

Design & Technology Curriculum – What will the children actually learn?

Key Threshold Concepts (Substantive Knowledge)

When constructing our curriculum, we considered key threshold concepts or “the big ideas” which shape the ways pupils think within each subject. These threshold concepts, also known as “substantive knowledge,” are explored in every year group which help pupils gradually increase their understanding of them. Over time this approach of revisiting concepts helps children to *know more and remember more*. In our Design & Technology lessons children are taught the key threshold concepts (substantive knowledge) below:

- i) Master practical techniques
- ii) Take inspiration from design
- iii) Design, make, evaluate and improve

The key threshold concepts for each class are set out in our three learning Milestones. Milestone 1 (Years 1 & 2), Milestone 2 (Years 3 & 4) and Milestone 3 (Year 5 & 6). These can be seen below alongside the topics that are to be taught in each class.

Topic Specific Milestones

In addition to the key threshold Milestones our curriculum sets out progression in the form of topic specific ‘Milestones’ for every topic taught. Each Milestone contains a range of descriptors which provide details of the skills, within each topic, to be covered and taught in class. KS1 children work to achieve the objectives set out in Milestone 1. Lower KS2 children work to achieve the objectives set out in Milestone 2 and upper Key Stage 2 children work to achieve the objectives set out in Milestone 3.

Vocabulary:

Research has shown that pupils with the most extensive vocabulary have:

- better reasoning, inference and pragmatic skills
- academic success and employment
- better mental health in adulthood.

Each milestone introduces a range of age appropriate Design & Technology vocabulary that the teacher will teach and revisit throughout the two-year period that the children are working on these milestone targets. These are set out below. In addition to this, each topic assessment tracker (see below) contains vocabulary that is specific to the individual topic.

Key Threshold Milestone 1 (Year 1 & 2)

– Assessment Tracker (print one copy of this page for each year group and tick/date the Milestone 1 targets when they are covered in class).

Class name: _____

Year groups: _____

Academic year: _____

Milestone 1

Master practical techniques

Materials

- Cut materials safely using tools provided.
- Measure and mark out to the nearest centimetre.
- Demonstrate a range of cutting and shaping techniques (such as tearing, cutting, folding and curling).
- Demonstrate a range of joining techniques (such as gluing, using hinges or combining materials to strengthen).

Structures

- Practise drilling, screwing, gluing and nailing materials to make and strengthen products.

Mechanisms

- Create products using levers, wheels and winding mechanisms.

Food and nutrition

- Cut, peel and grate ingredients safely and hygienically.
- Measure or weigh using measuring cups or electronic scales.
- Assemble and cook ingredients.

Take inspiration from design

- Explore objects and designs to identify likes and dislikes.
- Suggest improvements to existing designs.
- Explore how products have been created.

Design, make, evaluate and improve

- Design products that have a clear purpose and an intended user.
- Make products, refining the design as work progresses.
- Use software to design.

TOPICS TAUGHT in KS1:

In addition to the specific skills that the children will keep revisiting through the key concepts or substantive knowledge there will be specific learning related to individual topics. At Stapleford Primary School children are taught in mixed age classes e.g. Years 1 & 2 together etc. As a result, we have a two-year topic plan to prevent the children repeating subject matter. More detail is shown below as to what will be taught within each topic.

KS1 (Class 3 – Years 1 & 2) Rolling Programme

Subject	Year A (2022-2023), (2024-2025) (2026-2027) etc.			Year B (2021-2022), (2023-2024), (2025-2026) etc.		
	Autumn Term	Spring Term	Summer Term	Autumn Term	Spring Term	Summer Term
Design and Technology <small>(see Chris Quigley: D & T Curriculum Companion for topic details)</small>	What is Design & Technology? Structures introduction Frame structures	Slider mechanisms Lever mechanisms	Food technology - Portable snacks - Things to remember: i) Sources of food ii) Safety & hygiene	What is Design & Technology? Structures introduction Solid structures	Wheel & axle mechanisms	Food technology - Couscous dish - Things to remember: i) Seasonal food ii) Safety & hygiene

Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

The Assessment Tracker documents below outline what children will learn within each topic

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: What is design and technology?

Pupils:													
Targets:													
Children can/know/explain/understand:													
Describe what design and technology is.													
Draw a flow chart of the Design Process: Think, Make , Break, Repeat.													
Look at pictures of phones from the earliest telephones to the latest smartphones. Describe ways in which they have been improved.													
List a range of inventions, such as a juicer (the image in the 'Design inspiration' picture on the left is a juicer by the renowned product designer Philippe Starck), and describe what it is for and who might use it.													
Describe the design process and create a flow chart to represent it.													
Define the following design words: <ul style="list-style-type: none"> • product • purpose • intended users • inspiration • materials • features • techniques. 													
How is design and technology different from art?													

Topic specific vocabulary:

product	purpose	inspiration	materials	intended user	features	techniques
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Structures (Year A) – Stability 1 & 2

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is a structure?													
• List the four types of structure. (shell structures, frame structures, solid structures and combined structures)													
• Name three examples of each of the four types of structure.													
• Define the word 'natural'.													
• Name ten natural structures.													
• Define the word 'manufactured'.													
• Name ten manufactured structures.													
• List four reasons why people might manufacture structures.													
Make vertical cardboard tubes more stable by adding a base and using flanges.													
• Make a washing line with the poles (two pieces of dowel or pencils) anchored in Plasticine.													
• Follow these instructions to make an anchored frame: 1. Take two long (30 cm) art straws. 2. Fold them both half-way to make an upside-down V-shape. 3. Anchor the feet of the frame in Plasticine. 4. Glue another art straw to the top of each A-frame to connect them.													
• Follow these instructions to make a stable frame with no anchors: 1. Take two long (30 cm) art straws. 2. Fold them both half-way to make an upside-down V shape. 3. Using shorter art straws, glue a brace half-way on each to make them into A shapes. 4. Glue another art straw													

to the top of each A-frame to connect them.													
• Describe, using models and annotated diagrams, what is meant by an object's centre of gravity.													

Topic specific vocabulary:

structure	nature	combined	manufactured	protect	span	connected
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

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tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
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Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Frame structures

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is a frame structure? Identify the two types of frame structure (natural & manufactured) – give 3 examples of each.													
What are the three things a frame structure is normally made up of? (beam, column & slab)													
Draw a labelled diagram of a manufactured frame structure.													
What is finger fluency?													
Using art straws, experiment with making lots of different frames*, starting with flat frames (2-D) then 3-D.													
Draw and annotate diagrams of your frames, explaining the methods you have used to make the structure strong and stable.													
Adapt your work as you go, making improvements. Refine the joins you make. Compare and contrast your first and final frame. Explain why it is important to continually improve your work as you go.													
Label and annotate pictures of the following frame structures, showing their design features: • a climbing frame • a table • a bicycle.													
Describe the safety features for the user of a swing and a climbing frame.													
Practise step 1 of the design process (thinking) by completing your own product outline for a chair for a soft toy.													
For the inspiration section, arrange an annotated mood board to show more details of the soft toy.													
Apply your knowledge of techniques to decide which will be most appropriate for the task of making your soft toy.													
Decide which materials you will need to include.													

