Design Technology Overview

Blackrod Primary School

Content

- Our ‘Built for Blackrod’ Curriculum
- DT intent
- Curriculum Processes
- Subject long term plan
- Design Technology Progression
- Subject Overview and NC Coverage
- Example Knowledge Builders
- Assessment and endpoints
- Cultural Capital offer
- EYFS curriculum

Our Curriculum

Built for…

Values

B L A C K R O D

Bravery Learning Aspiration Citizenship Kindness Respect Optimism Determination

Curriculum Intent

At Blackrod Primary School we provide an ambitious, broad and balanced curriculum that is designed to meet the needs of all children. Our curriculum provides our children with meaningful experiences and opportunities with the knowledge and skills they need for life beyond Blackrod Primary School.

Our curriculum is organised and sequenced in a way that ensures the end points the children are working towards are clear. Our children acquire the knowledge and skills they need to accomplish the end points by building on what they have already learned.

Through our *'Built for Blackrod'* curriculum we are driven to create a positive school culture where diversity and equality is at the core. Social, Moral, Spiritual and Cultural development opportunities are woven throughout the curriculum and assemblies which incorporate the Rights of a Child, Fundamental British Values, Safety and the Equality Act 2010.

Our ambition is to develop the 'whole child', nurturing children's talents and celebrating their achievements and successes. Our values alongside our vision of 'A joy in learning and life' underpin all that we do at Blackrod Primary School.

Design Technology Intent

At Blackrod Primary School, we use Kapow as a scheme of work to enhancement our curriculum and to inspire children to be **innovative** and **creative** thinkers who have an appreciation for the product **design** cycle through **ideation, creation, and evaluation**. We want children to develop the **confidence to take risks**, through drafting design concepts, modelling, and testing and to be reflective learners who evaluate their work and the work of others.

Through Design and Technology, we aim to build an awareness of the impact of design and technology on our lives and encourage pupils to become **resourceful**, enterprising citizens who will have the skills to contribute to future design advancements.

Our Curriculum enables children to meet the end of key stage attainment targets in the National curriculum and the aims align with those in the National curriculum. EYFS (Reception) projects provide opportunities for children to work towards the Development matters statements and the Early Learning Goals.

Design and Technology is planned and sequenced so that the end points that it is building towards are clear and that pupils develop the **knowledge and skills**, building on what has been taught before, to be able to reach those end points.

It is our aim to create strong cross-curricular links with other subjects, such as Mathematics, Science, Computing, and Art. We want Design and Technology to prepare our children, to give them the opportunities, responsibilities, and experiences they need to be successful in later life.

Curriculum Design Processes

INTENT

Vision Statement → Drivers & Values → Curriculum Principles

Vision and Values

National Curriculum Coverage Map → Framework / Progression map → EYFS & KS1 NC Concept links → Subject Journeys → *Personal Develop-ment Overview* → *Curriculum Overview*

Breath

IMPLEMENTATION

Share planning sessions → *Project Plans* → *Planning Q & A and Review Meeting* → *Revisions, Resources, Provision and Enhancements* → *Delivery*

Teaching and Learning

IMPACT

Planning Q & A and Review Meeting → *Project Reflections*

Breath

Assessment

Teacher assessment and data → *Monitoring Overview*

Teaching and Learning

Case Study → Evaluation

Vision and Values

DT Subject Journey

Long Term Plan Overview

EYFS	Cooking and nutrition: Soup	Mechanisms: Sliding Santa Chimneys	Structures: Junk Modelling	Textiles: Bookmarks	Cooking and nutrition: Design and make a rainbow salad	Structures: Boats
KS1 (A)	Textiles: Pouches	Mechanism: Wheels and axles	Structures: Constructing a windmill	Cooking and nutrition: Smoothies	Mechanism : Making a moving monster	
KS1 (B)	Textiles: Puppets	Mechanisms: Making a moving story book	Structures: Baby bear's chair	Cooking and nutrition: Balanced diet	Mechanism : Fairground Wheels	
LKS2(A)	Mechanisms : Pneumatic toys	Textiles: Fastenings	Electrical systems: Torches	Structures: Constructing a castle.	Cooking and nutrition: Eating seasonally	
LKS2(B)	Mechanisms : Making a sling shot car	Textiles: Cross-Stitch and applique(Cushi ons	Digital world: Mindful moments timer	Structures: Pavillions	Cooking and nutrition: Adapting a recipe	
UKS2	Digital world: Monitoring Devices	Structures: Bridges	Cooking and nutrition: Come Dine with me	Mechanisms: Making a pop-up book	Textiles: Stuffed Coats	
	Electrical systems: Steady hand game	Structures: Playgrounds	Cooking and nutrition: Developing a recipe	Mechanisms: Automata Toys	Textiles: Waistcoats	

Design Technology Progression

Structures: Material functional and aesthetic properties, strength and stability, stiffen and reinforce structures			
	KS1	LKS2	UKS2
SKILLS: DESIGN	- Learning the importance of a clear design criteria - Including individual preferences and requirements in a design • Generating and communicating ideas using sketching and modelling • Learning about different types of structures, found in the natural world and in everyday objects	Designing a castle with key features to appeal to a specific person/purpose • Drawing and labelling a castle design using 2D shapes, labelling: - the 3D shapes that will create the features - materials needed and colours • Designing and/or decorating a castle tower on CAD software • Designing a stable pavilion structure that is aesthetically pleasing and selecting materials to create a desired effect • Building frame structures designed to support weigh	Designing a stable structure that is able to support weight • Creating frame structure with focus on triangulation • Designing a playground featuring a variety of different structures, giving careful consideration to how the structures will be used, considering effective and ineffective designs
SKILLS: MAKE	-Making stable structures from card, tape and glue • Learning how to turn 2D nets into 3D structures • Following instructions to cut and assemble the supporting structure of a windmill • Making functioning turbines and axles which are assembled into a main supporting structure -Making a structure according to design criteria • Creating joints and structures from paper/card and tape • Building a strong and stiff structure by folding paper	Constructing a range of 3D geometric shapes using nets • Creating special features for individual designs • Making facades from a range of recycled materials • Creating a range of different shaped frame structures • Making a variety of free standing frame structures of different shapes and sizes • Selecting appropriate materials to build a strong structure and for the cladding • Reinforcing corners to strengthen a structure • Creating a design in accordance with a plan • Learning to create different textural effects with materials	Making a range of different shaped beam bridges • Using triangles to create truss bridges that span a given distance and supports a load • Building a wooden bridge structure • Independently measuring and marking wood accurately • Selecting appropriate tools and equipment for particular tasks • Using the correct techniques to saws safely • Identifying where a structure needs reinforcement and using card corners for support • Explaining why selecting appropriating materials is an important part of the design process • Understanding basic wood functional properties • Building a range of play apparatus structures drawing upon new and prior knowledge of structures • Measuring, marking and cutting wood to create a range of structures • Using a range of materials to reinforce and add decoration to structures
SKILLS: EVALUATE	• Exploring the features of structures • Comparing the stability of different shapes • Testing the strength of own structures • Identifying the weakest part of a structure • Evaluating the strength, stiffness and stability of own structure	Evaluating own work and the work of others based on the aesthetic of the finished product and in comparison to the original design • Suggesting points for modification of the individual designs • Evaluating structures made by the class • Describing what characteristics of a design and construction made it the most effective • Considering effective and ineffective designs	• Adapting and improving own bridge structure by identifying points of weakness and reinforcing them as necessary • Suggesting points for improvements for own bridges and those designed by others • Improving a design plan based on peer evaluation • Testing and adapting a design to improve it as it is developed • Identifying what makes a successful structure
KNOWLEDGE: TECHNICAL	To understand that the shape of materials can be changed to improve the strength and stiffness of structures • To understand that cylinders are a strong type of structure (e.g. the main shape used for windmills and lighthouses) • To understand that axles are used in structures and mechanisms to make parts turn in a circle • To begin to understand that different structures are used for different purposes	To understand that wide and flat based objects are more stable • To understand the importance of strength and stiffness in structures • To understand what a frame structure is • To know that a 'free-standing' structure is one which can stand on its own	To understand some different ways to reinforce structures • To understand how triangles can be used to reinforce bridges • To know that properties are words that describe the form and function of materials • To understand why material selection is important based on their properties • To understand the material (functional and aesthetic) properties of wood • To know that structures can be strengthened by manipulating materials and shapes

Design Technology.pdf

Design Technology NC Coverage

National Curriculum by Kapow Primary's themes and topics

Key Stage 2 - National curriculum Design and technology content	Kapow Primary's Design and technology strands	Kapow Primary topics Lower key stage 2 - Year 3					
		*Eating seasonally	*Castles	*Cross stitch and appliqué	*Pneumatic toys	Electric poster	*Electronic charm
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	Design		✔	✔	✔	✔	✔
Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer- aided design	Design		✔	✔	✔	✔	✔
Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately	Make		✔	✔	✔	✔	✔
Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	Make		✔	✔	✔	✔	✔
Investigate and analyse a range of existing products	Evaluate		✔		✔		
Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	Evaluate		✔	✔	✔	✔	✔

*Units that are included in the condensed curriculum

National-Curriculum-mapping-DT-15-12-22.pdf

Knowledge Builders

BLACKROD PRIMARY SCHOOL – KNOWLEDGE BUILDERS

Subject: **Mechanical systems – Making a pneumatic system**

Enquiry Questions

1. How do pneumatic systems work?
2. Can I design a toy that uses a pneumatic system?
3. Can I create a pneumatic system?
4. Can I finalise and produce a pneumatic toy against my design criteria?

