

# Substantive and disciplinary knowledge D&T curriculum Morton Primary Academy

## Mechanisms/ mechanical systems technical knowledge

| EYFS | KS1 Cycle A   | KS1 Cycle B   | LKS2 Cycle A   | LKS2 Cycle B  | UKS2 Cycle A   | UKS2 Cycle B |
|------|---|---|--|---|--|--------------|
|      | <p><u>Wheels and Axles</u><br/><u>Spring 2</u></p> <ul style="list-style-type: none"> <li>•Know that wheels move because they are attached to an axle.</li> <li>•Know different reasons why a wheel might not turn around.</li> <li>•Know that wheels and axles are used in everyday life, not just in cars.</li> </ul> | <p>•<u>Making A Moving Monster/card - Autumn 2</u></p> <ul style="list-style-type: none"> <li>•Know how different levers, linkages and pivots work.</li> <li>•<b>Know that levers and pivots produce a desired movement.</b></li> </ul> | <p><u>Making a mechanical Car - Summer 2</u></p> <ul style="list-style-type: none"> <li>•<b>Know that the chassis is the load-bearing frame of a car.</b></li> <li>•Know how some cars are more sustainable than others.</li> <li>•Know ways of making models more durable.</li> </ul> | <p><u>Pneumatic toys</u><br/><u>Summer 2</u></p> <ul style="list-style-type: none"> <li>•<b>Know that a pneumatic system uses compressed air or gas as energy.</b></li> </ul> <p>Know that syringes and balloons can be used to create different pneumatic systems.</p> | <p><u>Making a pop-up book</u><br/><u>Autumn 1</u></p> <ul style="list-style-type: none"> <li>•Know that input is the motion used to start a mechanism and output is the motion that results from starting the input.</li> <li>•<b>Know that mechanisms control movement.</b></li> <li>•Know that for a product to be attractive, mechanisms sometimes need to be hidden.</li> </ul> |              |
|      | <p>Wheel, axle, axle-holder, chassis, diagram, dowel,</p>   | <p>Lever, pivot, wheel, linkage, mechanism</p>  | <p>Bearing, chassis, force, prototype, durable, sustainable</p>  | <p>Pneumatic, thumbnail sketch, exploded diagram, input, output, motion</p>   | <p>Slider, input, output, spacers, layers</p>  |              |

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## Design - make - evaluate

| EYFS  | KS1 Cycle A  | KS1 Cycle B   | LKS2 Cycle A  | LKS2 Cycle B   | UKS2 Cycle A   | UKS2 Cycle B |
|---|--|---|---|--|--|--------------|
| <p>Have an idea or purpose for what they want to make.</p> <p>Know what materials are best for the purpose they have in mind.</p> <p><b>Know how to hold and use tools appropriately.</b></p> <p><b>Join materials using different techniques.</b></p> <p>Say what I like about what I have made.</p> | <p><u>Wheels and Axles Spring 2</u></p> <ul style="list-style-type: none"> <li>•<b>Be able to fix a design so that the wheel can move.</b></li> <li>•Design, sketch and label a vehicle that includes functioning wheels, axles and axle holders.</li> </ul> <p>Make a moving vehicle with working wheels and axles.</p> | <p><u>Making A Moving Monster Aut 2</u></p> <ul style="list-style-type: none"> <li>•Evaluate toys and books with moving parts using the correct terminology.</li> <li>•Design an object with a moving part to satisfy a design criteria.</li> <li>•Make a mock up of the object to test if it will work.</li> <li>•<b>Measure, cut and join using appropriate tools.</b></li> </ul> | <p><u>Making mechanical Car - Summer 2</u></p> <ul style="list-style-type: none"> <li>•Follow instructions to build prototype car chassis - simple, sustainable and durable.</li> <li>•Evaluate prototypes to inform further designs.</li> <li>•Research and evaluate products that re on the market.</li> <li>•Design a mechanised toy car to meet a design brief.</li> <li>•<b>Use different tools and equipment safely to make a toy car.</b></li> </ul> | <p><u>Pneumatic toys Summer 2</u></p> <ul style="list-style-type: none"> <li>•Design a product using thumbnail sketches and exploded diagrams.</li> <li>•Make a pneumatic system that creates a desired motion.</li> <li>•Assemble an appealing product that incorporates a pneumatic system.</li> <li>•<b>Test and finalise ideas against design criteria.</b></li> </ul> | <p><u>Making a pop-up book Autumn 1</u></p> <ul style="list-style-type: none"> <li>•Design a product for younger chat uses a mixture of pop-up structures and interactive movements.</li> <li>•<b>Make mechanisms and structures using sliders, pivots and folds to create movement.</b></li> <li>•Use layers and spacers to hide relevant parts of mechanisms.</li> </ul> <p>Complete a product to a high standard.</p> |              |

