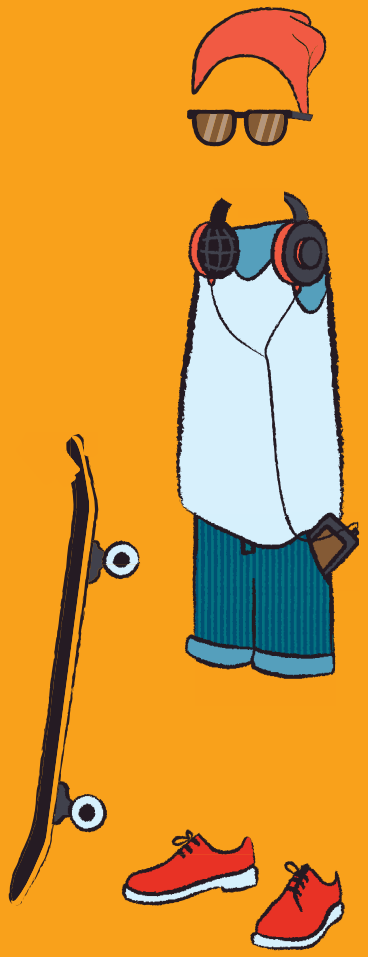
PART ONE

Which inventions are real?

1. Invisibility cloaks



REAL or IMAGINED

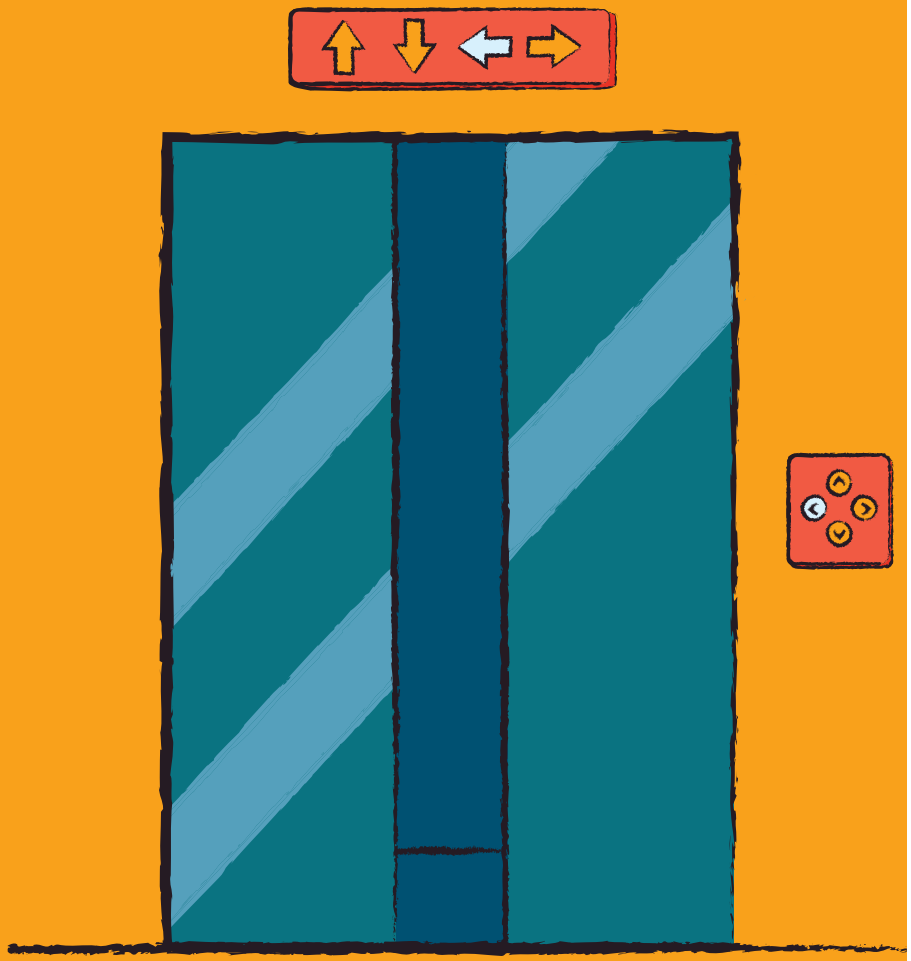
An **invisibility cloak** would hide objects that are under it or behind it.

