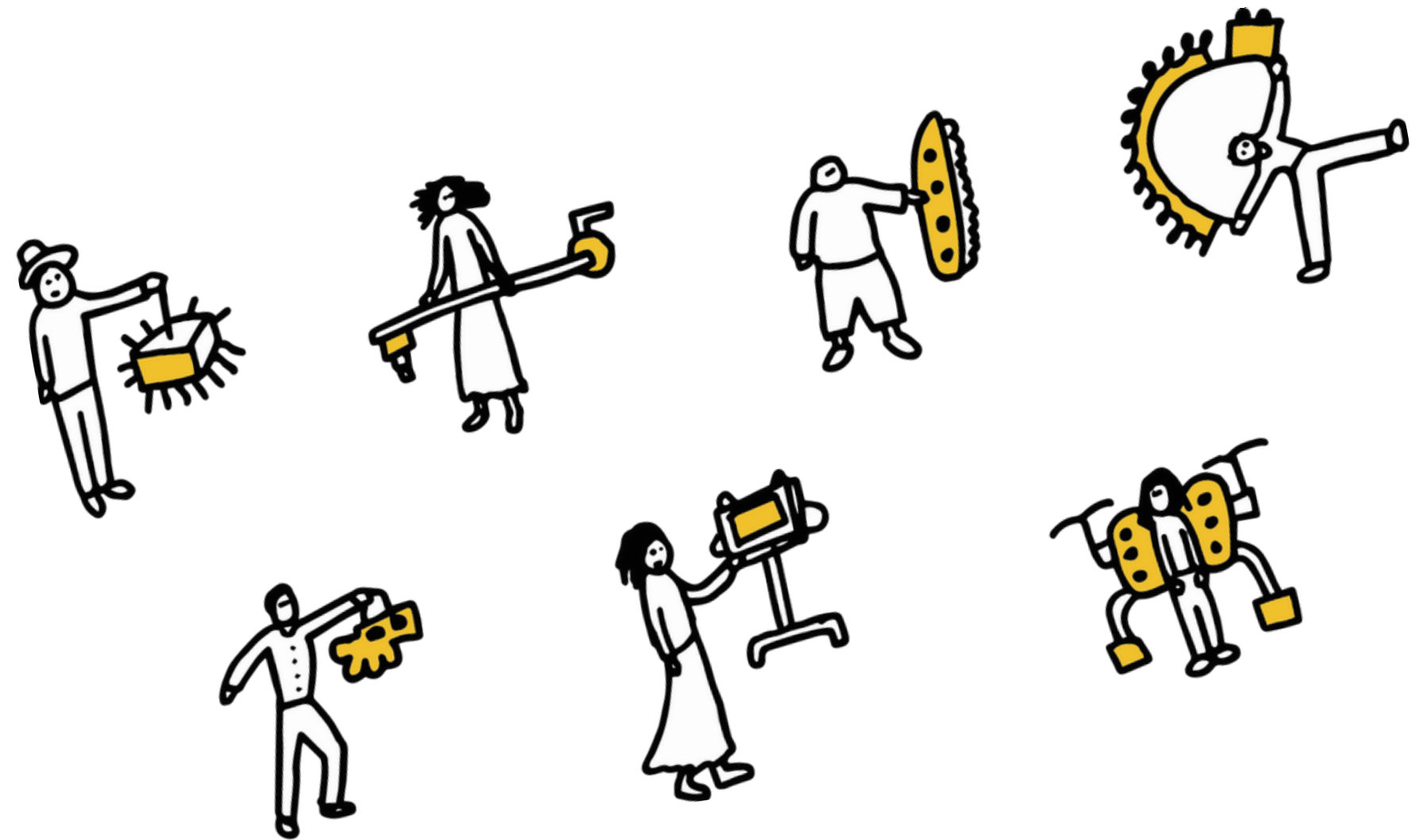


Who needs inventions?

Everyone! Think about the first humans who had, well, not very much at all, and now look at the world around you. Who do you think came up with the table, a fridge and a watch?

Everything in the world had to be invented at some point!

Coming up with inventions is one of the most natural things that humans (and some animals) do – it's how we learn to adapt to our environment, how we solve problems around us.



Discussion

Have a discussion using
these questions:



Can you name some well-known inventions?

Think about 'ordinary' objects? Why were they invented?

Can you think of things which are difficult to do now, and how they might be easier to do in the future?

Think about 2030 and how the world might have changed. What do you think will be different in everyday life?

Inventions are used to solve problems: can you think about problems or things that could be made more interesting or fun, now and in the future?

What are Sustainable Development Goals?

They were agreed by all United Nations Member States in 2015 to help achieve peace and prosperity for us and our planet, now and into the future.

There are 17 Sustainable Development Goals (SDGs), which are an urgent call for action by everybody.

They say we must end poverty and other deprivations, improve health and education, reduce inequality – all while tackling climate change and working to preserve our oceans and forests.



What are Sustainable Development Goals?

Click to
watch this
video



This Challenge

For this challenge, we will focus on SDG 13: Climate Action.

Climate Action is required to address Climate Change.



What is Climate Change?

Climate change is a change in average weather patterns in a place over a period of time. This includes temperature, wind and rain.

In the long term, the speed and scope of climate-related changes can have numerous consequences on the ecosystems and on human activities.



What a wonderful world!

From deserts to forests, oceans to mountains, our planet is home to the most amazing creatures and plants, a constant source of wonder for us.



Earth happened to be in the right place at the right time. The right distance from the sun, the right amount of water and the right atmosphere have led to life sprouting on Earth. It's the only planet in the whole galaxy with life on it... that we know of!



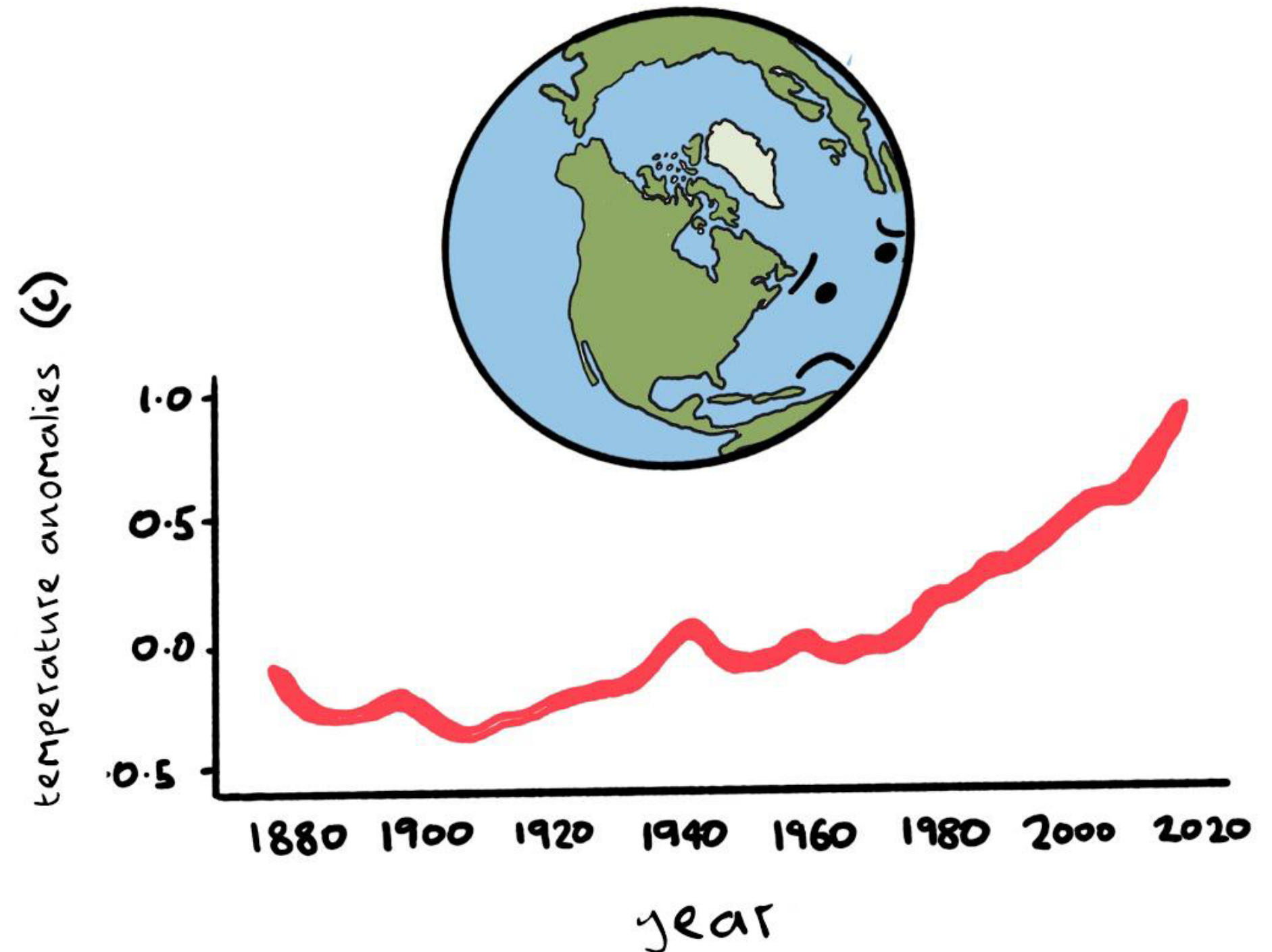
Activity

DO MIND MAPPING OF
WILDLIFE PROFILER

What is happening?

