My smartphone – a global product

12-16

3 x 45 min.

copies of the worksheets; equipment for watching online videos (e.g. tablet/laptop); pens; paper; ‘Yes’ and ‘No’ signs; world map; if desired, photographs or objects for placing on the map as illustrations of the stages of a smartphone’s production (e.g. a piece of metal for raw materials, a screwdriver for manufacturing, an old phone for disposal/e-waste, etc.); if desired, materials for creating a collage (paper, scissors, glue, advertising supplements);

This module teaches pupils about the production process behind a smartphone, from the mining of its raw materials and the product’s manufacture to its ultimate destination as electronic waste, and encourages them to explore ways of making it fairer and more sustainable.

Geography **Business and economics** **Political/social studies** **Ethics/values education**

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Introduction

Background information and didactical perspective

Mobile phones, specifically smartphones, are the epitome of our modern, flexible, fast-moving societies, and add to the current sense of ever-decreasing distance between the world's different parts, countries and peoples. After all, smartphones enable us – or so it seems - to communicate with others at any time, regardless of physical or geographical distance. There is another side to smartphones, however – the inhumane working conditions in the countries where they are made, the exploitation of natural resources for their raw materials, and a lack of transparency in global production and supply chains. This module explores smartphones as products that are highly illustrative of various aspects of globalisation, and enables pupils to access and understand the various associated economic, social, environmental, political and individual issues.

Learning outcomes

Competencies

- Methods: working with sources; understanding and analysing text and images
- Social and communication skills: formulating arguments and sharing them within a group
- Forming judgements and opinions that draw on sound evidence
- Acquiring knowledge about global interconnections

Topics / National curriculum

Globalisation, the global economy, labour, human rights, use and stewardship of resources and commodities, production of goods, life and economic activity on earth, sustainability, consumption

Lesson plan

Abbreviations:

A = Activity
D = Discussion
GW = Group work
IW = Individual work
HW = Homework
PW = Partnerwork
PTS = Previous Teacher's Study
PO = Pupils opinions
PP = Pupil's presentations
TP = Teacher's presentation

Lesson No 1 : Me and my phone

Phase	Content	Media, Material
Preparation (30 min.) PO	• The teacher has prepared 'Yes' and 'No' signs. • The teacher has read **M1** and considered which aspects of smartphone production she or he wishes to include on the map, as well as doing research on the background to these aspects. • A map of the world is available and displayed. • The teacher may wish to provide photographs or objects for display on the map as illustrations of the various stages of smartphone production (e.g. a piece of metal for raw materials, a screwdriver for manufacturing, an old phone for disposal/e-waste, etc.) • If required, materials for collage-making are available (paper, scissors, glue, advertising supplements).	**M1** Background information A journey from the mine to the dump: the life cycle of my phone
Opening phase (10 min.) PO	**Execution** Step 1 The pupils think and talk about their use of mobile phones. The teacher may elicit their thoughts and self-reflection on the topic by asking the following questions, which the pupils can answer in writing (on their own) or orally (via discussion in small groups): If the answer is *no*: ◦ Why don't you have a mobile phone/smartphone? If the answer is *yes*: ◦ How many phones do you have? ◦ How many phones do you use? ◦ How long have you had your current phone? ◦ How many phones have you owned altogether? ◦ Why did you get rid of your last phone/get your current one? ◦ What are the main things you use your phone for? Step 2 The teacher may ask the pupils to make a collage, including text and images, to show what they use their phones for and how important their phones are in their lives. (This activity could also be incorporated into art lessons)	**Additional material** • if desired, materials for creating a collage (paper, scissors, glue, advertising supplements)
Discussion (10 min.) D	Pupils now work in small groups to discuss the benefits and drawbacks of using smartphones. The teacher may ask the following questions to get the discussion going: • When does using a smartphone make you feel good? • When does using a smartphone make you feel bad? • Do you experience situations where you feel pleased not to have your phone to hand? • Do you experience situations where you feel weird or uncomfortable if you don't have your phone to hand? • What in your life does your smartphone help you with? • Where in your life does your smartphone hold you back?	

Sliding scale
(15 min.)

D A

Step 1 The teacher hangs/pins up the 'Yes' and 'No' signs at opposite ends of the room and then reads out a number of statements. For each statement, the pupils take a position along an imaginary line between the two signs, to show the extent to which they agree or disagree with the statement. Ideas for statements (which the teacher can adapt for her or his class) could be:

- I can imagine living without my phone.
- My phone makes my life easier.
- Phones and the internet have got people communicating more with one another.
- Everyone should be able to have a phone, even if they can't afford one by themselves.
- My phone is always switched on.
- I know which countries the raw materials in my phone come from.
- I know where my phone was made.
- We have old phones lying around in drawers at home.
- I know what happens to my old phones when I throw them away.
- I've never thought about the people who make phones and the processes it involves.

