Year 5 Autumn 2: AIWFC Topic Knowledge Organiser

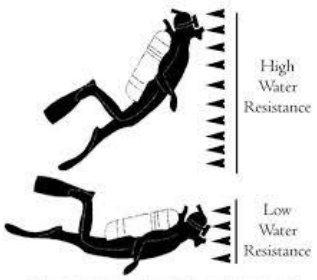
Section 1

Air Resistance and Water Resistance

Air resistance – A force that is caused by air with the force acting in the opposite direction to an object moving through the air.

	
The parachute has a **larger** surface area.	The parachute has a **smaller** surface area.
More air pushes against the parachute, so there is **more** air resistance.	**Less** air pushes against the parachute, so there is **less** air resistance.
The person falls **more slowly**.	The person falls **more quickly**.

Water resistance - A force that is caused by water with the force acting in the opposite direction to an object moving through the water.

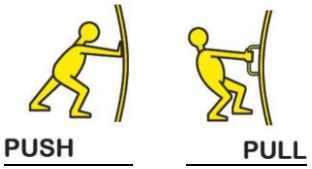


https://www.youtube.com/watch?v=fr9JxrqnpGU&ab_channel=NehalAnbar

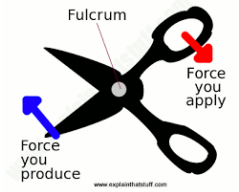
Section 2

Forces – *measured in newtons*

Force – A push or pull upon an object.



Fulcrum -The place where the lever pivots (moves).



Friction- the 'sticking' force that occurs when an object moves over another.

Section 3

SCIENCE - *Working Scientifically*

Aim – what the experiment is trying to find out

Equipment – list and/or diagram of what will be used

Prediction – ***use the aim*** to say what you think will happen and why. ***Use results*** to create future predictions.

Method – step by step of what you need to do

Results – measurements and/or observations

Conclusion – what you have found out from the results and what this tells you. This should be linked back to your aim.

Variables – A variable is a factor that can be changed in an experiment.

Independent – the variable which is being altered/changed.

Dependent – the variable being tested or measured

Control – the variable that is kept the same

- Identifying **control variables**, **independent** and **dependent** variables is important in **making experiments fair.**

- Knowing about variables can help you make scientific predictions and test them.

Evaluation – What was good? What went wrong? Why?

Fair test – when you only change the one variable you are measuring, and control all other variables.

TAKE A LOOK AT HOME: Variables - Working scientifically - KS3 Science - BBC Bitesize - BBC Bitesize

Section 4

Product Design

Key factors in product design:

Research for;

Purpose – *why* are we designing the product?

Function – *what* does the product need to do?

Audience – *who* will the product be made for?

Sustainability – it is important for designers to minimise the impact that their product will have on the environment.

Reuse - Can the product be passed on or its life extended by using it repeatedly? Reusable carrier bags from the supermarket are a good example.

Recycle - Can materials such as metal, plastic and glass be collected and converted? Plastic bottles can be shredded into pellets to make new plastic bottles.

Reduce - Are there products that last longer or can be recharged? Can the miles the product has to travel be cut? Or could *rechargeable batteries* or locally-sourced products be used?

Evaluating

Evaluation – this needs to be linked to the purpose and intended user/audience

Use of feedback from the intended users of a product can be used to assess how much the product met the aim of the research e.g. to create a product that

This includes both what worked well and what didn't so that if the product was to be made again, these changes can be implemented and hopefully achieve a better result.

- What went well?
- What went wrong?
- How can it be improved next time?

Section 5

Types of Mechanisms

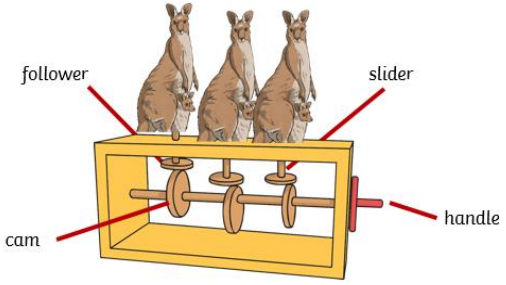
Gears or cogs- Used to change speed, direction or force of motion. When two gears are connected, they always turn in the opposite direction to one another. *E.g. Clocks, Bikes, Drills*

Levers Used to make a small force lift a lighter load. A lever always resets on a pivot or fulcrum. *E.g. door handle, light switch, scissors*

Pulleys – Used to reduce the amount of force needed to lift a load. The more wheels in a pulley the less force is needed to lift the weight. *E.g. crane, flagpole, window blind*

Identifying different parts of a CAM toy

Cam Mechanism - made up of three components: a **cam**, **slider** and **follower**. The mechanism causes components to move. Cams can be made out of metal, plastic or wood.