Scientists have noticed that the surface of the earth is getting warmer because us humans are putting lots of carbon dioxide and other greenhouse gasses into the air. This is called global warming.

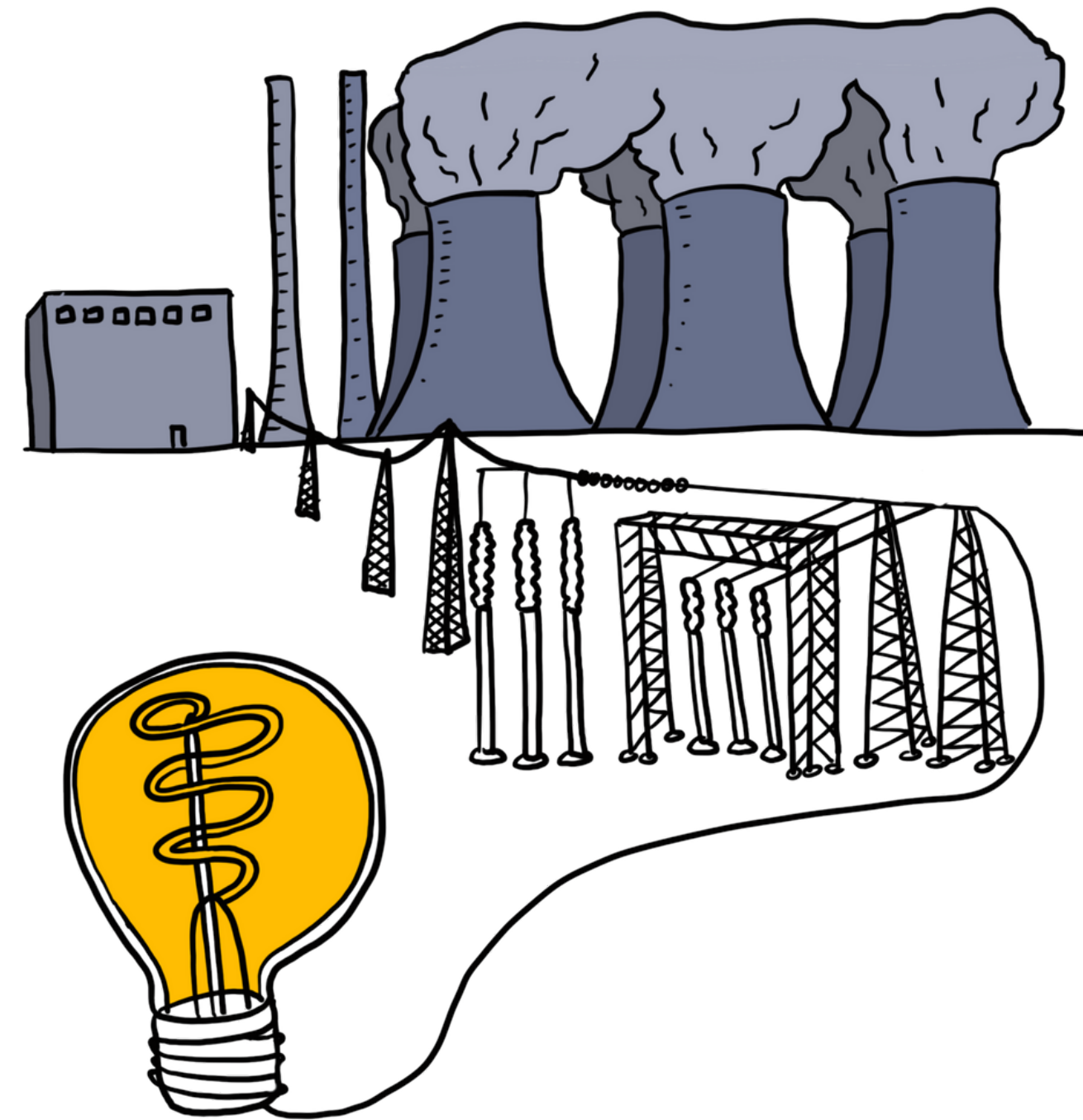
Global warming is causing big problems for all living things on land and in the ocean, and life is going to get much harder for everyone if we don't change the way we live very soon.



How does this happen?

The biggest cause of global warming is the use of fossil fuels - oil, coal and gas mainly. We burn them to create energy for heating our homes, driving cars and running factories. They are non-renewable meaning there is only so much available, so they will eventually run out.

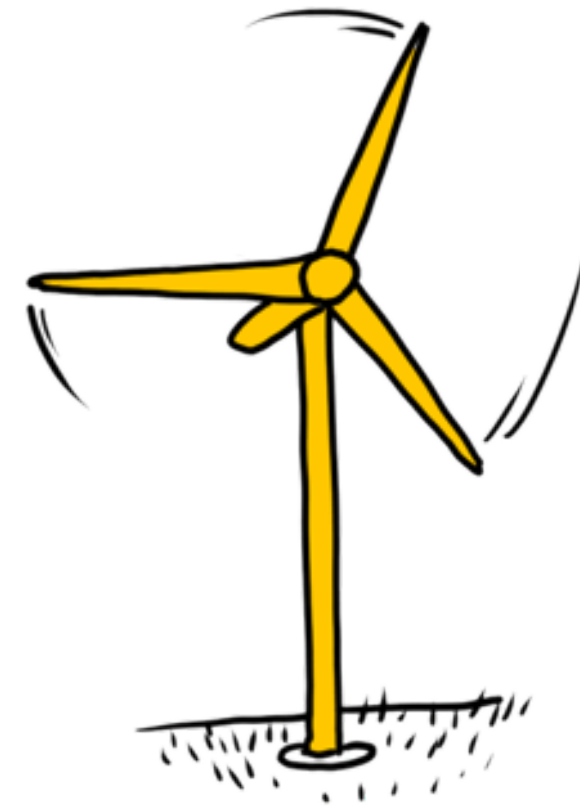
Burning these fuels releases carbon dioxide (CO₂) into the air, and having too much carbon dioxide in the air causes the Earth's atmosphere to heat up.



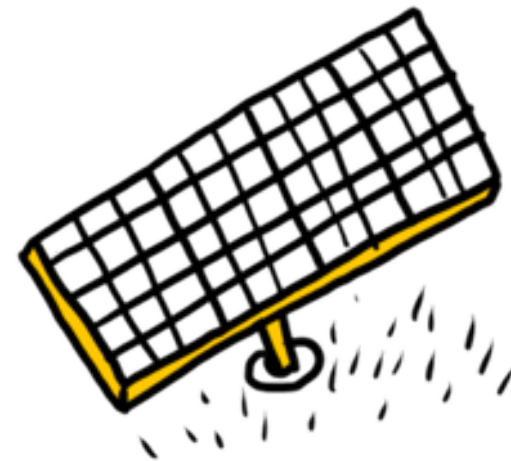
Renewable energy

We need to change how we create and use energy by using renewable sources.