Making a pneumatic system

The children will make a pneumatic system using a box, balloon and tube. The children will design the outside of the box to make it suitable for younger children; considering factors in which they can make it their own.

Compressed air and pneumatic systems

Pneumatics systems work when air causes movement. Compressed air allows something to move. Compressed air is when air is squeezed together into a small space such as through balloons and syringes.

Design criteria for a pneumatic toy

A design criteria includes our chosen idea for our design and includes points that we must follow when designing our toy. Our toy must have a pneumatic system that uses compressed air to make it move.

Pneumatic system	A mechanism that runs on air or compressed gas.
Compressed air	Air squeezed together into a small space
Input	The motion used to start a mechanism.
Output	The parts of an object that move together as part of a machine - mechanism. The motion that happens as a result of starting the input.
Mechanism	The parts of an object that move together as part of a machine.
Linkage	Lengths of a material (e.g. metal or card) that are joined together by pivots so that the links can move as part of a mechanism.
Net	A 2D flat shape that can become a 3D shape once assembled.
Properties	A quality of something such as strength, stretchiness or absorbency.
Research	Studying a subject in detail in order to discover new information about it.
Motion	The movement an object makes when controlled by an input or output (e.g. left, right, up or down).
Pivot	The central point, pin or shaft on which a mechanism turns or swings.
Reinforce	To make something stronger.
Properties	A quality of something such as strength, stretchiness or absorbency.
Function	How something works.
Component	A part of a machine.
Adapt	Changing something so that it is suitable for a different use.
Exploded diagram	A diagram that shows all of the parts of a product, including the internal and external parts.
Thumbnail sketch	Small drawings to get ideas down on paper quickly.

BLACKROD PRIMARY SCHOOL – KNOWLEDGE BUILDER

Design Technology: Monitoring Devices

Enquiry Questions

1. How will our research help the development of our animal monitor?
2. What are the key developments in thermometer history?
3. What must our program do to be successful?
4. How would my product be useful for an animal carer?
5. What event or fact from the last 100 years is significant in the history of plastic?
6. How does plastic affect planet Earth and how can we make more sustainable choices?
7. Why are building bricks useful when inventing a Micro:bit housing?
8. What can you achieve with a 3D CAD that you cannot with physical model?

Key Vocabulary	Definition
Monitor	To observe and record something over time
Device	Equipment created for a certain purpose or job
Ambient	In the surrounding area
Synthetic	Something artificial, made with substances that are not occurring naturally.
Variable	This could be a number or text that can change the program
Programming loop	A piece of code that repeats until instructed to stop
Boolean	A form of data which consists of (true) 1s and (false) as values
Design criteria	A set of instructions or requirements for a project

Technical Knowledge

Monitoring devices are an electronic device that observes and records something over time using data retrieved from one or more sensors such as security alarms that monitors motion or fire alarms that monitors heat.

(Q3) The program we are creating from our design criteria must monitor the ambient temperature and respond with an alert when the temperature rises above or falls below the specified optimal temperature range.

(Q4) The monitoring device that we are creating alerts the animal's owner that the current temperature is not suitable and will require action, such as putting the heating on or placing a cooling mat inside the animal's enclosure.

Evaluate

(Q2) It is important to understand how key events and individuals in design and technology have helped shape the world.

Before thermometers there were thermoscopes that had no scales or electronics as they used oil and water to show the **ambient** temperature in a room. These were developed by the Italian inventor **Galileo Galilei in 1593**.

The first accurate thermometer was invented in **1709 by Daniel Gabriel Farenheit** which used the numerical scale 'Fahrenheit' **(°F).** In **1742 Anders Celsius** developed 'Celsius' **(°C)** which is still used in the UK today.

Today, we have a range of non toxic, smart and digital thermometers such as infrared and probes.

Design

(Q1) Research helps the development of devices as it informs the design criteria to meet the specific needs - in your case the needs of a specific animal. Through your design process you will generate, develop, model and communicate your ideas through discussion, annotated sketches and computer-aided design.

(Q8) Computer-aided design enables you to develop a 3D model that can be saved, edited and shared.

(Q7) Plastic building bricks will be reused as they can be pulled apart and rebuilt without needing glue, therefore we are reusing/repurposing a plastic item.

Evaluate

(Q5) The first plastic was invented in 1907 by Leo Baekeland. It played a significant role in developing new technologies including the television. By the 1960s it was cheaper than wood and appeared in every household.

(Q6) Each year more the 400 million tons of plastics are manufactured and much of this is single use which is damaging the environment. Currently only 9% of all plastic is recycled.
The six R's help us make more sustainable choices:
Reuse, Recycle, Repair, Refuse, Rethink and Reduce

BLACKROD PRIMARY SCHOOL – KNOWLEDGE BUILDER

Subject: Textiles- Pouches

Enquiry Questions

- What skills are used in a simple running stitch?
- What do we use a template for?
- How do I join two pieces of fabric together?
- How can I decorate my pouch?

Resources

Key Vocabulary	Icon	Definition
Accurate		Neat correct shape, size and pattern with no mistakes.
Fabric		A natural or man-made woven or knitted material that is made from plant fibres, animal fur or synthetic materials.
Knot		A join made by tying two pieces of string or rope together.
Pouch		A small bag made to keep objects safe and to be carried easily.
Running-stitch		A simple style of sewing in a straight line with no overlapping.
Sew		To join or fasten by stitches made using a needle and thread.
Template		A stencil which you use to help you draw a shape more easily on to different materials.
Stencil		A shape that you can draw around.
Thimble		A small metal cap to cover and protect your finger when sewing.
Shape		The form of an object.

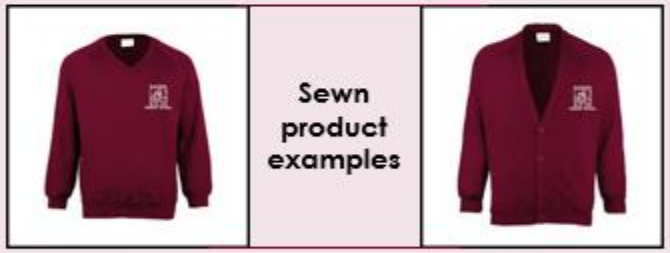
Remember to plan where your stitches will go on the pouch **template**.

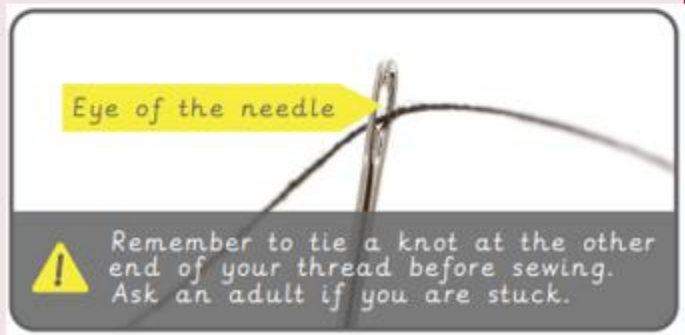
When cutting the **template** out, be careful and as **accurate** as possible.

What is a pouch?

A pocket- type small bag to carry and keep items safe.

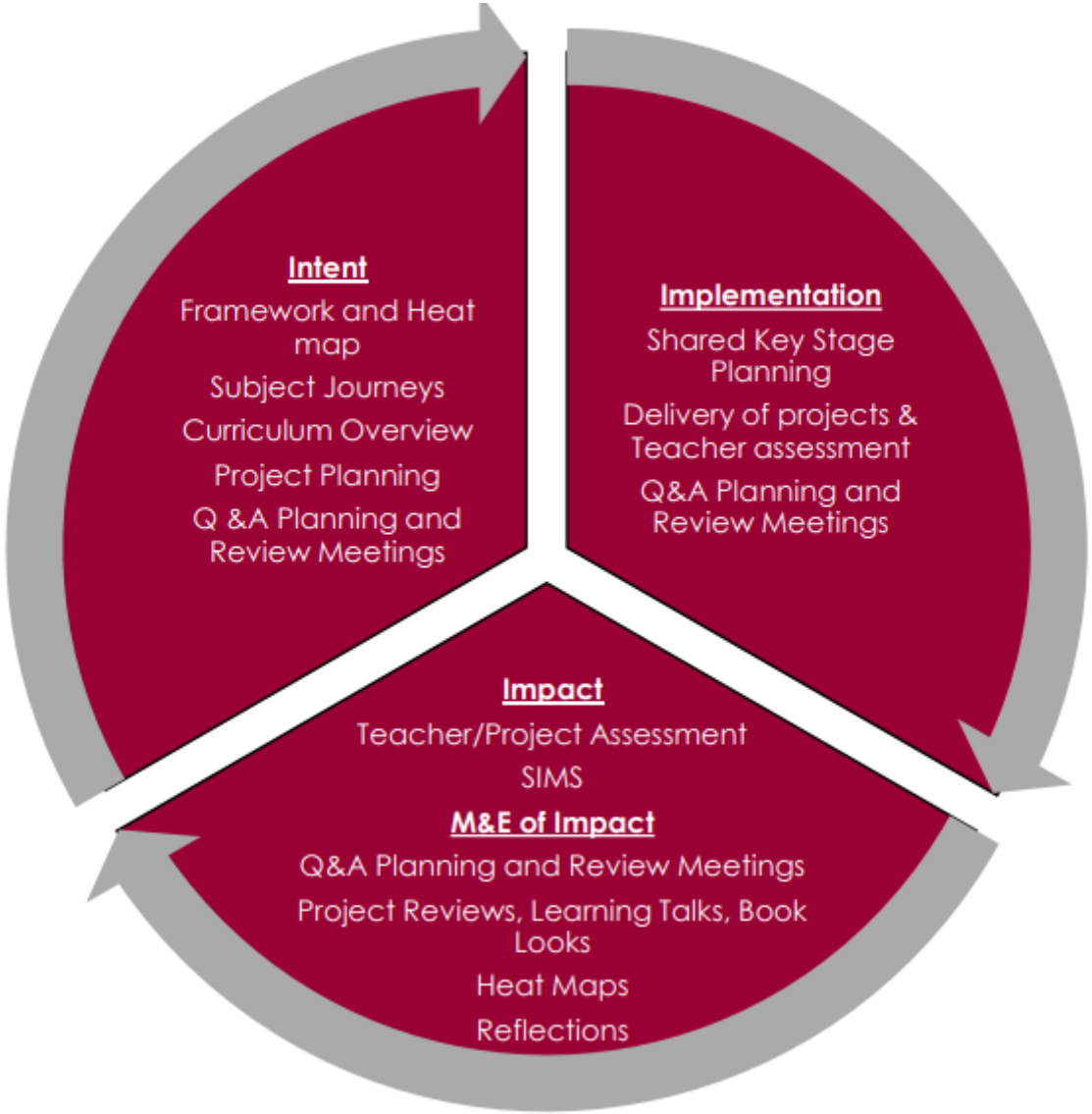
Here are some examples of sewn products:





Design and Technology Assessment

Our concepts exemplify the essential knowledge and skills needed to be successful in an area of learning for example, in Design and Technology, '*Design*' involves an understanding of how to design appropriately for your targeted audience.



Cultural Capital Design Technology

Our understanding of 'knowledge and cultural capital' is derived from the following wording in the national curriculum:

'It is the essential knowledge that pupils need to be educated citizens, introducing them to the best that has been thought and said and helping to engender an appreciation of human creativity and achievement.'

Cultural Capital Design Technology

What is Cultural Capital at Blackrod for Design Technology?

At Blackrod, Cultural Capital is seen in the way we incorporate our drivers of Possibilities, Environment, Community & Citizenship and Well-Being, into all of our areas of learning and by striving to provide the children the opportunities to experience and develop understanding of different cultural genres which may not be readily accessible to them outside of School.

By the very nature of Design and Technology as a subject pupils will develop and explore practical skills with designing and creating for a purpose. These are linked to real life experiences to enable our children to become well rounded members of society in preparation for later life. Encouraging children to become problem solvers and potential innovators of the future.

To support children's understanding, knowledge and skills they are given access to a wide range of resources and opportunities to inspire and challenge children to engage with the design process. Through learning design and technology, pupils will develop perseverance to design, make, test, evaluate and amend their creations. Empowering our children to become independent and resilient learners.

Design and Technology Assessment Quizzes

Multiple-choice

Question 1:

What is a **mechanism**?

A Parts of an object that conduct electricity

B Parts of an object that move together

C Parts of an object that slot together

D Parts of an object that attach to each other

Multiple-choice

Question 4:

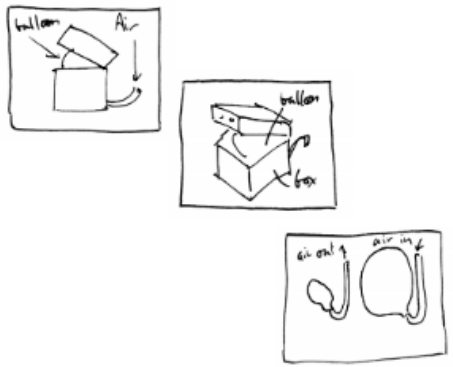
What type of **sketches** are these?

A Rushed

B Thumbnail

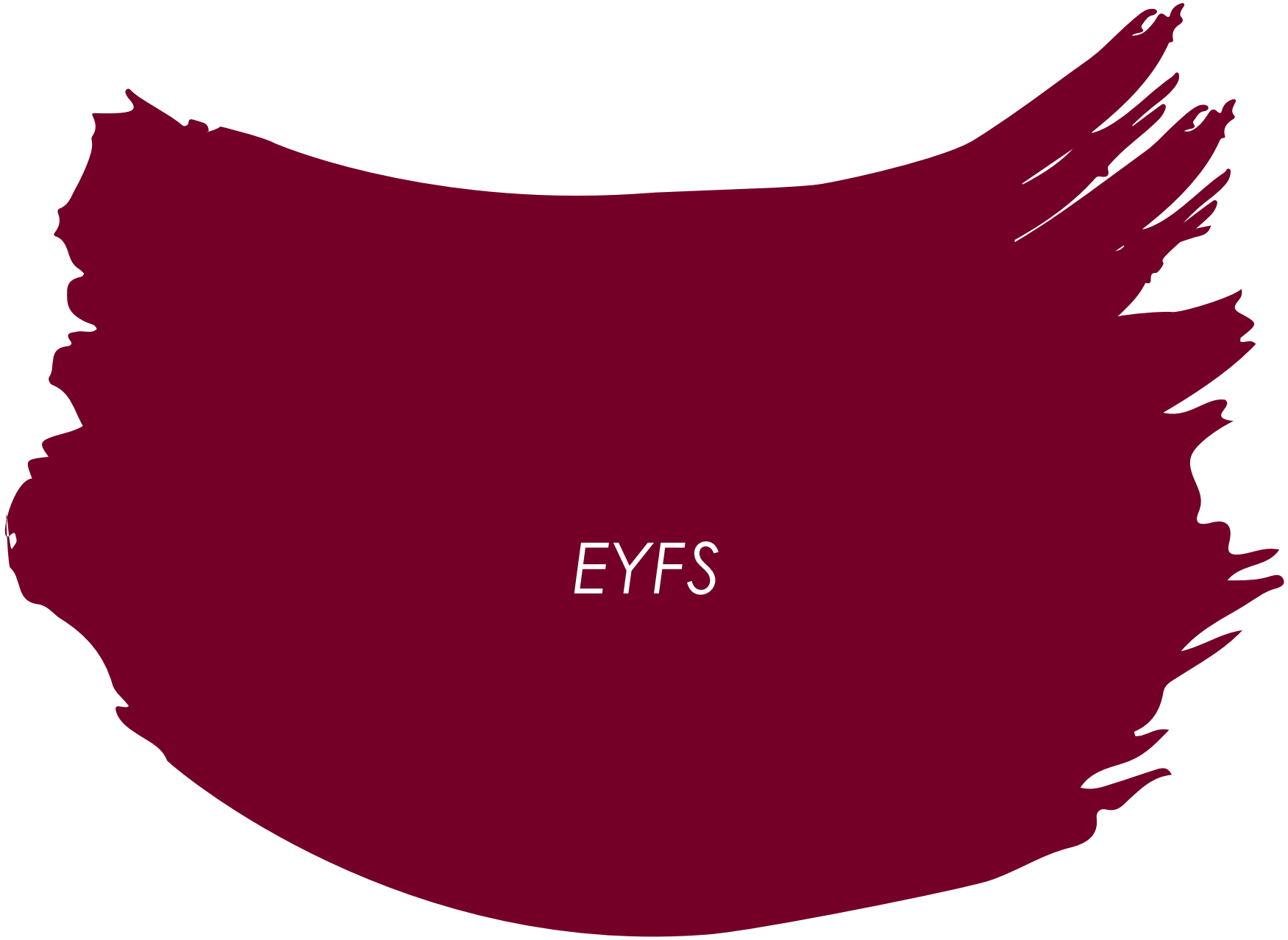
C Small

D Diagrams



Adaptive Teaching and Assessment

Depth of Learning *Progress Descriptors*	Cognitive Challenge	Predominant teaching method	Types of success criteria	Nature of Progress	Support	Typically children will…
Emerging	Low level cognitive demand. Involves following instructions.	Modelling Explaining	Instructional (e.g. steps to success)	Acquiring	High	Name, describe, follow instructions or methods, complete tasks, recall information, ask basic questions, use, match, report, measure and list, illustrate, label, recognise, tell, repeat, arrange, define, memorise.
Embedded	High level of cognitive demand. Involves mental processing beyond recall. Requires some degree of decision making.	Reminding Guiding	Guidance (e.g. remember to include)	Practising	Medium	Apply skills to solve problems, explain methods, classify, infer, categorise, identify patterns, organise, modify, predict, interpret, summarise, make observations, estimate, compare.
Secure	Cognitive demands are complex and abstract. Involves problems with multi-steps or more than one possible answer. Requires justification of answers.	Coaching Mentoring	Learner generated	Deepening understanding	Low	Solve non-routine problems, appraise, explain concepts, hypothesise, investigate, cite evidence, design, create, and prove.