Step 2 After each statement, the teacher asks a small number of pupils to explain why they placed themselves where they did. This will enable the class to take note of a variety of views on each statement.

Note

The teacher should not attach any judgement or moral value to the statements. The exercise is not about picking the 'right' response, but rather about raising pupils' awareness of a range of different attitudes and experiences on the subject of phones.

Additional material

- 'Yes' and 'No' signs

Presentation
(10 min.)

TP

The teacher gives the pupils a brief summary of a smartphone's life cycle, and may choose to indicate on the map of the world where each stage takes place.

- Development and design: at the head offices of the major smartphone brands (based in the US, China, Japan, South Korea, Europe)
- Mining of raw materials: largely in Africa and Latin America
- Production: primarily in Asia
- Sale and use: worldwide
- Disposal: Only a small proportion of discarded phones are recycled; many end up (illegally) on enormous e-waste dumps, in Ghana, India, China and other countries.

M1
Background information A journey from the mine to the dump: the life cycle of my phone

Additional material

- world map
- if desired, photos or objects to be placed on the map for illustrative purposes

Lesson No 2 : A smartphone’s journey

Phase	Content	Media, Material
Introductory phase (5 min.) TP	**Preparation** • For the group work phase, the teacher has made copies of the worksheets (**M2**, **M6** and **M9**), the reports from places where phones are produced (**M8**), the quote from a worker at an e-waste dump (**M10**) and potential solutions (**M12**). She or he has also printed and cut out the information cards (**M3** and **M7**), the stakeholder descriptions (**M5**) and the photos (**M11**). • A map of the world, large enough to accommodate small pictures, is available and displayed • A laptop or tablet with internet access for playing a video (**M4**) is available **Execution** Step 1 The teacher explains the ‘jigsaw’ method to the pupils. Each pupil will be assigned to a group, and each group will work on one of the aspects of the topic (raw materials, production, disposal), becoming ‘experts’ in this aspect. After this, the groups are mixed up and new groups formed which contain experts on each aspect. Each of these experts shares their newly acquired knowledge with the other members of this new group. Step 2 The teacher divides the class into three groups, one for raw materials, one for production, and one for disposal. A large class may be divided into six groups, with two groups each working on one stage of a smartphone’s life cycle.	

Work phase
(20 min.)

GW

Group 1: Raw materials in a phone

Step 1 Group 1 receives the worksheet on the raw materials contained in a phone (**M2**).

Step 2 The pupils also receive, and read through, the cards that give brief information on the raw materials that go into a phone (**M3**). Each card gives the name of one country in bold. The pupils find that country on the map of the world and place the picture of the associated resource/raw material on that country.

Step 3 The pupils watch a critical video (**M4**) about mining for raw materials for phones in Bolivia.

Step 4 Each pupil in the group takes one of the descriptions of stakeholders in relation to a (fictional) planned new mine (**M5**). They discuss together whether they think the mine should go ahead. If they think it should, they discuss the conditions they would place on this. They give their reasons if they think the mine should not happen.

Group 2: Working in mobile phone production

Step 1 The pupils are given the worksheet on the manufacture of mobile phones (**M6**).

Step 2 They consider together which workers' rights they would regard as important if they were workers, and write them down on the worksheet.

Step 3 They read through the information cards that detail the fundamental rights of workers (**M7**) and compare them with their own views.

Step 4 They read through the reports from places and settings where phones are made (**M8**) and identify the workers' rights that are at stake in these cases.

Group 3: E-waste and recycling

Step 1 The pupils in this group receive the worksheet on electronic waste (**M9**).

Step 2 They read the quote from a worker at an e-waste dump (**M10**) and discuss it.

Step 3 They look at the pictures of an e-waste dump in Ghana (**M11**).

Step 4 They agree on and write down three ways of improving the situation, which they would like to see implemented. The potential solutions in **M12** can provide inspiration.

M2
Worksheet Raw materials in a phone

M3
Information cards on raw materials

M4
Video A phone's life

M5
Stakeholder descriptions (Bolivia)

M6
Worksheet Making your mobile

M7
Information cards on workers' rights

M8
Reports from places where phones are made

M9
Worksheet on e-waste

M10
Quote on e-waste

M11
Photos from Ghana

M12
Potential solutions

Additional material

- world map
- tablet/laptop with internet access

Work phase
(10 min.)

GW

Step 1 The teacher mixes up the groups, ensuring that each group has at least one person from each of the three previous groups.

Step 2 In the new groups, each pupil tells the others what they learned in their original, 'expert' groups. Prompt questions to help them: What did I find out that I didn't know before? What did I find surprising? What do I think is most important to tell the others?

Reflection on learnings
(10 min.)

- The class comes together to discuss the things they have learned. The teacher may prompt the discussion with these questions (or others):
  - What things didn't you know before/did you find particularly interesting?
  - Is there anything you haven't quite understood yet?
  - What idea of Bolivia, China or Ghana do you now have after this lesson? Do you think anything is missing from this idea?