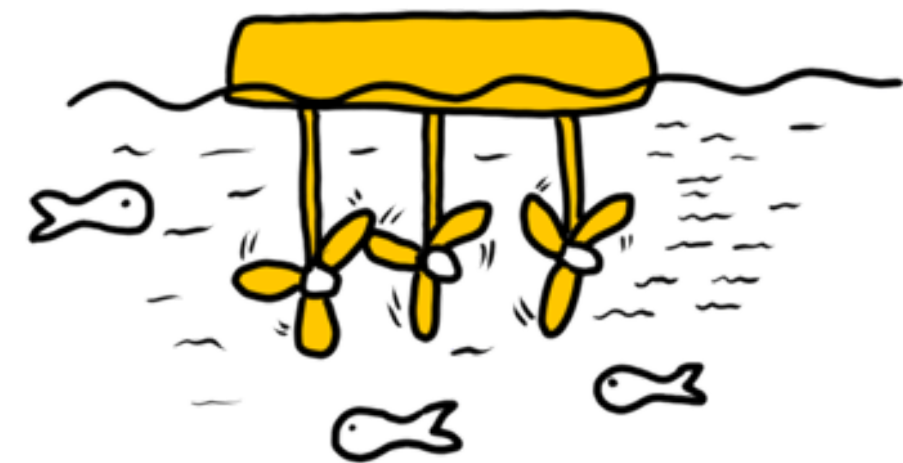
Examples of renewable energy sources are wind, sun (solar) and tidal. This is because they can be used again and again without running out or causing harm to the environment.



Wind



Sun



Tidal

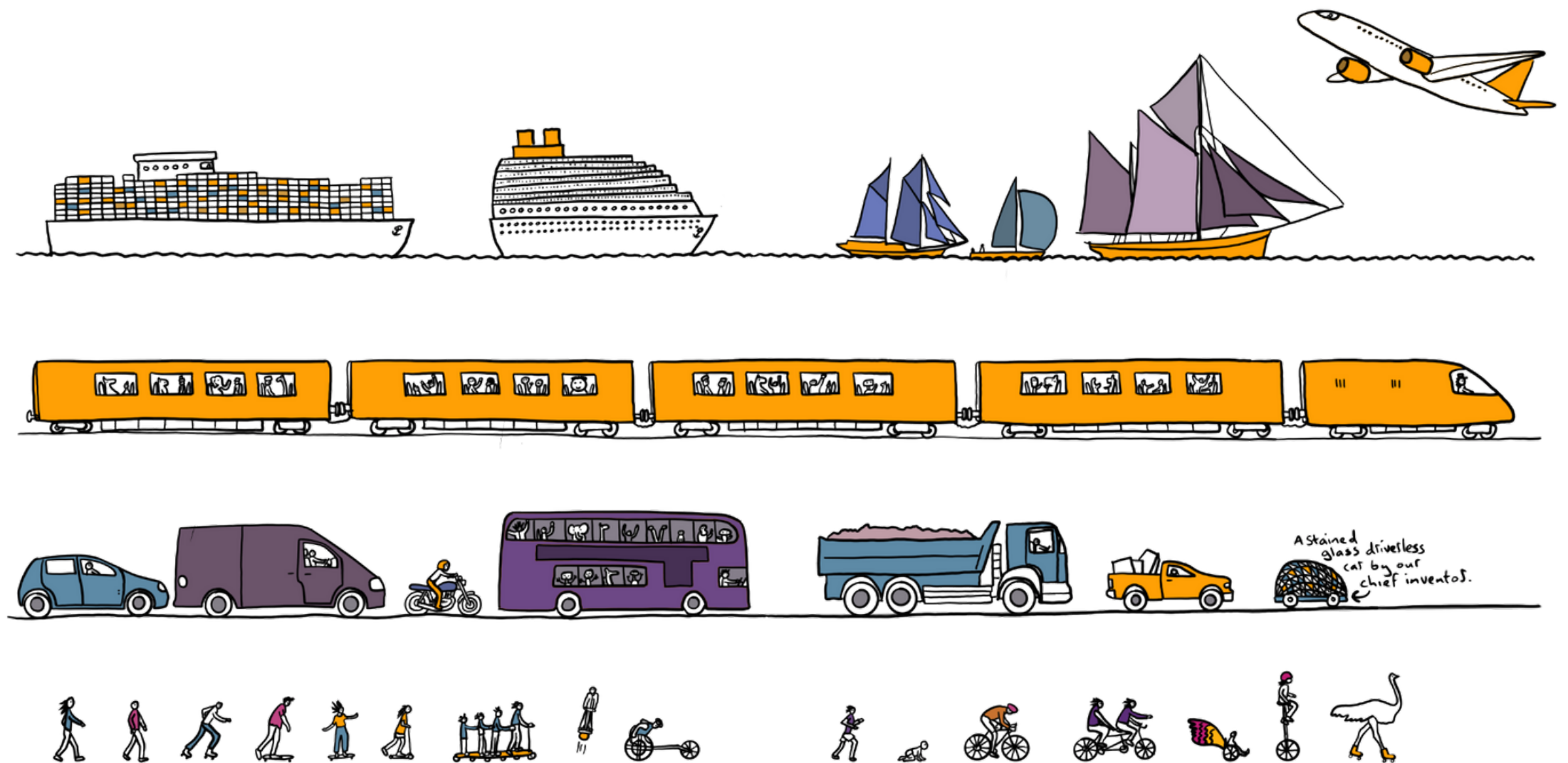
Travelling

The way we travel really matters as different types of transport create different amounts of pollution.

Travel is both necessary and fun, but we need to invent new ways to travel to help protect our planet!

One cruise ship can create as much pollution in one day as a million cars!

Sailing hardly creates any pollution because it uses the power of the wind!



Garbage

Another huge impact on our planet is garbage! It's said that 99% of everything we buy goes into the bin within six months. We live in a man-made world where everything is wrapped or carried in glass, metal, paper or plastic.

About one third of all food is wasted every year!



Takes 2 years to decompose



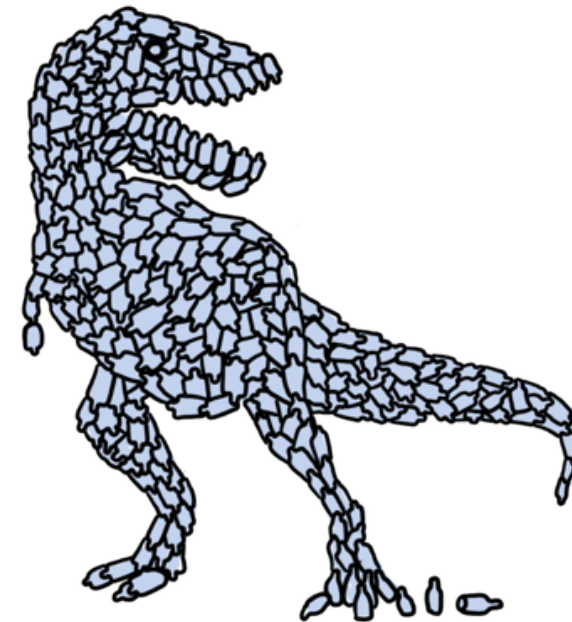
Food waste like banana peel can be recycled to produce energy or fertiliser to grow more food!



We throw away about our own body weight in waste every seven weeks.



And we throw away a million plastic bottles every minute. That's about the weight of almost two Tyrannosaurus Rex every minute!



One plastic bottle takes 450 years to decompose!