Adapt the design diagram on the previous page to make your own design diagram for a chair.													
Organise your diagram so that it is clear and gives enough detail for someone else to understand.													
Arrange your diagram to include annotations where they are helpful.													
Apply your knowledge of frame structures to: 1. draw sketches of how the chair will be constructed 2. make the first prototype of your frame structure 3. decorate the chair so that it looks attractive.													
Test (break) your chair to see if it has any weaknesses. Re-think your design decisions by applying your technical and practical knowledge of structures. Modify your design. Explain your decisions.													
Challenge: Design and make a frame structure of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

beam	column	slab	automatically	fluency	accurate	inspiration	purpose	user	rigid	stable	prototype	modify	test
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

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tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Slider mechanisms

Pupils:													
Targets: Children can/know/explain/understand:													
What is a slider mechanism?													
Make a slider mechanism without a guide bridge.													
Describe what happens to the slider rod without a guide bridge.													
Add the guide bridge and describe what happens when it is added.													
Draw annotated diagrams of what happened before and after the guide bridge was added.													
Make a slider mechanism with a curved slot and another with a wavy slot.													
For each one, describe what happens to the slider rod and the object attached to it.													
Decorate both your sliding mechanisms so that they have a purpose (e.g. helping to tell a story).													
Draw annotated diagrams of your products.													
Make a slider mechanism with an object that stands out from the background. Draw annotated diagrams showing how you attached the object to the Technical slider rod.													
Label and annotate a picture of a 'magic slider' card, showing its design features. • List the materials that the product is made from. • Apply your knowledge of slider mechanisms to make a product based on the giraffe picture.													
Practise step 1 of the design process (thinking) by completing your own product outline for a greetings card. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this													

task. • Decide which materials you will need to include.													
Make your own design diagram for a greetings card. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													
• Apply your knowledge of slider mechanisms to: 1. draw sketches of your card 2. show how the card will be constructed 3. make the first prototype of your card.													
• Test (break) your design techniques and see if they work. • Re-think your design decisions by applying your technical and practical knowledge of slider mechanisms. • Modify your design. • Explain your decisions.													
Challenge: • Design and make a slider mechanism of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

rear	guide bridge	rotating	horizontal	vertical	diagonal	attach	transparent	opaque
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Lever mechanisms

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is a lever?													
Define the words below: - rigid - pivot - fulcrum - force - input - output													
Draw annotated diagrams to show what happens to the input and output of a lever if the fulcrum is moved.													
Apply your knowledge of lever mechanisms to make products.													
Explain how the lever mechanisms are made, using annotated diagrams.													
Experiment with a variety of different lever mechanisms in your products.													
Label and annotate a picture of a lever mechanism, showing its design features. List the materials that the product is made from.													
Apply your knowledge of lever mechanisms to make a product based on the picture above.													
Practise step 1 of the design process (thinking) by completing your own product outline for a litter grabber. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for a litter grabber.													

<ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of lever mechanisms to: 1. draw sketches of your grabber 2. show how the grabber will be constructed 3. make the first prototype of your grabber.													
Test (break) your design ideas to see if they work. <ul style="list-style-type: none"> • Re-think your design decisions by applying your technical and practical knowledge of lever mechanisms. • Modify your design. • Explain your decisions. 													
Challenge: <ul style="list-style-type: none"> • Design and make a lever mechanism of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

rigid	pivot	fulcrum	force	input	output	fluency	accurate	inspiration	purpose	user
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Food technology: Portable snacks

Pupils:													
Targets:													
Children can/know/explain/understand:													
Label and annotate pictures of the following portable snacks showing their design features: a sandwich, a wrap, a sausage roll.													
• Describe the safety features to be taken into account when preparing one of these snacks.													
• List the ingredients that one of the snacks is made from.													
• Describe how you would transport one of these snacks.													
Using a box grater with four different sides, experiment with grating different foods on each side. Remember you do not have to grate all the food. It is best to leave a little bit to hold on to.													
• Draw and annotate diagrams of your grated foods, explaining the methods you have used to produce the best consistency for each type of food.													
• Using a swivel peeler, experiment with peeling different foods. Remember to peel away from yourself.													
• Spread a soft food such as hummus or mashed banana onto bread or a wrap. • Compare and contrast your first and later attempts at spreading.													
• Using the bridge hold, experiment with slicing some soft food such as tomatoes, strawberries and apples.													
• Using the fork secure hold, experiment with slicing some soft food with a flat surface such as a halved cucumber.													
• Draw and annotate diagrams of your sliced foods, explaining the methods you have used to produce the best consistency for each type of food.													
• Compare different ways of folding a wrap.													
• Practise step 1 of the design process (thinking) by completing your own product outline for a portable snack. • For the inspiration section, arrange an annotated mood board to show more details.													

<ul style="list-style-type: none"> • Apply your knowledge of techniques to decide which will be appropriate for this task. • Decide which ingredients you will need to include. 													
Make your own design diagram for a portable snack. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of cooking techniques and nutrition to: <ol style="list-style-type: none"> 1. draw sketches of how the snack will be constructed 2. list possible ingredients for your snack 3. make the first prototype of your snack 4. use seasonal ingredients 5. wrap the snack securely. 													
<ul style="list-style-type: none"> • Taste (test) your snack to see if it has any weaknesses. • Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition. • Modify your recipe. • Explain your decisions. 													
Challenge: <ul style="list-style-type: none"> • Design and make a portable snack of your choice, remembering to include: <ol style="list-style-type: none"> 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

spreading	grating	peeling	folding	snipping	stirring	weighing	secure	inspiration	purpose	user
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Food technology: Things to remember: sources of food

Pupils:													
Targets: Children can/know/explain/understand:													
List four different foods that come from plants.													
Name two examples of food that come from each of following parts of a plant: the roots, stems, leaves, flowers, seeds and fruits.													
Describe what is meant by processed food.													
Name ten types of food that come from animals.													
Name four foods we eat that are made by animals.													
Name two examples of processed foods and explain which parts come from plants and which from animals.													
List two foods from each category: grown, reared and caught.													

Topic specific vocabulary:

grown	reared	caught	processed foods
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Food technology (Year A): Things to remember: safety and hygiene

Pupils:													
Targets: Children can/know/explain/understand:													
Draw a fridge with food items stored correctly inside.													
List some hygiene rules that should be followed when cooking and preparing food.													
Explain why you should wash your hands before cooking.													
List ten food items that should be stored in a cupboard.													
Collect pictures of food from magazines and say where the food should be stored.													

Topic specific vocabulary:

food poisoning	prepare	stored	hygiene	safely	permission
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: What is design and technology? (Year B)

Pupils:													
Targets:													
Children can/know/explain/understand:													
Describe what design and technology is.													
Draw a flow chart of the Design Process: Think, Make , Break, Repeat.													
Look at pictures of cars from the earliest ones to the latest electric cars. Describe ways in which they have been improved.													
List a range of inventions, and describe what it is for and who might use it.													
Describe the design process and create a flow chart to represent it.													
Define the following design words: <ul style="list-style-type: none"> • product • purpose • intended users • inspiration • materials • features • techniques. 													
How is design and technology different from art?													

