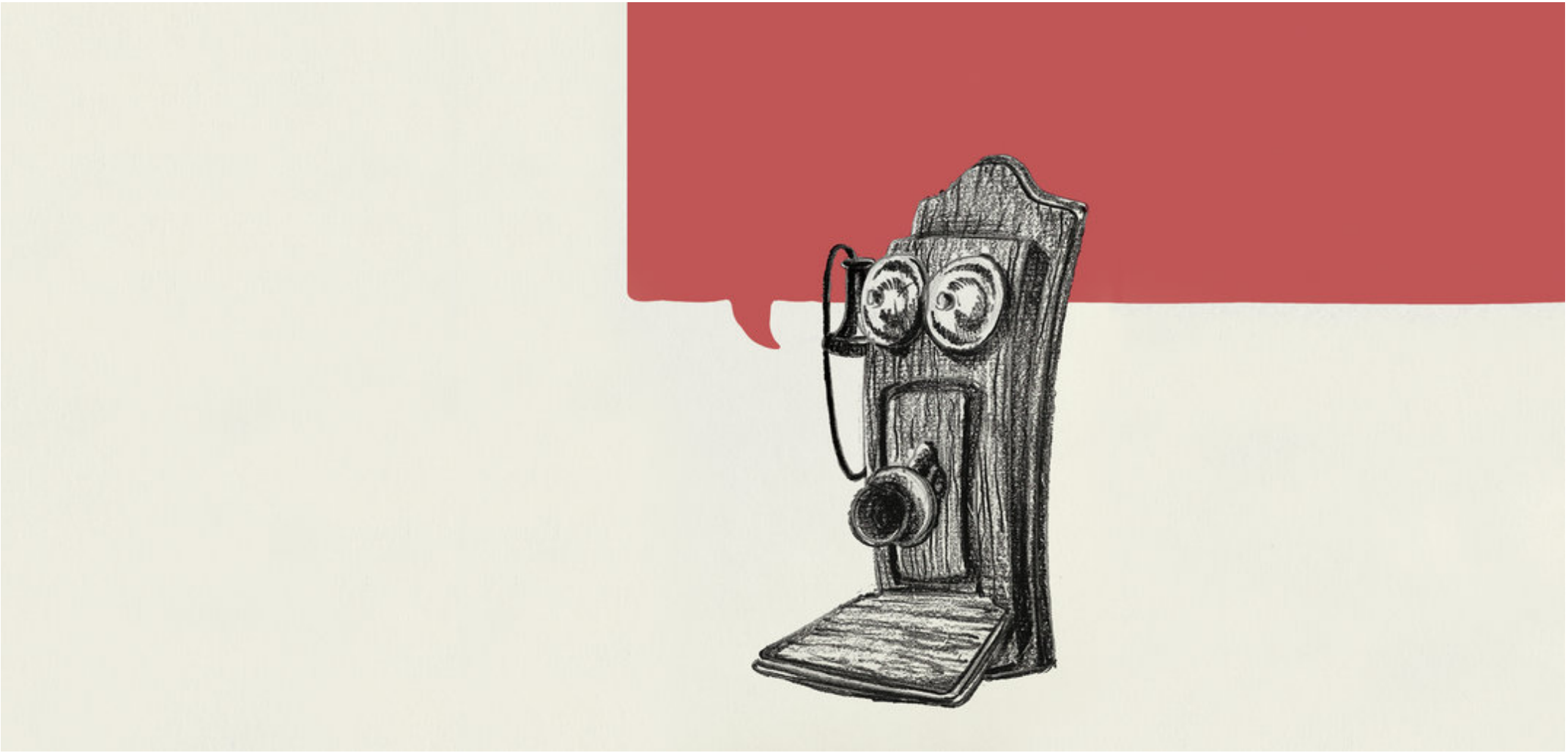

PRATHAM BOOKS

Level 4

Telephones - Bell to Cell

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Illustrator: Nishith Mehta

When you want to make a call, what do you do? Reach out for a cell phone? Or use a landline plugged to a wall? Perhaps the one in the post office or the phone at the grocery store, where you pay the shopkeeper to use it?

Whichever it is, the way you make the call remains the same: you enter the number and wait for it to ring.

