

Design and Technology Knowledge Progression



The National Curriculum Aims and opening paragraph for each key stage state the knowledge that children need to learn throughout Key Stage 1 and 2. This knowledge is broken down into year group objectives in this knowledge progression document.

Using the document:

The National Curriculum content is broken into __ areas:

Each of these areas then has 'To know' or '**To know how to**' statements for the children to meet within their given year group, including vocabulary to be taught in each unit. These statements can be used as learning objectives and to aid assessment. 'To know' is content knowledge. '**To know how to**' is **procedural** knowledge.

These statements are not progressive within one year group, but they are progressive throughout the year groups and the colours help map the progression. The lightest colour in _____ in Year 1, links to the same _____ colour in Year 2 and then Year 3, and so on, providing a progression throughout school. If the colour is no longer included, then it is expected that the children have acquired that knowledge.

EYFS building the foundations for D&T:

Nursery

Design and technology prepares children to take part in the development of tomorrow's changing world. Creative thinking and imagination encourages children to make positive changes to their quality of life. The subject encourages children to become autonomous and creative problem solvers, both as individuals and as part of a team. It enables them to identify needs and opportunities and to respond by developing ideas and eventually making products and systems. Through the study of Design and Technology they combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industrial practices. This allows them to reflect on and evaluate present and past design technology, its uses and its impacts. Design and technology helps children to become discriminating and informed consumers and potential innovators. The aims of design and technology are:

- To develop imaginative thinking in children and to enable them to talk about what they like and dislike when designing and making
- To enable children to talk about how things work and to draw and model their ideas
- To encourage children to select appropriate tools and techniques for making a product, whilst following safe procedures
- To explore attitudes towards the material world and how we live and work in it
- To develop and understanding of technological processes, products and their manufacturer, and their contribution to our society
- To foster enjoyment, satisfaction and purpose in designing and making

Early Years are building the foundations for success in the DT National Curriculum through **Expressive Arts and Design, Understanding the World, Physical Development, Personal, Social and Emotional Development and Communication and Language.**

Design and Technology Strands:

Design

Have and discuss some ideas of things they would like to make or create. (C&L, EAD)

Technical Knowledge

Name & explore everyday products and know they are designed to help us. (UW, PSED)
To know ride on toys have wheel that help them more. (PHY)
Batteries power some objects; a switch turns them on and off. (UW, PSED)
Different materials are used for different constructions. (EAD, PHY)
To manipulate materials (tear, scrunch, stick) to create a piece of work; tools have different purposes. (EAD, PHY)
Some foods are healthy (fruit, vegetables, nuts, seeds); food can come from animals or plants. (PSED)

Make

Explore and develop own ideas using a range of construction kits to build models, including kits with wheels, create own small worlds linked to interests. (PHY, EAD)
With some adult support, select and use resources to help them reach a goal. (PSED)
Explore how things work. (PHY)
Explore and experiment (making shapes and structures) using a range of tools & materials. (EAD, MAT)
Make marks using large and small movements.
Help prepare healthy snacks

Evaluate

Say what they have made. (C&L)
Share their creation with others and respond to questions and suggestions about how it was made. (C&L, PSED)

EYFS building the foundations for D&T:

Reception

Design and technology prepares children to take part in the development of tomorrow's changing world. Creative thinking and imagination encourages children to make positive changes to their quality of life. The subject encourages children to become autonomous and creative problem solvers, both as individuals and as part of a team. It enables them to identify needs and opportunities and to respond by developing ideas and eventually making products and systems. Through the study of Design and Technology they combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industrial practices. This allows them to reflect on and evaluate present and past design technology, its uses and its impacts. Design and technology helps children to become discriminating and informed consumers and potential innovators. The aims of design and technology are:

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Design and Technology Strands:

Design

Discuss ideas and begin to plan what they would like to make. (CL, PSED)
Choose and select appropriate materials from a range of media to help them to achieve their goals. (PSED)
Know it is possible to change and alter their designs and ideas as they are making them. (PSED, CL)
Suggest healthy ingredients that can be used to make simple snacks. (CCL, PSED)