Topic specific vocabulary:

product	purpose	inspiration	materials	intended user	features	techniques
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

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tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Structures (Year B) – Strength

Pupils:													
Targets: Children can/know/explain/understand:													
What is a structure?													
• List the four types of structure. (shell structures, frame structures, solid structures and combined structures)													
• Name three examples of each of the four types of structure.													
• Define the word 'natural'.													
• Name ten natural structures.													
• Define the word 'manufactured'.													
• Name ten manufactured structures.													
• List four reasons why people might manufacture structures.													
• What does the word 'rigid' mean? Give an example of a material that is rigid.													
• What does the word 'properties' mean? Give an example of some of the properties of a sheet of paper.													
• Make a triangle tower out of paper: 1. Cut strips of paper 30 cm long and 5 cm wide. 2. Mark every 10 cm and then fold the strips into three equal lengths. 3. Tape the ends together to make triangles. 4. Construct a structure by joining the triangles together. 5. Draw an annotated diagram of your structure, showing how you strengthened paper.													
• Make a newspaper tower: 1. Roll sheets of newspapers into cylinders, using small pieces of tape to hold the paper together. 2. Glue the rolls of paper together to make a tower. 3. Draw an													

annotated diagram of your structure, showing how you strengthened paper.													
• Make laminated card: 1. Glue together five pieces of card, one on top of the other. 2. Draw an annotated diagram, showing how you strengthened paper.													
• Experiment with folding, rolling and joining paper to make structures.													

Topic specific vocabulary:

structure	nature	combined	manufactured	protect	span	connected
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structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Solid structures

Pupils:													
Targets:													
Children can/know/explain/understand:													
Define:													
- a solid structure													
- a hollow structure													
List five examples of:													
- a natural solid structure													
- a manufactured solid structure.													
What is mortar?													
Make brick walls using:													
- a stacked bond.													
- a running bond.													
Remove bricks from the lower course and describe what happens.													
Draw annotated diagrams of what happened to the walls.													
Use construction sets to build solid structures.													
Define the words stable and balanced.													
What is an architect?													
Make three towers: one with a narrow base, one with a wider base and another with a very wide base. Put the towers on a piece of paper and then move the piece of paper, as if there was an earthquake, and describe what happens to the towers.													
Draw annotated diagrams of what happens to each tower.													
Apply your knowledge of solid structures to make stable models.													
Explain why the models are stable, using annotated diagrams.													
Experiment with a variety of different solid shapes in your structures.													
Label and annotate pictures of the following solid structures showing their design features: a garden wall, a concrete dam, a stone bridge and a marble statue.													

Apply your knowledge of solid structures to make a model of the pyramids.													
Practise step 1 of the design process (thinking) by completing your own product outline for a stone bridge. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which is most appropriate for this task. • Decide which materials you will need													
Make your own design diagram for a bridge. • Organise your diagram so that it is clear & gives detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													
Apply your knowledge of solid structures to: 1. draw sketches of your bridge 2. show how the bridge will be constructed 3. make the first prototype of your structure.													
• Test (break) your design. Have the techniques you used worked? • Re-think your design decisions by applying your technical and practical knowledge of structures. • Modify your design. • Explain your decisions.													
Challenge: Design and make a solid structure of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

solid	mortar	hollow	dam	arranged	bond	remove	balanced	earthquake	architects	foundations
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Wheel and axle mechanisms

Pupils:													
Targets: Children can/know/explain/understand:													
What is a mechanism?													
Define the words: - rotate - force													
Draw annotated diagrams to show what happens to the speed and force of a wheel & axle when one or the other is turned.													
Apply your knowledge of wheels and axles to make products. Explain how the wheel and axle mechanisms are made and attached, using annotated diagrams.													
Experiment with a variety of different ways to attach wheels and axles in your products.													
Label and annotate a picture of a wheel and axle mechanism, showing its design features. List the materials that the product is made from.													
Apply your knowledge of wheel and axle mechanisms to make a product (plastic bottle racing car)													
<ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for a wind-powered car. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include 													
Make your own design diagram for a wind-powered car. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to 													

understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram													
Apply your knowledge of wheel mechanisms to: 1. draw sketches of your car 2. show how the car will be constructed 3. make the first prototype of your car.													
• Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of wheel and axle mechanisms. • Modify your design. • Explain your decisions.													
Challenge: • Design and make a wheel and axle mechanism of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

mechanism	rotating	force	attach	chassis
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Food technology: Couscous dish

Pupils:													
Targets: Children can/know/explain/understand:													
Label and annotate pictures of the following couscous dishes showing their design features: <ul style="list-style-type: none"> • a spiced vegetable couscous • a tricolore couscous salad • a couscous with pulses • a salmon couscous. 													
• Describe the safety features to be taken into account when preparing one of these dishes.													
• List the ingredients that one of the couscous dishes is made from.													
Practise step 1 of the design process (thinking) by completing your own product outline for a couscous dish. <ul style="list-style-type: none"> • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which ingredients you will need to include. 													
Make your own design diagram for a couscous dish of your choice. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of cooking techniques and nutrition to: 1. draw sketches of how the couscous dish will be constructed 2. list possible ingredients for your couscous dish													

3. make the first prototype of your couscous dish 4. use seasonal ingredients 5. cost out your couscous dish 6. decide how long the recipe will take.													
<ul style="list-style-type: none"> • Evaluate (test) the look of your couscous dish and see if it has any weaknesses. • Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition. • Modify your recipe. • Explain your decisions. 													
Challenge: Design and make a couscous dish of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

slice	pour	fluff	snip	chop	couscous	seasonal	ingredients
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Food technology: Things to remember: seasonal food

Pupils:													
Targets:													
Children can/know/explain/understand:													
List four seasonal fruits and vegetables for each of the following:													
• spring													
• summer													
• autumn													
• winter.													
Make a fruit kebab made with seasonal summer fruits.													
List some seasonal vegetables that might be found in a winter soup.													
Match fruits and vegetables to their seasons.													

Topic specific vocabulary:

seasonal food	harvest	autumn	winter	spring	summer	produce
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	indentify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Design and Technology: KS1 – Assessment tracker: Year 1 & 2

Topic: Food technology (Year B): Things to remember: safety and hygiene

Pupils:													
Targets: Children can/know/explain/understand:													
Draw a fridge with food items stored correctly inside.													
List some hygiene rules that should be followed when cooking and preparing food.													
Explain why you should wash your hands before cooking.													
List ten food items that should be stored in a cupboard.													
Collect pictures of food from magazines and say where the food should be stored.													

Topic specific vocabulary:

food poisoning	prepare	stored	hygiene	safely	permission
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Milestone 1: Vocabulary (words to revisit throughout the two-years that the children study Milestone 1). Shaded words to be covered within this topic.

materials	practical	techniques	inspiration	design	make	evaluate	improve	software	explore
tools	measure	mark	shaping	joining	gluing	hinges	combining	strengthen	identify
structures	practise	drilling	screwing	nailing	mechanisms	levels	winding	nutrition	improvements
peel	grate	safely	hygienically	ingredients	weigh	electronic	scales	assemble	refining

Key Threshold Milestone 2 (Year 3 & 4)

– Assessment Tracker (print one copy of this page for each year group and tick/date the Milestone 2 targets when they are covered in class).

Class name: _____

Year groups: _____

Academic year: _____

Milestone 2

Master practical techniques

Materials

- Cut materials accurately and safely by selecting appropriate tools.
- Measure and mark out to the nearest millimetre.
- Apply appropriate cutting and shaping techniques that include cuts within the perimeter of the material (such as slots or cut outs).
- Select appropriate joining techniques.

Electrics and computing

- Create products with series and parallel circuits.
- Control and monitor models using apps designed for this purpose.

Mechanisms

- Use scientific knowledge of the transference of forces to choose appropriate mechanisms for a product (such as linked levers or pneumatics).