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## Electrical systems

| EYFS | KS1 Cycle A | KS1 Cycle B | LKS2 Cycle A  | LKS2 Cycle B | UKS2 Cycle A  | UKS2 Cycle B  |
|------|-------------|-------------|---|--------------|---|---|
|      |             |             | <u>Torches - Summer 1</u><br>•Know what makes a torch successful.<br>•Know that a switch works by breaking or connecting an electrical circuit. |              | <u>Doodlers - Spring 2</u><br>•Know electricity flows in one direction.<br>•Know an electric motor converts electrical energy into rotational movement. | <u>Navigating the World - Spring 1</u><br>•Know that accelerometers can detect movement.<br>•Know that sensors can be useful in products as they mean the product can function without human input.<br>•Know that multifunctional means an object has more than one function. |
|      |             |             | Electric circuit, switch,   |              | Circuit component, series circuit, current, rotational movement   | Application (apps), cardinal compass, GPS tracker, accelerometers, pedometer, navigation  |

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## Design - make - evaluate

| EYFS | KS1 Cycle A | KS1 Cycle B | LKS2 Cycle A  | LKS2 Cycle B | UKS2 Cycle A  | UKS2 Cycle B  |
|------|-------------|-------------|---|--------------|---|---|
|      |             |             | <p><u>Torches - Summer 1</u></p> <ul style="list-style-type: none"> <li>•Design a torch that fits the success criteria.</li> <li>•Assemble a product that incorporates a simple circuit and a functioning switch.</li> <li>•Evaluate a product referring to the original design brief.</li> </ul> |              | <p><u>Doodlers - Spring 2</u></p> <ul style="list-style-type: none"> <li>•Investigate an existing product to determine factors that affect the form and function of it.</li> <li>•Apply findings from research to develop a unique product.</li> <li>•Make a functional series circuit, incorporating a motor.</li> </ul> | <p><u>Navigating the World - Spring 1</u></p> <ul style="list-style-type: none"> <li>•Write a design brief to fulfil a client's request.</li> <li>•Write a program to include multiple functions as part of a navigation device.</li> <li>•Develop a sustainable product concept.</li> <li>•Develop 3D CAD skills to produce a virtual model.</li> <li>•Present a pitch to 'sell' the product to a specified client.</li> </ul> |

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## Food technology

| EYFS  | KS1 Cycle A   | KS1 Cycle B  | LKS2 Cycle A  | LKS2 Cycle B  | UKS2 Cycle A   | UKS2 Cycle B |
|---|---|--|---|---|--|--------------|
| <p>Know the names of different fruits and vegetables and where some of these come from.</p> <p>Know some different techniques that can be used when cooking.</p> <p>Know that we should eat different foods to keep healthy.</p> <p>Know the different senses and use these to talk about products.</p> | <p><u>Cooking and Nutrition: Balanced diet Sum 2</u></p> <ul style="list-style-type: none"> <li>• Know the main food groups: carbohydrates, fruits and vegetables, protein, dairy and oils and spreads.</li> <li>• Know that a balanced meal should include the different food groups.</li> <li>• Know that food can be prepared in different ways - cutting, grating, snipping.</li> </ul> <p>Know that ingredients are the items in a recipe.</p> | <p><u>Smoothies - Spring 1</u></p> <ul style="list-style-type: none"> <li>• Know the names of a variety of fruits and vegetables and where they come from.</li> <li>• Know that some fruits can be juiced but others need blending to create a drink.</li> </ul> | <ul style="list-style-type: none"> <li>•</li> </ul> | <p><u>Eating Seasonally - Autumn 1</u></p> <ul style="list-style-type: none"> <li>• Know why food comes from different places around the world.</li> <li>• Know the benefits of seasonal food.</li> </ul> | <p><u>Developing a recipe - Autumn 2</u></p> <ul style="list-style-type: none"> <li>• Know how ingredients are reared and processed.</li> <li>• Know that recipes can be adapted to suit personal preference.</li> <li>• Know how to determine the nutritional content of ingredients.</li> <li>• Know how to prepare ingredients to avoid cross contamination.</li> </ul> |              |
|   | Carbohydrates, protein, balanced, grater, diet, snip, appearance, smell, taste  | Blend, blender, juice, juicer, ingredients, recipe,  |   | Seasonal, Mediterranean, tropical, climate, export, import, peel,   | Abattoir, cross contamination, nutrient, nutrition, hygiene, nutritional value,  |              |

