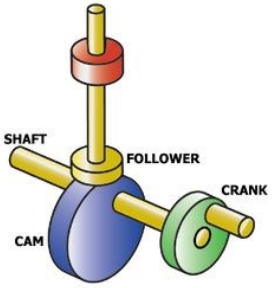
Mechanical Systems - CAMS

Key Knowledge

Working as engineers, you will be:

- Investigating toys with moving cam mechanisms;
- Investigating and experimenting with different types of cam mechanisms and how they affect movement differently;
- Designing and making a product (linked to your enquiry) with a moving cam mechanism;
- Evaluating your own product.



Working as engineers, you will:

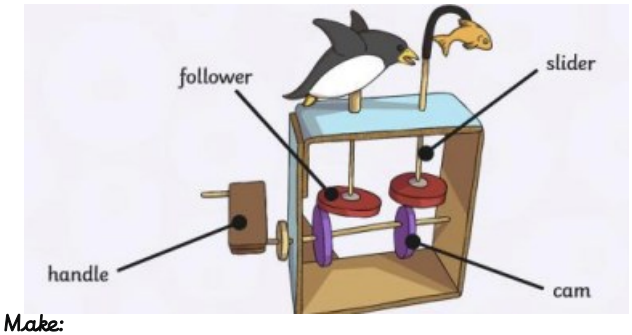
- Understand that mechanical systems have an input, process and an output;
- Know that a cam mechanism is made up of 3 components: cam, slider and follower;
- Understand how cams can be used to produce different types of movement and change the direction of movement;
- Know and use technical vocabulary relevant to the project.

Key Skills

Working as engineers, you will learn how to:

Design:

Research what cams operated mechanisms are used for.
Design a product (annotated diagram; cross-sectional; exploded diagram).
Develop mock-ups/prototypes.



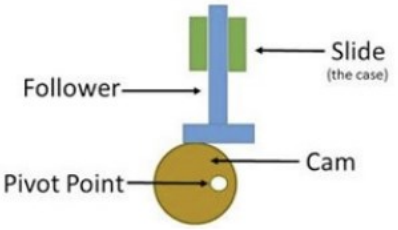
Make:

Produce detailed lists of tools, equipment and materials.
Formulate step-by-step plans
Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished.
Work within the constraints of time, resources and cost.

Evaluate:

Compare the final product to the original design specification.
Test products with the intended user.
Evaluate the quality of the design, manufacture, functionality and fitness for purpose.
Consider the views of others to improve their work.

Key Vocabulary

Cam	A piece of specifically shaped material, which is fixed to a rotating shaft. A shaped component used to turn one form of movement into another.
Slider	A rigid bar that moves. The housing (case) for the follower that allows it to move.
Follower	These are mechanisms that are in contact with the cam. The component that is moved up and down or rotated by the cam.
Pivot point	The point around where rotational movement occurs. 
Linear movement	This is when it moves in a straight line, up and down, caused by a non-circular cam.
Rotary movement	This is when it is turning around in circle, like a wheel turning. Spinning around the pivot point.
Dowling	Thin pieces of wood.
Non-circular cam	Any cam that is not round.
Eccentric cam	The cam is a disc with its centre of rotation positioned 'off centre'. This means as the cam rotates the flat follower rises and falls at a constant rate
Snail cam	Cam that produces a slow rise and quick drop movement
Prototype	A full-size, working model of a product or object to test to see if it works properly before you make your finished item.
Axle	An axle is a bar that goes through the wheels, keeping them in place and allowing them to turn.
Mechanism	A system of parts working together in a machine.

Some common types of cams