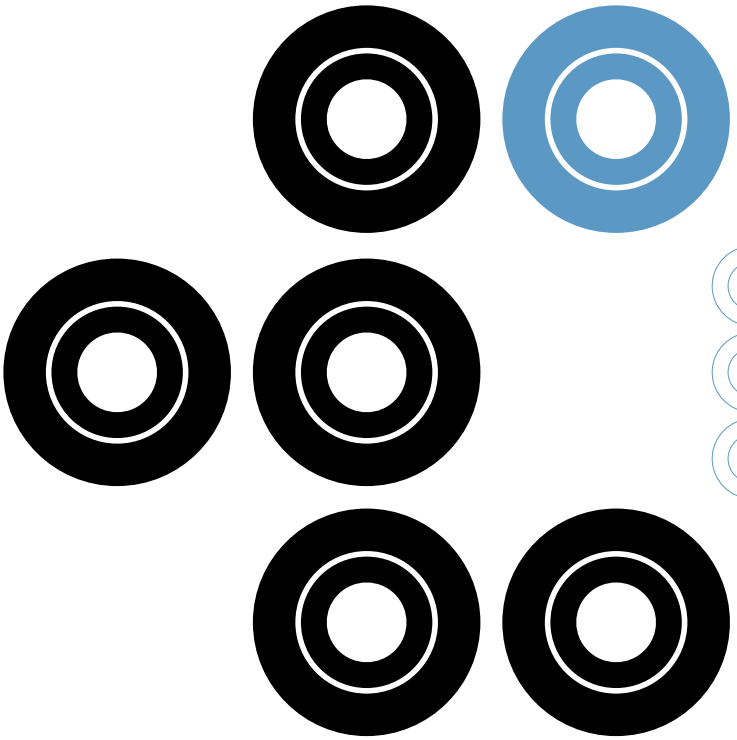
ACTIVITY 3

ROLL UP YOUR SLEEVES!

MINI-WORKSHOP

TARGET AUDIENCE 10 to 12 years



PREPARATION

- The 'background information in this document contains the discipline-specific and didactic knowledge and insights you need to prepare this activity.
- Optionally, you could do assignment 2.3 from lesson 2 on the importance of repairing together.
- Find a repairer to give a workshop:
  - a relative of a pupil, a repairer from a local Repair Café, or a repairer from a consumer electronics shop in the locality of the school.
  - Some charity shops might have repair workshops for electrical and electronic devices.
  - Consult https://mapping.sharepair.org/ for a network of repairers and Repair Cafés in your area.

This activity is part of the Sharepair primary education teaching pack on repairing electrical and electronic devices. It offers didactic tips for a mini-workshop to investigate the flow of water in a coffee machine. The activities described here can be carried out at various stages of the lesson plan: as stimulus, introduction or additional activity.

MAKE IT WORK! ACTIVITY 3

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Before the lesson, watch a few interesting videos on the way coffee machines work. Consider choosing clips and/or prepare a few observation questions in advance. Pause the video at certain points and ask what the pupils have observed.

- What is inside a coffee maker?
- How do drip coffee machines work?
- How it works: coffee maker

MATERIALS REQUIRED

- A working coffee machine (for example from the staff room)
- Option: a number of old (working or broken) coffee machines with a filter
- Small box to collect screws
- Small torch (smartphone)
- Tools: to be determined in consultation with the expert

Consider asking someone with the technical skills and tools required to supervise the mini-workshop.

This sheet provides brief information for a mini-workshop that introduces pupils to the flow of water through a coffee machine. The same formula can be applied to examine the parts of other appliances and how they work. Talk to a repairer about the options.

FUN FACT

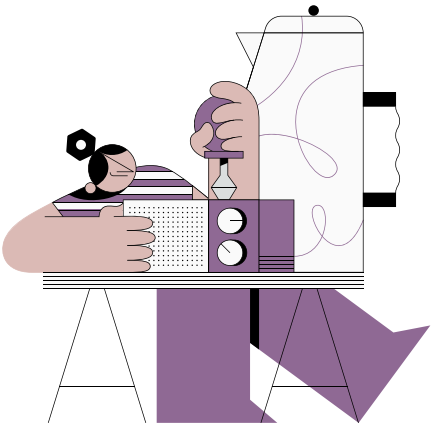
Disassembling an appliance, studying the parts and their function and then reassembling the appliance is called reverse engineering.

1 – Mini-workshop: plan

Divide the pupils into groups of at most six. Every group then examines a traditional coffee machine under the guidance of an expert. Ask the groups to attend the mini-workshop in sequence while the other groups work on some other assignment.

TIP

Consult sheet 1 (campaign and survey) or sheet 2 (preparing a visit by or to a repairer) for inspiration for other assignments.



1.1 – The appliance and its function

What purpose does this appliance serve? What parts can you see? What do you think these parts do? What parts are still inside the device? What is the coffee made of? What should this appliance be able to do?

The expert talks to the pupils about the various coffee brewing processes that occur in a coffee machine. They explain what an average coffee machine should be able to do: collect water, heat it, move the hot water through the coffee filter, keep the brewed coffee hot, etc.

1.2 – The flow of water (top)

Ask the pupils to unscrew a coffee machine under the expert's guidance. Begin with the water reservoir and the filter holder. Ask the pupils to examine how the water flows through the coffee machine here.

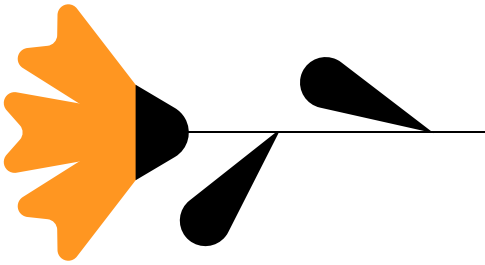
What parts does the water pass? How does the water exit and how is it moved back up to the filter holder? What part of the flow of water can we not see here? What happens between the hole and the tube that we can see in the reservoir?

Discuss beforehand with the expert what things the pupils can do safely themselves.

1.3 – The flow of water (bottom)

The expert unscrews the bottom plate. Discuss in advance whether the pupils can independently unscrew the bottom plates of other coffee machines. Then they examine the parts that have now become visible together.

What parts can you see here? Where does the water flow? What do you think these parts are for?



The expert then explains in greater detail how the coffee machine works, while the children examine the parts. If possible, the expert removes several parts from the device and displays them on the table.

1.4 – Repair options

The expert asks the pupils to look at the parts and the flow of water and to consider potential defects, both in the top and the bottom part of the machine.

What do you think could go wrong? What could entirely or partially impede the flow of water? What other parts could break?

The expert then tells the pupils about a number of cases of broken coffee machines that they have been able to repair or that they have seen.

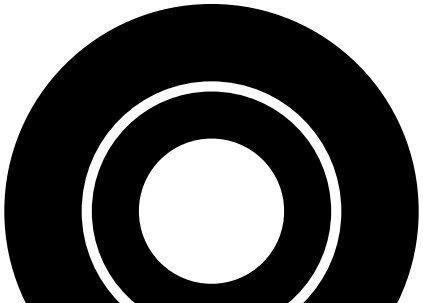
Finally, the expert and the pupils reassemble the coffee machine together.

TIP

Ask the pupils to draw up an action plan for disassembling and reassembling the coffee machine.

2 – Reflection

What did you think of this activity? What did you like, not like so much or not like at all about it? What appliance would you like to disassemble and repair? Why? How important is it to know how a device functions? What if an appliance doesn't work anymore, does it make sense to disassemble it? Why or why not?



ACKNOWLEDGMENTS

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