

# Circuits 3—Steady Hand Game

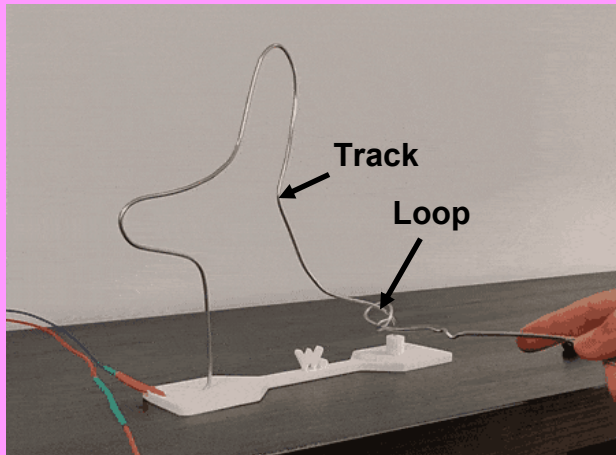


## Key knowledge

A steady hand game is a circuit with a gap in it. When the gap is closed the LED will light.

To win the game the loop must travel the length of the track without completing the circuit.

To lose the game you complete the circuit and the LED will light.



Soldering is a process where 2 wires are joined by melting and putting filler metal (solder) into the joint.

Solder has a lower melting point than the wires.

Unlike welding, soldering does not melt the wires.

In the past solder contained tin and lead, but the fumes generated by lead solder are toxic and now lead-free solder is used. Lead-free solder is an alloy of mainly tin.

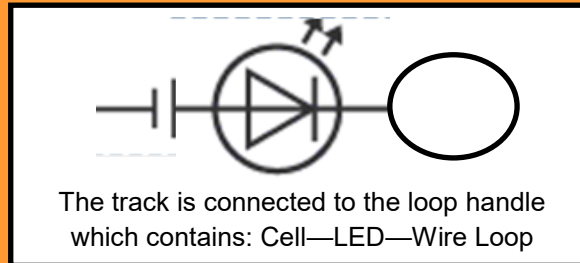
## Key Skills

Circuit diagrams are drawn using a pencil and ruler—using correct circuit symbols.

Circuits must be designed to fulfil the design brief as simply as possible.

The circuit must contain a cell, an LED and a gap between the track and loop.

A smaller loop will make the game more difficult.



## Soldering

*Do not use the soldering iron without adult supervision.*

Check the soldering iron for damage before use.

Do not touch the element—even to check it's off.

Use a heat resistant mat.

Do not hold wires to be soldered in your fingers.

Always return the soldering iron to its stand.

Work in a ventilated area.

Wear eye protection.

Keep the cleaning sponge damp.

## Key vocabulary

**Insulator**—does not allow electrical current to flow

**Conductor**—does allow electrical current to flow

**Current**—flow of electrical charge, measured in amperes or amps (A)

**Resistance**—opposition to the flow of current, measured in ohms ( $\Omega$ )

**Complete circuit**—when there are no gaps in the circuit, the switch is closed

**Wire**—used to connect components in a circuit

**Cell**—uses chemicals to generate electricity

**Battery**—2 or more cells in series

**Diode**—a component that allows current to flow in one direction—very high resistance in opposite direction

**LED**—Light Emitting Diode

**Design brief**—a brief outline of the problem to be solved

**Specification**—detailed description of the design and materials needed

**Soldering Iron**—a hand tool that supplies heat to melt solder

**Solder**—A tin alloy that melts and fills the joint between wires (or metal components).