Technical Knowledge

Know everyday products are used everyday and have a specific use. (UW, PSED)
Name and explore a range of everyday products; begin to talk about how they are used. (UW, CL)
Vehicles and machines have wheels and axis to help them move. (PHY, UW)
Know that many appliances at home and school need electricity to work. The appliances need to be attached to electricity through a plug and socket, or use batteries. (KW, PSED)
Develop fine and gross motor skills to hold pencils, paintbrushes, knives and forks and other tools. (PHY)
Use a range of tools and techniques to achieve the desired effect with increasing independence; know different tools are used for different tasks. (PHY, EAD)
Know different materials have different properties and can be used for different purposes. (EAD)
There are healthy and unhealthy foods; fruit & vegetables are part of a healthy diet. (PSED)
Food comes from different sources, including from animals, such as meat, fish, eggs and dairy, or from plants, such as fruit and vegetables. (PSED, KUW)

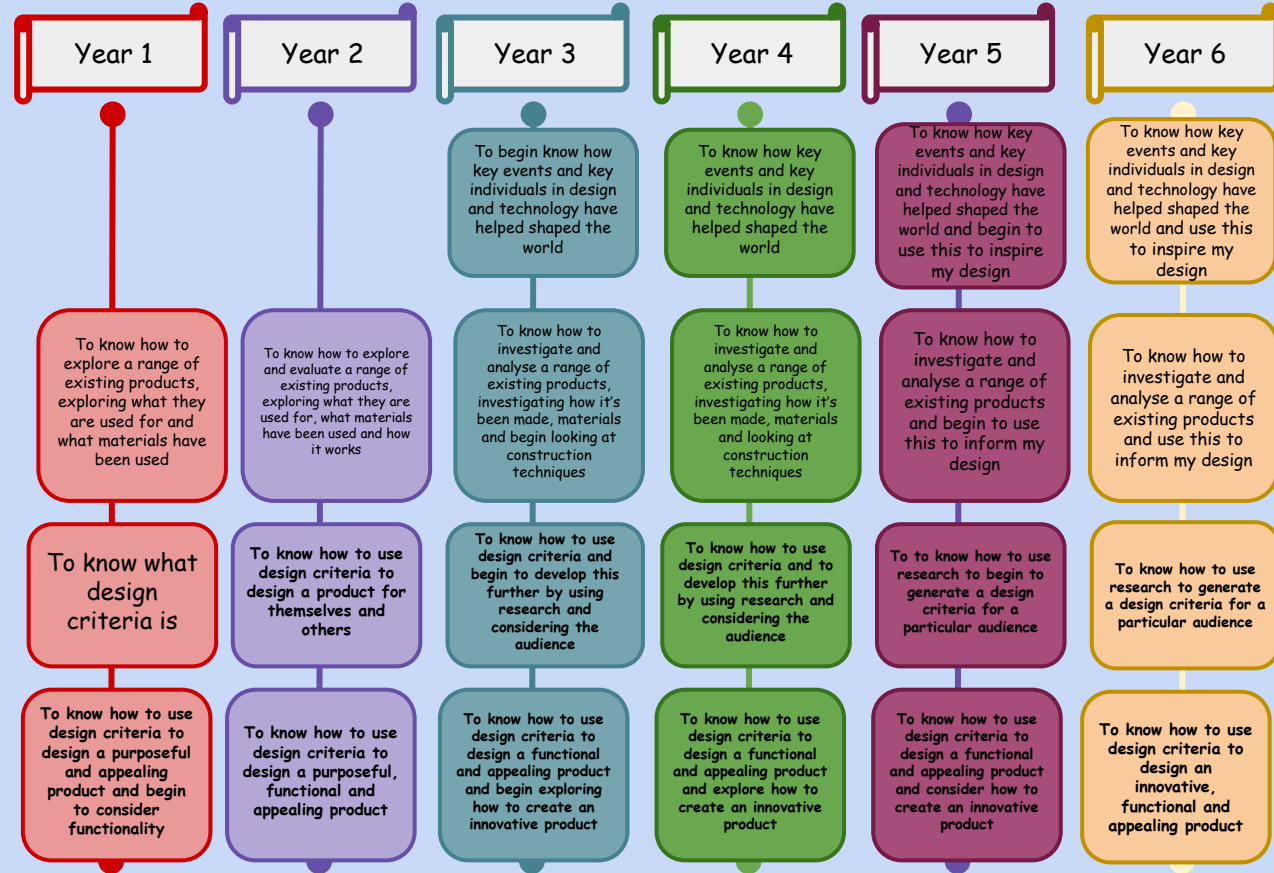
Make

Explore and develop own ideas using a range of construction kits to build models, including kits with wheels, create own small worlds linked to interests. (PHY, EAD)
Create collaboratively, share ideas and use a variety of resources to make products inspired by existing products, stories or their own ideas, interests or experiences. (EAD, PHY, CL, PSED)
Cut and prepare ingredients safely and hygienically. (PHY, PSED)
Tear and cut paper or card. (EAD, PHY)
Use glue or tape to join. (EAD, PHY)
Follow instructions, including simple recipes, that include measures and ingredients. (MAT, PHY, PSED, CL)
Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
Construct simple structures and models using a range of materials. (EAD)

Evaluate

Explain what they have made and why. (CL, PSED)
Adapt and refine develop work as they are constructing and making. (PSED, EAD, CL)