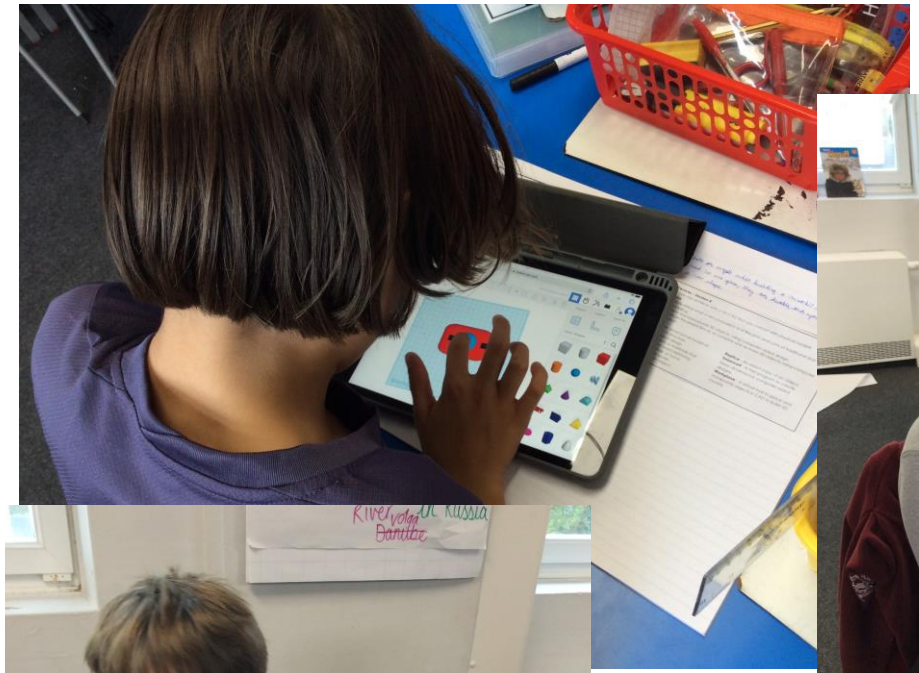

EYFS

PICASSO - LONG TERM PLAN

	KS1 Concept Transitions	Autumn		Spring		Summer	
Expressive Arts and Design	Art	**Marvellous Marks**		**Painting and Mixed Media: Paint my World**		**Sculpture and 3D: Creation Station**	**Craft and Design: Let's Get Crafty**
		Drawing - Self portraits Seasonal craft: nature wreaths	Class Artist – Picasso's Trousers Seasonal craft: Salt dough decorations	Paint everywhere! Seasonal craft: threaded snowflakes	Collage and Collaborate Seasonal craft: egg threading	Exploring with Clay Seasonal craft: petal mandala sun catchers	Tissue Paper Flowers Seasonal craft: salt painting
	Design Technology	Cooking and Nutrition: soup	Seasonal: Sliding Santa chimneys DT Day	Cooking and Nutrition: Make a Rainbow salad	Textiles: Bookmarks	Structures: Junk Modelling	Structures: Boats
	Music	Developing Early Musical Skills across the year: ●Singing simple actions songs ●Circle games ●Songs linked to topic themes ●Listening and moving to music ●Exploring inter-related dimensions of music ●Exploring sounds around us ●Exploring classroom percussion instruments ●Finding the pulse ●Copying simple rhythms Spring: Theatre visit with singing opportunities					
	Computing	Digital Citizenships	Online Safety	Computer Science	Information Technology	Information Technology	Digital Literacy

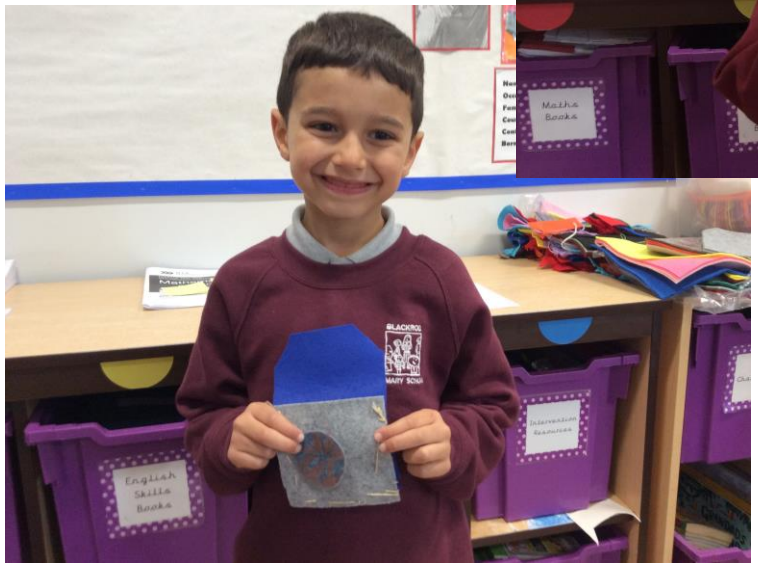
PICASSO - LONG TERM PLAN

	Autumn		Spring		Summer	
Further Opportunities in addition to our EYFS art and music curriculum bridged to KS1 and KS2						
Expressive Arts and Design *Painting, 3D modelling, messy play, collage, cutting, drama, role play, threading, moving to music, clay sculptures, following music patterns with instruments, singing songs linked to topics, making instruments, percussion.* *Children to produce a piece of art work each half term to be displayed for 'Celebration wall' for school / parents to show how drawings have developed - lots of links to Fine Motor Skills. Children to explain their work to others. Children will have opportunities to learn and perform songs, nursery rhymes and poetry linked to their work / interests and passions.*	The development of children's artistic and cultural awareness supports **their imagination and creativity**. It is important that children have regular opportunities to **engage with the arts**, enabling them to explore and play with a wide range of **media and materials**. The quality and variety of what children see, hear and participate in is crucial for developing their understanding, **self-expression, vocabulary and ability to communicate through the arts**. The frequency, repetition and depth of their experiences are fundamental to their progress in interpreting and appreciating what they hear, respond to and observe. Give children an insight into new musical worlds. Invite musicians in to play music to children and talk about it. Encourage children to listen attentively to music. Discuss changes and patterns as a piece of music develops.					
	Join in with songs; beginning to mix colours, join in with role play games and use resources available for props; build models using construction equipment. Sing call-and-response songs, so that children can echo phrases of songs you sing. Self-portraits, junk modelling, take picture of children's creations and record them explaining what they did. Exploring sounds and how they can be changed, tapping out of simple rhythms. Provide opportunities to work together to develop and realise creative ideas. Superhero masks.	Use different textures and materials to make houses Listen to music and make their own dances in response. Castle models Firework pictures, Christmas decorations, Christmas cards, Divas, Christmas songs/poems The use of story maps, props, puppets & story bags will encourage children to retell, invent and adapt stories. Role Play Party's and Celebrations Role Play of The Nativity	Rousseau's Tiger / animal prints / Designing homes for hibernating animals. Collage owls / symmetrical butterflies Children will be encouraged to select the tools and techniques they need to assemble materials that they are using e.g creating animal masks. Making lanterns, Chinese writing, puppet making, Chinese music and composition Shadow Puppets Teach children different techniques for joining materials, such as how to use adhesive tape and different sorts of glue.	Make different textures; make patterns using different colours Children will explore ways to protect the growing of plants by designing scarecrows. Collage-farm animals / Making houses. Pastel drawings, printing, patterns on Easter eggs, Life cycles, Flowers-Sun flowers Mother's Day crafts Easter crafts Home Corner role play Artwork themed around Eric Carle / The Seasons – Art Provide a wide range of props for play which encourage imagination.	Design and make rockets. Design and make objects they may need in space, thinking about form and function. Learn a traditional African song and dance and perform it / Encourage children to create their own music. Junk modelling, houses, bridges boats and transport. Exploration of other countries – dressing up in different costumes. Retelling familiar stories Creating outer of space pictures Provide children with a range of materials for children to construct with.	Sand pictures / Rainbow fish collages Lighthouse designs Paper plate jellyfish Puppet shows: Provide a wide range of props for play which encourage imagination. Salt dough fossils Water pictures, collage, shading by adding black or white, colour mixing for beach huts, making passports. Colour mixing – underwater pictures. Father's Day Crafts



Curriculum Examples

KS1 Examples



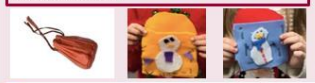
BLACKROD PRIMARY SCHOOL – KNOWLEDGE BUILDER

Subject: Textiles- Pouches

Enquiry Questions
- What skills are used in a simple running stitch?
- What do we use a template for?
- How do I join two pieces of fabric together?
- How can I decorate my pouch?

Resources

What is a pouch?
A pocket- type small bag to carry and keep items safe.



Key Vocabulary	Icon	Definition
Accurate		Neat correct shape, size and pattern with no mistakes.
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Knot		A join made by tying two pieces of string or rope together.
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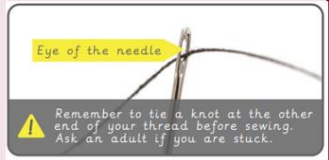
Sew		To join or fasten by stitches made using a needle and thread.
Template		A stencil which you use to help you draw a shape more easily on to different materials.
Stencil		A shape that you can draw around.
Thimble		A small metal cap to cover and protect your finger when sewing.
Shape		The form of an object.