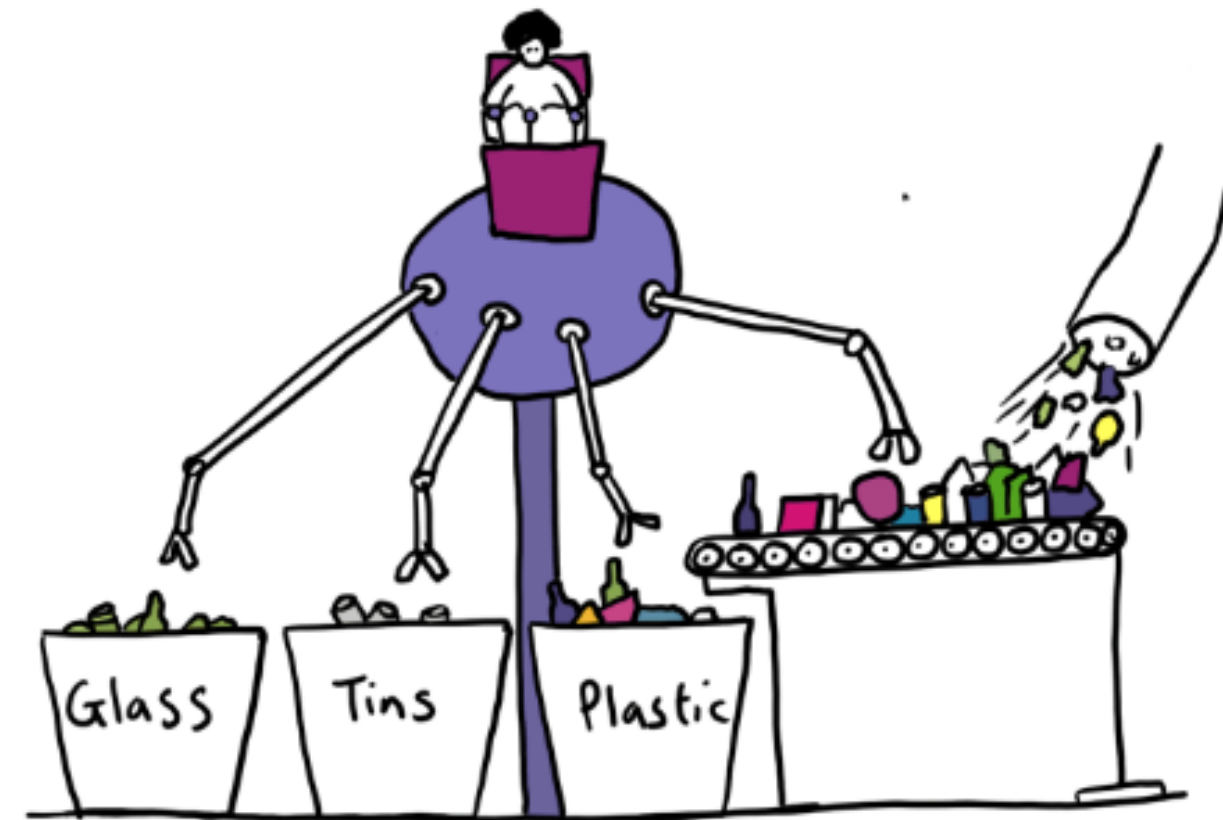
And once we've finished using something we tend to throw it away. But where does it go?

The waste problem

Most of our rubbish ends up in landfill or in the ocean, which causes a huge damage to the environment and wildlife.

Recycling is very important in reducing garbage, but we need to think about other ways to reduce the amount of waste we produce.

But the problem of waste is not always visible. When plastic breaks down, it doesn't disappear but turns into tiny pieces of plastic called microplastics.



Huge amounts of waste is carried by rivers into our oceans, harming wildlife...

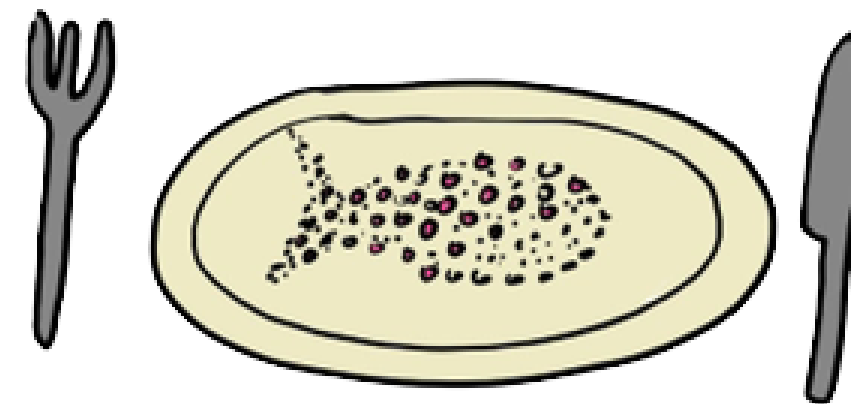
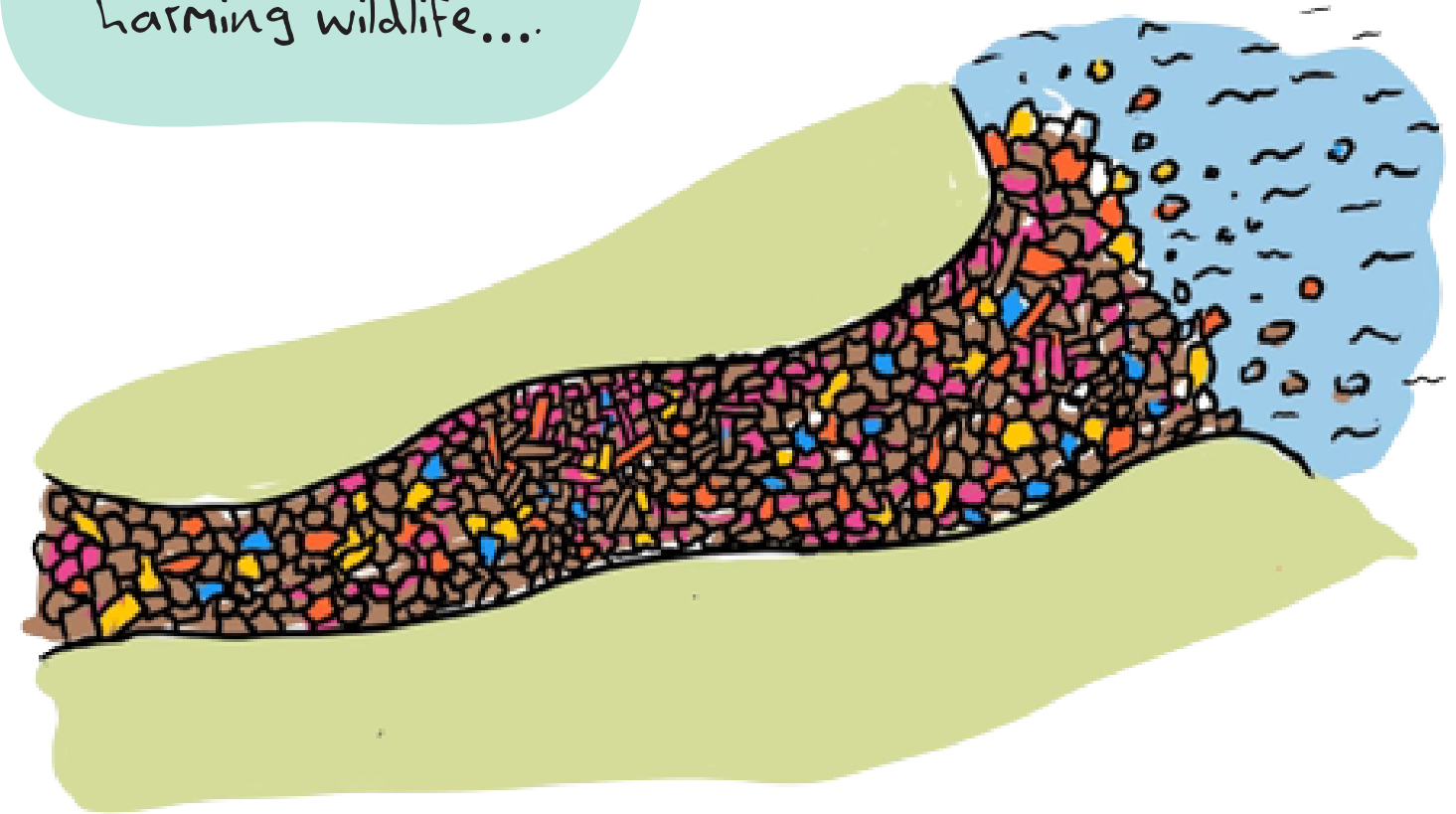
Microplastics

Microplastics are added to cosmetics, toothpaste, and clothes. These microplastics shed when washed and end up in the ocean.

Car tires also leave microplastics on the road, which are washed off by the rain and straight to lakes, rivers and oceans.

These microplastics are swallowed by creatures like plankton, seabirds and whales - all of which are part of our natural food chain - so we eat them too.

Huge amounts of waste is carried by rivers into our oceans, harming wildlife....