Structures

- Choose suitable techniques to construct products or to repair items.
- Strengthen materials using suitable techniques.

Food and nutrition

- Prepare ingredients hygienically using appropriate utensils.
- Measure ingredients accurately to the nearest gram.
- Follow a recipe.
- Assemble and cook ingredients (controlling the temperature of the hob, if cooking).

Take inspiration from design

- Identify some of the great designers in all of the areas of study (including pioneers in horticultural techniques) to generate ideas for designs.
- Improve upon existing designs, giving reasons for choices.
- Disassemble products to understand how they work.

Design, make, evaluate and improve

- Design with purpose by identifying opportunities to design.
- Make products by working efficiently (such as by carefully selecting materials).
- Refine work and techniques as work progresses, continually evaluating the product design.
- Use apps to design and represent product designs.

TOPICS TAUGHT in Lower KS2:

In addition to the specific skills that the children will keep revisiting through the key concepts or substantive knowledge there will be specific learning related to individual topics. At Stapleford Primary School children are taught in mixed age classes e.g. Years 3 & 4 together etc. As a result, we have a two-year topic plan to prevent the children repeating subject matter. More detail is shown below as to what will be taught within each topic.

Lower KS2 (Class 2 – Year 3 & 4) Rolling Programme

Subject	Year A (2022-2023), (2024-2025) (2026-2027) etc.			Year B (2021-2022), (2023-2024), (2025-2026) etc.		
	Autumn Term	Spring Term	Summer Term	Autumn Term	Spring Term	Summer Term
Design and Technology (see Chris Quigley: D & T Curriculum Companion for topic details)	What is Design & Technology? App control	Linked levers Frame structures	Food technology - Vegetable soup - Things to remember: i) Balanced diet ii) Seasonal food	What is Design & Technology? Paper circuits	Pneumatics Shell structures	Food technology - Dips - Things to remember: i) Safe storage ii) Seasonal food

The Assessment Tracker documents below outline what children will learn within each topic

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: What is design and technology? (Year A)

Pupils:													
Targets: Children can/know/explain/understand:													
Collect pictures of buildings from the earliest structures to the latest eco homes. Describe ways in which they have been improved.													
List a range of inventions and describe what it is for and who might use it.													
Describe the design process.													
Define the following design words: • product • purpose • intended users • inspiration • materials • features • techniques.													
How is design and technology different from art?													

Topic specific vocabulary:

product	purpose	intended users	inspiration	materials	features	techniques
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: App control

Pupils:													
Targets: Children can/know/explain/understand:													
What is: - a device? - an internal app? - an external app? - an app-enabled device?													
List examples of app-enabled devices.													
Draw annotated diagrams to show examples of how an app-enabled device works.													
Apply your knowledge of coding to create apps that control products.													
Explain how coding and the device interact using annotated diagrams.													
Label and annotate a picture of an app-controlled model.													
Describe the electrical system components that may be included in the product.													
Apply your knowledge of electrical systems that are controlled by apps to make a product .													
<ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for a lifestyle helper. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of components and programming to decide which will be most appropriate for this task. • Decide which components and app elements to include. 													
Make your own design diagram for a lifestyle helper. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. 													

<ul style="list-style-type: none"> • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of app-controlled products to: <ol style="list-style-type: none"> 1. draw sketches of your robot 2. show how the robot will be constructed 3. make the first prototype of your robot 4. make the first prototype of your app to control the robot. 													
Test (break) your design ideas to see if they work. <ul style="list-style-type: none"> • Re-think your design decisions by applying your technical and practical knowledge of app-controlled products. • Modify your design. • Explain your decisions. 													
Challenge: Design and make an app-controlled product of your choice, remembering to include: <ol style="list-style-type: none"> 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

device	app-enabled	respond	Bluetooth	Wi-Fi	coding	response	prototype
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Linked levers

Pupils:													
Targets:													
Children can/know/explain/understand:													
Describe the purpose of linked levers.													
What does pivot mean?													
Define the word fulcrum.													
Describe the following types of movement: - linear - rotary - reciprocating - oscillating.													
Draw a range of annotated diagrams to show which outputs you would see with different arrangements of linked levers.													
Apply your knowledge of linked levers to make products.													
Explain how the linked levers are made and attached, using annotated diagrams.													
Experiment with a variety of fixed and moving pivots in your products.													
Label and annotate a picture of a linked lever mechanism, showing its design features.													
List the materials that the product is made from.													
Apply your knowledge of linked lever mechanisms to make a product.													
Practise step 1 of the design process (thinking) by completing your own product outline for a fold-away safety barrier. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for a linked lever mechanism safety barrier.													

<ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
<ul style="list-style-type: none"> • Apply your knowledge of linked lever mechanisms to: <ol style="list-style-type: none"> 1. draw sketches of your barrier 2. show how the barrier will be constructed 3. make the first prototype of your barrier 													
<ul style="list-style-type: none"> • Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of linked lever mechanisms. • Modify your design. • Explain your decisions. 													
Challenge: Design and make a linked lever mechanism of your choice, remembering to include: <ol style="list-style-type: none"> 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

pivot	fulcrum	linear	rotary	reciprocating	oscillating	prototype	mechanism
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Frame structures

Pupils:													
Targets:													
Children can/know/explain/understand:													
• What is the theory of triangulation?													
• Define the word 'rigid'.													
What is: - a truss? - a strut? - a joining plate?													
Draw annotated diagrams showing the theory of triangulation.													
Apply your knowledge of frame structures to make products.													
Explain how the frames are made and joined, using annotated diagrams.													
Experiment with a variety of 3-D shapes in your products.													
Label and annotate a picture of a truss bridge, showing its design features.													
List the materials that the product is made from.													
Apply your knowledge of frame structures to make a product.													
Practise step 1 of the design process (thinking) by completing your own product outline for a truss bridge. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be the most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for a truss bridge. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													

Apply your knowledge of frame structures to: 1. draw sketches of your bridge 2. show how the frame will be constructed 3. make the first prototype of your bridge.													
<ul style="list-style-type: none"> • Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of pneumatic mechanisms. • Modify your design. • Explain your decisions 													
Design and make a frame structure of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

rigid	truss	distribute	strut	joining plate	triangulation	pioneer	chord	pier	braces
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Food technology: Vegetable soup

Pupils:													
Targets:													
Children can/know/explain/understand:													
Label and annotate pictures of the following vegetable soups, showing their design features: <ul style="list-style-type: none"> • minestrone soup • vegetable and lentil soup • summer vegetable soup. 													
Describe the safety features to be taken into account when preparing one of these dishes.													
List the ingredients that one of the soups is made from.													
Using the claw hold, experiment with chopping foods such as cucumbers and courgettes. Ask an adult for help if unsure.													
List foods that are best cut with a bridge hold or claw grip.													
Draw and annotate diagrams of your sliced and chopped foods, explaining the methods you have used to produce the best consistency for each type of food.													
Experiment with recipes that include chopped and diced foods.													
Adapt your work as you go, making improvements.													
Compare and contrast your first and most recent attempts at chopping.													
Experiment with: <ul style="list-style-type: none"> - juicing different fruits. - making fruit smoothies. 													
Draw and annotate diagrams of your smoothies, explaining which ones you preferred and why.													
Experiment with recipes: <ul style="list-style-type: none"> - that include juiced foods. - that include blending. 													
Adapt your work as you go, making improvements. Explain why it is important to continually improve your work as you go.													
<ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for vegetable soup. • For the inspiration section, arrange an annotated mood board to show more details. 													