M1
Background information A journey from the mine to the dump: the life cycle of my phone

Note

While using examples from specific countries is a helpful way of illustrating the issues and problems associated with the smartphone production process, there is a risk that pupils will be left with reductive ideas of these countries, such as 'Bolivia = mines', 'China = factories', and 'Ghana = rubbish dumps', which do not reflect their true social, economic and cultural complexity and diversity. The people in these countries and in the examples are not passive objects to whom things are done. There are numerous local activists and campaigning groups working for improvements in the conditions and issues detailed in the examples. If the teacher gains the impression that the pupils have begun to form stereotypes, she or he may find it helpful to show other images/aspects of the countries discussed or to ask the pupils to do some research about them or about local grass-roots campaigns. This may help counteract simplistic, one-sided ideas and images of the countries and open up new vistas on them.

Lesson No 3 : Creating a fair smartphone

Phase	Content	Media, Material
Introductory phase (5 min.) TP	**Preparation** • The teacher has made sufficient numbers of copies of the worksheet (**M13**) and information sheet (**M14**). **Execution** • The teacher divides the pupils into small groups, in each of which there is at least one pupil from the 'raw materials' group (from the previous lesson), at least one from the 'production' group and at least one from the 'e-waste' group. This will ensure that each group's prior knowledge covers the entire smartphone life cycle. • Each group is given a copy of the worksheet (**M13**) and the information sheet (**M14**).	**M13** Worksheet Our start-up **M14** Information sheet on Fairphone
Work phase (25 min.) GW	• The groups' task is to set up a new business producing phones. The groups consider what issues they would take account of in relation to purchasing, production and recycling. They give their business a name, design a logo and prepare a two-minute presentation (**M13**). • They may draw inspiration from the example of Fairphone (**M14**).	**M13** Worksheet Our start-up **M14** Information sheet on Fairphone
Presentation (10 min.) GW	• The pupils give their presentations.	

Concluding phase
(5 min.)
 	
D
	• The class comes together to discuss one or several of these questions:
	  ○ What did you learn during these lessons that you hadn't known before? What did you find especially interesting? What aspects of the topic would you like to find out more about?
	  ○ Who has, or could have, the most power to change the way things are done now in mobile phone life cycles/production chains?
	  ○ What is the role of politicians and policymakers?
	  ○ What is the role of businesses in the sector?
	  ○ What role do we play?	

M1 Background information A journey from the mine to the dump: the life cycle of my phone

1. Extraction of raw materials

The production processes associated with electronic devices are complex. A mobile phone, a computer or a washing machine contain innumerable components consisting of a hugely diverse range of raw materials, some of which are rare and highly specific. All this means that the process of producing an electrical or electronic device is considerably more complicated and much less transparent than that for other products, such as coffee, plastic or clothing. This is also why it is so difficult to award certification such as the Fairtrade mark to electronic products.

The metals found in our electrical and electronic devices originate mostly from Latin America, Asia or Africa. The extraction of these metals takes place in two ways. One is high-tech mining conducted by large companies which are often based in Europe, North America, China or Australia. These companies generally supply most of the specialist workers for the mines and take the major portion of the profits. This means that local populations benefit little from the mining operations. The other type of mining, known as artisanal mining, often takes place on a casual basis; the workers are largely young men who carry out the mining in extremely perilous conditions. Time and again, people find themselves forced to engage in artisanal mining because major companies have driven them from their land or because they are no longer able to sell the produce of their farming activities at a profit. Poverty is a major factor pushing people down the mines. The work is often highly hazardous and can pose a risk to life; accidents are commonplace, as is the development of long-term illnesses such as silicosis. Depending on the country in which it takes place, artisanal mining may be relatively well paid, but it would be inaccurate to suppose that this is the case for all those involved in the industry worldwide. Additionally, the income people make from artisanal mining is not stable or secure, as luck plays a significant role in striking a profitable vein.

Impact on the environment and on local populations

Mining has a huge impact on local and regional communities. The noxious chemicals used contaminate water sources, and people living in a wide radius around mines suffer from illnesses and from the effects of the environmental damage to wildlife and plants. In many areas, the mines cause water shortages. Mining also consumes an enormous amount of energy. There are numerous instances of communities facing forced displacement/resettlement to make way for mines. Even once a mine has been closed, the area around it will only recover slowly from the immense damage done.

There are various local activists and organisations that campaign for the closure of existing mines or to prevent the opening of new ones; European NGOs support the work of some of them.