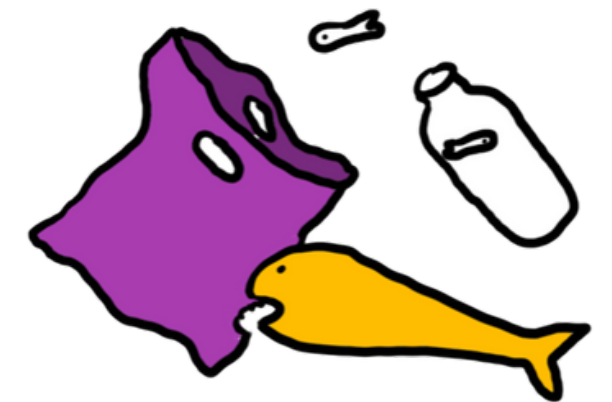


...and even ending up on our plates as microplastics!

How did we get here?

Since the industrial revolution when we started using lots of machines, us humans have created lots of pollution. Plus, new materials like plastic are great but cause huge problems because it doesn't break down fast and is piling up on earth and in the oceans.

With 7 billion mouths to feed on Earth and 9 billion expected by 2050 - how we use the Earth's resources for feeding people really matters. Earth's resources are not endless or create pollution when we use them, so we need to learn to live more sustainably.

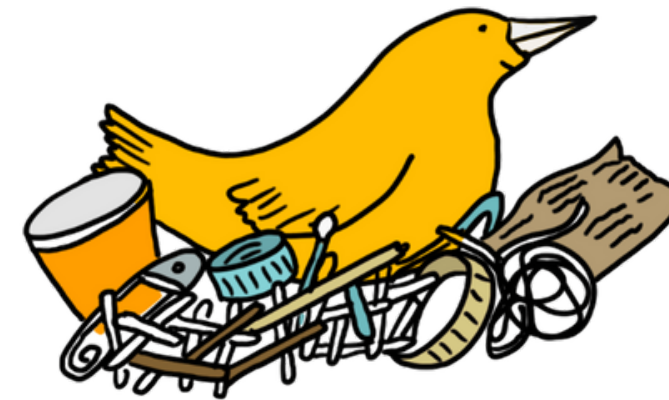


Waste not, want not!

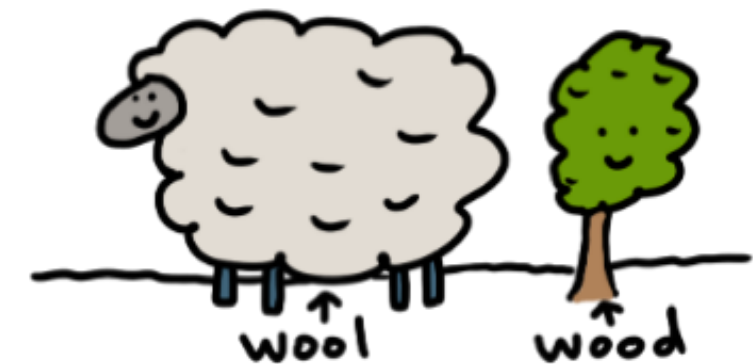
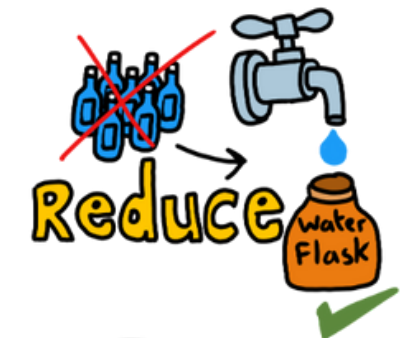
Natural materials like wood, paper and bees wax are biodegradable because they break down back into the earth. But they still use a lot of energy to be produced, so the best thing we can do is think about how we can reuse and reduce what we use.

We need more ingenious ideas about how to deal with rubbish, first to create less of it and then to be really clever with what's left!

Repairing broken items is a brilliant solution to preventing waste.



Birds are great re-users, they use all sorts of things to build their nests!



Natural materials biodegrade much faster!

Activity

DO TRASH TO TREASURE

No time to lose...

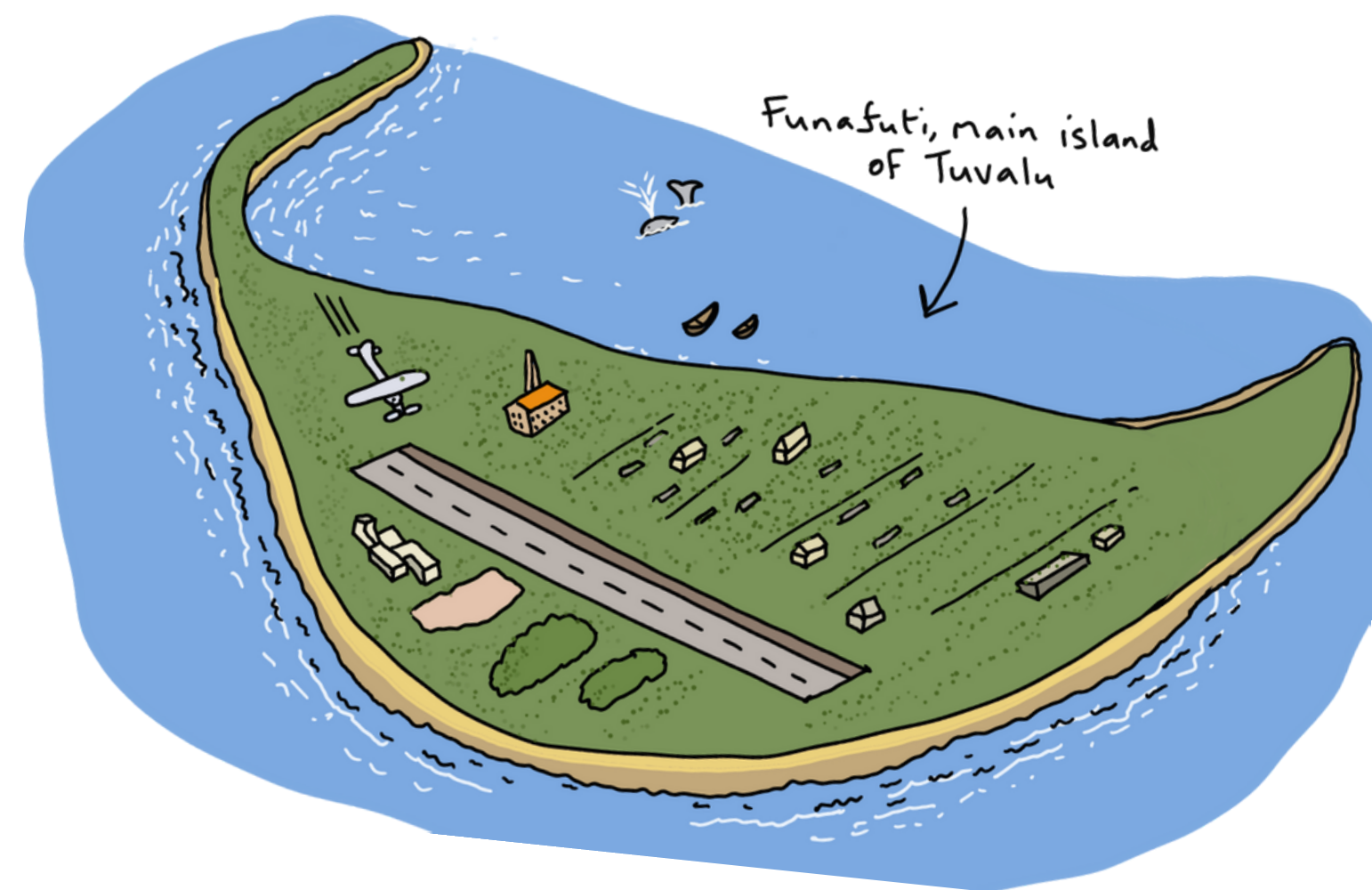
Higher temperatures have already melted lots of sea ice resulting in rising sea levels - and the islands of Tuvalu, home to 11,000 people, are already on the verge of going under water.



Many people think of climate change as something that might happen in the future but its effects are already beginning to impact people's lives all across the globe.

