

Tinkering - reducing the risks

Taking items apart presents a range of learning opportunities for all ages; however, it is important that tinkering activities are as safe as possible. Along with this article, we have produced a video guide to highlight the key safety considerations.

Learning opportunities through tinkering

- Learning through play – exploration, enquiry, investigation
- Roleplay
- Literacy skills – talking, listening, describing
- Turn taking
- Using tools safely – fine motor skills
- Assessing risk
- Ideal opportunity to use magnification devices, including digital microscopes

Items to avoid

Please be aware that some electrical appliances are not safe to disassemble, except by a trained professional. Simply unplugging an appliance does not necessarily make it safe to take apart.

TV units, screens and computer monitors should not be used for tinkering. Older TVs, monitors and laptop screens can contain dangerous chemicals, including lead and mercury. Some units also carry the risk of electrocution via high voltage capacitors that can hold their charge for a significant amount of time.

Electrical appliances with a plug carry the risk of the plug or wires being cut off and inserted into a socket, causing electrocution. To reduce this risk, completely remove and dispose of the plug and connecting wires in advance, so learners cannot insert these parts into a socket. Avoiding mains-powered equipment altogether is a safer option.



Under no circumstances should smoke detectors be used for tinkering, as some smoke detectors - old or newer - contain radioactive sources.

Which items are safer to tinker with?

Safer options include:

- Landline telephones
- Torches
- Reasonably modern pocket radios
- Computer keyboards (remove batteries from wireless keyboards)
- Clocks
- Clockwork toys
- Simple electronic toys with buttons, such as a musical toy phone

If your item is battery-powered, remove the batteries (also known as cells) in advance of the tinkering activity.

Avoid providing learners with equipment containing button cells (also known as button batteries) and tools to remove these. Button cells are extremely dangerous if swallowed. >>



Some equipment enclosures are of a snap-fit design, which often requires leverage with some force. Avoiding this type of item is safer due to risks from prising open the snap-fit cover. Instead, use items which can be unscrewed or opened without excessive force.

Taking items apart

When disassembling items with learners, it is safer to avoid hammers and electrical tools. Instead, we would recommend using a set of screwdrivers and pliers. Demonstrate the safe use of these tools and work out the possible dangers with the children and how to minimise the risk; for example, wearing safety goggles. Close supervision may be necessary depending on the stage and experience of the learners. Be aware of the risks of inhaling harmful dust from printed circuit boards (PCBs) in some items – you may wish to open the item in advance wearing a face mask, and remove dust with a Hoover.

Ideally, carry out the disassembly in an area without electrical sockets or any source of electrical supply, and warn learners not to insert any parts into an electrical socket.

Never disassemble individual components – if something cannot be explored by carefully pulling apart or unscrewing, it should not be broken down further (for example, by breaking or cutting it apart).

Avoid reassembly

We recommend disassembly only, and no attempt should be made to rebuild and test the item due to risks caused by incorrect reassembly.

Disposal

Once items have been disassembled, ensure that the pieces are collected carefully. Parts can often be recycled following your Local Authority's guidance. Electrical equipment and parts cannot be simply binned and must be disposed of according to the Waste Electrical and Electronic Equipment (WEEE) regulations.

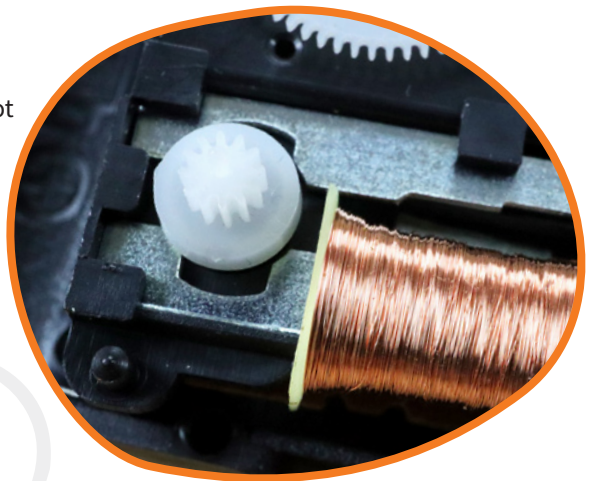
After tinkering

Clothes should be brushed down, and hands washed thoroughly after tinkering activities.

Explain to learners and families that it is not safe for children to take items or appliances apart without supervision, for example, on their own at home.

Risk assessment

The above advice is provided to underpin the planning of these kinds of tinkering activities and support you in creating your own risk assessment. Your risk assessment should take into account the age, stage and behaviour of the learners and your experience working with the group, as this would be different for each group of learners. Ensure



that the learners and all adults in the classroom are involved in the risk assessment process. Everyone involved must be aware of the risks and how to minimise them, to learn in a way that is as safe as possible.

- Consult the Association for Science Education's "Be Safe! Fourth Edition" (the Health and Safety Handbook for Science and Technology in Early Years and Primary).
- Follow local authority and school advice.
- Any questions? Contact us at primary@sserc.scot for Early Years and Primary STEM Health and Safety advice.