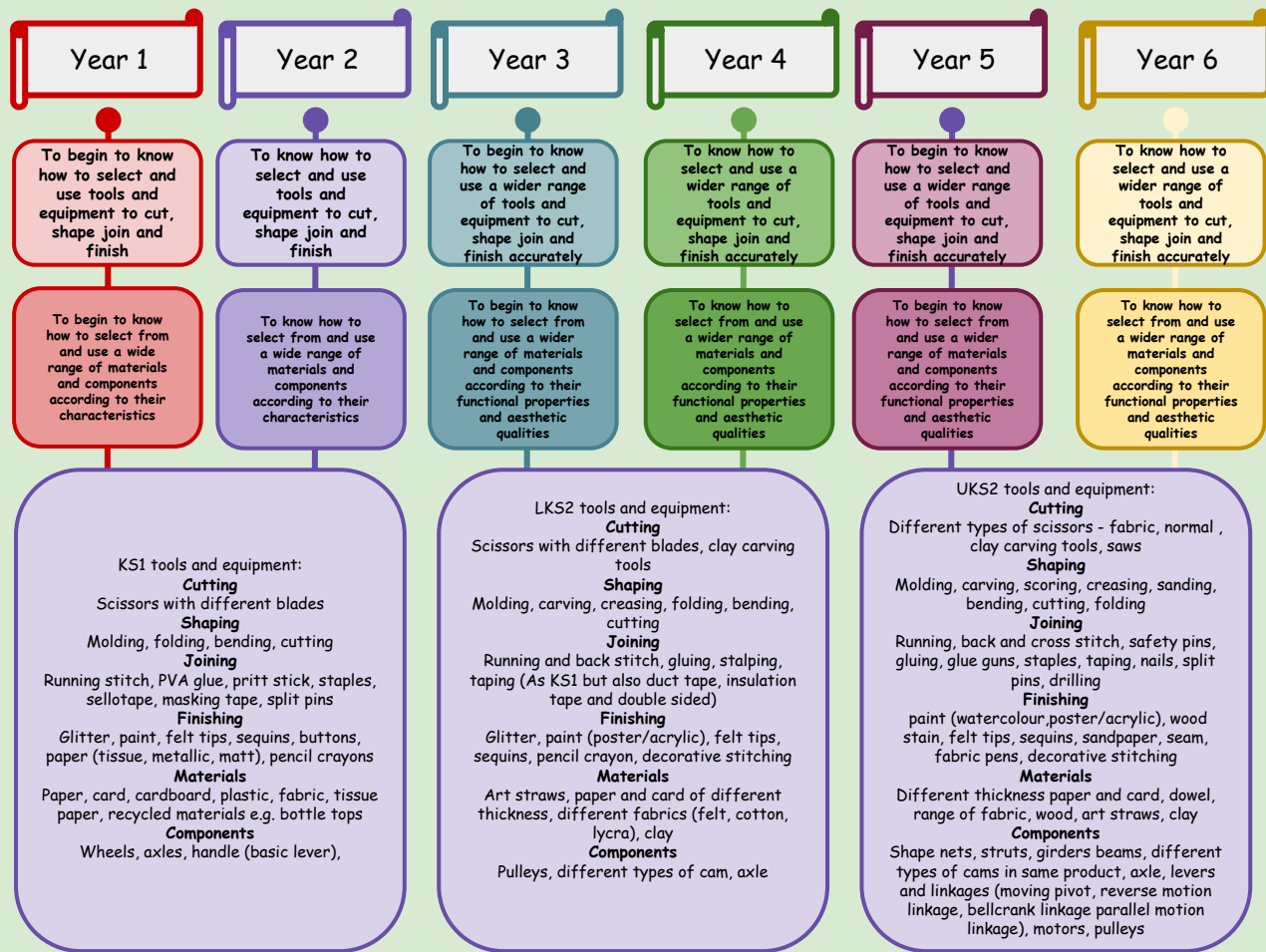
Design Stage 1



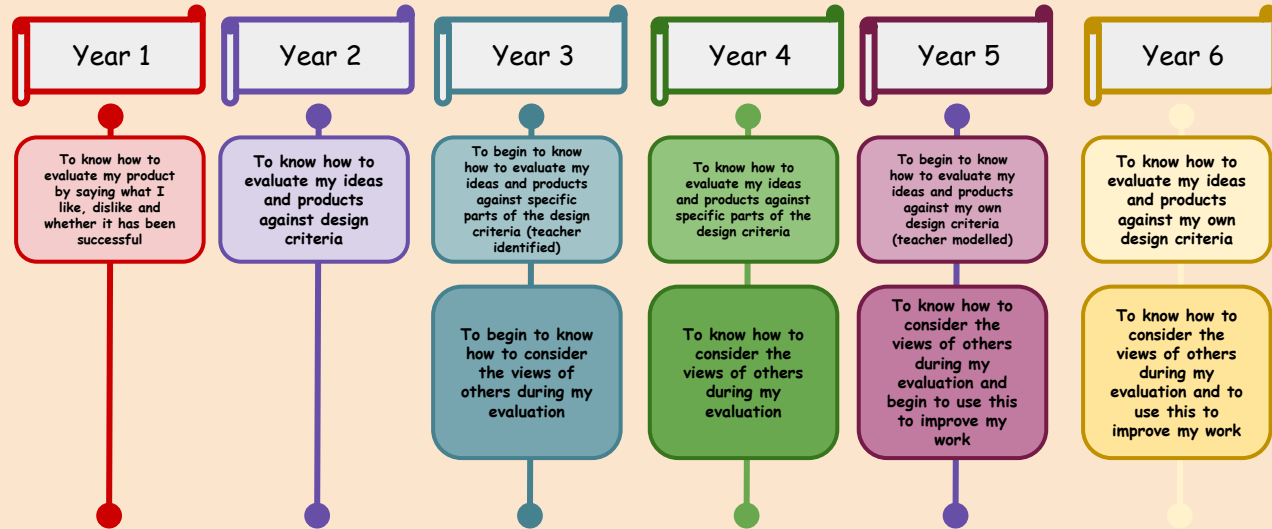
Design Stage 2



Make



Evaluate



Technical knowledge

Year 1

To begin to know how to build structures, exploring how they can be made stronger, stiffer and more stable choosing from different tools and 3 materials

To know how to explore and use wheels and axles and slider mechanisms in my products

Year 2

To know how to build structures, exploring how they can be made stronger, stiffer and more stable, choosing from a wider range of different tools and materials

To know how to explore and use wheels and axles and slider and lever mechanisms in my products

Year 3

To know how to strengthen, stiffen and reinforce more complex structures by joining identifying weak areas and choosing from a wider range of different tools and materials

To know how to understand and use four different cams, levers and sliders and pulley mechanical systems in my product

To know how to understand and use series circuits incorporating switches and buzzers in my product

To know how to apply my understanding of computing to program, monitor and control my product using microbits and begin to explore the use of coding.

Year 4

To know how to strengthen, stiffen and reinforce more complex structures by identifying and joining weak areas and choosing from a wider range of different tools and materials

To know how to understand and use four different cams, levers and sliders and pulley mechanical systems in my product

To know how to understand and use series circuits incorporating switches and buzzers in my product

To know how to apply my understanding of computing to program, monitor and control my product using microbits and explore the use of coding.

Year 5

To know how to apply my understanding of how to strengthen, stiffen and reinforce more complex structures by using nets, struts, girders and beams

To know how to understand and use four different cams with holes in different positions, motors, pulleys and axles and different types of linkages and lever mechanical systems in my product

To know how to understand and use series circuits incorporating switches, bulbs and buzzers in my product considering the brightness and volume of these

To know how to apply my understanding of computing to program, monitor and control my product using microbits with sensors & coding with looping and sequencing.