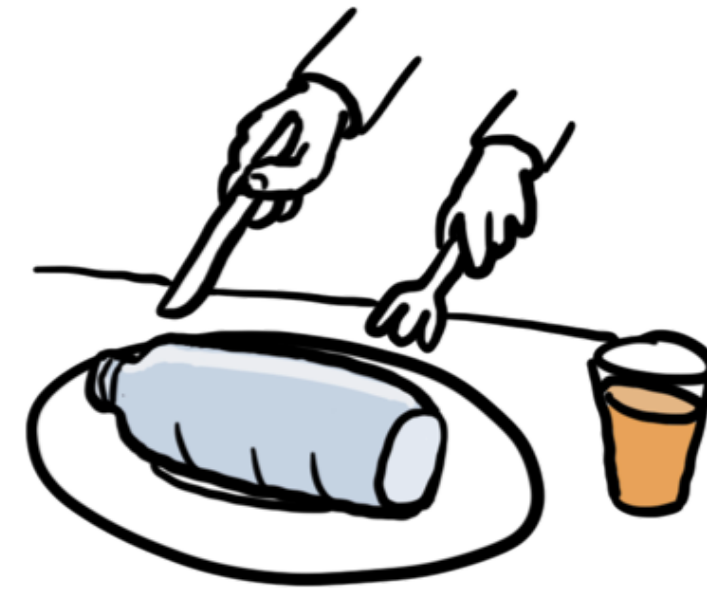


People who live near to the coast and on small islands are experiencing the effects more dramatically than some other places inland.



What does this mean for us?

The impact of climate change means flooding, extreme weather, less fresh water, less food and materials and wildfires.



It's in our hands...

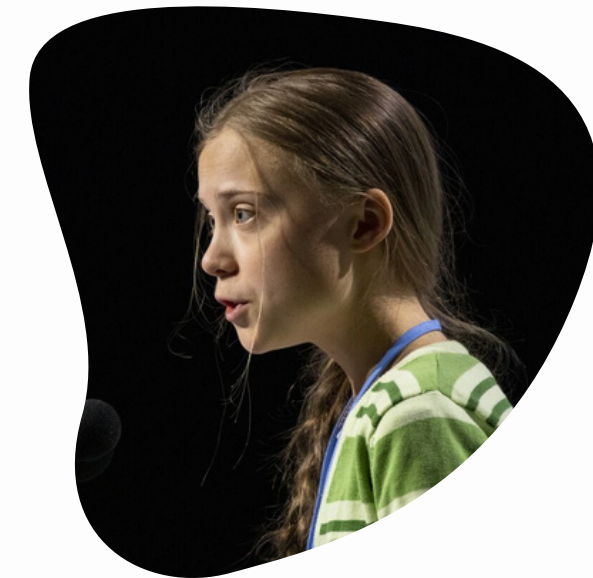
We all have a responsibility to do what we can to tackle climate change. Children all over the world are taking part in climate action and making their voices heard.

One person can make a difference, and together we can change the world.



"We children are doing this to wake the adults up. We children are doing this because we want our hopes and dreams back."

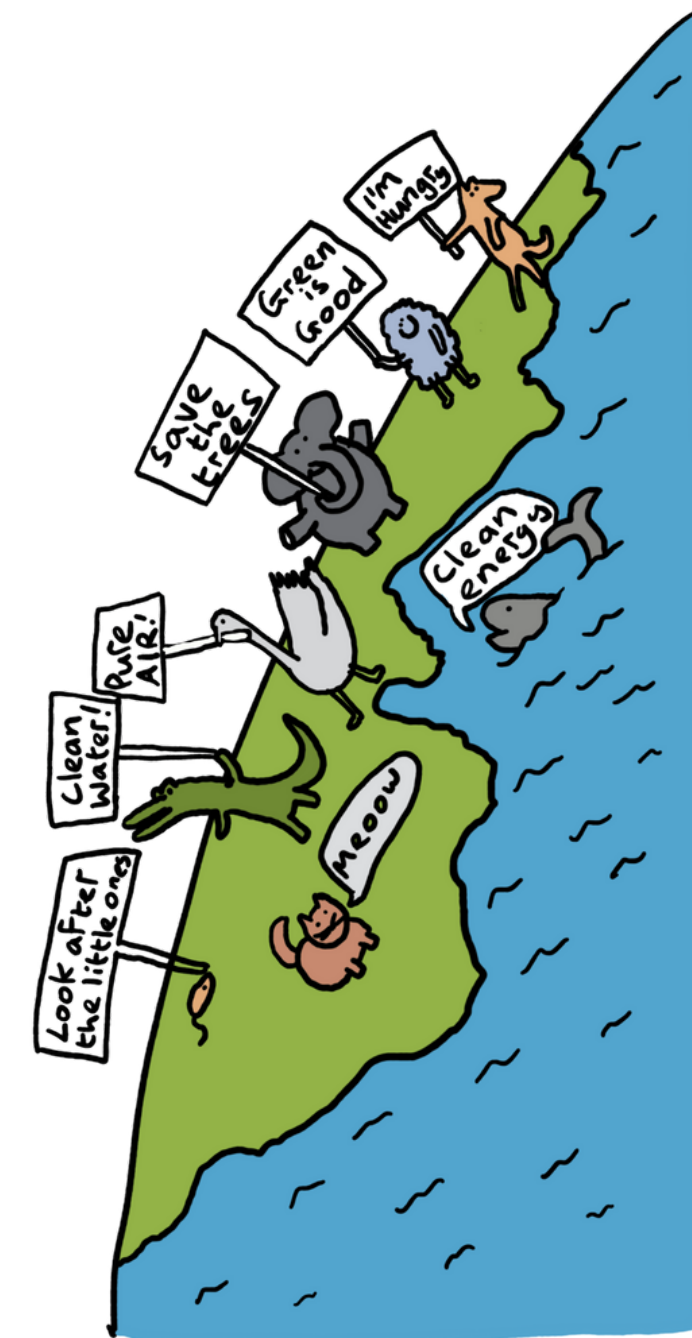
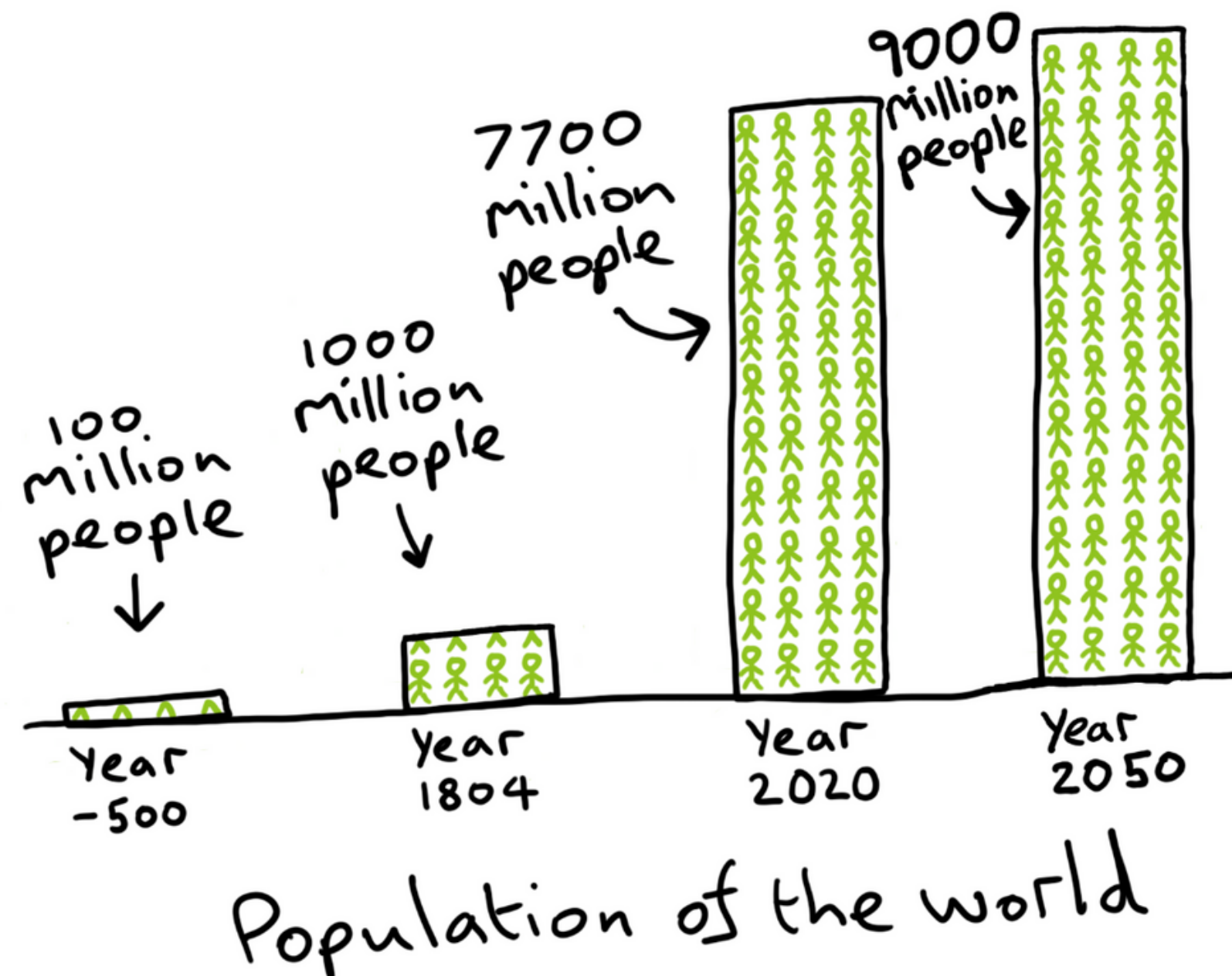
Greta Thunberg,
Climate Activist