2. Jet packs

REAL or IMAGINED

A **jet pack** would be worn like a backpack and use tiny jets to make you fly around.

3. Multi-directional elevators



REAL or IMAGINED

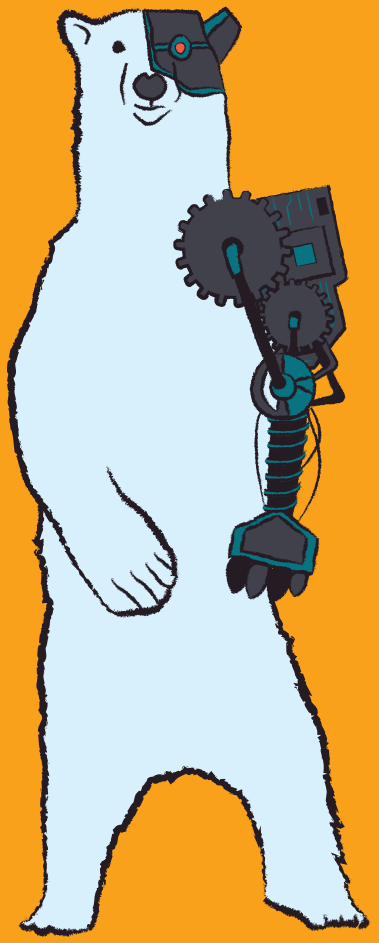
A **multi-directional elevator** would be able to move up, down, side to side, and even diagonally.

4. Exoskeletons

REAL or IMAGINED

An **exoskeleton** would be a hard covering worn by a person to protect or support their body. Some animals naturally have exoskeletons, including: beetles, snails, and scorpions.

5. Cyborg animals



REAL or IMAGINED

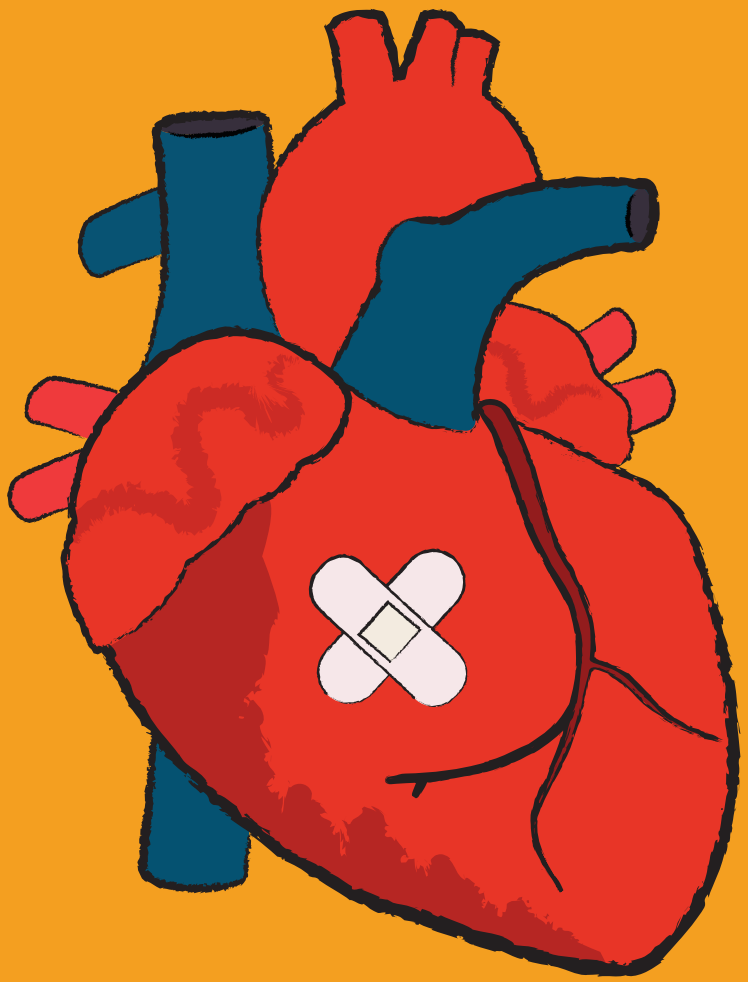
A **cyborg animal** would be an animal that can do new things because it has machines built into it.