But it wasn’t always this simple.

Alexander Graham Bell invented the telephone in the 1880s.

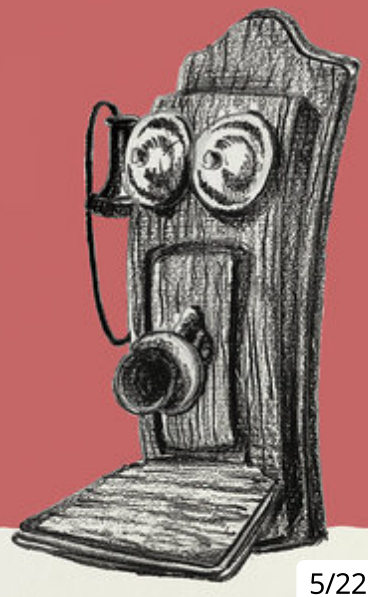
He made the first call on March 10, 1876, in his office in Boston, USA, to his assistant Thomas Watson. Bell shouted into the mouthpiece, asking Watson to come and see him. The assistant heard Bell through his earpiece and came running from the next room.

At that time, the telephones did not have dials - the two phones were directly connected to each other by a wire!

As more people began to get telephones, a central place called an exchange was set up. The exchange had a switchboard connected to every telephone in the area. An operator could plug in the wires on a switchboard to connect any two phones.

A switchboard looked like this.

And the telephones looked like this. They had
a separate mouthpiece to speak into
and an earpiece to listen from.
They still didn’t have number dials!
How did you make calls then?



“Hello! How may I help you?”
“Operator, could you please connect me to Doctor Andrew?”
“One moment.”

First, you picked up the receiver. A telephone operator would greet you. The operator would then plug in a few wires and the doctor’s phone would start ringing.

But you had to be mindful of what you said, because the telephone operator could listen to your conversation if she wanted to.

As the number of telephones grew, it was not possible for an operator to know all the connections.

So telephones were designed to have dials. You dialled a number instead of telling the operator to connect you. This number would get transmitted to a switchboard that could automatically connect telephones.

However, operators still routed long-distance calls.

In the late 1920s, the design of the phone changed. What changed?

The mouthpiece and the earpiece were fused into a single handset. You could hold the handset in one hand, or cradle it between your neck and shoulder, leaving your hands free to write or wear your watch.

Soon, people wanted to make calls on the move.

No, they didn’t have cell phones yet. But you could stop on the street and call someone from public telephone booths. By the 1930s, many major cities across the world had such booths.

In fact, this is how most people made calls. Only very rich people had telephones at home.

Some years later, people wanted to use telephones while driving.
So phones – complete with handsets and dials – were built into cars.

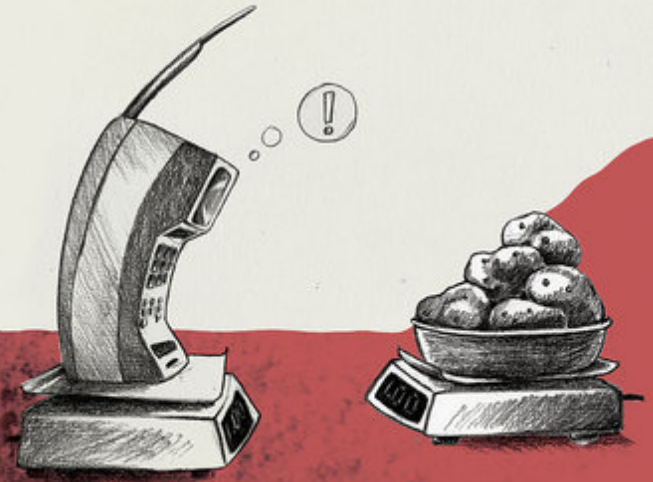
But these car phones had no wires! They used radio waves to connect to other phones.

In the 1970s, a few people had phones that they could carry around in their bags.
This was the satellite phone. It could connect to other phones using satellites.

Satphones were never popular because they needed a clear line-of-sight
to a satellite in the sky. So if you lived on the second floor of a 20-storey building,
you would have to go up to the terrace to make or receive calls.