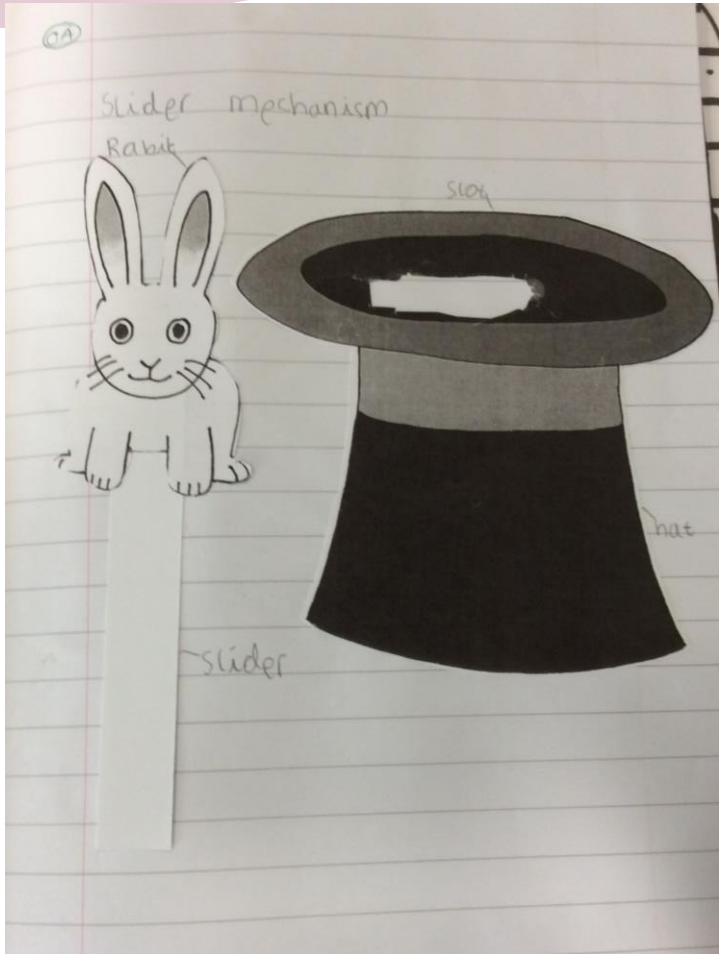
Remember to plan where your stitches will go on the pouch **template**.

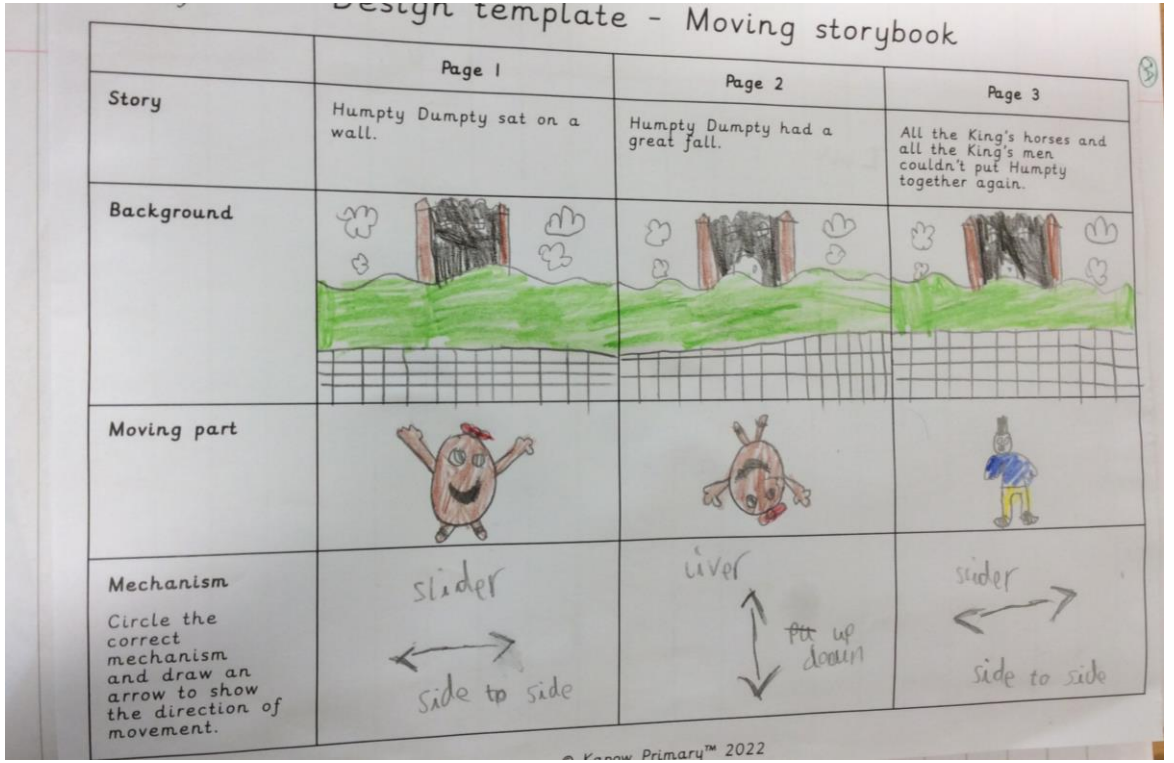
When cutting the **template** out, be careful and as **accurate** as possible.

Here are some examples of sewn products:

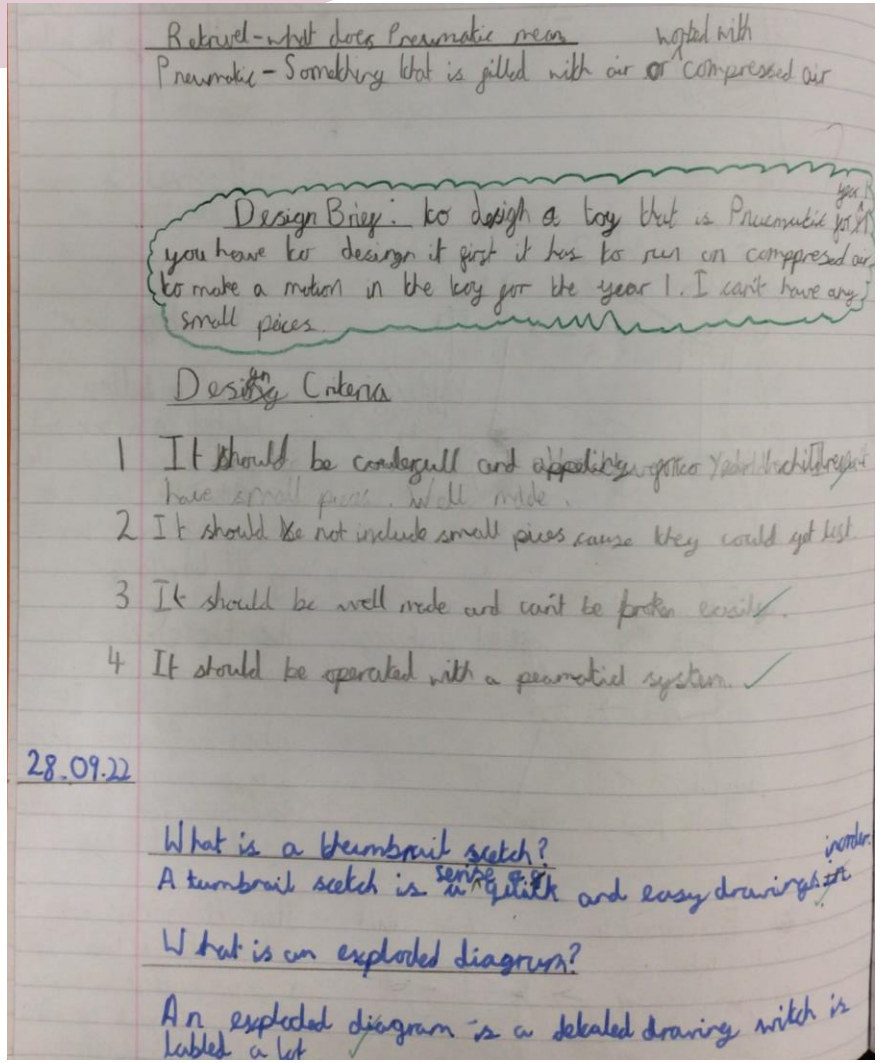


KS1 Examples





LKS2 Examples



Retrived - what does Pneumatic mean
Pneumatic - Something that is filled with air or compressed air

Design Brief: to design a toy that is Pneumatic for a year 1 you have to design it first it has to run on compressed air to make a motion in the toy for the year 1. I can't have any small pices.

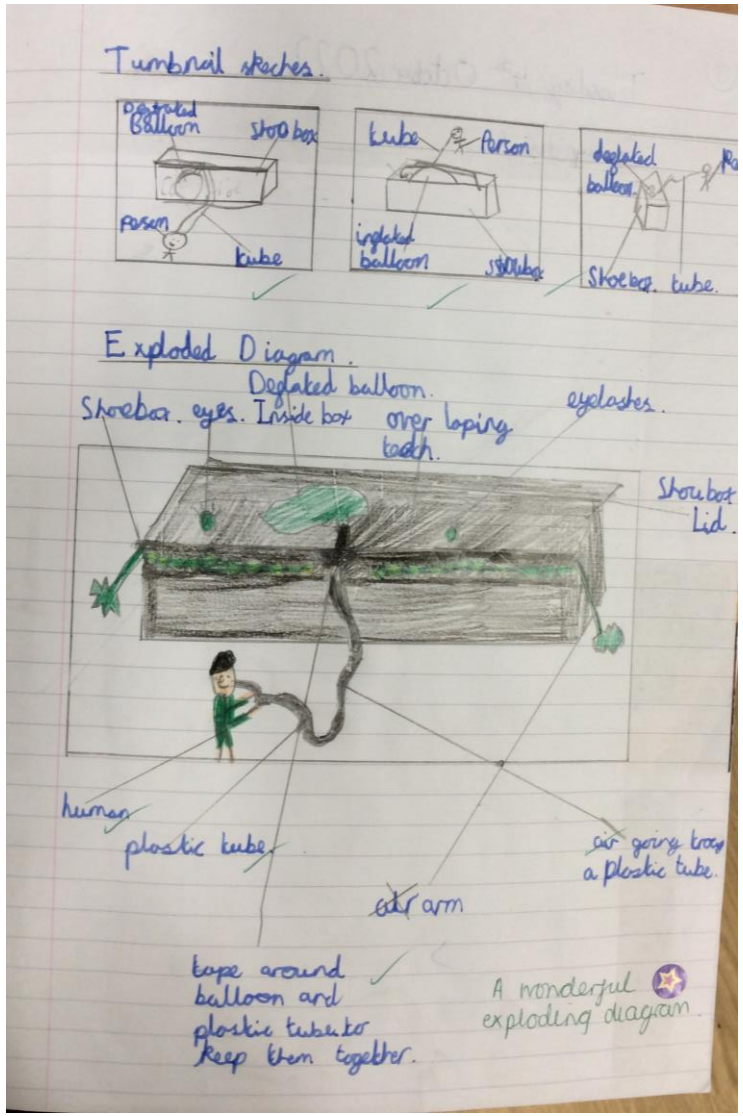
Design Criteria

1 It should be coolergull and appealing for Year 1 children it might have small pices. Well made.
2 It should be not include small pices cause they could get lost.
3 It should be well made and can't be broken easily.
4 It should be operated with a pneumatic system.

