

# Life Cycle of a Phone

*Exploring the impact that our phones have on the planet from sourcing the materials to end-of-life disposal.*

**Curriculum subjects covered:** English, Science, Geography, PSHE, Design and Technology.

## Introduction

The purpose of this set of resources is to expose young minds to battery research and technology through interactive activities that can be led by teachers, industry experts and older students.

Battery technology is all around us, in phones, computers, clocks, it's safe to say life without batteries would be very different. Consider, on top of this, the current push towards electrification of transportation and grid-scale energy storage: it is a wonder that batteries are not more prominent in the curriculum.

These resources were created with the goal of introducing batteries to students at an early age and inspire them into a career in STEM (Science, Technology, Engineering and Maths) whilst showing there is a wide range of jobs in battery technology outside just science and engineering.

Through these resources, your students will learn about materials and how they apply to the design of phones and batteries; how we can recycle and dispose of batteries; and the global economy and ethics of battery material sourcing and production.

The slides provided can be used as a full lesson plan and come with presenter notes to help develop talking points for those with little experience teaching this subject. We invite you to make any edits you see fit to help you deliver as effective a lesson as possible. All we ask is that you leave The Faraday Institution and FutureCat logos unedited.

## Resources

### **Section 1** - Building Blocks of a Phone

**Curriculum Subjects:** Science, Design and Technology.

In this activity, students will first learn about some of the most important components inside a phone (mainboard, battery, camera, screen). They will be given an opportunity to match materials such as plastic, metal, glass and wood, to particular components taking into account their application. This will require students to consider the properties, advantages and disadvantages of these materials.

Students can also build and decorate their own paper phones using the instructions and templates provided.

*Tips:*

*Slide 8* - this can be done as a printed worksheet or done as a group activity. The slide has been set up so that the text inside the properties and components boxes can be moved without affecting the layout of the slide. Teachers or students can drag and drop properties into relevant materials. Copies of the text are overlaid so the pile shouldn't run out.

## **Section 2** - What Happens to Our Phones When We No Longer Need Them?

**Curriculum Subjects:** PSHE, English, Science

The purpose of this activity is to encourage students to consider how they can minimise their environmental impact through reducing, reusing and recycling their waste. It challenges some of the misconceptions that only plastic and paper can be recycled.

The comprehension activity will have students consider the impacts of throwing things away to landfills and the advantages and disadvantages of recycling to give them a more balanced view of disposal options.

This section also introduces the first of two researcher profiles to help give a name and a face to scientists and show that the science being carried out impacts us beyond the lab.

*Tips:*

*Slide 4* - The link is for an activity where the process of recycling batteries is explained through a Crunchie Bar analogy. This is an activity that can be done as a demonstration, activity at a science fair-style event or recommended for home learning.

*Slide 5* - Reduce-Reuse-Recycle: This is a great opportunity to have a class or group discussion about what the pupils can do in their day-to-day lives to minimise the impact of their waste. Some examples of potential answers to the questions have been provided in the notes section.

## **Section 3** - Where do the materials we use in phones come from?

**Curriculum Subjects:** Geography, Science, PSHE

This activity introduces students to the global nature of battery manufacturing. It shows that batteries affect a wide range of cultures around the globe and as consumers and future scientists we need to consider where we source our materials from. The slides discuss the environmental as well as ethical issues surrounding certain materials like cobalt and lithium and what scientists are doing to offset these issues.

The accompanying activity allows students to go on a "Battery Safari" to complete a worksheet. The posters provided can be printed and displayed around a classroom or a school hall allowing students to go from poster to poster, learning a little about each country, what material it provides us with and how that material is used.