Inventing a sustainable future

In 1987, the UN defined sustainability as "meeting the needs of the present without compromising the ability of future generations to meet their own needs."

To achieve this, we all need to make changes - and inventions can make a huge difference.

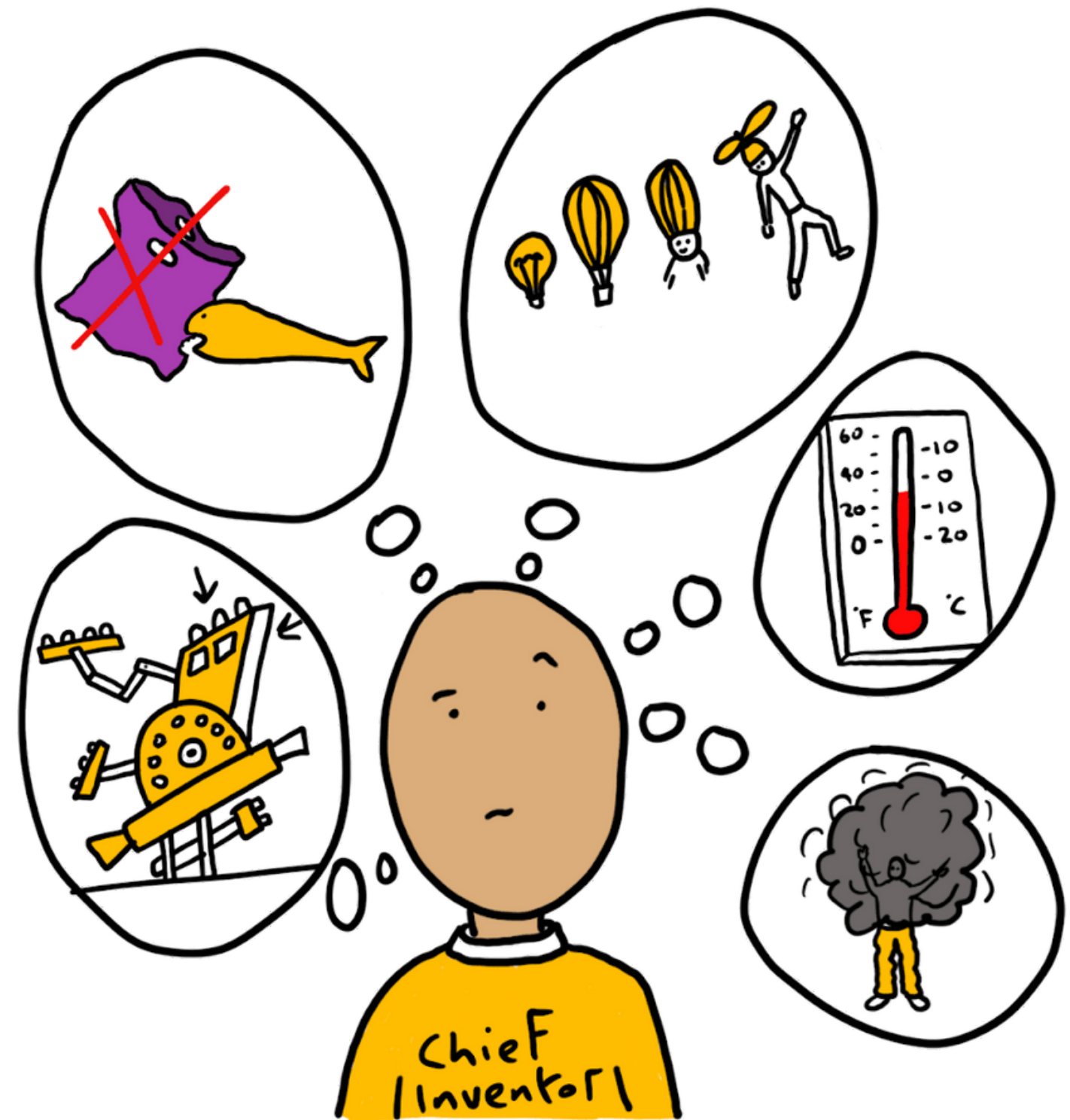


Coming up with ideas... Follow that thought

Try to stop thinking for a minute. It's pretty much impossible!

Our brains are constantly taking in information and working out what to do with it.

Trust your brain and try to catch a thought, go with it, and see where it takes you!



Coming up with ideas...who needs your help?

Thinking about who your invention is for is a great place to start.

It could be for someone in your family or an animal you spot while you're out and about.

Imagine what they like, dislike, what they might find difficult or boring - how can you help them?



Coming up with ideas... no problem too small

It might be how to help a snail go faster, how to water a cactus, or how to protect a ladybird (ladybug) from the rain.

No problem is too small to capture your inventive imagination!



Coming up with ideas...
no limits!

And of course, the opposite is also true - there is no problem too big to have a go at either!

If you worry about how to reduce the pollution in the atmosphere or how to make travel faster, safer and non-polluting, then have a go.