6. Floating train tracks

REAL or IMAGINED

A **floating train track** would allow trains to cross a large body of water without having to build a bridge.

7. Heart patches

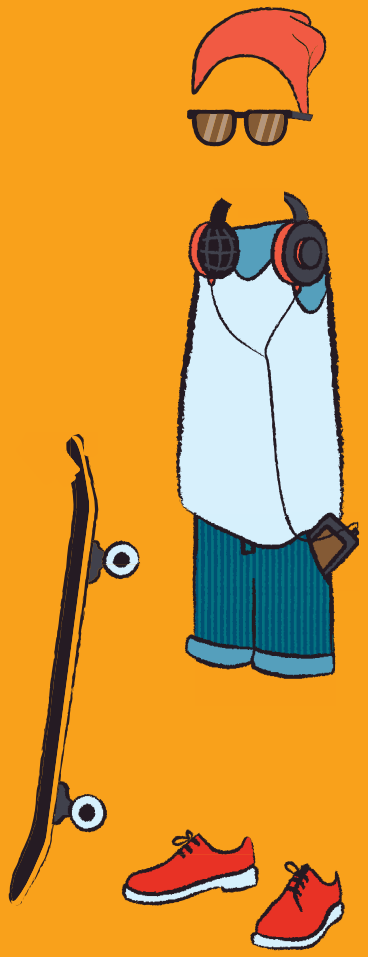


REAL or IMAGINED

A **heart patch** would be used to help someone with a sick heart get better.

Be sure to record all of your guesses before moving on to the next slide.

1. Invisibility cloaks



REAL

Engineers and physicists at the University of Rochester created an "invisibility cloak."

The team made it by using just 4 lenses! The cloak only creates a donut shape, so things in the center are still visible. Now, researchers have a new challenge to solve!

What uses exist for an invisibility cloak?

Fun fact:
Google "Rochester Cloak" and you will find instructions on how to make your own invisibility cloak!

2. Jet Packs

REAL

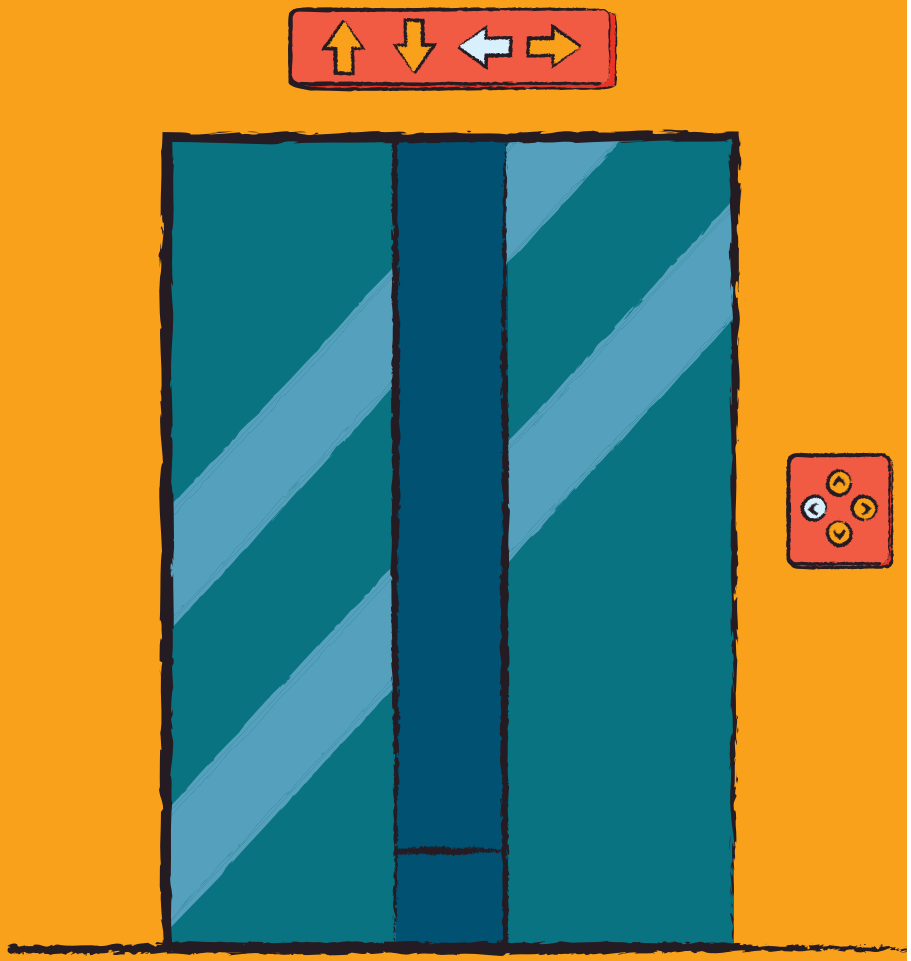
Aeronautical engineers have been building jet packs since the 1950's.