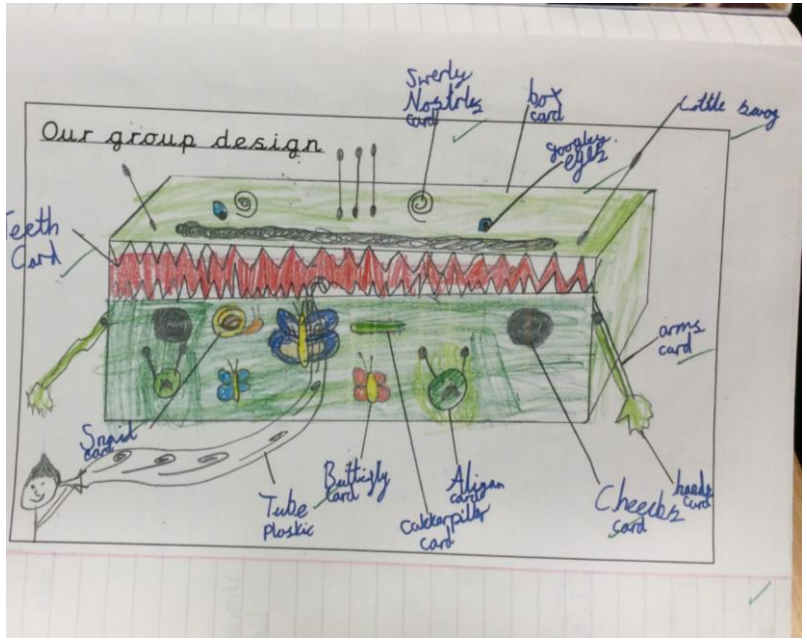
28.09.22

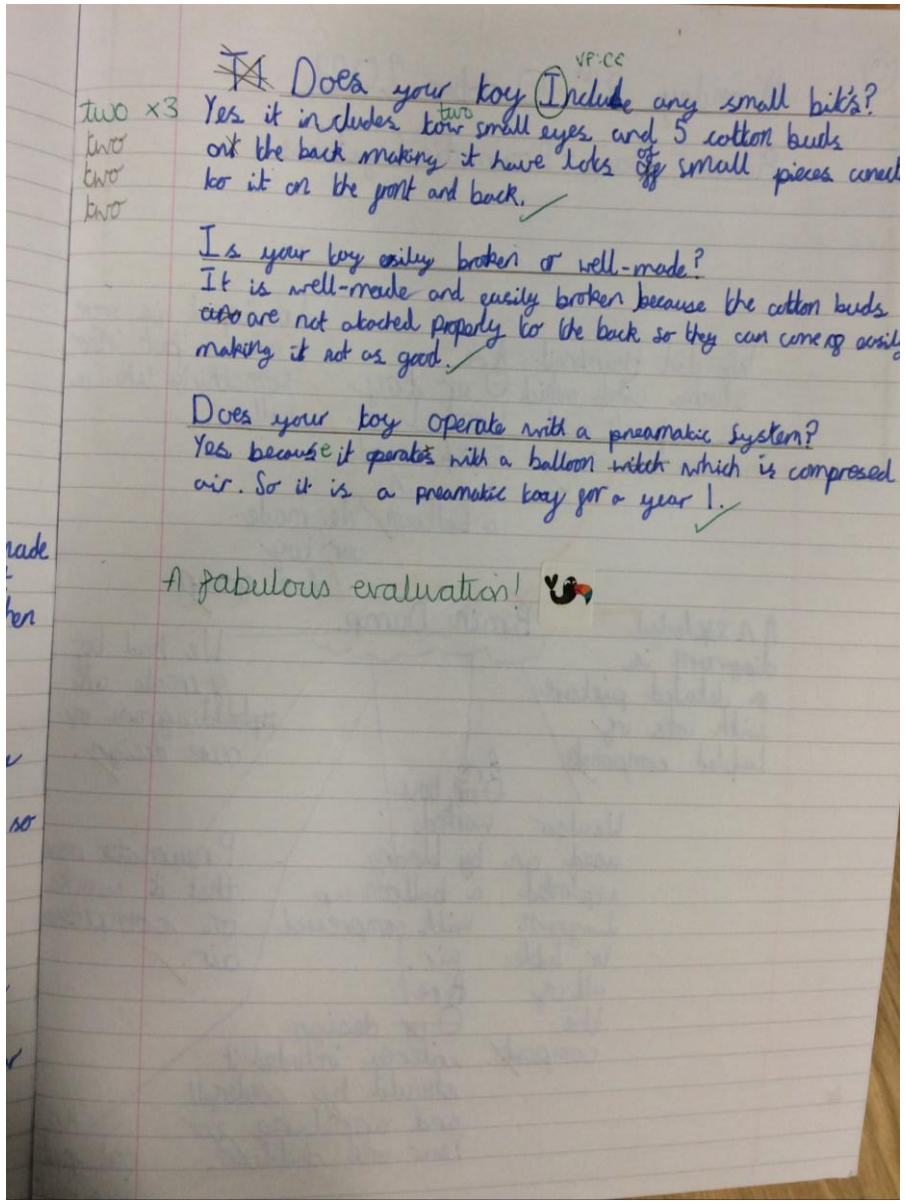
What is a thumbnail sketch?
A tumbnail sketch is a quick and easy drawing.

What is an exploded diagram?
An exploded diagram is a detailed drawing which is labled a lot

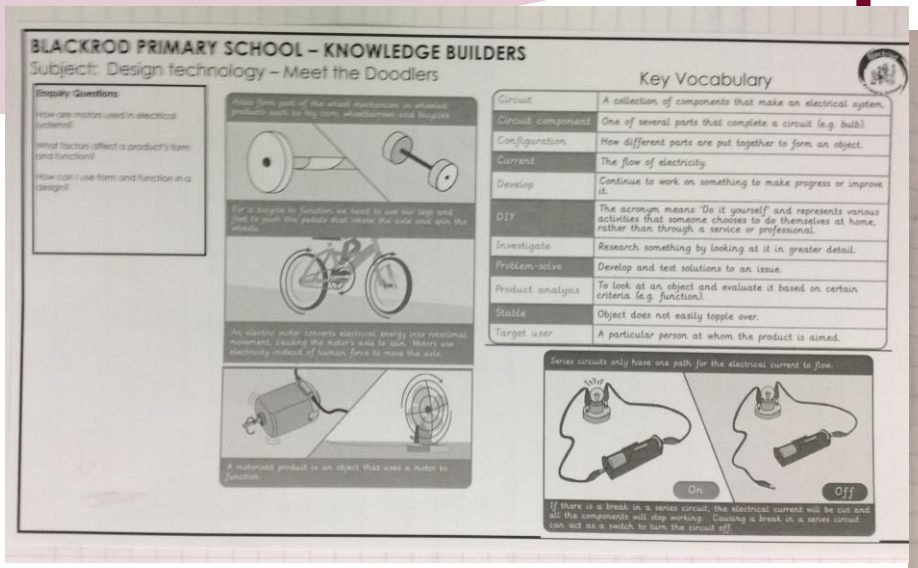


LKS2 Examples





UKS2 Examples



BLACKROD PRIMARY SCHOOL – KNOWLEDGE BUILDERS

Subject: Design technology – Meet the Doodlers

Enquiry Questions

How are motors used in electrical systems?

What factors affect a product's form and function?

How can I use form and function in a design?

Key Vocabulary

Circuit	A collection of components that make an electrical system.
Circuit component	One of several parts that complete a circuit (e.g. bulb).
Configuration	How different parts are put together to form an object.
Current	The flow of electricity.
Develop	Continue to work on something to make progress or improve it.
DIY	The acronym means 'Do it yourself' and represents various activities that someone chooses to do themselves at home, rather than through a service or professional.
Investigate	Research something by looking at it in greater detail.
Problem-solve	Develop and test solutions to an issue.
Product analysis	To look at an object and evaluate it based on certain criteria (e.g. function).
Stable	Object does not easily topple over.
Target user	A particular person at whom the product is aimed.

Also form part of the wheel mechanism in wheeled products such as toy cars, wheelbarrows and bicycles

For a bicycle to function we need to use our legs and feet to push the pedals that rotate the axle and spin the wheels.

An electric motor converts electrical energy into rotational movement, causing the motor's axle to spin. Motors use electricity instead of human force to move the axle.