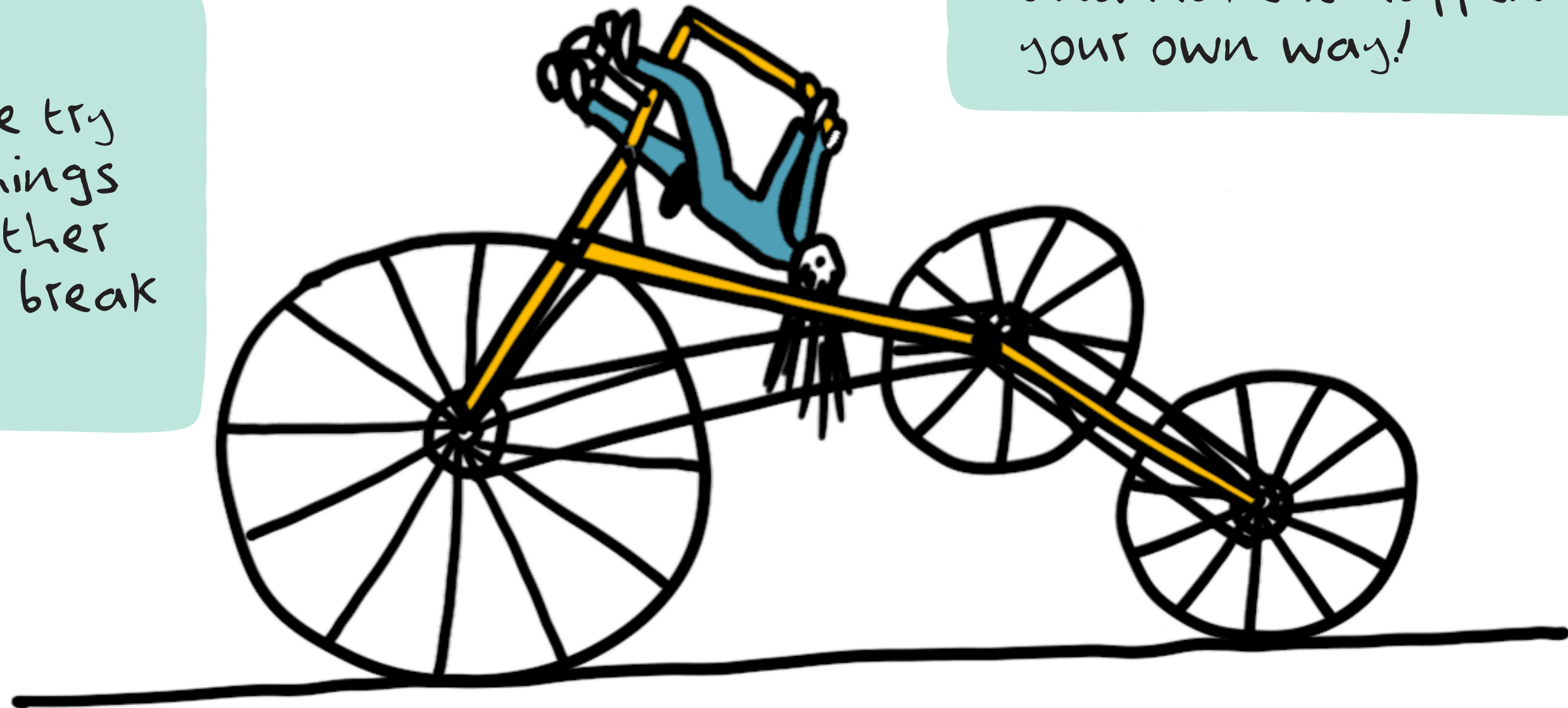


We need all kinds of ideas to help our planet stay green! What might seem impossible today could well happen in the not-so-distant future.

Coming up with ideas... BREAK THE RULES!

New inventions happen when we try to think or do things differently - in other words, when we break the rules.

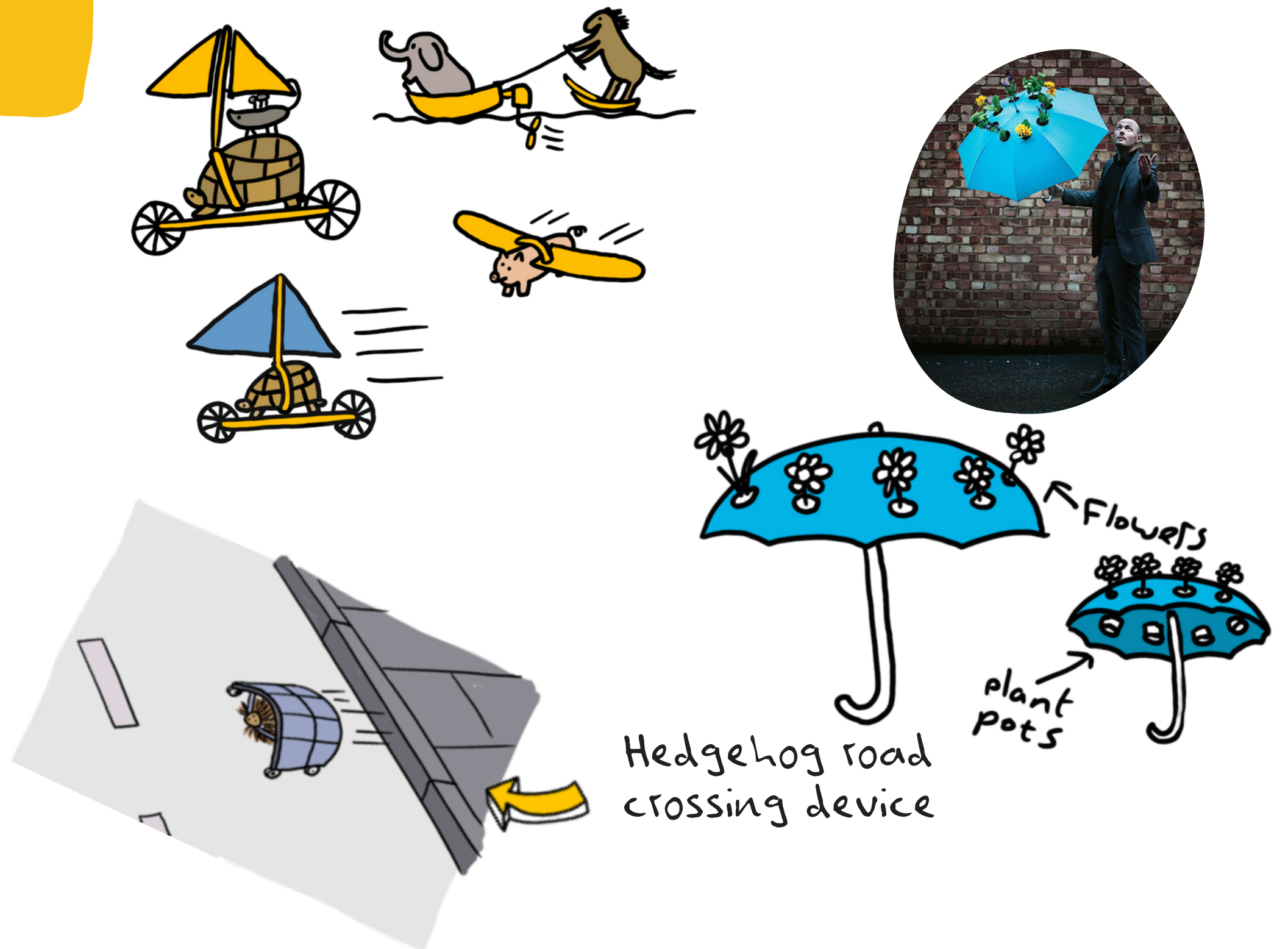
So forget how things are supposed to work and make it happen your own way!



Bonkers is BRILLIANT!

Here are some ideas from Dominic, our Chief Inventor.

Dominic loves to draw to get the ideas out of his brain and onto paper. Sometimes he doesn't even know what they'll be until he starts drawing but putting pen to paper is the first step to inventing!



Inspiration from our Chief Inventor

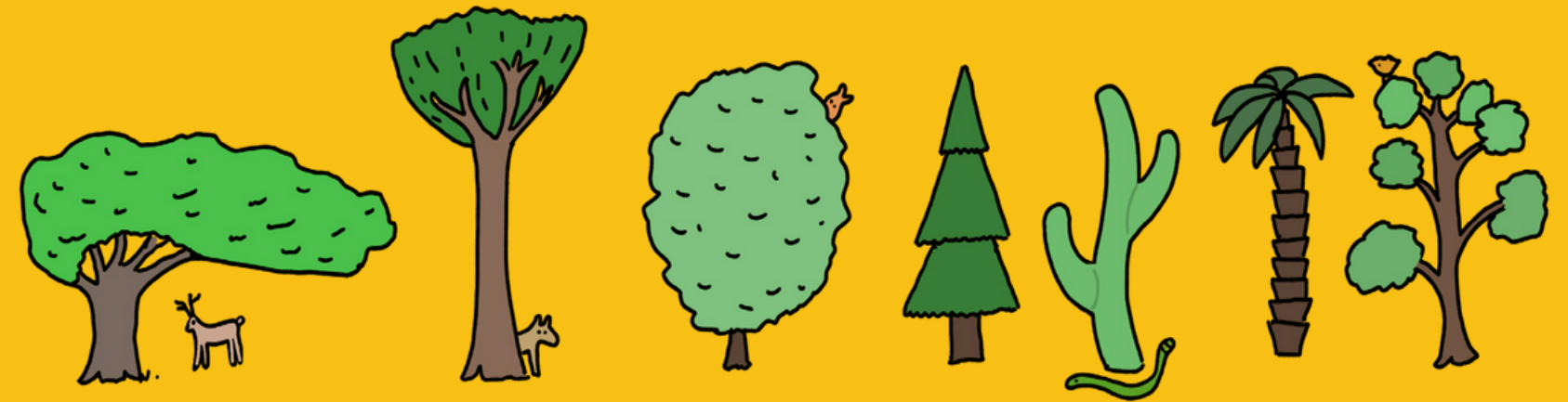
Click to watch this video



Activity

DO WHAT'S THE STORY OF
MINI CHALLENGE CARDS

THE MAIN CHALLENGE



What can you invent to help prevent climate change and protect our planet?

Use the Invention Drawing Sheet in the Activity Pack!