Year 6

To know how to apply my understanding of how to strengthen, stiffen and reinforce more complex structures by using nets, struts, girders and beams

To know how to understand and use four different cams with holes in different positions, motors, pulleys and axles and different types of linkages and lever mechanical systems in my product

To know how to understand and use series circuits incorporating switches, bulbs and buzzers in my product considering the brightness and volume of these

To know how to apply my understanding of computing to program, monitor and control my product using microbits with sensors & coding with selection and variables.

KS1 tools and equipment:

Cutting

Scissors with different blades

Shaping

Molding, folding, bending, cutting

Joining

Running stitch, PVA glue, pritt stick, staples, sellotape, masking tape, split pins

Finishing

Glitter, paint, felt tips, sequins, buttons, paper (tissue, metallic, matt), pencil crayons

Materials

Paper, card, cardboard, plastic, fabric, tissue paper, recycled materials e.g. bottle tops

Components

Wheels, axles, handle (basic lever),

LKS2 tools and equipment:

Cutting

Scissors with different blades, clay carving tools

Shaping

Molding, carving, creasing, folding, bending, cutting

Joining

Running and back stitch, gluing, stapling, taping (As KS1 but also duct tape, insulation tape and double sided)

Finishing

Glitter, paint (poster/acrylic), felt tips, sequins, pencil crayon, decorative stitching

Materials

Art straws, paper and card of different thickness, different fabrics (felt, cotton, lycra), clay

Components

Pulleys, 4 different types of cam (pair, circular, heart and drop), axle

UKS2 tools and equipment:

Cutting

Different types of scissors - fabric, normal, clay carving tools, saws

Shaping

Molding, carving, scoring, creasing, sanding, bending, cutting, folding

Joining

Running, back and cross stitch, safety pins, gluing, glue guns, staples, taping, nails, split pins, drilling

Finishing

paint (watercolour, poster/acrylic), wood stain, felt tips, sequins, sandpaper, seam, fabric pens, decorative stitching

Materials

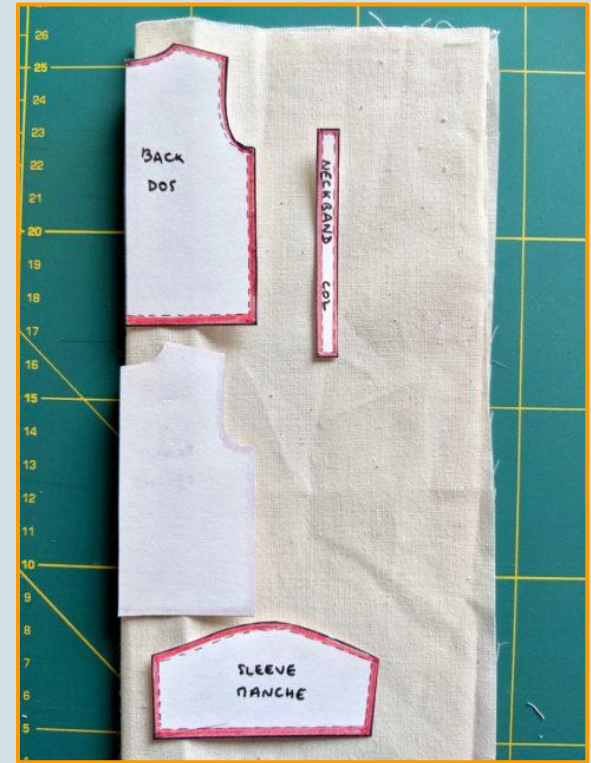
Different thickness paper and card, dowel, range of fabric, wood, art straws, clay

Components

Shape nets, struts, girders beams, 4 different types of cam and hole positioning (pair, circular, heart and drop) in same product, axle, levers and linkages (moving pivot, reverse motion linkage, bellcrank linkage parallel motion linkage), motors, pulleys

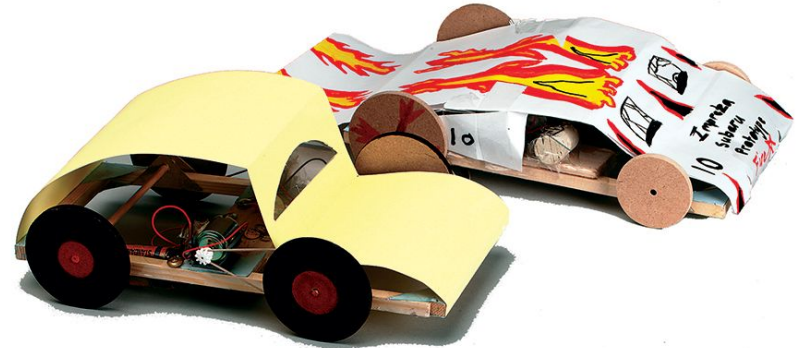
Pattern pieces - the 'pattern' for sewing cut out in paper and then used to pin on the fabric.