Forced labour and corruption

In many places, the extraction of raw materials for mobile phones is associated with forced and child labour. There is often a lack of transparency around what happens to the profits of mining activities. They may be channelled into dubious purposes by, for instance, being entangled in corruption or used to support or perpetuate armed conflict. Mining for coltan in the Democratic Republic of Congo is a well-known example of a setting in which profits from mining go to fund the creation or expansion of armies and therefore to promote violent conflict. There are numerous instances of criminalisation of local civil society initiatives that protest against mining, whose members are often on the receiving end of threats.

2. Producing phones

Assembly of electronic devices primarily takes place in Asia, a continent favoured for this work in part due to its large and cheap workforce, a considerable part of which is highly skilled.

Computers and mobile phones are mostly assembled in China, while numerous other countries in Asia are home to component suppliers.

The issues with working conditions at manufacturing sites are so extensive and diverse that we limit ourselves here to giving a rough overview of the worst abuses:

- Pay that is well below a decent living wage
- Exposure to chemicals that harm human health and the environment
- Massive environmental pollution which also has an impact on local populations; businesses that pollute face few or no sanctions
- Inadequate health and safety training and information for workers; a lack of personal protective equipment and protective clothing
- Misleading information given by recruiters
- Employment of immigrant labour – the workers are without a local support network, increasing their dependence on their managers and making them highly vulnerable to exploitation
- Managers requiring workers to surrender documents proving their identity (this practice is unlawful)
- Huge pressure on workers to meet very challenging work targets within extremely demanding timeframes
- Unions are banned or company management has corrupted them
- Organisations whose job is to monitor working conditions do not receive access to the facility
- Physical and psychological violence against workers
- Forced labour (for example, school and university students are made to complete unpaid 'mandatory work experience' in the electronics industry)
- Excessive hours, leading to overtiredness and physical exhaustion, and the associated impacts on health and occupational safety
- Workers who become ill, and the families of workers who die by suicide due to the working conditions they have been made to endure, receive no or inadequate compensation

Some companies that produce mobile phones have launched initiatives to improve working conditions in phone manufacturing, but there are yet to be serious efforts to make a change for the better for the millions of people working in this industry. Phones and computers are products with huge profit margins; by contrast, the pay of those working for suppliers to the big companies is stagnating. The profits end up in the pockets of the big companies, who are fully aware of the issues in the production facilities.

It is these big businesses that have the most influence and the greatest financial means to ensure that workers in the industry have their rights respected and that standards for the protection of workforces and the environment are high across the production chain. Currently, however, companies are doing little to improve the situation. In response to this, civil society initiatives such as Electronics Watch, goodelectronics and SACOM are pushing for companies to accept monitoring by independent organisations, which would help create transparency in the industry and shine a spotlight on abuses. But even if businesses comply with the laws of the countries in which they are active, this may not mean that workers enjoy full respect of their rights and dignity.

3. E-waste

Many states – including some prosperous countries in Europe, Asia and North America – do not have appropriate recycling systems for electronic devices. We expect our computers and phones to do more and more for us and have ever fancier features; this means that the useful lives of devices are getting increasingly shorter and we are replacing them more and more often. Sometimes a device's life comes to an end simply because one particular component no longer works – such as the battery or the camera, both of which are often impossible to replace. Where repairs are possible, they may cost more than simply buying a new device.

Sorting and reuse of raw materials from devices at the end of their useful lives is an extremely complex and technically difficult process, and is sometimes impossible; this means that devices largely end up as electronic waste. Each year, despite the fact that the Basel Convention of 1992 prohibits businesses and states from exporting e-waste into so called "developing countries", colossal amounts of it end up in countries such as Ghana, India and China, either via illegal exports or through the shipping of discarded devices as second-hand goods or as 'donations'.

E-waste dumps

One of the world's best-known e-waste dumps is Agbogbloshie in Ghana, which serves as an illegal 'graveyard' for old electronic devices from Europe and other parts of the world. At the dump, boys and young men aged 14 to 30 and women with children smash the devices with baseball bat-type implements to break open their casing, and melt the plastic from the

wiring using open fires so they can reclaim and sell the copper inside. Similar processes take place to reclaim other metals. Agbogbloshie was once a wetland and a fishing area, but is now one of the most polluted spots on earth. Mike Anane, an environmental journalist from Ghana, has been working for over two decades to research and write about environmental crime in his country, including the illegal shipping of electronic waste, and is a source of first-hand information on the situation at Agbogbloshie.

Recycling electronic devices

In the best case, discarded electronic devices taken to a local collection point are recycled, which can also have financial advantages because the raw materials they contain are valuable. 'Urban mining' – the reclamation of raw materials from old electronic devices – is not only good for the environment by saving resources and avoiding waste, it can also be a profitable activity.

Countries such as Ghana, India and China, which receive large volumes of e-waste from Europe, are also home to numerous small businesses specialising in repairing the imported devices or reclaiming the materials used in them. This type of informal recycling frequently impacts the environment and damages the health of those working in the sector.

