

Year 8 STEADY HAND GAME

Key Words: Vacuum forming, input, process, output, Thyristor, Medium Density Fibreboard (MDF), latch, sensor, resistor, circuit, switch, electron, softwood, hardwood, laminating, perpendicular.

Key Skills: Soldering, cutting, measuring, vacuum forming, sanding, diagram reading, testing, evaluating.

Subject: Technology

Year: 8

Term: 1/3/5

Topic: Steady Hand Game

Lesson Sequence

1. Begin soldering recap and start the Thyristor circuit.
2. Complete the Thyristor circuit, label it and bag it.
3. Start construction of the MDF case base.
4. Complete construction of MDF case base.
5. Sand case base, vacuum form and drill required holes.
6. Assemble the circuit into the casing and make the connections to the wire shape.
7. Complete all making and evaluate the effectiveness of your product.

Key Assessments

Key assessment 2/4/6 Exam and class work mark.

Core Texts
Design and Technology KS3 class book.

The things you need to learn in this knowledge organiser are:

1. Know how to **solder** the circuit effectively. Describe the soldering process in at least **4 stages**.
2. Describe how the **electrons flow** around the circuit and explain how the Thyristor '**latch**' works in simple terms.
3. Describe the properties of a range of woods (5 different) and man-made boards: **MDF, Ply wood, Softwood, Hardwood**.
4. Describe the correct **tools** (5 tools) for cutting and **shaping MDF sheet**.
5. Describe the **vacuum forming** process with a diagram. Describe **injection moulding** and press forming.
6. Describe which 2 parts of the steady hand game set off the **2 parts of the trigger or 'switch'**.
7. Be able to describe 3 electrical or mechanical systems naming their **input / process / output**.
8. Draw the Thyristor symbol and label the 3 legs.

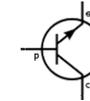
Knowledge summary: Soldering requires you to: place the **component** in the right place, heat the joint (component and circuit), add **solder** until it flows, keep heating until the **pyramid shape** appears. The **electrons** flow around the **circuit** from positive to negative until they are allowed to reach the **Thyristor 'GATE'** which triggers electrons to flow through the **Anode** and the **Cathode**, which in turn allows them to flow through the **buzzer** and the **light** making them work. The **Thyristor** will then '**latch**' on making the flow through buzzer and light **constant**, even if the trigger is removed. **MDF** is a flat board made from a glue and **particles** of wood through recycling. **Ply-wood** is thin layers of wood cut from a log in a spiral like a swiss roll which are then glued together in **layers** where the grain of each layer is **perpendicular** to the grain of the one above and below it. **Vacuum forming** involves using a **vacuum** under a heated (soft) sheet of **thermoplastic** allowing air pressure (above) the plastic to push the soft heated plastic down over a mould of a chosen shape. || When cooled, the plastic is no longer soft and **sets** to a hard shell. **Injection moulding** involves squirting a hot liquid plastic into a **mould** where it sets hard. The mould is removed and the plastic item can be taken out. The process can be repeated **many times** to make many cheap products such as bottle caps or computer mice and toys. Even chairs.

Input / process / outputs: Bicycle gears: **Input** = rider pedals and selects gear, **Process** = gear cogs change the speed that the chain moves the back wheel, **Output** = Back wheel turns faster or slower.

Steady Hand Game: **Input** = hand wand touches the shape to trigger a flow to the Thyristor gate, **Process** = electrons open the gate in the Thyristor allowing electrons to flow through the Anode and Cathode, **Output** = the buzzer busses and the light lights up.

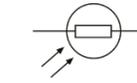
You should be able to draw these component symbols without looking

Transistor



LDR

(light dependant resistor)



Resistor

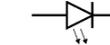


Thermistor

(heat dependant resistor)



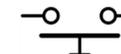
LED (light emitting diode)



Variable resistor



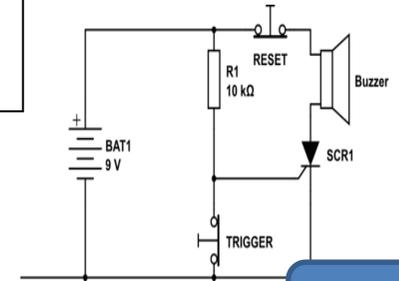
Push switch



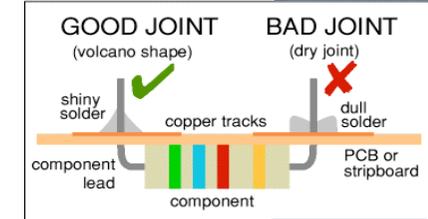
Switch (click on)



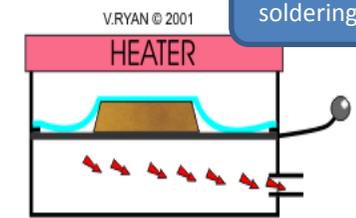
Visual Reminders



Circuit Diagram



Correct soldering



THE AIR IS PUMPED OUT OF THE AREA BELOW THE PLASTIC AND MOULD.

Vacuum forming



A System