They are real, but aren't used because of 2 challenges. First, they can't fly for long because too much fuel makes them too heavy to launch. Second, they are hard to steer!

Fun fact:
Engineers have not created jet packs that work well on Earth, but they have made ones that work well in space!

Why are jet packs easier to steer in space than on Earth?

3. Multi-directional elevators



REAL

A German engineering company created an elevator that can travel in many different directions.

Most elevators use a rope and pulley system, so they only move up and down. By using electromagnetic tracks, these elevators can move in any direction!

If you had a multi-directional elevator, how would you use it?

Fun fact:
These elevators use similar technology that many amusement park rides use!

4. Exoskeletons

REAL

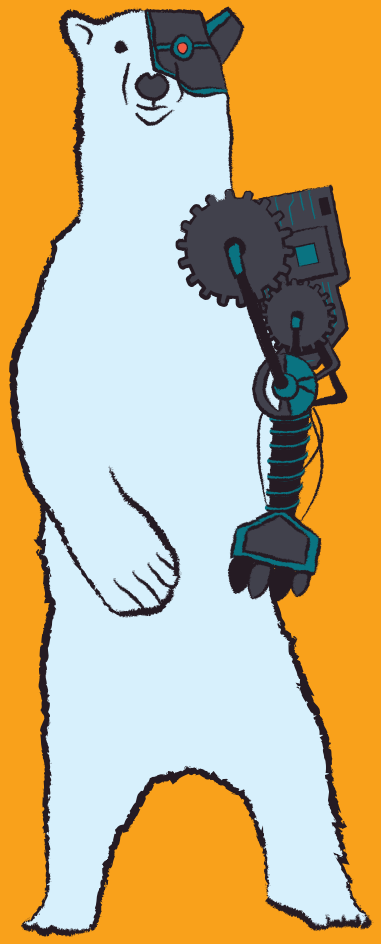
Many engineers are working on creating powered exoskeletons. These devices help make people stronger, faster, and more protected.

Exoskeletons can: help people with spine injuries walk again, keep soldiers safe, and protect firefighters so they can save more people.

Who else might need a special exoskeleton?

Fun fact:
This idea was inspired by nature. Many animals, such as beetles and crabs, have exoskeletons!

5. Cyborg animals



REAL

A "cyborg" is an animal that has machines built into it so it can do new things. Many cyborg animals exist – like cyborg rats.

Researchers from University of Florida gave rats homing beacon backpacks, implanted chips in their brain, and taught them to sniff out humans. They hope cyborg rats can learn to find lost humans and give their location to rescuers.

Why did they use rats over other animals?

Fun fact:
Engineers are developing cyborg stingrays that can be steered by light!