4. Potential solutions

Extend phones' useful lives

In Europe, the average duration of a smartphone's use is only 18 to 24 months. One potential response to the massive consumption of raw materials in the production of these devices is to use existing ones for longer. Two ways of extending battery life are practising a sensible charging strategy (never charging the battery fully and never allowing it to run down completely) and switching off unused services. Sometimes it is possible to repair issues with a phone using video tutorials online. An alternative may be a repair café - these are now opening in many towns and cities. People working in local mobile phone shops may also be knowledgeable about repairs.

Make smart consumer choices

Ideally, a phone's design should be modular, meaning that individual components (such as the battery) can be changed, and that a problem with one of these components does not lead to the whole device losing its useful life. FairPhone and ShiftPhone are two examples of phones that seek to achieve this aim.

Before buying a new phone, consumers should try and find information about potential weak points of the device and the extent to which repairs are possible. Asking a manufacturer in a public forum, such as Facebook, whether a particular component can be removed and replaced can also raise awareness of the issue and help others make consumer choices. Instead of buying a new device, it's worth considering a 'refurbed' second-hand one that has been checked and overhauled before being sold on. There are now a number of businesses selling refurbed phones.

Dispose of old phones correctly

As well as valuable materials, electronic devices contain substances harmful to health and the environment, and therefore need correct disposal procedures. It's best to hand them in to local collection points for special categories of waste or give them to organised collections that may take place from time to time.

Use consumer power to make demands

It's important to remind the major electronics companies of their responsibilities. One way of doing this is taking to their social media channels to ask questions and call for them to make their supply chains transparent, respect workers' rights and comply with environmental standards.

Push for responsible public procurement

The public sector – including local administrative services and educational institutions – purchases large volumes of computers and other electronic devices. Public institutions should seek to uphold ethical and environmental responsibility in their procurement processes. Citizens can help the push for fairer supply chains by calling for public servants to meet this responsibility. They can get information and support from the international monitoring organisation Electronics Watch.

Work towards political change

The UN has been in negotiations around a binding treaty on business and human rights since 2014, following an initiative launched by Ecuador. The treaty would ensure that major companies would be unable to continue evading their responsibility for human rights and would be called to account for abuses, regardless of the country in which they took place and including infringements committed by subsidiaries or dependent suppliers.

In view of these developments, campaigning at national and European level for legislation and formal agreements on transparent and responsible supply chains appears a promising way of taking action. For example, citizens can sign petitions and contact political decision-makers to call for change.

Spread the word

A crucial part of change always involves those who know about the issues raising awareness of them among their families, colleagues and friends, sharing information and talking about the action people can take.

M2 Worksheet Raw materials in a phone

1. What raw materials can we find in a mobile phone?

A mobile phone contains about **60 different materials, of which 30 are metals**. These materials originate from various countries.

- Find the countries on the map of the world which have the largest natural reserves of the various raw materials, and place the pictures on these countries.

2. A new mine in Bolivia: for or against?

There are plans to develop a new mine in **Bolivia** to help meet demand for valuable raw materials to produce digital devices. But the project is surrounded by controversy.

- Watch the video 'Das Leben eines Handys' ('A phone's life').
- Take a stakeholder description, read it and consider the planned mine from the perspective of this person.
- Discuss:
  - Should the planned mine project in Bolivia go ahead?
  - If so, what conditions should be set?
  - If not, why not?

Either:

- Yes, the mine should go ahead, as long as the following conditions are met:

Or:

- No, the mine shouldn't go ahead, because:

M3 Information cards on raw materials

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Gold

The high conductivity of **gold** means it finds frequent use for contacts in circuit boards and plug connectors. **SIM cards** also contain extremely small amounts of gold.

Reserves found in: **South Africa**, China, USA, Australia

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Lithium

Lithium is a principal component of lithium-ion **batteries** in mobile phones.

Reserves found in: **Chile**, Bolivia, USA, Argentina

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Crude oil

Most of a smartphone consists of plastic, whose basic component is derived from **crude oil**.

Reserves found in: **Saudi Arabia**, Russia, USA, Iraq

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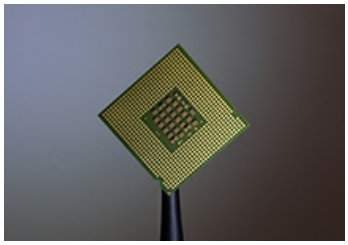
Silicon

Silicon finds use in **microchips** and in the glass of a mobile phone's display. Silicon is extracted from pure silica.

Reserves found in: **China**, Russia, USA



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Copper

Alongside other metals, **copper** is used in **circuit board** contacts.

Reserves found in: **Chile**, Peru, USA, Indonesia

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M4 Video A phone's life

You can access the Südwind video *'A phone's life'* (original title *'Das Leben eines Handys'*) here (running time: 3 minutes):

Link: https://www.youtube.com/watch?v=nP9SaSaKhGk&t=63s (03:02 min.)