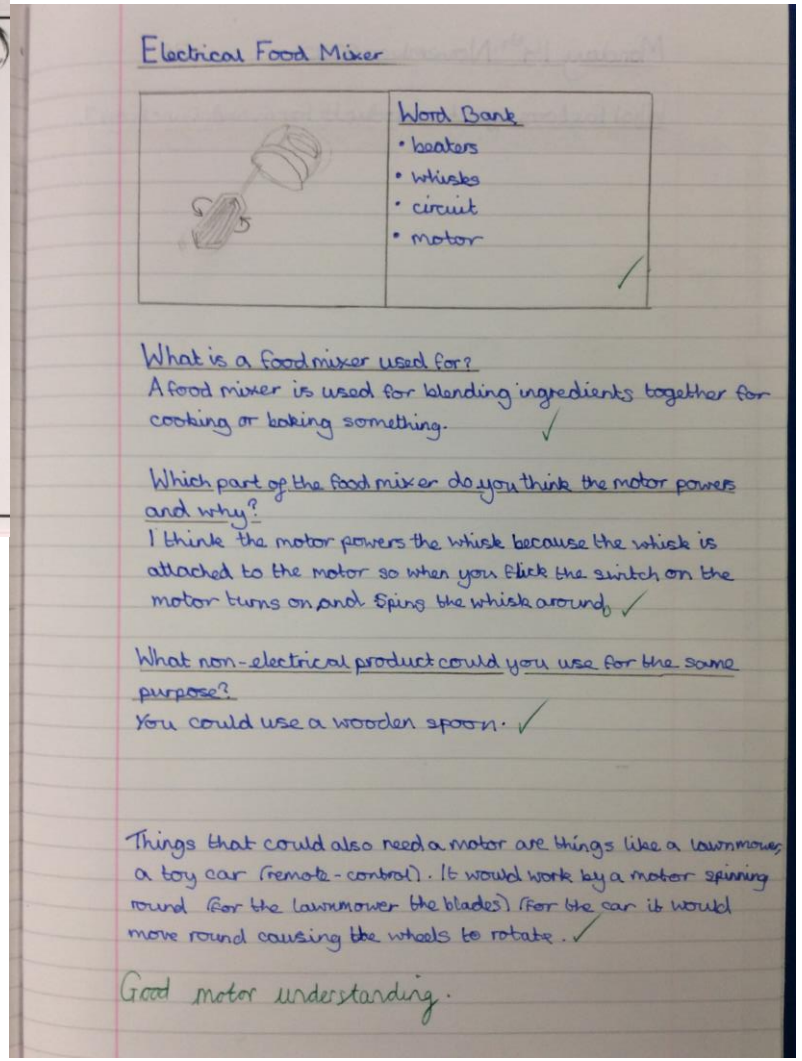
A motorised product is an object that uses a motor to function.

Series circuits only have one path for the electrical current to flow.

On

Off

If there is a break in a series circuit, the electrical current will be cut and all the components will stop working. Causing a break in a series circuit can act as a switch to turn the circuit off.



Electrical Food Mixer

Word Bank
- beaters
- whisks
- circuit
- motor

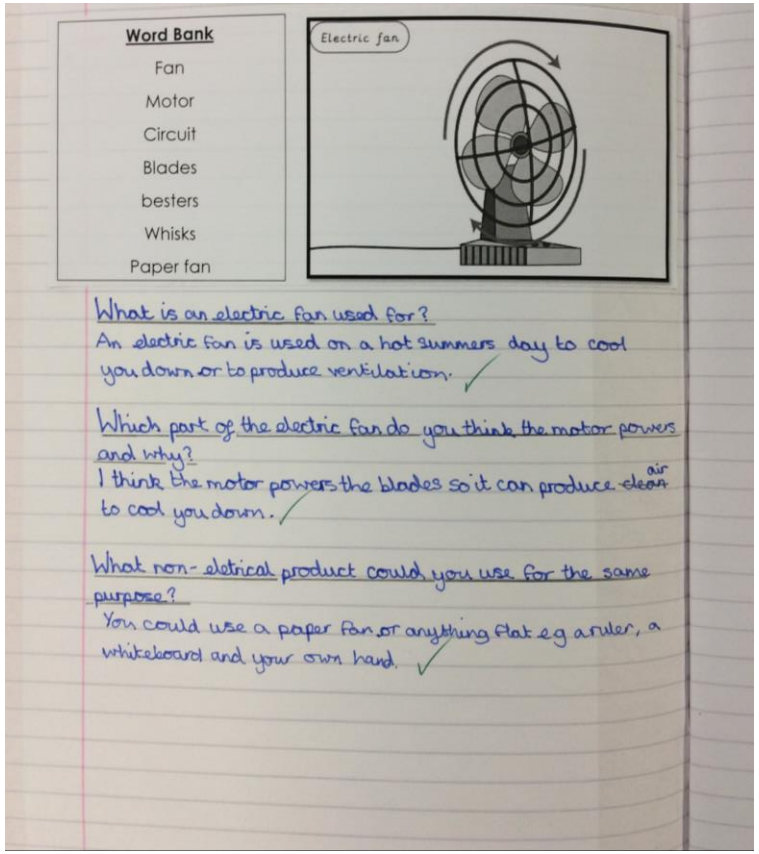
What is a food mixer used for?
A food mixer is used for blending ingredients together for cooking or baking something.

Which part of the food mixer do you think the motor powers and why?
I think the motor powers the whisk because the whisk is attached to the motor so when you flick the switch on the motor turns on and spins the whisk around.

What non-electrical product could you use for the same purpose?
You could use a wooden spoon.

Things that could also need a motor are things like a lawnmower, a toy car (remote-control). It would work by a motor spinning round (for the lawnmower the blades) (for the car it would move round causing the wheels to rotate.

Good motor understanding.



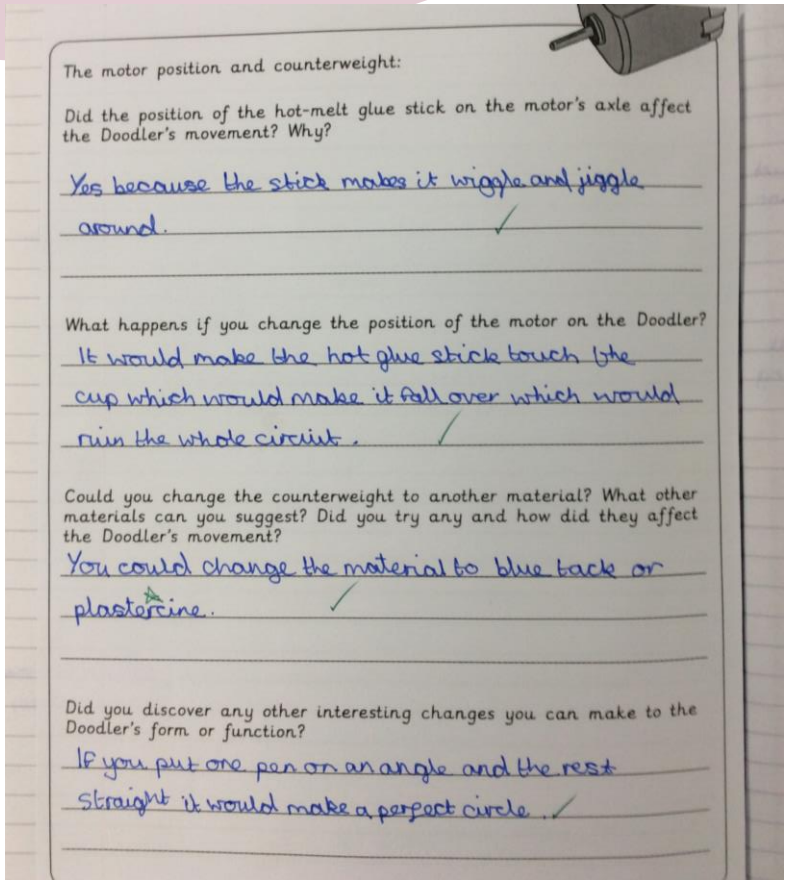
Word Bank
- Fan
- Motor
- Circuit
- Blades
- besters
- Whisks
- Paper fan

What is an electric fan used for?
An electric fan is used on a hot summers day to cool you down or to produce ventilation.

Which part of the electric fan do you think the motor powers and why?
I think the motor powers the blades so it can produce air to cool you down.

What non-eletrical product could you use for the same purpose?
You could use a paper fan or anything flat eg a ruler, a whiteboard and your own hand.

UKS2 Examples



The motor position and counterweight:

Did the position of the hot-melt glue stick on the motor's axle affect the Doodler's movement? Why?

Yes because the stick makes it wiggle and jiggle around.

What happens if you change the position of the motor on the Doodler?

