



Year 5 Design and Technology: CAM mechanisms

How can CAM mechanisms be used to make a moving toy?



Prior Learning

- I have made mechanisms that use axels, pneumatics, sliders and levers.
- I have explored different type of movement through pneumatic mechanisms.
- I have learnt some cutting and joining techniques with a range of materials including card, plastic and wood.
- I have learned some ways to stiffen and reinforce structures.

Sticky Knowledge

- I understand how cams can be used to produce different types of movement and change the direction of movement.
- I can 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 can produce detailed lists of tools, equipment and materials and create step-by-step plans.
- I can select from and use a range of tools and equipment to make products that that are accurately assembled and well finished.
- I can test products with the intended user and evaluate the quality of the design, manufacture, functionality and fitness for purpose.

Vocabulary

User*	The person or people who will use the product.
Purpose*	What the product will be used for.
Function*	What the product should be able to do to work properly.
Design*	A plan or idea of what the product will be like and how it will function.
Rotary Motion*	Movement that goes round.
Oscillating Motion*	Moving to and fro around a pivot point, as in a lever.
Reciprocating Motion*	Backwards and forwards movement in a straight line, as in a slider.
CAM	A mechanism that changes one sort of movement to another. Cams can be an off-centre wheel or a specially shaped wheel.
Follower	The device that follows the movement of the cam: a lever or a slider.
Guide	A piece of material used to guide the movement of another.
Spacer	A piece of material used to create extra space to allow moving parts to move freely.

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How can CAM mechanisms be used to make a moving toy?

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).

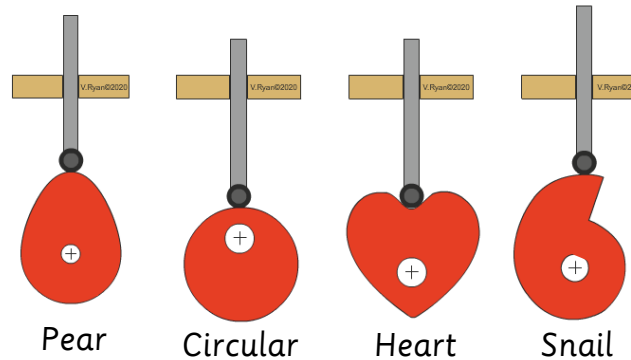


RECIPROCATING MOTION

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?



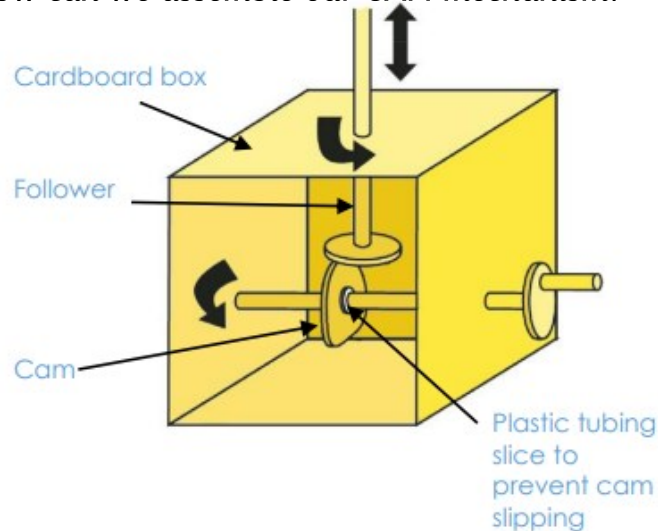
PEAR: Stays still for half a turn then gently rises and falls. These are used to make carousel horses rise and fall.

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.

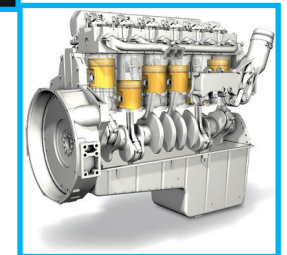
SNAIL: It causes the follower to remain stationary for half a turn before gently rising and suddenly falling. They can only work by rotating in one direction.

How can we assemble our CAM mechanism?



Carousels

Engines and factory machinery



Climbing equipment