Trailblazers Cycle A: Autumn 1
Mechanical Systems: Automata toys
Overview, Vocabulary and Sticky Knowledge

What do I already know about Cooking and Nutrition?

In Little Explorers, I learned...

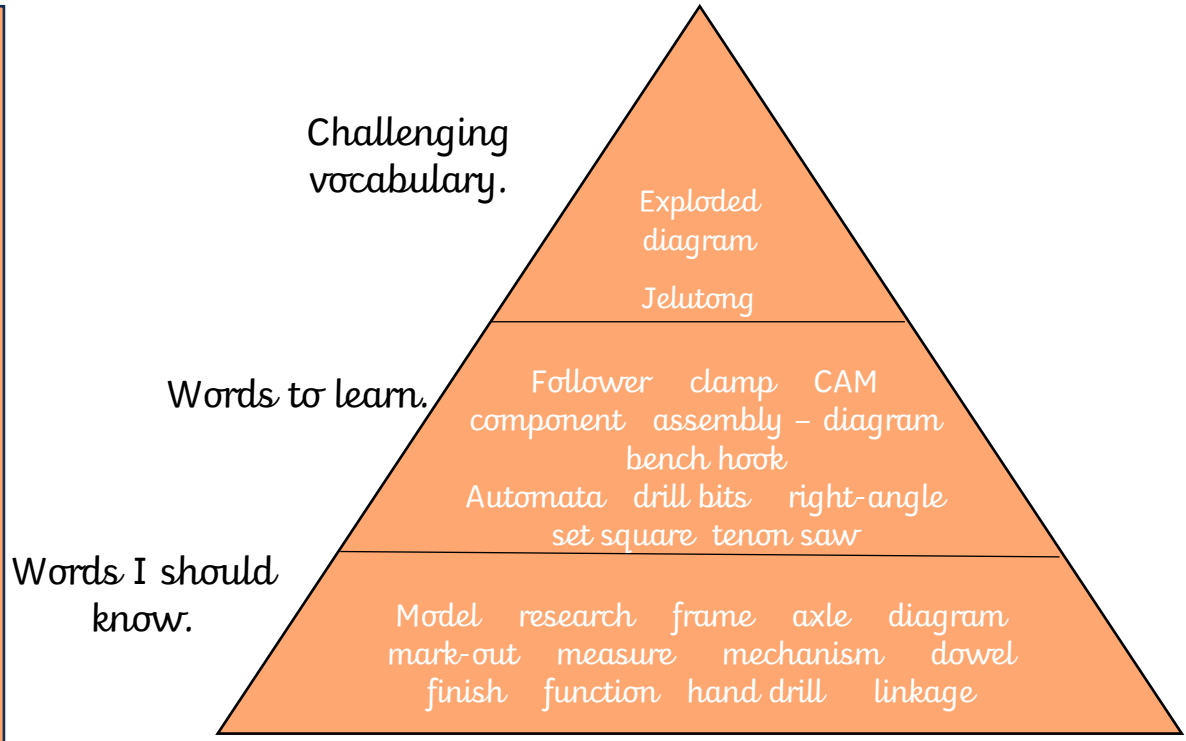
- How to make and use a winding mechanism.
- Cut and join materials in different ways.
- Describe how you winding mechanism was made.

In Big Explorers, I learned...

- How to use a linkage system to make a wheel move.
- How to select materials based on their properties.
- A structure is something built for a reason.
- Stable structures do not topple.
- Adding weight to the base of a structure can make it more stable
- How to use slider mechanisms to make characters move.
- How to restrict the movement of a slider using bridges and guides.
- That mechanisms are parts of an object that work together to make something move.

In Philosophers, I learned...

- You can use syringes and/or balloons to make a toy move using a pneumatic system.
- A pneumatic system can be used as part of a mechanism.
- Pneumatic systems operate by drawing in, releasing



Key facts I will learn...