Source:
https://www.suedwind.at

M5 Stakeholder descriptions (Bolivia)

María

My name is María. I am 66 years old and work in tin mining in the Bolivian highlands. I get up at 4:00 am every day, cook food for my family, and then go to work. I'm actually retired, but I can't survive on my monthly pension of 500 bolivianos (= 65 euro), and I have a big family to support. So I keep on working.

Lucía

I'm Lucía. I come from Bolivia and work as a silver miner. The mine shaft is not adequately ventilated, which means my work makes me ill – I have silicosis. I also have headaches and backaches a lot, but I can't stay at home to rest, because that would mean I don't get paid, and my two children need to eat.

Matías

I'm Matías. I work in a mining cooperative. We take the rock we remove from the mine to our middleman [who buys it from us to sell on]. We weigh and test the rock first, but we still always get cheated. The middleman claims that the material only weighs 850 kilos rather than the 1000 kilos it said on my scales. And he says the rock's mineral content is only 45% and not 50%. I can't take the rock to someone else because that's too expensive. So I have to accept it and put up with getting a lower price.

Lucas

My name is Lucas, and I am a member of Bolivia´s government. My job is to decide whether new mines should be allowed in Bolivia. We need more and more mines because of the demand for metals for mobile phone and computer production, so these projects create a lot of jobs. But we also have to take care of our environment – mining has been very destructive to a lot of natural habitats in our country.

Alexandra

I'm Alexandra. I've saved 400,000 euro which I would like to invest in a profitable venture – a new mine in Bolivia. It will create jobs for 300 people and I will earn interest of 10% on my investment – a win-win situation, I think! And, because the mined metals will be used in mobile phones, I will also be investing in our future.

José

My name is José. A few years ago, I had a farm in Bolivia that grew potatoes, but I had to close it down. My field is contaminated and the plants no longer grow. The main reason for this is the mining that's going on locally. When it rains, waste from the mine that's dumped near my land comes into contact with water and air and turns into noxious substances that ruin our soils.

M6 Worksheet Making your mobile

1. Your rights at work

- Imagine you've left school and are now going to work. **What is important to you in a job, a workplace?** What rights do you have as an employee of a company? What do you need in order to do a good job?

- Now compare your notes with the **information cards** giving brief definitions of key workers' rights. Are they similar to your own ideas?

2. Places where mobile phones are made

- Each of these four reports is about a place where mobile phones are manufactured. Decide who will read which article, and then share the information you've learned.
- Which workers' rights do the four reports revolve around? Write your ideas down here.

M7 Information cards on workers' rights

Adequate pay and a living wage	**Legally defined working hours that are not excessive**
Safe and healthy working conditions	**No discrimination**
A contract of employment	**The right to join a union**
Prohibition of forced labour	**No child labour**

Adequate pay and a living wage means that workers earn enough to pay for food, a home, healthcare expenses and transport, with money left over for other purposes, such as children's education. Statutory minimum wages are often too low to cover all these expenses adequately.

Legally defined working hours that are not excessive

It is not permitted to force anyone to work for longer hours than the law of their country allows. Companies and bosses are not allowed to constantly require overtime from their workers – all people need to be able to rest. People also have to receive appropriate pay for overtime worked.

Businesses are required to protect the **health and safety** of their workers. They must provide people whose work exposes them to noxious substances or dust with protective clothing and equipment such as masks and gloves. Mines and factories need to be built in a way that means they are safe to work in and will not collapse.

No discrimination

All people have the same rights. Nobody should be discriminated against at work because of their age, religion, sex or gender, ethnic origin, skin colour or other protected characteristics.

A **contract of employment** sets out working hours, pay, holiday, sick leave and various other terms and conditions of someone's employment. A written contract is proof that someone is employed by a specific company. It may also be important for a person to be formally employed in order for them to benefit from health insurance and a pension.

Employees have the right to organise in **unions**. Unions are groups of workers in a particular industry that seek to protect workers' rights. All employees must be able and allowed to join a union or start one themselves.

Forced labour and slavery are banned by international agreements. They are violations of human rights. 'No one shall be held in slavery or servitude. No one shall be required to perform forced or compulsory labour.' is written in the European Convention on Human Rights (Article 4).

No child labour

Child labour is work that is damaging to the physical, cognitive or social development of a child or restricts its right to an education. Many countries allow young people to do paid work from the age of 15. Hazardous work is often not allowed until the age of 18.

M8 Reports from places where phones are made

Insecure employment in Central Europe

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Itinerant workers from Central and Eastern Europe told us of their experiences in a factory in the Czech Republic belonging to Foxconn, which supplies companies such as HP. They describe low pay, job and income insecurity, and – as a worker from Romania explained - the impossibility of planning around extremely short-notice changes in shifts.

