



# Y4 We Are Engineers: Steady Hand Game —Knowledge Organiser



## Key Knowledge

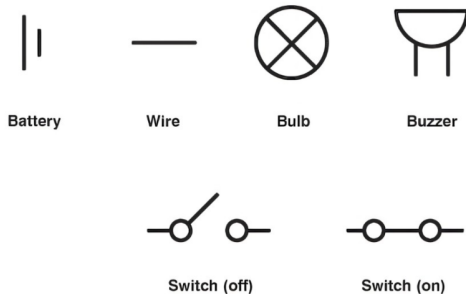
### What is a Steady Hand game?

The Steady hand game involves trying to get a metal loop on a handle from one side of a wavy wire to the other, without the two touching.

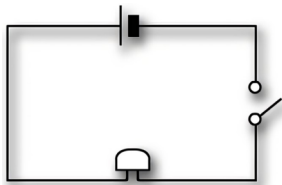
The game works because it is made from an incomplete electrical circuit. When the metal loop touches the metal wire shape track, the circuit is completed and the buzzer will sound!



### Why are scientific diagrams with symbols drawn instead of pictures?



**They are easier to draw, clearly show how equipment links together and everyone can identify the components used!**



**Steady-hand game circuit.**

## Key Skills

**Smooth wood by sanding** —Vigorously rub sand paper against the wooden base to smooth the rough edges.

**Strip the wire**—using scissors, carefully cut down through the rubber but not hard enough to cut through the wire. Rotate the scissors and then pull the rubber off, exposing the copper wire.

**Manipulate (bend) heavy-duty wire** using hands.

**Join two wires** using **terminal block/connector**—loosen the screw in the terminal block by turning the screwdriver left (lefty-loosey). Insert the wire into the connector and then, holding it in place, tighten the screw by turning the screwdriver right (righty-tighty) to secure.

**Secure buzzer onto base** by screwing it onto the wooden base. Use 2 screws, pushing down into the wood while rotating the screwdriver right.

**Use a glue gun** to secure components to wooden base—insert glue stick if needed, allow to heat up, squeeze trigger to release glue pointing nozzle on component, place on stand when not in use.

### Problem solving

**If the buzzer does not sound when the circuit is complete, you will need to problem solve to find out why it is not working.**

**Check the common errors listed below:**

- Check batteries are correct way round in cage.
- Ensure the wire is secure in terminal block.
- Check that the batteries are working (try in circuit that is working).
- Ensure the circuit is connected to shape track securely without a gap.
- Check additional components are functioning by replacing them one at a time, e.g. buzzer and battery cage.

## Key Vocabulary *Understand these key words*

Word	Definition
<b>Series circuit</b>	A series circuit is one in which the entire current travels through all of the components.
<b>Components</b>	A part or element of a larger whole.
<b>Shape track</b>	Heavy-duty wire manipulated to make a desired shape, of which the loop is carefully manoeuvred around.
<b>Copper wire</b>	A copper wire is a single electrical conductor made of copper.
<b>Heat Shrink Tubing</b>	A shrinkable tube that shrinks radially when exposed to heat.
<b>Terminal block/connector</b>	These are simply used to connect two wires together.
<b>Flexible</b>	Capable of bending easily without breaking.
<b>Heavy duty</b>	Material designed to withstand the stress of manipulation.
<b>Battery cage</b>	A plastic outer casing to house the batteries.
<b>Buzzer</b>	An electrical device that makes a buzzing noise.
<b>Loop</b>	A shape produced by a curve that bends round.
<b>Join</b>	Link; connect.
<b>Switch</b>	A device for making and breaking the connection in an electric circuit.
<b>Screwdriver</b>	A tool with a flattened or cross-shaped tip that fits into the head of a screw to turn it.
<b>Handle</b>	The part by which a thing is held/handled/controlled.
<b>Conductor</b>	A material or device that conducts or transmits heat or electricity.
<b>Insulator</b>	An insulator is a material that does not conduct electrical current .
<b>Electricity</b>	A form of energy resulting from the existence of charged particles.