<ul style="list-style-type: none"> • Apply your knowledge of techniques to decide which is appropriate for this task. • Decide which ingredients you will need. 													
Make your own design diagram for a vegetable soup. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of cooking techniques and nutrition to: <ol style="list-style-type: none"> 1. draw sketches of how the vegetable soup will be constructed 2. list ingredients for your vegetable soup 3. make the prototype of your vegetable soup 4. use seasonal ingredients. 													
Test your soup and decide what you could add to make the soup more substantial. Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition. Modify your recipe. Explain your decisions.													
Challenge: Design and make a vegetable soup of your choice, remembering to include: <ol style="list-style-type: none"> 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

claw grip	diced	juicing	crushing	blending	boiling	simmering
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Food technology: Things to remember - a balanced diet

Pupils:													
Targets:													
Children can/know/explain/understand:													
List the five main food groups and give four examples from each one.													
Explain why we should limit our fat intake.													
Describe a balanced meal for a vegetarian.													
What does the term 'balanced diet' mean?													
Describe your favourite meal. How does it compare to the 2/3:1/3 rule? What might you change to make it healthier?													
Complete a food diary for the day. What might you change to ensure a balanced diet?													

Topic specific vocabulary:

nutrients	vitamins	carbohydrates	protein	fibre	fat	vegetarian
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Food technology: Things to remember: seasonal food (Year A)

Pupils:													
Targets:													
Children can/know/explain/understand:													
Describe a menu for a main course and a dessert for summer and winter. Explain your choices.													
Describe what is meant by 'comfort food'.													
List the ingredients for a recipe for a spring soup (e.g. asparagus) and an autumn soup (e.g. parsnip).													
List the foods that are in season throughout the year.													
List where your food has come from for a week. What conclusions can you draw from the information?													

Topic specific vocabulary:

nutrients	vitamins	carbohydrates	protein	fibre	fat	seasonal
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: What is design and technology? (Year B)

Pupils:													
Targets:													
Children can/know/explain/understand:													
Collect pictures of computers from the earliest to the latest available to buy. Describe ways in which they have been improved.													
List a range of inventions and describe what it is for and who might use it.													
Describe the design process.													
Define the following design words: • product • purpose • intended users • inspiration • materials • features • techniques.													
How is design and technology different from art?													

Topic specific vocabulary:

product	purpose	intended users	inspiration	materials	features	techniques
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Paper circuits

Pupils:													
Targets:													
Children can/know/explain/understand:													
What does conductive mean?													
What is copper tape? List some advantages of using copper tape in projects.													
What is an LED?													
Describe how an LED should be connected to a cell.													
What is an exploded diagram?													
Draw annotated diagrams to show the correct way to connect an LED to a cell.													
Draw exploded diagrams that show how switches can be made with copper tape.													
Apply your knowledge of paper circuits to make products.													
Explain how the paper circuits are made, using annotated diagrams.													
Experiment with a variety of different paper circuits in your products.													
Label and annotate a picture to show the design features of the paper circuit, both the visible ones and the ones that cannot be seen.													
List the components that the product is made from.													
Apply your knowledge of paper circuits to make a product based on the picture above.													
<ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for a paper circuit greetings card. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. 													

• Decide which materials and components you will need to include.													
Make your own design diagram for a paper circuit greetings card. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													
Apply your knowledge of paper circuits and components to: 1. draw sketches of your card 2. show the components and circuit your card will use 3. make the first prototype of your card.													
• Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of paper circuits. • Modify your design. • Explain your decisions.													
Challenge: Design and make a paper circuit of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

circuit	switches	LED	conductive	adhesive	illuminate
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Pneumatics

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is a pneumatic mechanism?													
Define the word 'compressed'.													
What is a hydraulic mechanism?													
List examples of machines that use either pneumatics or hydraulics.													
Draw annotated diagrams to show how a pneumatic or hydraulic mechanism works.													
Describe the type of movement of a piston.													
Apply your knowledge of pneumatics and hydraulics to make products.													
Explain how the systems are made and attached, using annotated diagrams.													
Experiment with a variety of arrangements of cylinders, pistons and connecting tubes in your products.													
Label and annotate a picture of a hydraulic mechanism, showing its design features.													
List the materials that the product is made from.													
Apply your knowledge of linked lever mechanisms and hydraulics to make a product.													
Practise step 1 of the design process (thinking) by completing your own product outline for a pneumatic lifting device. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for a pneumatic lifting device. • Organise your diagram so that it is clear and gives enough detail for someone else to understand.													

<ul style="list-style-type: none"> • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of pneumatic mechanisms to: 1. draw sketches of your lifter 2. show how the lifter will be constructed 3. make the first prototype of your lifter.													
<ul style="list-style-type: none"> • Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of pneumatic mechanisms. • Modify your design. • Explain your decisions. 													
Challenge: <ul style="list-style-type: none"> • Design and make a pneumatic or hydraulic mechanism of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

pneumatic	compressed	pressure	hydraulic	piston	hollow-cylinder	reciprocating
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Shell structures

Pupils:													
Targets:													
Children can/know/explain/understand:													
List a variety of natural shell structures.													
Describe the shapes and purposes of the structures you have listed.													
List a variety of manufactured shell structures.													
Describe the construction and purposes of the structures you have listed.													
What does it mean to use frames and shells in conjunction with one another?													
Draw annotated cross-section diagrams showing how natural and manufactured shell structures gain their strength													
Apply your knowledge of shell structures to make products.													
Explain how the shells are made, using annotated diagrams.													
Experiment with a variety of folds and joins in your products.													
Apply your knowledge of CAD to design and make shell structures.													
Explain how the shells are made, using annotated diagrams.													
Experiment with a variety of 3-D shapes in your products.													
Label and annotate a picture of a cardboard igloo, showing its design features.													
List the materials that the product is made from.													
Apply your knowledge of frame structures to make a product.													
<ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for a cardboard chair. • For the inspiration section, arrange an annotated mood board to show more details. 													

<ul style="list-style-type: none"> • Apply your knowledge of techniques to decide which will be the most appropriate for this task. • Decide which materials you will need to include. 													
Make your own design diagram for a cardboard chair. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of shell structures to: <ol style="list-style-type: none"> 1. draw sketches of your chair 2. show how the chair will be constructed 3. make the first prototype of your chair 													
<ul style="list-style-type: none"> • Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of shell structures. • Modify your design. • Explain your decisions. 													
Challenge: Design and make a shell structure of your choice, remembering to include: <ol style="list-style-type: none"> 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). 													

Topic specific vocabulary:

variety	contain	purpose	conjunction	external	aspects	component parts	coordinates	assemble
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Food technology: Dips

Pupils:													
Targets: Children can/know/explain/understand: <ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for a hummus dip. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which ingredients you will need to include. 													
Make your own design diagram for a dip. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram. 													
Apply your knowledge of cooking techniques and nutrition to: <ol style="list-style-type: none"> 1. draw sketches of how the dip will be constructed 2. list possible ingredients for your dip 3. make the first prototype of your dip 4. list possible accompaniments for the dip. 													
Investigate the flavours your friend might like. <ul style="list-style-type: none"> • Test out your new dips on your friend. • Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition. • Modify your recipe. • Explain your decisions. 													
Challenge: Design and make a dip of your choice, remembering to include:													

1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													
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Topic specific vocabulary:

consistency	allergies	spoonable	scoop	weighing	stirring	juicing	blending	crushing	measuring
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Food technology: Things to remember: safe storage

Pupils:													
Targets:													
Children can/know/explain/understand:													
List four items that should be kept in the salad drawer of a fridge.													
Explain why refrigerating food is important.													
What is the importance of a use by date?													
Explain where cooked and uncooked meat should be stored in a fridge. Give reasons for your decision.													
List five foods that should be kept in a fridge.													
How was food preserved before fridges were invented?													
Describe the differences between food stored in a fridge and food stored in cupboards.													
Describe how to look after leftover food.													