6. Floating train tracks

REAL

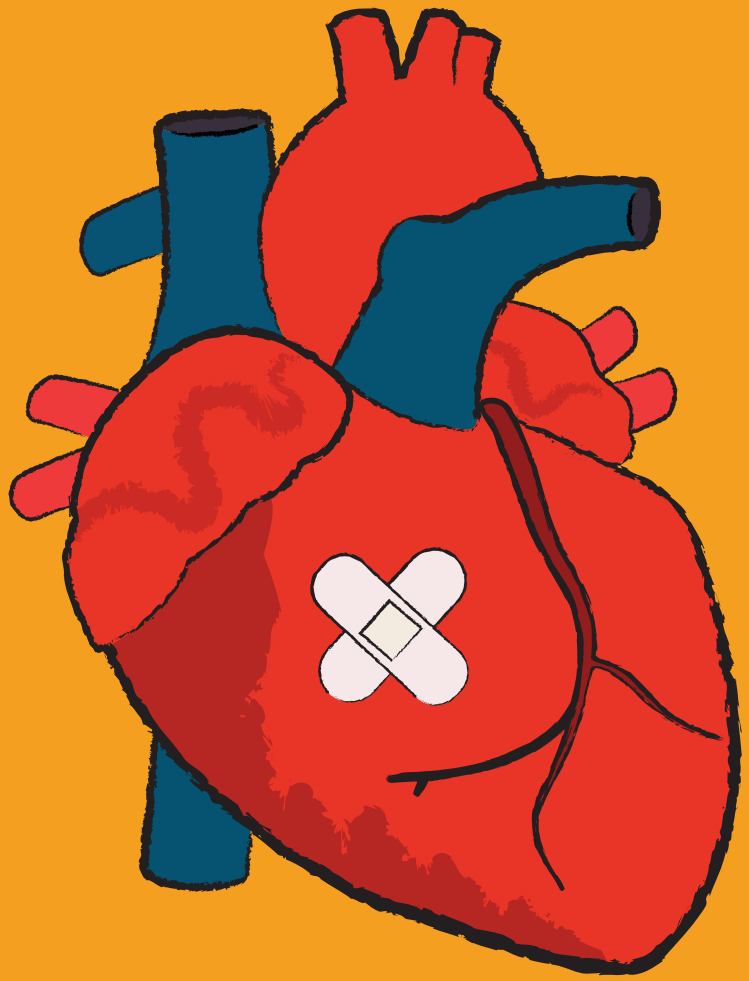
Floating train tracks might not sound difficult, but engineers had to solve 2 challenges to make them work.

First, trains weigh over 50,000 pounds! Engineers had to invent floats that could hold them. Then, they had to design tracks that moved when the floats moved but still worked with the train!

Why do the train tracks have to be able to move?

Fun fact:
The first floating train tracks are being built in Washington but won't be finished until 2023!

7. Heart patches



(almost) REAL

When you cut your hand, your skin can repair itself. However, when your heart gets injured, it cannot fix itself.

To solve this tricky problem, researchers from 3 universities formed CELL-MET, an engineering research center. Together, they are creating heart tissue so doctors can patch sick hearts.

