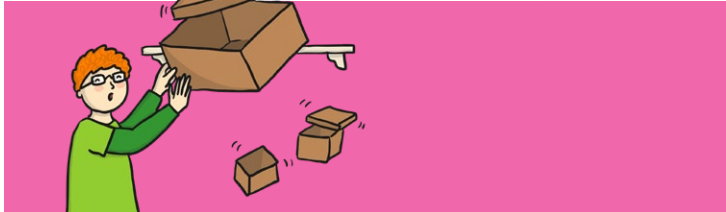


## Introduction

This 'Automata Animals' unit gives children opportunities to further develop their understanding of mechanical systems. Children learn about controlling movement with a cam mechanism as part of an automata animal. They develop their designing skills through using information sources to research ideas about animals which are then incorporated into the design criteria and designs. They make a simple cam mechanism to formulate an understanding of how different shaped cams can be used to produce different movements. Children extend their making skills by developing techniques in cutting, shaping and joining to combine components and by selecting tools and equipment to measure and cut wood and card accurately. Through these activities they gain an understanding of the working characteristics of the materials and components and how they can be combined to create more useful properties. Peer assessment is used to improve designs and evaluate final products.

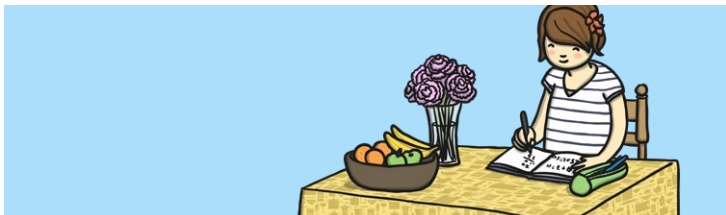


## Health & Safety

When carrying out a risk assessment for this unit, teachers will need to consider the materials, tools and equipment being used. Scissor safety rules should always be followed. In addition, the following points should be noted:

Hacksaws, drills and hammers should be used under strict supervision.

Teachers and additional adults should follow the [Using Tools Safely in Design and Technology Adult Guidance](#).



## Home Learning

**Save the Endangered Animal Poster:** Children are asked to design a poster to help raise awareness of endangered animals.

**The Movements of Different Shaped Cams:** Children are asked to look at the different shaped cams and draw the motion path of the follower in the box provided.



## Wider Learning

A visit from a 'toys school workshop' would allow the children to explore how cams and other mechanisms are used to make toys move.

To look at all the resources in the Automata Animals unit [click here](#).

To find out more about PlanIt download our [free guide here](#).

## Assessment Statements

By the end of this unit...

### ...all children should be able to:

- Generate, as a group, one viable idea after discussion with the teacher.
- Cut materials accurately and safely by selecting appropriate tools.
- Assemble a simple cam mechanism as part of the design.
- Use tools with some accuracy and finish their automata animal in a design that they have prepared with some assistance.
- Use design criteria to evaluate what they did well on their product.

### ...most children will be able to:

- Use research to develop design criteria.
- Use their knowledge of the animal and movement made by the cam in the design of their automaton.
- Measure, mark out and cut materials accurately and safely to the nearest cm using a wider range of tools and equipment.
- Work mainly independently to make a mechanical device, selecting materials to make a framework, handle, cam mechanism and finishing the device.
- Use peer feedback and design criteria to help guide the evaluation process.

### ...some children will be able to:

- Use research to develop design criteria centred on the design brief.
- Create a detailed design with at least two moving parts.
- Cut materials with precision to the nearest mm and refine the finish with appropriate tools (such as sanding wood after cutting).
- Make a model which is accurate, functions well and is a quality finish.
- Continually evaluate their work as it develops and at the end against design criteria and the design brief.

# Lesson Breakdown

## 1. Amazing Animals

Use research and develop design criteria to inform the design of innovative, functional appealing products that are fit for purpose, aimed at particular individuals or groups in the context of researching animals that will be used in their mechanical models.

- I can research ideas about different animals to inform my design.

## Resources

### Lesson Pack

#### KWL

- Access to computers
- Non-fiction books about animals
- Sticky notes



## 2. Cams and Followers

Understand and use mechanical systems in their products (for example cams) in the context of understanding how cams can be used to make a model move.

- I can explain how simple cam mechanisms work.

### Lesson Pack

#### KWL

- None



## 3. Exploring Cam Movement

Understand and use mechanical systems in their products (for example cams) in the context of understanding how changing the shape of the cam changes the movement of the follower.

- I can research ideas about different animals to inform my design.

Select from and use a wider range materials and components, including construction materials according to their functional properties and aesthetic qualities in the context of selecting materials to make a simple cam mechanism.

- I can select materials according to their functional properties.

### Lesson Pack

#### KWL

- Thick and thin card
- Corrugated card
- Split pins
- Scissors
- Plasticine
- Double sided sticky tape



## 4. Designing

Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at individuals or groups in the context of developing design criteria for the Automata Animals.

- I can use research and develop design criteria to inform my design.

### Lesson Pack

#### KWL

- A3 paper



## 5. Making a Framework

Select from and use a wider range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing), accurately in the context of using tools and equipment to perform the job of cutting, joining and finishing wood to make a frame.

- I can build a framework, accurately using a wider range of tools and equipment.

### Lesson Pack

#### KWL

- Cardboard boxes roughly 15x15cm (wash tablet boxes are ideal)
- Dowel, square section wood, corrugated plastic, corrugated card, ready-made corner joints or strong card, PVA glue, glue gun, pin hammer, pins, vices, bench hooks, junior hacksaws.



## 6. Using Mechanical Systems

Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work in the context of evaluating the product design.

- I can evaluate my product.

Understand and use mechanical systems in their products in the context of using a cam mechanism to make a model of an animal move.

- I can understand and use a mechanical system.

### Lesson Pack

#### KWL

- Dowel, corrugated plastic, corrugated card, foam sheets, PVA glue, cotton reels, wooden cams, sticky tack glue gun, vices, bench hooks, junior hacksaws, plastic tubing



To look at all the resources in the Automata Animals unit [click here](#).

National Curriculum Aim Lesson Context Child Friendly