Topic specific vocabulary:

bacteria	preserve	refridgerated	container	leftovers	uncooked
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Design and Technology: KS2 – Assessment tracker: Year 3 & 4

Topic: Food technology: Things to remember: seasonal food (Year B)

Pupils:													
Targets:													
Children can/know/explain/understand:													
Describe a menu for a main course and a dessert for spring and autumn. Explain your choices.													
Describe what is meant by 'comfort food'.													
List the ingredients for a recipe for a winter soup (e.g. leek & potato) and a summer soup (e.g. tomato & basil).													
List the foods that are in season throughout the year.													
List where your food has come from for a week. What conclusions can you draw from the information?													

Topic specific vocabulary:

nutrients	vitamins	carbohydrates	protein	fibre	fat	seasonal
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Milestone 2: Vocabulary (words to revisit throughout the two-years that the children study Milestone 2). Shaded words to be covered within this topic.

device	app-enabled	respond	automatically	fluency	internal	external	purpose	user	components
LED	conductive	adhesive	illuminate	enhance	pivot	fulcrum	linear	rotary	reciprocating
oscillating	pneumatic	compressed	pressure	hydraulic	rigid	truss	strut	joining plate	pioneer
chord	pier	coordinates	pulses	wholegrain	bacteria	preserve	refridgerated	refine	improve

Key Threshold Milestone 3 (Year 5 & 6)

– Assessment Tracker (print one copy of this page for each year group and tick/date the Milestone 3 targets when they are covered in class).

Class name: _____

Year groups: _____

Academic year: _____

Milestone 3

Master practical techniques

Materials

- Cut materials with precision and refine the finish with appropriate tools (such as sanding wood after cutting or using a more precise scissor cut after roughly cutting out a shape).
- Show an understanding of the qualities of materials in order to choose appropriate tools to cut and shape (e.g. the nature of fabric may require sharper scissors than would be used to cut paper).

Electrics and computing

- Create products using electronics kits that employ a number of components (such as LEDs and resistors).
- Write code to control and monitor models or products.

Structures

- Develop a range of practical skills to create products (such as cutting, drilling and screwing, nailing, gluing, filing and sanding).

Mechanisms

- Convert rotary motion to linear using cams.
- Use innovative combinations of electronics (or computing) and mechanics in product designs.

Food and nutrition

- Understand the importance of correct storage and handling of ingredients (using knowledge of micro-organisms).
- Measure accurately and calculate ratios of ingredients to scale up or down from a recipe.
- Demonstrate a range of baking and cooking techniques.
- Create and refine recipes, including ingredients, methods, cooking times and temperatures.

Take inspiration from design

- Combine elements of design from a range of inspirational designers throughout history, giving reasons for choices.
- Create innovative designs that improve upon existing products.
- Evaluate the design of products so as to suggest improvements to the user experience.

Design, make, evaluate and improve

- Design with the user in mind, motivated by the service a product will offer (rather than simply for profit).
- Make products through stages of prototypes, making continual refinements.
- Ensure products have a high-quality finish, using art skills where appropriate.
- Use prototypes, cross-sectional diagrams and computer-aided designs to represent designs.

TOPICS TAUGHT in Upper KS2:

In addition to the specific skills that the children will keep revisiting through the key concepts or substantive knowledge there will be specific learning related to individual topics. At Stapleford Primary School children are taught in mixed age classes e.g. Years 5 & 6 together etc. As a result, we have a two-year topic plan to prevent the children repeating subject matter. More detail is shown below as to what will be taught within each topic.

Upper KS2 (Class 1 – Years 5 & 6) Rolling Programme

Subject	Year A (2022-2023), (2024-2025) (2026-2027) etc.			Year B (2021-2022), (2023-2024), (2025-2026) etc.		
	Autumn Term	Spring Term	Summer Term	Autumn Term	Spring Term	Summer Term
Design and Technology (see Chris Quigley: D & T Curriculum Companion for topic details)	What is Design & Technology? Artificial intelligence	Arch structures Pulleys and gears	Food technology - Bread - Food throughout the year i) Christmas ii) Diwali	What is Design & Technology? Electronic motors	Frame structures Cams	Food technology - Bolognese - Food throughout the year i) Hanukkah ii) Chinese New Year

The Assessment Tracker documents below outline what children will learn within each topic

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: What is design and technology? (Years A)

Pupils:													
Targets:													
Children can/know/explain/understand:													
Collect pictures of televisions from the earliest TV's to the latest smart TV's.													
Describe ways in which they have been improved.													
List a range of inventions and describe what it is for and who might use it.													
Describe the design process.													
Define the following design words: • product • purpose • intended users • inspiration • materials • features • techniques.													
How is design and technology different from art?													

Topic specific vocabulary:

product	purpose	intended users	inspiration	materials	features	techniques
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwell	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Artificial intelligence

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is Artificial Intelligence?													
List some smart devices													
Draw annotated diagrams to show how a smart speaker works - use the headings: Inputs, Processes and Outputs													
What is a device that is operated remotely?													
Describe: - a manual input - an automatic input.													
What is a: - force sensor? - distance sensor?													
Draw annotated diagrams to show examples of both automatic & manual input(s) processes & outputs for these smart devices: • a light bulb • a thermostat • a security camera.													
Apply your knowledge of sensors to make products and your knowledge of programming to control them.													
• Explain how the sensors are used with other components (such as lights or motors), using annotated diagrams.													
• Explain the inputs, processes and outputs in your programs.													
Label and annotate a picture of a robotic car.													
List the electrical system components included in the car.													
Practise step 1 of the design process (thinking) by completing your own product outline for a colour-sensing toy. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of components and programming to decide which will be most appropriate for this task.													

• Decide which components and app elements to include.													
Make your own design diagram for a colour-sensing robot. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													
Apply your knowledge of Artificial Intelligence to: 1. draw sketches of your robot 2. show how the robot will be constructed 3. make the first prototype of your robot													
• Test your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of construction techniques. • Modify your design. • Explain your decisions.													
Challenge: Design and make an Artificial Intelligence product of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make).													

Topic specific vocabulary:

artificial intelligence	sensor	component	detect	input	output	manual	remotely	thermostat	force	Bluetooth
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Arch structures

Pupils:													
Targets: Children can/know/explain/understand:													
Explain what each of the items below is: • keystone • voussoir • impost • pier													
Draw and describe elliptical, parabolic and catenary arch shapes.													
Draw an annotated 3-D diagram showing how an arch structure gains its strength.													
Apply your knowledge of solid structures to make products that have an arch. Experiment with a variety of arches in your products.													
Explain how the arches are made, using annotated diagrams.													
Label and annotate this picture of a house (p.358 curriculum companion), showing its design features.													
List the materials that the product is likely to be made from.													
Apply your knowledge of frame structures to make a product based on the picture above.													
<ul style="list-style-type: none"> • Practise step 1 of the design process (thinking) by completing your own product outline for a model school. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include. 													
Make your own design diagram for a model school. <ul style="list-style-type: none"> • Organise your diagram so that it is clear and gives enough detail for someone else to understand. 													