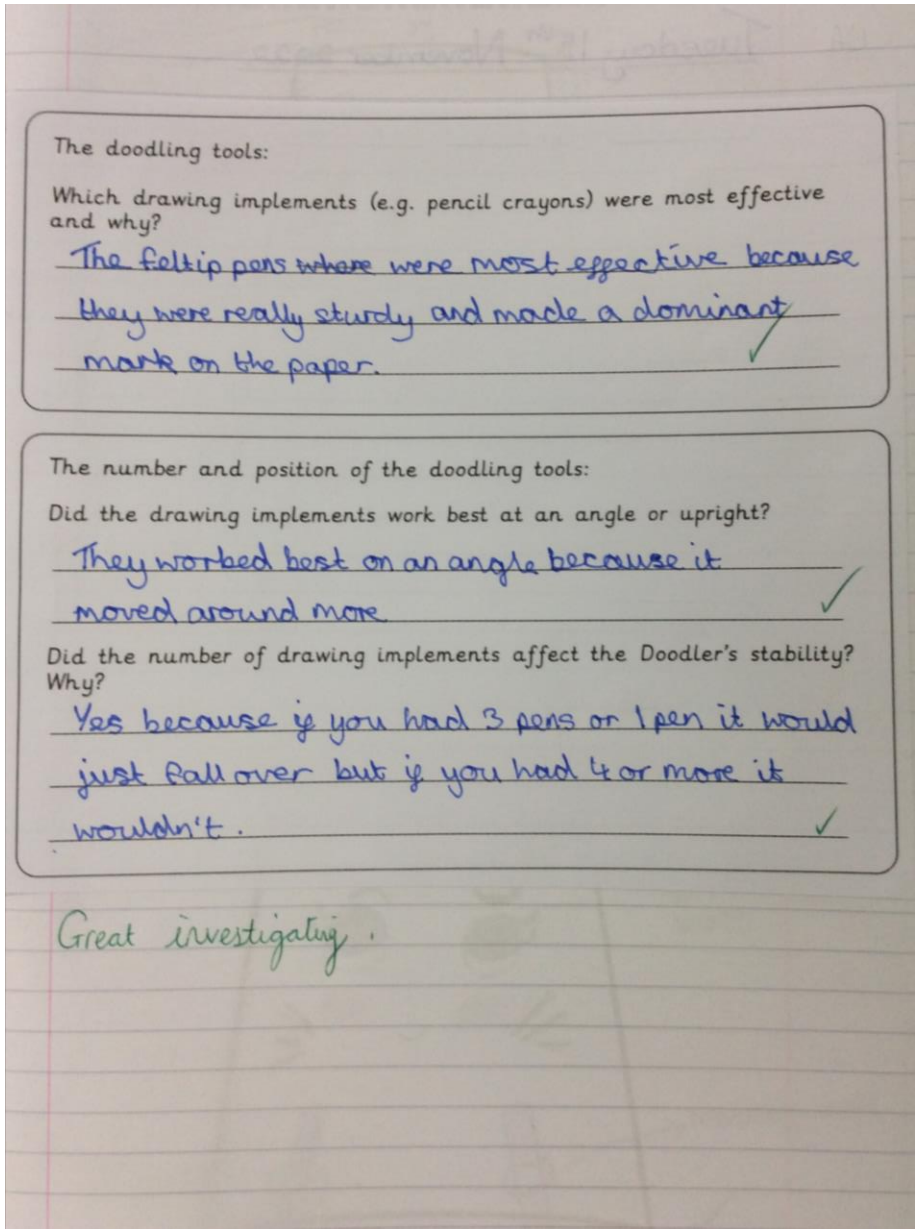
It would make the hot glue stick touch the cup which would make it fall over which would ruin the whole circuit.

Could you change the counterweight to another material? What other materials can you suggest? Did you try any and how did they affect the Doodler's movement?

You could change the material to blue tack or plastercine.

Did you discover any other interesting changes you can make to the Doodler's form or function?

If you put one pen on an angle and the rest straight it would make a perfect circle.



The doodling tools:

Which drawing implements (e.g. pencil crayons) were most effective and why?

The feltip pens where were most effective because they were really sturdy and made a dominant mark on the paper.

The number and position of the doodling tools:

Did the drawing implements work best at an angle or upright?

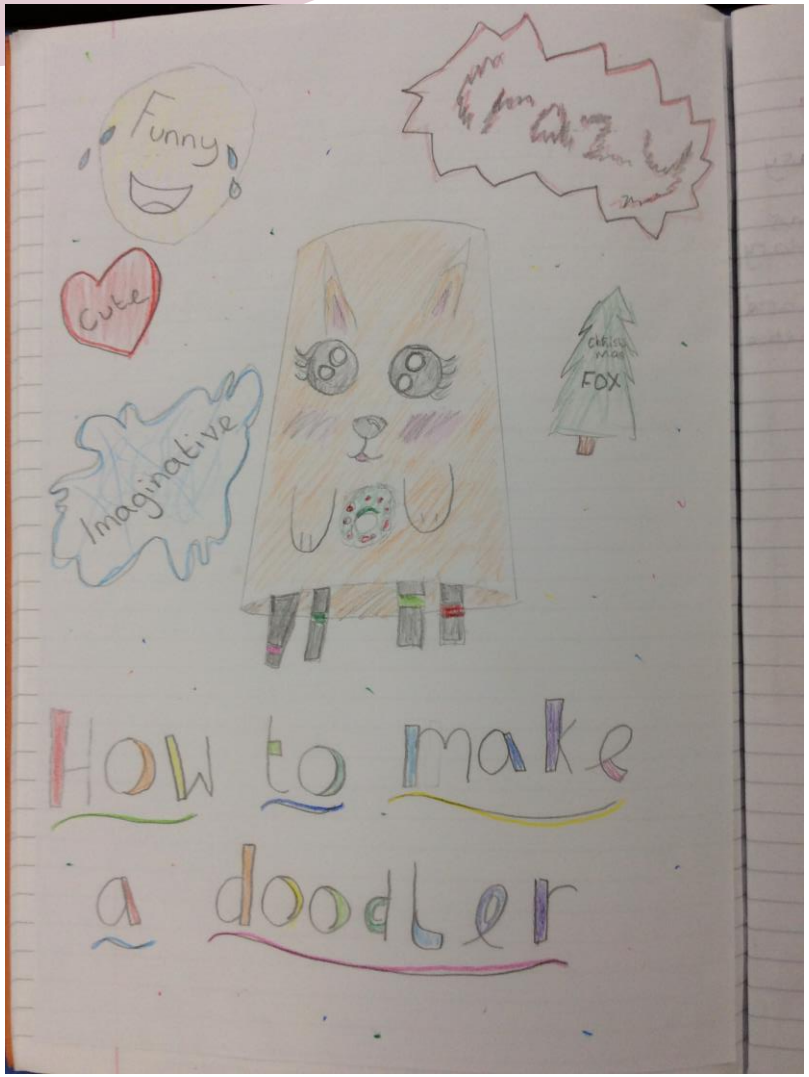
They worked best on an angle because it moved around more

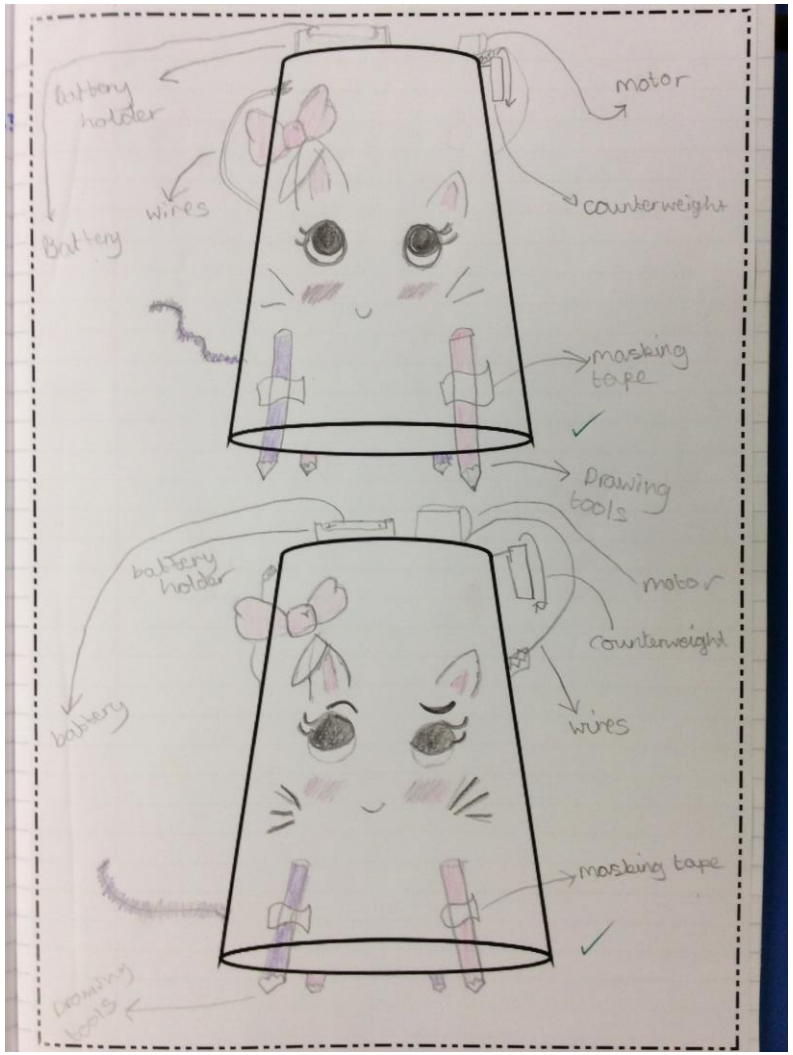
Did the number of drawing implements affect the Doodler's stability? Why?

Yes because if you had 3 pens or 1 pen it would just fall over but if you had 4 or more it wouldn't.

Great investigating.

UKS2 Examples





Review Day Examples

KS1 Example

Label all of the fruit and vegetables that you can see. Are they fruit or vegetables?

Question	How can you tell the difference between a fruit and a vegetable?

We completed a quiz recapping on all of the knowledge and skills we learnt to make a smoothie. We then sorted different fruit and vegetables into groups.

KS2 Examples