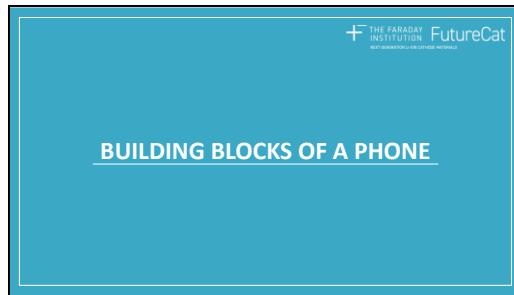


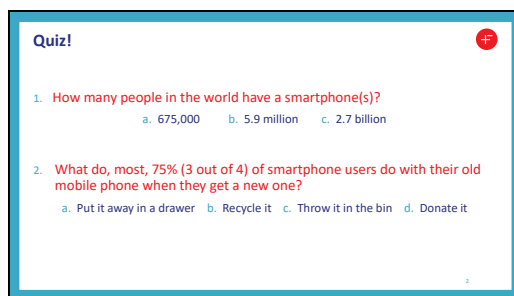
Slide 1



THE FARADAY INSTITUTE FutureCat  
www.faradayinstitute.org.uk

BUILDING BLOCKS OF A PHONE

Slide 2

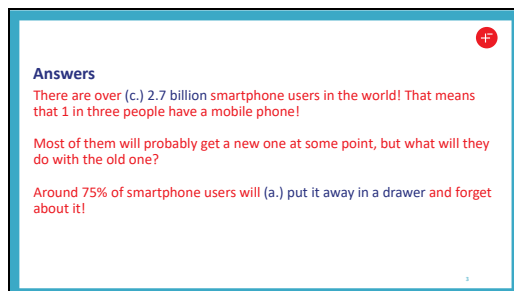


Quiz!

1. How many people in the world have a smartphone(s)?  
a. 675,000    b. 5.9 million    c. 2.7 billion
2. What do, most, 75% (3 out of 4) of smartphone users do with their old mobile phone when they get a new one?  
a. Put it away in a drawer    b. Recycle it    c. Throw it in the bin    d. Donate it

2

Slide 3



Answers

There are over (c.) 2.7 billion smartphone users in the world! That means that 1 in three people have a mobile phone!

Most of them will probably get a new one at some point, but what will they do with the old one?

Around 75% of smartphone users will (a.) put it away in a drawer and forget about it!

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Slide 4

**Learning Outcomes:**

Find out what's inside our phones and why we chose the materials we do.

You will need to cut out a template, decorate your phone and finally stick it all together.

Slide 5


What's inside your phone?

### The Mainboard

The brains of your smartphone!

Covered with computer chips, wires, and other tiny electronic bits-and-bobs which turn your phone into a handheld computer!

All other parts of the phone like the screen, camera and battery all connect to the mainboard.



The mainboard is the brains of your smartphone, without it the phone is nothing more than a paper weight. It is covered with tiny computer chips as well as lots of connectors and wires. It controls all other functions of the phone sending out instructions to everything including the screen, camera and speakers.

Slide 6



What's inside your phone?

### The Battery

The battery stores CHEMICAL energy which it can then release as ELECTRICAL energy to power your phone.

### The Camera

Not only is your phone great for calling and messaging friends and family it can also take photos and videos!



Without a battery your phone would have to be plugged into the wall at all times... not ideal. Batteries store chemical energy when they are charged and release it as electrical energy to power the phones and any other electronics.

- The function of the camera is pretty self explanatory but isn't it amazing how we can fit it inside a mobile phone that we carry around in our pocket?


Slide 7

What's inside your phone?

### The Frame and Screen

The frame keeps everything together and helps protect the fragile components inside.

The screen is the main way we interact with our mobile devices. It converts electricity to light.



Slide 8

What's inside your phone?

Our phones contain many, many different materials. Each material was chosen for its specific properties which allow it to carry out its specific task.

- MOVE a property to assign it to a material.
- MOVE a component into the box of the material it might contain.
- DISCUSS which properties of a material make it suitable for a particular component.

Properties

Hard Soft Transparent

Stiff Conductor Flammable

Insulator Bendy Opaque

Component

Mainboard Frame

Camera Battery

Screen

Material

Metal Glass Plastic

Wood

There are multiple of each component and property that can be drag-and-dropped into the desired material box. (only works when viewed as Powerpoint)

This slide can be set as a homework activity to consolidate materials and their properties.

Slide 9

What's inside your phone?

**Metal**

Camera  
Screen  
Mainboard  
Frame  
Battery

Hard  
Soft  
Stiff  
Conductor  
Insulator  
Opaque

Metal is a great all-round material. It is **HARD** and **STIFF** making it a great material for structural components like the frame. It is also a **CONDUCTOR** so can be used in electronics to make wires, computer chips, connectors and is essential in batteries.

However, metal can be **HEAVY** and **EXPENSIVE** so we don't want to use too much of it in a handheld device.

**Glass**

Transparent

Hard  
Soft  
Stiff  
Insulator

Frame  
Camera  
Screen

Glass is very useful for making screens and lenses as it is **TRANSPARENT**. It is also very **HARD**, **STIFF** and can be attractive making it a good material to use in the frame of your phone.

However, glass can be **BRITTLE** and shatter or smash easily, and therefore can be dangerous when broken. Imagine dropping a phone made completely out of glass!

**Plastic**

Hard  
Soft  
Insulator  
Bendy  
Stiff  
Transparent  
Opaque  
Flammable

Mainboard  
Camera  
Frame  
Battery  
Screen

Plastic is a **CHEAP** and readily **AVAILABLE** material. Depending on the process used to make it, it can take on any number of properties as can be seen above. All this makes it a great candidate for **INSULATING** electronics or adding strength and structure.

However, plastic takes thousands of years to decompose so we want to limit its use to protect our planet.

**Wood**

Hard  
Soft  
Insulator  
Stiff

Flammable  
Opaque

Wood has many desirable qualities for use in a phone. Unfortunately, wood can be difficult to turn into the shapes we require for our phones and isn't always very **DURABLE**.


Other materials such as plastic or metal can carry out the same functions better.

Answer sheet

## Slide 10

Build your phone


1. **Cut out the phone template, cutting along the black lines.**  
Do not cut the dotted lines.
2. **Cut out the components, cutting along the thicker black line.**  
You might want to label the back so you don't forget which is which.



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## Slide 11

Build your phone





3. **Decorate your phone on the side that doesn't have writing or lines on it.**  
Think about what will have to be on the front of the phone: buttons, screen, camera?  
What about the back?  
Design how your case will look. What type of patterns or pictures will be on it?
4. **Make a fold along each of the dotted lines.**  
Make sure your decorations and designs are on the outside.

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## Slide 12

Build your phone

5. **To give the phone its shape you will need to apply glue to the outside (side with no lines) of the small folded tabs and press it against the side of the phone next to it to make a corner.**  
Don't stick down the screen yet!

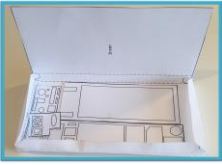


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## Slide 13

Build your phone +

6. Complete your phone by placing all the components inside.  
How do you think they should be arranged?  
Do you think it matters?



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