• Arrange your diagram to include annotations where they are helpful.													
Apply your knowledge of arches to: 1. draw sketches of your model school 2. show how the school will be constructed 3. make the first prototype of your school													
Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of arch structures. • Modify your design. • Explain your decisions.													
Challenge: Design and make an arch structure of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). Here are some examples of products you may make: • a building or shelter • a bridge.													

Topic specific vocabulary:

keystone	voussoir	impost	pier	parabola	perfected	ellipse
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwelt	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Pulleys and gears

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is mechanical advantage?													
Draw annotated diagrams showing how the following pulleys work: • a simple pulley • a moving pulley • a combined block-and-tackle pulley.													
Draw annotated diagrams of how the following gear trains work: • gearing up • mitre gear • gearing down.													
Apply your knowledge of pulleys and gear trains to make products. • Explain how the products are made, using annotated diagrams. • Experiment with a variety of pulleys and gear trains in your products.													
Label and annotate this picture (p.392 curriculum companion) of a pulley system, showing its design features.													
List the materials that the product is likely to be made from.													
Apply your knowledge of pulley systems to make a product based on the picture above.													
• Practise step 1 of the design process (thinking) by completing your own product outline for an aerial tramway. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for an aerial tramway (cable car). • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													

<p>Apply your knowledge of pulleys to:</p> <ol style="list-style-type: none"> 1. draw sketches of your cable car 2. show how the cable car will be constructed 3. make the first prototype of your cable car. <p>Combine your knowledge of electrical circuits, and frame and shell structures with your knowledge of pulleys in designing your cable car.</p>													
<p>Test (Break) your design ideas to see if they work.</p> <ul style="list-style-type: none"> • Re-think your design decisions by applying your technical and practical knowledge of pulleys. • Modify your design. • Explain your decisions. 													
<p>Challenge: Design and make a pulley system of your choice, remembering to include:</p> <ol style="list-style-type: none"> 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). <p>Here are some examples of products you may make:</p> <ul style="list-style-type: none"> • a crane • a vehicle with a drive pulley • a heavy lifting device (combining pulleys for maximum mechanical advantage). 													

Topic specific vocabulary:

circumference	mechanical advantage	physicist	pulley	tension	gear train	interlock	mitre	gondola	cable car
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Food technology: Bread

Pupils:													
Targets: Children can/know/explain/understand:													
Label and annotate pictures of the following breads showing their design features: • bread rolls • pizza • sourdough loaf • sandwich loaf • tea cake.													
Describe the safety features to be taken into account when preparing one of these dishes.													
List the ingredients that one of the breads is made from.													
Experiment with kneading different types of dough.													
Draw and annotate diagrams of your dough.													
Analyse how the dough changes as you knead it.													
Investigate recipes which involve kneading. • Adapt your work as you go, making improvements. • Explain why it is important to continually improve your work as you go.													
Practise step 1 of the design process (thinking) by completing your own product outline for a type of bread. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which ingredients you will need to include.													
Make your own design diagram for bread rolls. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													
• Apply your knowledge of cooking techniques and nutrition to:													

1. draw sketches of how the bread rolls will be constructed 2. list possible ingredients for your bread rolls 3. make the first prototype of your bread rolls 4. list possible additions to the bread dough.													
Investigate how bread proves at different temperatures. • Test out different water temperatures. • Analyse any factors that might stop the bread from rising • Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition. • When making bread, the normal ratio of yeast to flour is 7g : 500g. What will you need to change if you follow this ratio and why? • Modify your recipe. • Explain your decisions.													
Design and make a bread of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). Here are some examples of products you may make: • a pizza • rolls with a variety of toppings such as poppy seeds or oats • differently shaped breads such as a plaited loaf, a cob or a cottage loaf.													

Topic specific vocabulary:

kneading	flour	yeast	sourdough	dough	rise	prove
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwell	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Food technology: Food throughout the year – Cultural events: Christmas

Pupils:													
Targets:													
Children can/know/explain/understand:													
Create a menu for a main course & a dessert for each season. Explain your choices.													
Describe what is meant by 'comfort food'.													
List the ingredients for a winter soup and a summer soup.													
Where is turkey often served for Christmas dinner?													
What is the Christmas festival and who celebrates it?													
What is a turkey Christmas dinner often accompanied by?													
What is a chocolate log dessert and in which country would you be most likely to be served it after your Christmas dinner?													
Which country has a meat free day on Christmas Eve?													
Describe the Wigilia meal. Where would you be served this?													
What is panettone and where does it come from?													
Where might you have a BBQ for your Christmas dinner? Why? What would you be likely to have as the centrepiece item of food?													

Topic specific vocabulary:

Wigilia	panettone	BBQ	meringue	annual	festival	Christian	traditional
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Food technology: Food throughout the year – Cultural events: Diwali

Pupils:													
Targets:													
Children can/know/explain/understand:													
List the foods that are in season throughout the year.													
List where your food has come from for a week. What conclusions can you draw from the information?													
What is Diwali and who celebrates it?													
What does Diwali actually mean?													
Why do children particularly enjoy Diwali?													
Explain what a samosa is.													
What is chawal ki kheer and how is it made?													
What is dal makhani and how is it made?													
Where does rava laddu come from and what does rava mean?													
What are kaju barf?													

Topic specific vocabulary:

Hindu	Sikh	Jains	samosa	annual	festival	traditional	chawal ki kheer	dal makhani	rava laddu	kaju barf
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: What is design and technology? (Year B)

Pupils:													
Targets: Children can/know/explain/understand:													
Collect pictures of different types of transport from the earliest carts and steam trains to the latest lorries and trains.													
• Describe ways in which they have been improved.													
• List a range of inventions and describe what it is for and who might use it.													
• Describe the design process.													
• Define the following design words: • product • purpose • intended users • inspiration • materials • features • techniques.													
• How is design and technology different from art?													

Topic specific vocabulary:

product	purpose	intended users	inspiration	materials	features	techniques
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwelt	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Electronic motors

Pupils:													
Targets: Children can/know/explain/understand:													
What sort of motion is created by a motor?													
Draw annotated diagrams to show the effect of attaching a motor to: • a pulley • a propeller • a fan • gears, axles and wheels.													
Apply your knowledge of motors to make products. • Explain how the products are made, using annotated diagrams. • Experiment with a variety of motor components, such as fans, propellers, pulleys and gears in your products.													
Label and annotate a picture of a motorised vehicle (p. 342 curriculum companion), showing its design features. • List the materials that the product is made from. • Apply your knowledge of motors, pulleys, wheels and axles to make a product based on the picture above.													
Practise step 1 of the design process (thinking) by completing your own product outline for a motorised car. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for a motorised car. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful.													

• Experiment with different ways to present your diagram.													
Apply your knowledge of wheel mechanisms to: 1. draw sketches of your car 2. show how the car will be constructed 3. make the first prototype of your car													
Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of motors, electrical circuits, pulleys, and wheels and axles. • Modify your design. • Explain your decisions.													
Challenge: Design and make a motorised product of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). Here are some examples of products you may make: • a vehicle • a fan • a motorised pulley system • a motorised geared system.													