They are the pieces/templates that you lay on your fabric to cut around and sew together to create a garment. It is an important step that must be done carefully and accurately for great-looking results.

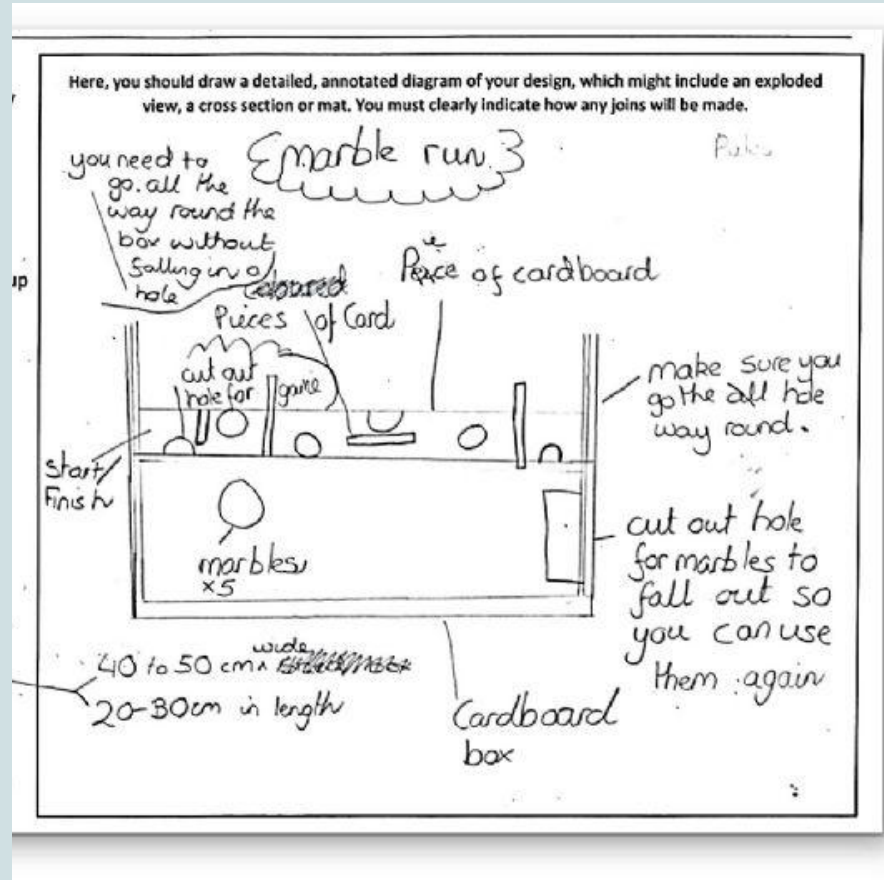


Prototype - fully create working product, then test and develop from there - testing, development and evaluation. It continues to change until it's the final product.

A **prototype** is a test, or original, model of a product from which improvements, upgrades or fundamental changes can be made.