The mechanism in an automata uses a system of cams, axles and followers.
Different shaped cams produce different outputs.
An automata is a hand-powered mechanical toy.
A cross-sectional diagram shows the inner workings of a product.

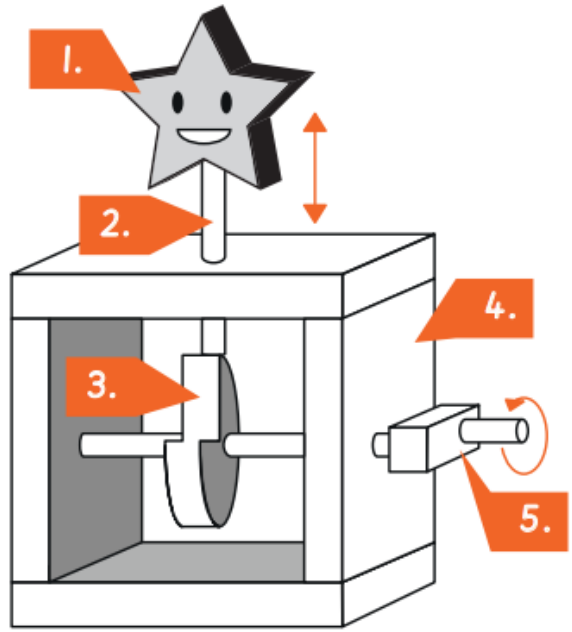
Mechanical Systems - Automata toys

Assembly-diagram	An exploded view diagram of an object, that shows you how to construct an object or order of assembly of various parts.
Automata	Automata toys are sometimes known as mechanical toys or kinetic art. They use hand-powered mechanisms to create movement in a scene of characters.
Axle	In an Automata the axle rotates, turning the cam with it. It is attached to the handle.
Bench hook	A tool which hooks onto the edge of the workbench. It's used to hold woodwork still when sawing.
Clamp	A tool for holding objects together, such as when you are waiting for glue to dry on something that you have glued together.
Cam	A cam is a rotating or sliding piece in a mechanism. It changes rotary motion to linear motion.
Component	One of several parts of which something is made.
Cutting list	An outline drawn true to size on paper, which shows the size and how many of each piece which you need to make for the project.
Dowel	Wood in the shape of a cylinder. Dowels come in all different sizes and thicknesses.
Drill bits	The cutting tools that go in drill to make different sized holes.
Exploded-diagram	A diagram which shows all of the internal and external parts of a product.
Finish	To complete your product with a high quality appearance.
Follower	The post which traces the shape of the cam, rising and falling in a linear or reciprocating motion.
Frame	The rectangular structure which holds the Automata together.
Function	How an object or product operates or works.
Hand drill	A small portable drilling machine for making holes which is operated by hand.
Jelutong	A type of softwood, it is lightweight, easy to cut and shape.
Linkage	A set of bars linked together to form a mechanism.
Mark out	To measure and mark where a piece of material needs to be cut or shaped.
Set square or Engineer's square	A right-angle triangular plate, wood or metal tool used for drawing lines at 90°, 45°, 60°, or 30°.
Tenon saw	A saw with a flat blade, used for cutting wood in straight lines or angles.

Key facts

Automata toy **components**:

1. Character
2. Follower
3. Cam
4. Frame
5. Axle attached to handle



Cam shapes

Round	Snail	Ellipse
No movement	Drop and climb	Steady up and down

Changing the shape of the **cam** in your **Automata**, will create different movements.

Design Brief

Automata Toys

You will be creating your own Automata toy. You will be using different cam shapes to explore how to make a character move in different ways.

Your toy must include:

- A character
- A follower
- A cam
- A frame
- An axle attached to a handle.

Challenge: Can you use different cams to create different movements?

Sticky knowledge

Use the sticky knowledge statements as part of your sticky learning starters each lesson.

NEED TO FINISH!