



Design and Technology: Year 5 and 6 – Spring term

– Mechanisms: CAM mechanisms

Prior Learning

- I know how mechanisms that use axels, pneumatics, sliders and levers work.
- I know about different type of movement through pneumatic mechanisms.
- I know how to cut and join techniques with a range of materials including card and wood.
- I know some ways to stiffen and reinforce structures.

Sticky Knowledge

- I know how cams can be used to produce different types of movement and change the direction of movement.
- I know how to generate, develop, model and communicate realistic ideas through discussion and annotated sketches, cross-sectional and exploded diagrams, thinking about the **user**, **purpose** and **function** of my product..
- I know how to produce detailed lists of tools, equipment and materials and create step-by-step plans.
- I know how to select from and use a range of tools and equipment to make products that that are accurately assembled and well finished.
- I know how to test products with the intended user and evaluate the quality of the design, manufacture, functionality and fitness for purpose.

Vocabulary

Annotated sketch	Drawings with labels or notes to explain the different parts or ideas. It's like adding little explanations around your picture.
Axle	A rod or bar that goes through the middle of wheels, helping them turn. Think of the part that holds the wheels on a toy car.
CAFEQUES	customer, aesthetics, function, ergonomics, quality, usability, environment, safety
Cam	A mechanism that changes one sort of movement to another. Cams can be an off-centre wheel or a specially shaped wheel.
Evaluate	To look at something carefully and decide how good or useful it is. For example, after building a project, you might evaluate it by thinking about what worked well and what could be better
Exploded diagram	A picture that shows all the parts of something separated but in the correct order, so you can see how they fit together. It's like showing a LEGO set before you snap all the pieces into place.
Follower	The device that follows the movement of the cam: a lever or a slider.
Functionality	What the product should be able to do to work properly.
Linear motion	Movement that goes in a straight line.
Rotary motion	Movement that goes around.

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–Mechanisms: CAM mechanisms

What movement will my product use?
There are FOUR types of movement:



LINEAR MOTION

To move something in a straight line (e.g. a train on a track).



ROTARY MOTION

When something moves around an axis or pivot (e.g. a wheel).



OSCILLATING MOTION

Has a repeated up-and-down or back-and-forth motion (e.g. a pump).

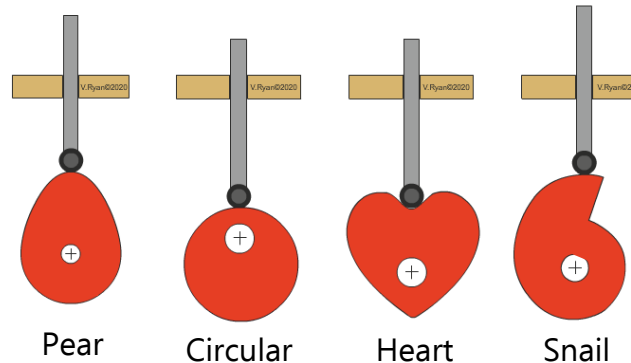


RECIPROCATING MOTION

Has a curved backwards and forwards motion that swings on an axis or pivot (e.g. a pendulum).



What different CAMS can I use and how will these change the movement?



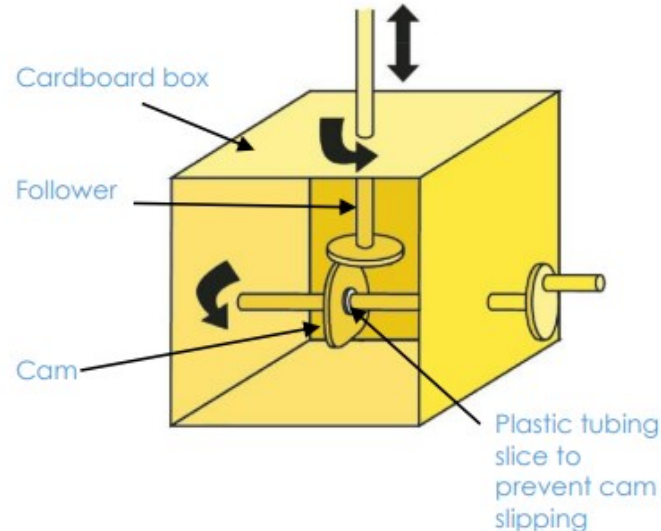
PEAR: Stays still for half a turn then gently rises and falls. These are used to make carousel horses rise and fall.

CIRCULAR: The follower will rise and fall by a reasonably large amount. These can be seen in pistons, for example on steam engines.

HEART: The follower rises and falls steadily with no stopping.

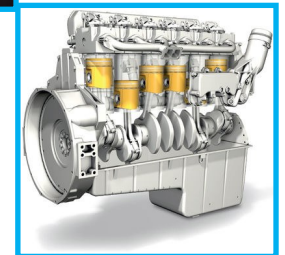
SNAIL: It causes the follower to remain stationary for half a turn before gently rising and suddenly falling. They can only work by rotating in one direction.

How can we assemble our CAM mechanism?



Carousels

Engines and factory machinery



Climbing equipment