Topic specific vocabulary:

rotary	propeller	combined	gears	axles	wheels	mount
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwell	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Frame structures

Pupils:													
Targets: Children can/know/explain/understand:													
Demonstrate ways in which straws can be joined.													
Draw annotated diagrams showing the techniques you have used to join straws.													
Describe how the joins give strength to a frame structure.													
• Apply your knowledge of frame structures to make 3-D products made from straws.													
• Explain how the arches are made, using annotated diagrams. • Experiment with a variety of arches in your products.													
Label and annotate a picture of a box kite, showing its design features. • List the materials that the product is likely to be made from. • Apply your knowledge of frame structures to make a product based on the picture above.													
Practise step 1 of the design process (thinking) by completing your own product outline for a tetrahedral kite. • For the inspiration section, arrange an annotated mood board to show more details. • Apply your knowledge of techniques to decide which will be most appropriate for this task. • Decide which materials you will need to include.													
Make your own design diagram for a kite. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													
Apply your knowledge of frame structures to: 1. draw sketches of your kite													

2. show how the kite will be constructed 3. make the first prototype of your kite.													
Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of frame structures. • Modify your design. • Explain your decisions.													
Challenge: Design and make a frame structure of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). Here are some examples of products you may make: • a kite • a model pyramid (such as the entrance to the Louvre Museum in Paris) • a geodesic dome (such as the structures of the Eden Project in Cornwall).													

Topic specific vocabulary:

technique	assemble	construct	extend	dowel
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Cams

Pupils:													
Targets:													
Children can/know/explain/understand:													
What is the purpose of a cam?													
Draw annotated diagrams showing how the following cams work: • a pear-shaped cam • a snail-shaped cam • an eccentric circle cam.													
What is reciprocating movement?													
What does dwell mean?													
Apply your knowledge of cams and followers to make products.													
Explain how the products are made, using annotated diagrams.													
Experiment with a variety of cam profiles in your products.													
Label and annotate this picture of an automaton (p. 408 curriculum companion), showing its design features.													
List the materials that the product is likely to be made from.													
Apply your knowledge of pulley systems to make a product based on the picture above.													
Practise step 1 of the design process (thinking) by completing your own product outline for an automaton. • For the inspiration section, arrange an annotated mood board to show details. • Apply your knowledge of techniques to decide which will be best for this task. • Decide which materials you will need.													
Make your own design diagram for an automaton. • Organise your diagram so that it is clear and gives enough detail for someone else to understand. • Arrange your diagram to include annotations where they are helpful. • Experiment with different ways to present your diagram.													

Apply your knowledge of cams and followers to: 1. draw sketches of your automaton 2. show how the automaton will be constructed 3. make the first prototype of your automaton. • Combine your knowledge of cams and followers with your knowledge of frame structures.													
Test (break) your design ideas to see if they work. • Re-think your design decisions by applying your technical and practical knowledge of cams and followers. • Modify your design. • Explain your decisions.													
Challenge: Design and make a cam system of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). Here are some examples of products you may make: • a toy for a younger child • a model that shows how a piston (linear motion) in an engine can turn a wheel and axle (rotary motion).													

Topic specific vocabulary:

eccentric circle	linear reciprocating	vice-versa	lever	axle	rise	fall	dwell	automaton	crank	handle	cam shaft	fulcrum
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
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reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwell	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Food technology: Bolognese

Pupils:													
Targets: Children can/know/explain/understand:													
<ul style="list-style-type: none"> Label and annotate pictures of the following dishes showing their design features: spaghetti bolognese lasagne pasta al forno (bolognese sauce mixed with rigatoni pasta, sprinkled with mozzarella cheese and baked in the oven). 													
Describe the safety features to be taken into account when preparing one of these dishes.													
List the ingredients that one of the dishes is made from.													
Practise step 1 of the design process (thinking) by completing your own product outline for a bolognese sauce. <ul style="list-style-type: none"> For the inspiration section, arrange an annotated mood board to show more details. Apply your knowledge of techniques to decide which will be most appropriate for this task. Decide which ingredients you will need to include. 													
Make your own design diagram for bolognese. <ul style="list-style-type: none"> Organise your diagram so that it is clear and gives enough detail for someone else to understand. Arrange your diagram to include annotations where they are helpful. Experiment with different ways to present your diagram. 													
Apply your knowledge of cooking techniques and nutrition to: <ol style="list-style-type: none"> draw sketches of how the bolognese will be constructed list possible ingredients for your bolognese make the first prototype of your bolognese list possible additions to the bolognese 													

5. investigate what type of pasta you might serve with your bolognese.													
Investigate different recipes for bolognese sauce. • Investigate some simple sauces for pasta. • Analyse how you might add more vegetables to a bolognese sauce. • Re-think your design decisions by applying your technical and practical knowledge of cooking and nutrition. • Modify your recipe. • Explain your decisions.													
Challenge: Design and make a mince dish of your choice, remembering to include: 1. a product overview sheet (think) 2. a mood board to give more detail about your inspiration (think) 3. a design sheet (think) 4. pictures of your product (make) 5. diagrams or pictures of how you tested your product (break) 6. diagrams or pictures of how you re-thought your design (think) 7. diagrams or pictures of your improved design (make). Here are some examples of products you may make: • lasagne • chilli con carne • shepherd's pie • pasta al forno.													

Topic specific vocabulary:

chop	simmer	fry	ingredients	baked	mozzarella	pasta al forno	lasagne	spaghetti	rigatoni	penne	fusilli
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
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reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Food technology: Food throughout the year – Cultural events: Hanukkah

Pupils:													
Targets:													
Children can/know/explain/understand:													
Create a menu for a main course & a dessert for each season. Explain your choices.													
Describe what is meant by 'comfort food'.													
List the ingredients for a spring soup and an autumn soup.													
What is the Hanukkah festival and who celebrates it?													
What does Hanukkah mean?													
Explain why children receive small presents for the eight days of the festival.													
Explain what a hanukkiah is.													
Explain what the following foods are: - latkes - beef brisket - blintzes - apple cake - gelt													

Topic specific vocabulary:

latkes	beef brisket	blintzes	apple cake	gelt	custom	traditional	gratitude
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
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reciprocating	parabola	keystone	voussoir	impost	pier	construct	assemble	motor	physicist	annual	Diwali
mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwelt	refine	improve	Hanukkah	extend

Design and Technology: KS2 – Assessment tracker: Year 5 & 6

Topic: Food technology: Food throughout the year – Cultural events: Chinese New Year

Pupils:													
Targets:													
Children can/know/explain/understand:													
List foods that are in season throughout the year.													
List where your food has come from for a week. What conclusions can you draw from the information?													
What is Chinese New Year also known as?													
What may you see at a Chinese New Year celebration?													
The food is chosen for the Chinese New Year menu to bring good luck.													
Explain what the Reunion Dinner is.													

Topic specific vocabulary:

longevity noodles	dumplings	glutinous	iconic	banquet	custom	traditional	gratitude	reunion	festivities	parade	lantern
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Milestone 3: Vocabulary (words to revisit throughout the two-years that the children study Milestone 3). Shaded words to be covered within this topic.

artificial intelligence	sensor	processes	kneading	fluency	inputs	outputs	purpose	user	component	perishable	infectious
eccentric circle	rotary	propeller	combined	pulley	gears	axle	chassis	dowel	circumference	compost	perennial
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mechanical advantage	mitre	gear train	interlock	linear	ellipse	detect	dwel	refine	improve	Hanukkah	extend