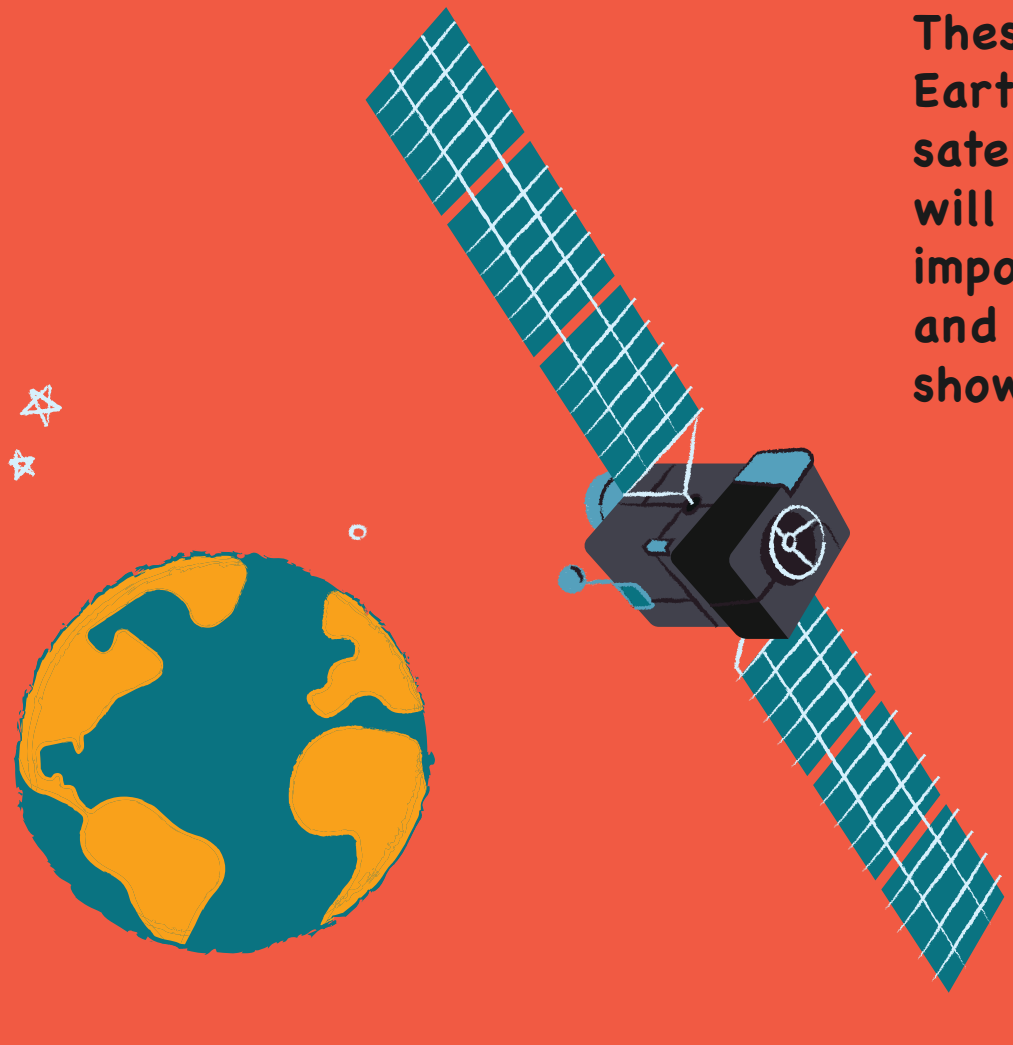
Fun fact:
Your heart is about the size of your fist!

How big (or small) do you think a heart patch would have to be?

PART TWO

What inspired each invention?

Geostationary satellites



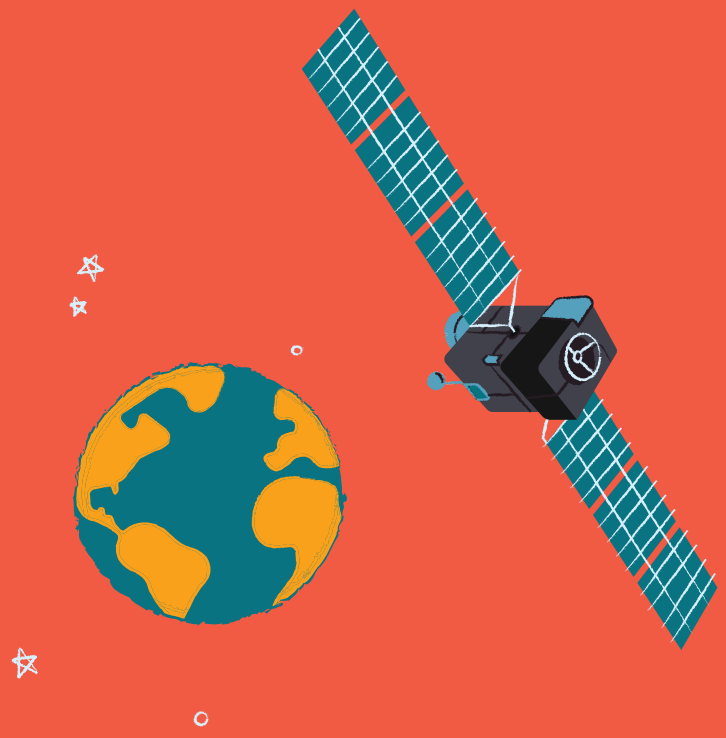
These satellites move with Earth's rotation. This means a satellite that is over New York will stay over New York. This is important for tracking weather and for broadcasting television shows.