'If orders come in, we have to work at weekends as well as in the week. During the week, they cancel shifts and then reinstate them again. This week alone, I have a day shift on Monday, nightshifts on Tuesday and Wednesday… and now they've put in a shift on Saturday [which was supposed to be a day off].'

Workers from Bulgaria expressed their worries around their job security. One of them told us:

'I want to say that I, and all the Bulgarian workers, are afraid of being laid off. If they'd at least tell us a month in advance. But they tell us on Thursday that we have to go back to Bulgaria on Sunday because our contract's run out. They don't care whether you have a fixed-term or permanent contract. They can throw you out at any time. They call you into their office and say that you have to sign an agreement that your contract is ending. You can't say no. They force you to sign.'

Electronics Watch: https://electronicswatch.org/en/the-insecurity-of-working-for-a-subcontractor-in-central-europe_2548695

Exposure to noxious chemicals in Indonesia

Workers in a factory in Indonesia produce loudspeaker units to be built into headphones and earbuds for several leading brands. The overwhelming majority – 95 % - of the factory's workforce of 4,200 are women aged between 18 and 23.

Some of these women have the job of washing the transparent film for the speaker unit in toluene, an industrial solvent that can attack and damage the central nervous system, the eyes, skin, respiratory tracts, liver and kidneys, depending on the level of exposure. Young women are particularly at risk due to the capacity of toluene to damage the foetus in pregnancy.

A woman who has spent the last seven years washing film in toluene for speaker units told us:

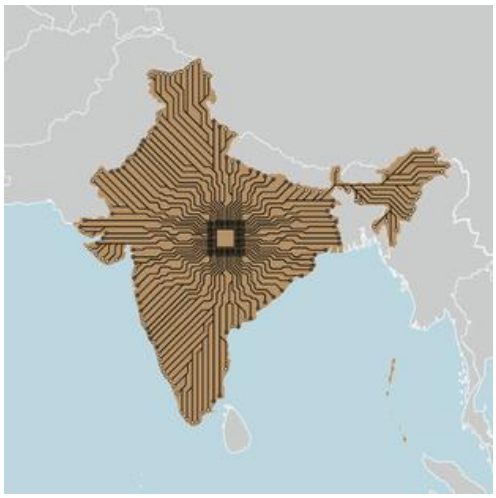
'We get dizzy when we inhale the toluene. We wear masks, but they're only normal, thin ones, although really they should be providing us with proper [gas] masks. Some of the workers have to throw up [from the fumes]. When it's very hot, we sometimes don't wear the masks. There isn't any aircon, not even a fan.'

'Lots of workers suffer from respiratory illnesses and allergies. They have lung conditions and shortness of breath. These are caused by the toluene vapour. The open-plan design of the working areas means the vapour gets everywhere.'

These workers, and millions more like them working in the electronics industry, have no power or influence in their workplace and cannot rely on local authorities to enforce compliance with occupational health and safety standards.

Electronics Watch: https://electronicswatch.org/en/when-no-voice-and-no-remedy-equals-poor-health_2548722

Unmanageable workloads in India



A young woman who works in an industrial estate in India shows us the blisters on her fingers. She and around 50 of her colleagues are spending their day off at a training course about workers' rights. She holds up her hands so everyone can see her fingers. 'Sometimes they bleed', she tells us.

This woman's work, day in, day out, is to produce chargers for electronic devices – she has to glue two components together.
'Do you know what the chemicals you have to handle are?' we ask her.
She answers no.
'But surely you wear gloves to protect your hands?'
'No. That would make me too slow. I wouldn't be able to meet my target. I have to put together 15,000 chargers every day.'
In other words, over the course of an eight-hour day she has to produce, on average, more than one charger every two seconds.
'If you don't meet your target, you're called to a meeting with the management. If you miss the target a second time, you get a warning. That's why we don't wear gloves. We could only protect ourselves if we let new workers take our place.'

What this means is that large orders with tight delivery deadlines and low prices impose tough targets on workers – targets they can only meet at the risk of their health and safety.

Electronics Watch: https://electronicswatch.org/en/why-purchasing-practices-have-consequences-for-workers_2548735

Overtime as forced labour in the Philippines

Excessive overtime is a frequent occurrence in the electronics industry. Workers often agree to long shifts so they can earn enough money to live on. But overtime isn't always down to low pay. Sometimes it is a type of forced labour.

A worker from the Philippines explains what happens:
'Our overtime is forced labour […] If you refuse, you get penalised, suspended. You have to meet the targets they give you… Many workers are threatened with being fired if they refuse to do overtime.'

Workers from the Philippines told us that the management refused their request to be spared overtime for three main reasons: They needed to meet the production volumes required for a delivery due to go out soon. There were no other workers available to replace or relieve them. Or a customer was due to visit the facility.

These workers told us they had to do the overtime or otherwise they risked a bad appraisal or even the loss of their job. Some trainees added that their low pay forced them to do overtime so their income wouldn't fall below the poverty line.