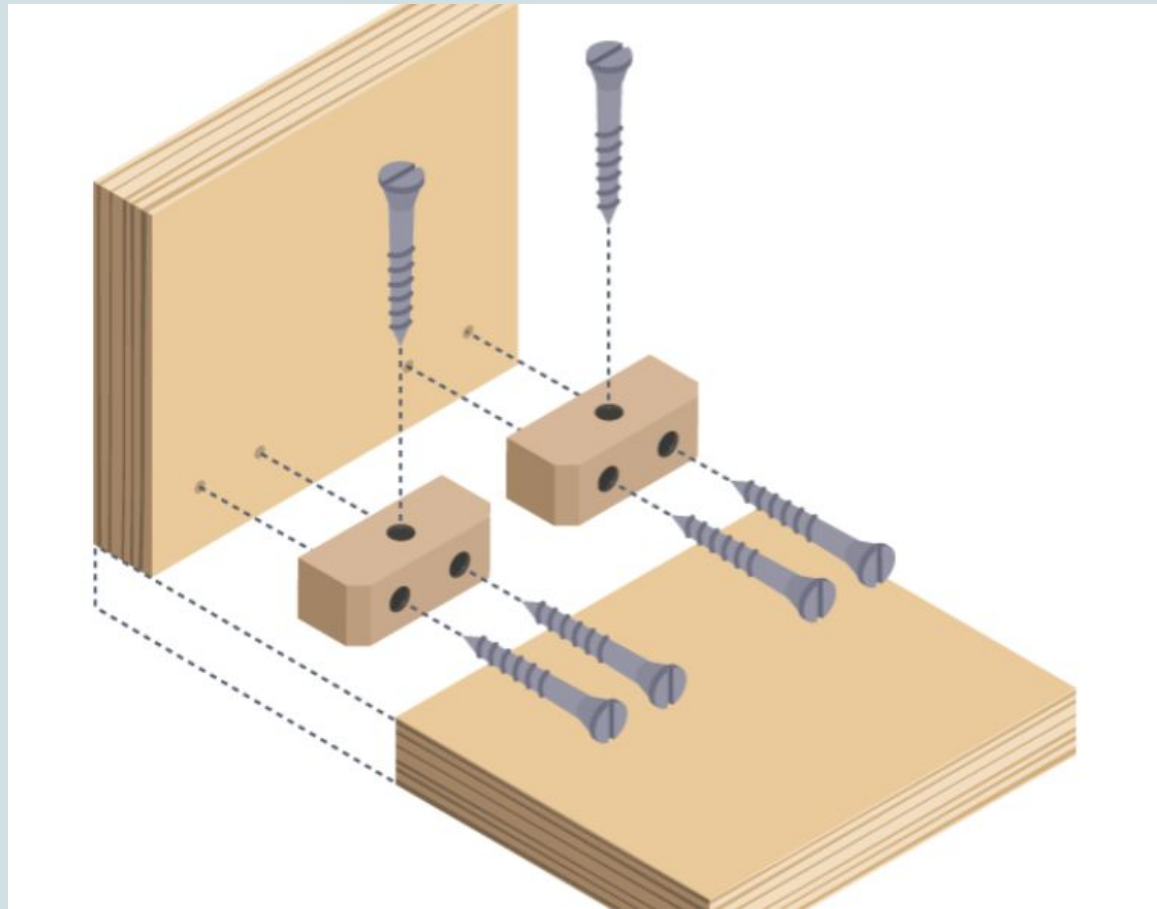


Cross section - The cross section of a 3D shape is the flat surface you make by slicing through it. For example, the cross section of a cylinder is a circle. It allows you to show what is happening inside.



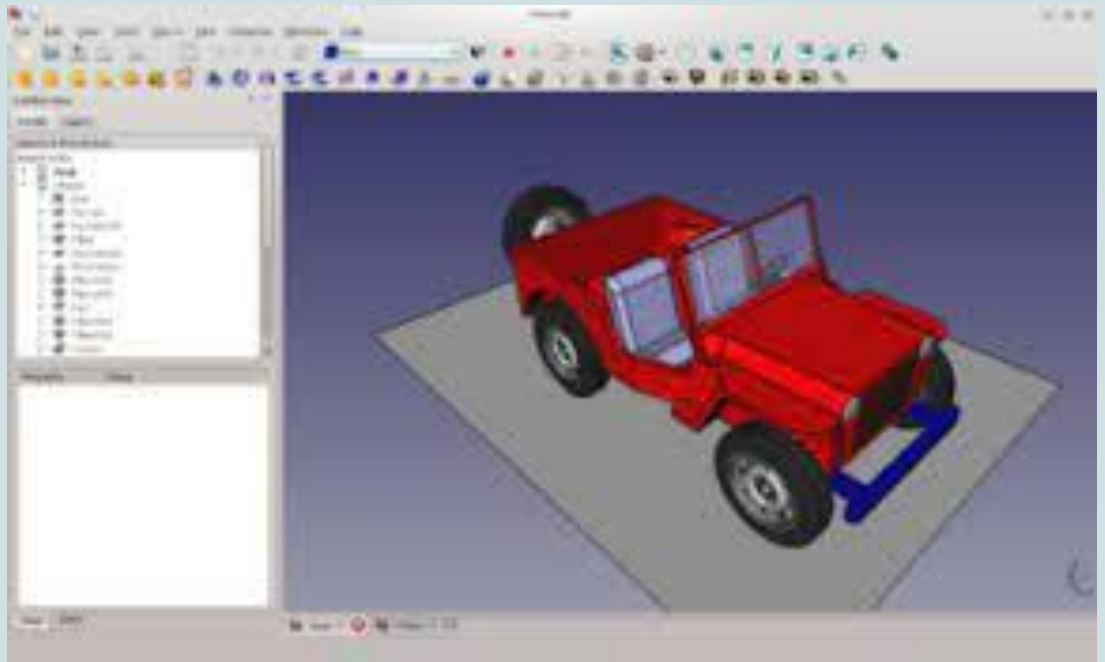
Exploded diagrams - show how a product can be assembled and how the separate parts fit together, with dotted lines showing where the parts slide into place. The diagrams also show components that would usually be hidden in a solid drawing.