Where did this idea come from?

AN ARTICLE!

In 1945, Arthur C. Clarke wrote a science fiction story imagining a device that moved with the Earth's rotation.

He inspired aerospace engineers, who made the first geostationary satellite in 1963. There are now over 600 in space!



Fun fact:
Arthur Clarke was inspired by the engineer, Herman Potocnik.

Computer music players

People play music on their computers, phones, and tablets using programs like iTunes, Spotify, and SoundCloud. This technology hasn't always existed!

Where did this idea come from?

A TV SHOW!

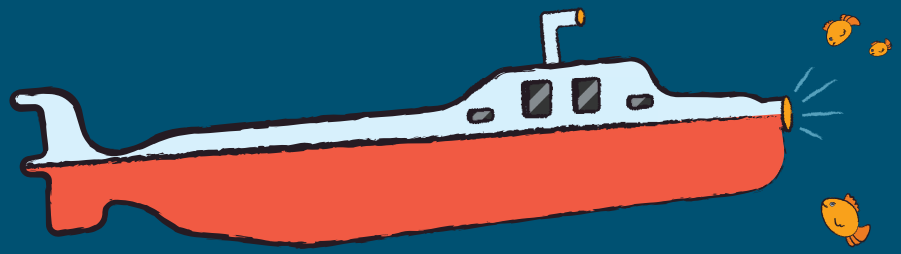
Software engineers create programs that played music.

The very first music player was QuickTime. It was invented in 1985. The inventors were inspired by Star Trek when a character played music from a computer.

Fun fact:
QuickTime was released to the public in 1991 – that's 10 years before iTunes!

Submarines

Submarines are a type of underwater vehicle. We often hear about them being used by the military, but explorers and researchers use them, too.



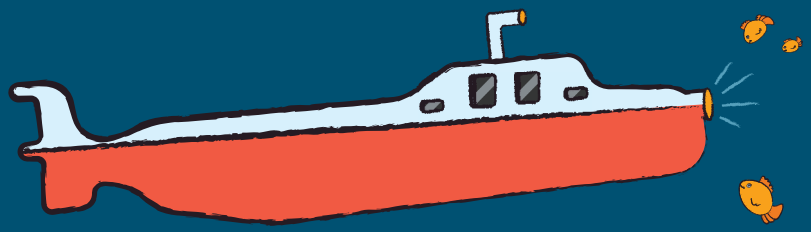
Where did this idea come from?

A NOVEL!

Attempts to build submarines started in 1578, but the U.S. first made one in 1894.