Rotary motion -takes place around a fixed axis, meaning that it doesn't wobble or move up and down.

Linear motion –when an object moves in a straight line.

Uses: Car engines**,** Drills**,** Toys

Section 6

Instructions for making a CAM toy

1. Design and create your background and moving part on study card.

2. Cut twelve, 7cm pieces of balsa wood.

3. Measure and cut 13cm of dowel wood.

4. Measure and cut 8cm piece of dowel.

5. Pierce the 13cm dowel through your CAM

6. Stick a small piece of cardboard to the end of the 8cm dowel.

Constructing the CAM toy

1. Hot glue four, 7cm pieces of balsa together to make a square.

2. Repeat step 1 with 4 more pieces of balsa wood.

3. Hot glue the remaining 4 pieces of balsa to the corners of one of the squares.

4. Stick the second square on top to form a cube.

5. Glue your card to the outside of the cube.

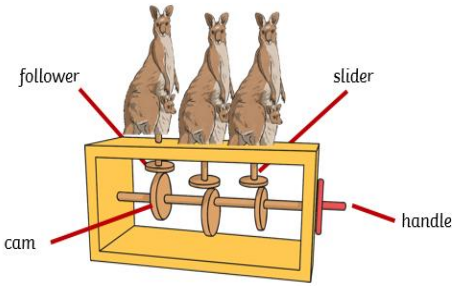
6. Attach the cam mechanism inside the frame.

7. Turn the handle and watch your toy move!

Section 4 WB 27th November

Identifying different parts of a CAM toy

Cam Mechanism - A cam mechanism is made up of three components: a **cam**, **slider** and **follower**. The mechanism causes components to move. Cams can be made out of metal, plastic or wood.



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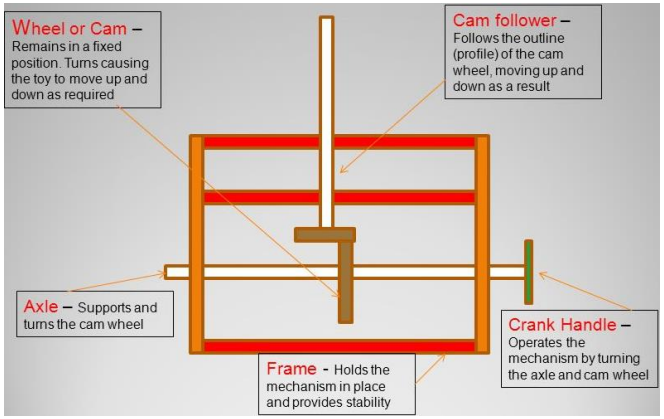
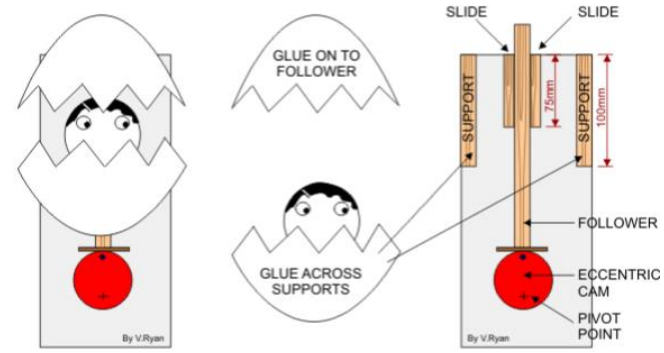
Section 5 WB 5th December

Cross Sectional and Exploded Diagrams

Cross sectional diagrams –used to show an object cut in half so you can see the inside.



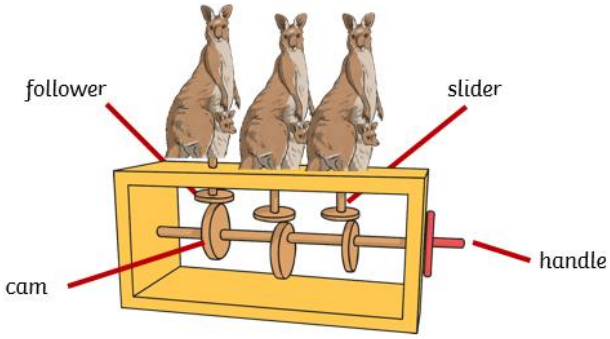
Exploded diagrams –used to show the individual parts of an object and how they fit together.



Section 6 WB 12th December

Identifying different parts of a CAM toy

Cam Mechanism - A cam mechanism is made up of three components: a **cam**, **slider** and **follower**. The mechanism causes components to move. Cams can be made out of metal, plastic or wood.



Rotary motion -takes place around a fixed axis, meaning that it doesn't wobble or move up and down.

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Uses

Car engines

Drills

Toys

Working scientifically,

Use old book covers for recycled and reused card