Exploded diagrams can take the place of detailed written instructions, meaning they can explain the construction of something without the barrier of different languages. They are widely used as instructions for self-assembly furniture to show how the parts should be assembled and in what order.



Computer-aided design -

Computer-aided design (CAD) is a way to digitally create 2D drawings and 3D models of real-world products before they're ever manufactured.



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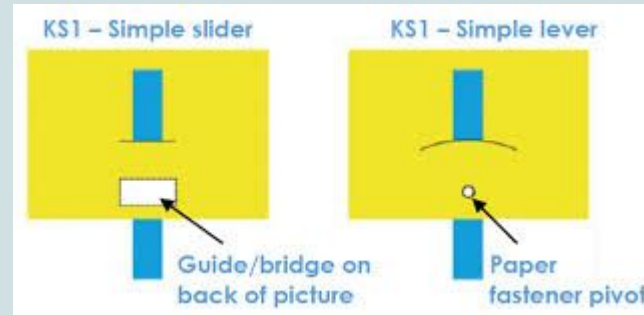
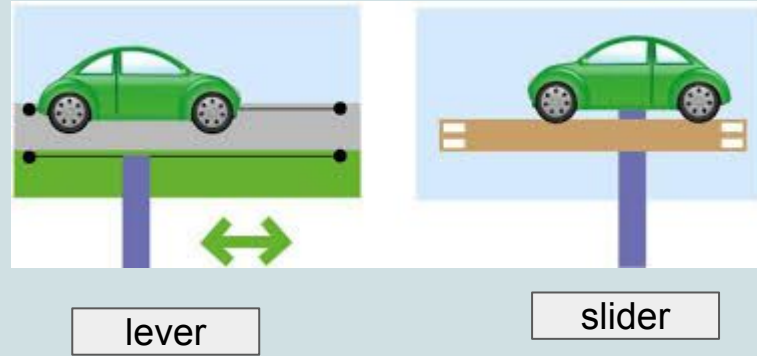
Levers and sliders

KS1

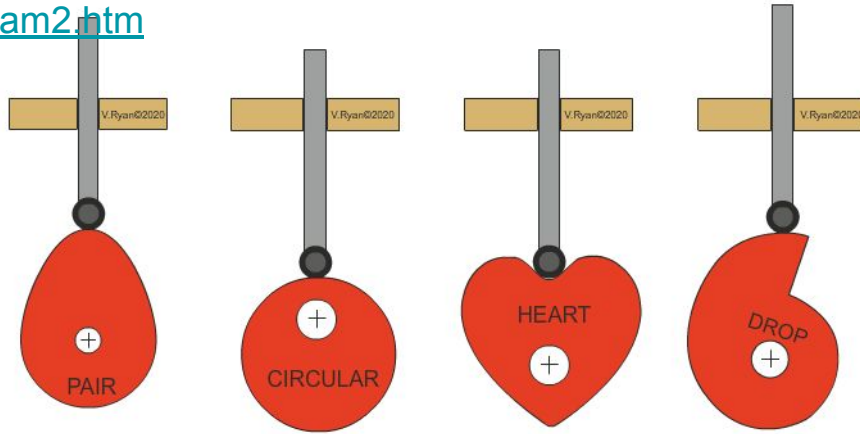
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Ks2

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