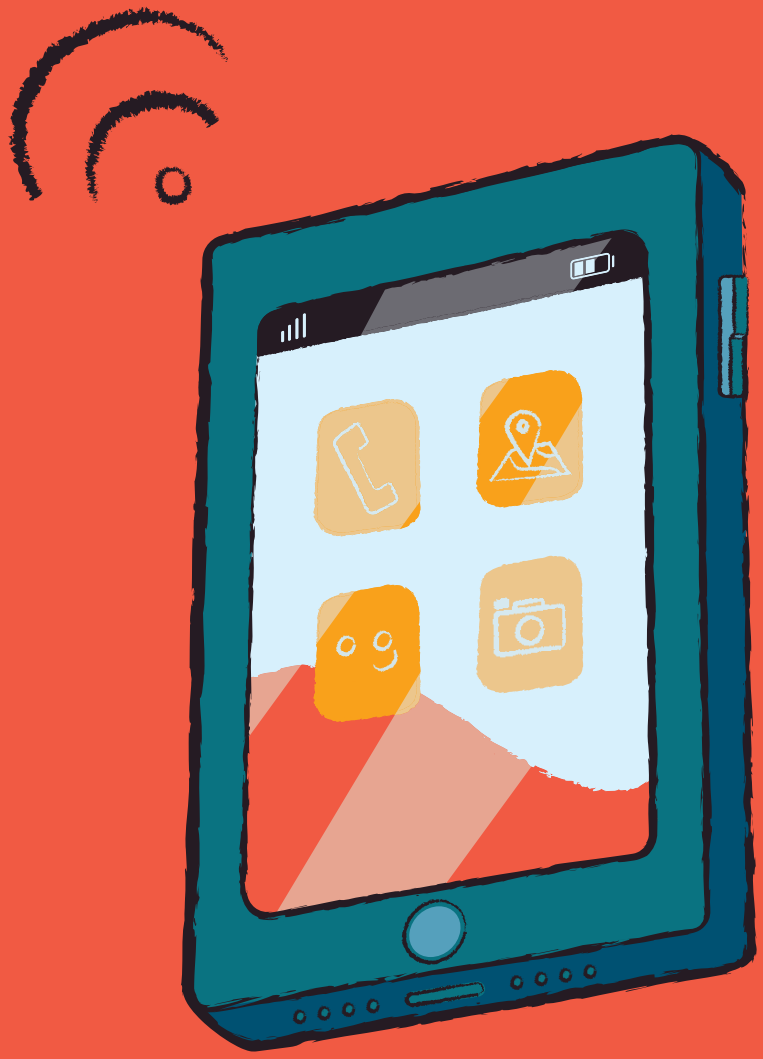
They were invented by mechanical engineers who specialized in vehicles that operate on and under water.

An inventor, Simon Lake, first imagined his submarine as a child. He got the idea from a book - Twenty Thousand Leagues Under the Sea by Jules Verne.



Fun fact:
Simon's submarine used 3 wheels to drive it around the ocean floor!

Cellphones



Cellphones are used to talk to people, listen to music, get directions,and more.

Though we use them a lot not, cellphones didn't exist until about 40 years ago!

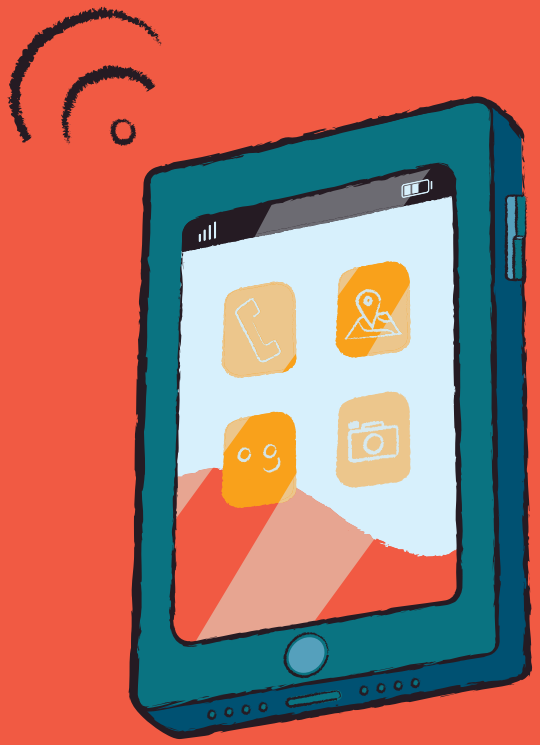
Where did this idea come from?

A CARTOON STRIP!

The first cellphone was created in 1983.

Martin Cooper, the cellphone inventor, is an electrical engineer who specializes in wireless communications. He got his idea from Chester Gould and his cartoon strip, Dick Tracy!

Chester first introduced the concept of the "wrist radio" in 1946.



Fun fact:
A TV show, Star trek, inspired a 1996 cellphone. It was called the StarTAK.

PART THREE

Imagine and draw your own invention!

WHAT IS YOUR INVENTION?

IMAGINE: What would you create?

DRAW: What would it look like?

EXPLAIN: How would it work? What problem would it solve?