Cell phones began to be used at around the same time. These did not need a straight connect with a satellite. They connected to a tower nearby. So you could make calls sitting inside your house or office.

The first cell phone, made in 1973, weighed more than one kilogram! Later, it got smaller and smaller until it could fit into your pocket.



A cell phone is convenient in other ways too.

Landline phones have to be connected with wires. This means a lot of digging to lay cables across and between towns. Since this also requires money, many villages did not have phones. But the wireless cell phone has changed that. Nearly everyone has a cell phone now.

Today’s cell phones are for more than just making calls. You can chat, play games, send emails, browse the internet, listen to music, watch movies, click photos and record videos, download apps...

What we call a smartphone is really a computer that can also make calls.

What else could a phone of the future do?

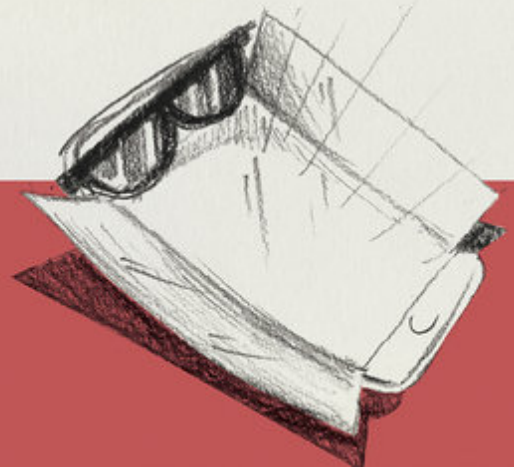
Today, you can speak out your friend’s name and your phone will call her up.
Maybe one day you would be able to tell your phone, “Find me
the number of my third standard math teacher,” and it would!

The phone might be able to beam out three-dimensional images of objects.
So you can look at a school bag from every side before you buy it online. On the inside too!

I also imagine these phones as bendy. You can wrap them around your wrist
or roll them up to fit a tiny purse.

And charging! There has to be a better way to do that. Solar cells would be great – you would only have to be out in the sun to charge it.

Or motion-based charging. This would use kinetic energy, which means that the phone would keep getting charged as long as it was on the move. If the battery was dying, you could take a quick run down the road. The phone would get charged and you would get some exercise.



Smartphones become outdated very quickly! Most people throw away their phones in one or two years to buy newer ones. That means a lot of waste. How nice it would be if phones were earth-friendly. No harmful radiation, no toxic materials – all reusable or biodegradable parts. Now, that’s really smart technology!

Now, tell me, what do you think phones will be like in the future?

Inventor and Teacher

Alexander Graham Bell invented the telephone. Other scientists also worked on similar inventions. Bell's parents inspired him to learn about sound and speech.

His father was a professor of elocution. Alexander's mother was almost completely deaf, but she learnt to play the piano. Alexander used to speak close to her forehead so that she could feel the vibrations and make out the words. He later started a school for the deaf in Boston.

Throughout his life, Alexander kept discovering new ways to communicate. He had 18 patents to his name. His first invention, as a 16-year-old, was a machine to remove husk from wheat grains.

Bell was fascinated by the way sound travels through vibrations. If you place your fingers on your throat and speak, you can feel the vibrations of your vocal chords that make the sound.

When someone speaks, the vibrations reach your ears and make the eardrum vibrate. That’s how you hear things. As people move farther away, the vibrations become weaker and fade out.

See the Sound!
-An experiment

Things you need:
- 1 bowl
- Plastic cling wrap
- A few grains of rice
- A steel plate and spoon

Steps:
1. Take the bowl and stretch a plastic cling wrap tightly over it.
   Make sure it doesn’t sag.
2. Sprinkle a few grains of rice on the plastic film.
3. Take the steel plate and spoon, go close to the bowl with the plastic film, but don’t touch it.
4. Start hitting the plate with the spoon. But be careful not to touch the bowl!

What do you see?

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Telephones - Bell to Cell

(English)

When Alexander Graham Bell first invented the phone, there were only two in the entire town! Now, nearly everyone has a cell phone. Flip through this book and find out how the telephone evolved – from Bell to cell.

This is a Level 4 book for children who can read fluently and with confidence.

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