Electronics Watch: https://electronicswatch.org/en/when-overtime-is-forced-labour_2548782

M9 Worksheet on e-waste

E-waste and recycling

- Look at the picture, which shows a **quote from a Chinese worker** at an e-waste dump: "…keep your trash!"
- What do you think about this quote? Who do you think is responsible for electronic waste?

- Agbogbloshie is a giant **e-waste dump in Ghana**, where around 6,000 people smash up discarded electronic devices to reclaim the materials inside. Look at the pictures.
- Discuss what you think should happen to e-waste. How can we avoid situations like that at Agbogbloshie? Who or what can help make things better? You can read through the information sheet with **potential solutions** to find ideas.
- **Write down three demands** for better management of e-waste:

1.

2.

3.

M10 Quote on e-waste

> To work with electronic waste is poisonous, demoralizing and poorly paid. If I could I would do a different job. Keep your trash!
>
> — worker at a Chinese electronic waste disposal site
> *(The speaker has been hidden to protect his/her identity)*

M11 Photos from Ghana

© Südwind

Faruk, 12, burns cables from computers and fridges to get at the copper inside. He sells the copper to traders at the dump, who pay him around one euro per pound (0.45 kg) of copper.

© Südwind

The young people at the dump use old car tyres to accelerate the fire. Once the wires' plastic coating has melted, they cool what is left to get at the copper wire.

© Südwind

The Agbogbloshie dump is considered one of the most toxic places on earth. The people at work there do not wear masks or protective clothing. The river that runs through the dump flows directly into the nearby sea, with no filtering of its water that then goes on to poison sea fish.

M12 Potential solutions

How can I help avoid and reduce e-waste?

Extending devices' useful lives

On average, a smartphone owner in Europe uses their device for just 18 to 24 months before getting a new one. Let's try to extend the useful lives of our devices instead, and find out how we can look after them so they last longer.

You can extend battery life by using a sensible charging strategy (never charging the battery fully and never allowing it to run down completely) and switching off unused services. Sometimes it is possible to repair issues with a phone using video tutorials online, or you may find help from someone working in your local mobile phone shop who is good at repairing devices.

Making smart consumer choices

Ideally, the design of devices should allow individual components (such as the battery) to be changed, which means that a problem with one of these components does not lead to the whole device losing its useful life. FairPhone and ShiftPhone are two examples of phones that seek to achieve this aim. Before buying a new phone, try and find information about potential weak points of devices and ask which ones are more easily repairable. You can also ask manufacturers directly – doing this (e.g. asking whether a battery can be replaced) in a public forum, such as a company's Facebook page, is a good way of raising the profile and visibility of the issue.

Some companies sell 'refurbed' computers or phones – these aren't new, but have been checked, overhauled and updated to current standards. Buying a used phone means you save money – and resources can be left in the earth rather than being extracted.

Dispose of old devices correctly

As well as valuable materials, electronic devices can contain substances harmful to health and the environment. It's therefore vital to use correct disposal procedures. You should hand in old devices to local collection points for special categories of waste or to your local electronics shop or give them to organised collections that may take place from time to time.

M13 Worksheet Our start-up

Your task is to launch your own environmentally and socially responsible smartphone brand.

1. Aspects to think about and discuss:

- **Procurement:** Where will you buy your raw materials, and what is important to you in doing so?
- **Design:** How will you design your phones to make their environmental impact as low as possible? What are important points in this regard?
- **Production:** What will you insist on when it comes to manufacturing? Think about where your factories will be located, the wages you will pay, and the health and safety of the workers.
- **Recycling:** How will you handle faulty phones or those at the end of their useful lives? Will you have them reused or disposed of, and how?
- **Name:** What are you going to call your new business?
- **Logo:** Design a logo for your brand.

Read through the information sheet about Fairphone to give you some ideas.

2. Create a two-minute presentation about your new venture. You should try to enthuse and inspire people with your passion for your ideas.

Our brand is called:

Logo:

What makes your phone a good choice for the environmentally and socially aware consumer?
Note down some words and phrases that describe your business.

M14 Information sheet on Fairphone

Fairphone

Sadly, there is no such thing yet as a smartphone produced in a truly fair manner. But there are a few companies and initiatives who are trying to make one. One of them is Fairphone, a small business that is attempting to move towards creating a phone with as little environmental impact, and as high a regard for social justice, as possible.

A Fairphone consists of numerous components and is easy to disassemble and repair. This means that if a component breaks, you don't have to buy a whole new phone, but can just replace the part that isn't working. This extends the phone's useful life and reduces e-waste.

The company is transparent about its pricing and about which proportions of a phone's price cover which costs. It also publishes information on the origins of the raw materials it uses in production. Unfortunately, it can't guarantee fair mining for all the materials it needs, but its policy of transparency means customers understand more clearly where the components of their phone come from.