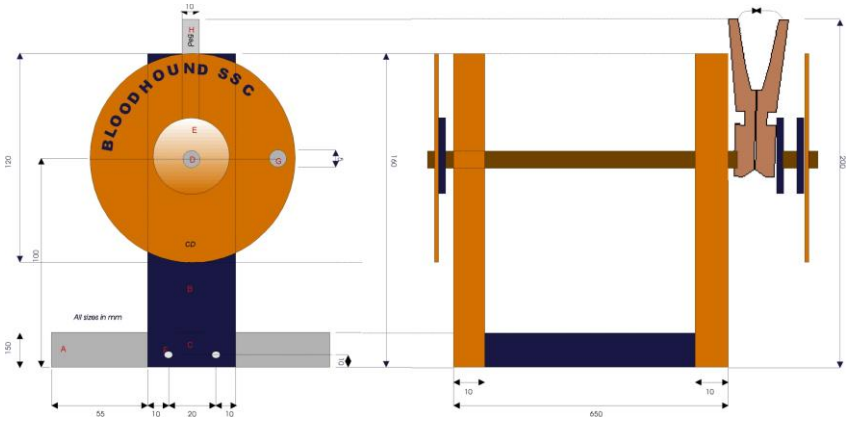
Pupil Discovery Sheet

Discovery Sheet



Resources

One 160m length of wood, 60 mm X 20mm	Two 160 mm lengths of wood. 40mm X 10mm	Two CDs One clothes peg three 40mm MDF wheels	20 mm of 5mm dowel
Screwdriver Four 1¼" size 8 screws One ½" size 6 screw	Junior hack saw Sanding paper	Impact glue (Evo-Stick or similar)	Hand drill 3mm drill bit 5mm drill bit 8mm drill bit.

Construction

- Print off the BLOODHOUND SSC Disc Braked machine drawings
- Saw off one 160 mm length of 60mm X 20mm of wood. Sand the ends and edges smooth. Marked ***A*** on the plan.
- Saw off two 160mm lengths of 40mm X 10mm of wood. Sand the ends and edges smooth. Marked ***B*** on the plan.

- Mark two holes centres 10mm from one end of and 10mm in from the edges on each piece of wood (***B***) at ***C***. Drill these with a3mm drill bit. Sand smooth.

- Mark each piece of wood ***B*** at point ***D*** and drill with a 5mm drill bit. Sand smooth.

- Glue two MDF wheels to the inside centre of the two CDs at ***E***. (The plan shows it to the front to exaggerate its position)

- Cut a 150mm length of 4mm dowel.

- Screw the pieces of wood ***B*** perpendicularly to the base ***A*** 40mm in at **F**. *Accuracy is very important as holes **D** must line up with each other.*

- Take the clothes peg and drill a 5mm hole through the closed (pinched) end. Drill one side again only to 8mm diameter.

- Glue the third MDF wheel to the peg so that its centre aligns with the newly drilled holes and leave to set hard.

- Drill a 5mm hole 10mm in from the edge of the second CD at point ***G***. Back the hole with tape and glue the remaining dowel into the hole. Leave to set hard. This forms a winding handle.

- Slide 15mm of dowel through hole ***D***.

- Slide the peg H onto one end of the dowel outside of the framework ***B*** and screw to ***B*** with the ¼" screw.

- Slide the CD with the MDF wheel inside and adjacent to the peg ***H*** MDF wheel.

- Slide the winding CD onto the other side of the framework ***B***.

- Wind the machine forward using the dowel handle and let it run freely.

- Slowly pinch the peg until the two MDF wheels engage with each other and friction between them brings the machine to a standstill.

Investigation

What I plan to do
What I will keep the same and what I will change
What I expect to happen

Diagram

Extension Work & Science Discussion

"Acceleration is optional, braking is not!"

Andy Green

When BLOODHOUND SSC runs at a new World Land Speed Record of 1,000 mph, it will then need to slow and stop. When the driver, Andy Green needs to slow the car, he will use *drag to help him* by deploying air brakes as the car decelerates from transonic to subsonic speeds. A *Drogue Chute* will then open to slow the car to about 200 mph. We study the use of air brakes and drogue chutes to slow the car at transonic speed in the series; **Air Resistance – An Opposing Force (1-6).** We now look at the more conventional use of disc brakes on the wheels similar to that used by aircraft to finally slow BLOODHOUND SSC to a stop.

Your notes and ideas...