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## Design - make - evaluate

| EYFS  | KS1 Cycle A   | KS1 Cycle B   | LKS2 Cycle A | LKS2 Cycle B  | UKS2 Cycle A   | UKS2 Cycle B |
|---|---|---|--------------|---|--|--------------|
| <p><b>Practice safe food hygiene by washing hands before handling food.</b></p> <p>Use knives safely to cut and spread.</p> | <p><u>Cooking and Nutrition: Balanced diet Sum 2</u></p> <ul style="list-style-type: none"> <li>•Use equipment safely to cut, grate, snip and spread ingredients.</li> <li>•Select balanced combinations of ingredients to create a healthy wrap.</li> </ul> <p>Evaluate a wrap based on the design criteria.</p> | <p><u>Smoothies - Spring 1</u></p> <ul style="list-style-type: none"> <li>•Select ingredients to meet a design brief.</li> <li>•Use a knife safely to cut different fruits and vegetables.</li> <li>•Use a manual juicer to squeeze fruits.</li> <li>•Safely use a blender to create a smoothie.</li> <li>•Evaluate their smoothie against the design brief.</li> </ul> |              | <p><u>Eating Seasonally - Autumn 1</u></p> <ul style="list-style-type: none"> <li>•Develop cutting and peeling skills using equipment safely.</li> </ul> <p>Taste and evaluate a range of seasonal ingredients.</p> <ul style="list-style-type: none"> <li>•Design a seasonal tart that looks appealing and tastes yummy.</li> <li>•Prepare and cook a savoury dish.</li> </ul> | <p><u>Developing a recipe - Autumn 2</u></p> <ul style="list-style-type: none"> <li>•Evaluate and compare existing sauces. Prepare a range of ingredients safely.</li> <li>•Design an appealing label to market a product.</li> <li>•Follow and make an adapted recipe.</li> </ul> |              |

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| Structures |   |  |              |   |              |  |
|------------|---|--|--------------|---|--------------|--|
| EYFS       | KS1 Cycle A   | KS1 Cycle B  | LKS2 Cycle A | LKS2 Cycle B  | UKS2 Cycle A | UKS2 Cycle B   |
|            | <u>Baby Bear's Chair - Summer 2</u><br>•Know that a <b>broad base will make a structure more stable.</b><br>•Know that structures can be made stronger, stiffer and more stable.<br>Know why they have chosen specific textiles or materials. | <u>Constructing a Windmill - Spring 2</u><br>•Know that a windmill is a structure with sails that are moved by the wind.<br>•Know that the <b>shape and weight of a structure will affect how stable it is.</b><br>Know that a windmill needs sails that catch the wind a rotor that allows the sails to turn. |              | <u>Constructing a castle - Summer 1</u><br>•Know the main features of a castle.<br>•Know that <b>multiple shapes can be combined to form a strong and stable structure.</b> |              | <u>Bridges - Summer 2</u><br>•Know some <b>different ways to reinforce structures.</b><br>•Know that <b>triangles are a strong shape.</b><br>Know why material selection is important based on their properties. |
|            | Structure, stable, model, base  | Base, centre, rotate, rotor, rotor blades, sails   |              | Turrets, battlements, drawbridge,   |              | Beam bridge, truss bridge, arch bridge, reinforce, joints, hardwood, softwood  |

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## Design - make - evaluate

| EYFS  | KS1 Cycle A   | KS1 Cycle B  | LKS2 Cycle A | LKS2 Cycle B  | UKS2 Cycle A | UKS2 Cycle B   |
|---|---|--|--------------|---|--------------|--|
| <p>Know what resources are available to make their creation and chose these appropriately.</p> <p>Know which tools to use for different purposes and use them safely.</p> | <p><u>Baby Bear's Chair - Summer 2</u></p> <ul style="list-style-type: none"> <li>•Design a stable chair that will hold a given weight.</li> <li>•<b>Evaluate the product based on the criteria given.</b></li> </ul> | <p><u>Constructing a Windmill - Spring 2</u></p> <ul style="list-style-type: none"> <li>•Create a stable structure that will not get blown over in the wind.</li> <li>•Create sails that are shaped to catch the wind.</li> <li>•Use a sharp point to safely create a hole.</li> <li>•<b>Evaluate a product on its suitability for purpose.</b></li> </ul> |              | <p><u>Constructing a castle - Summer 1</u></p> <ul style="list-style-type: none"> <li>•Design a castle that is strong, stable and made from a series of 3D shapes.</li> <li>•<b>Cut accurately, score edges and use glue appropriately to construct different 3D shapes.</b></li> <li>•Join 3D shapes to create a castle that fits the design brief.</li> </ul> |              | <p><u>Bridges - Summer 2</u></p> <ul style="list-style-type: none"> <li>•<b>Design a stable structure that is able to support weight.</b></li> <li>•Use triangles to create truss bridges that span a given distance and support a load.</li> <li>•Independently measure and mark wood accurately.</li> <li>•Use the correct technique to saw safely.</li> </ul> <p>Adapt and improve own bridge structure by identifying points of weakness and reinforcing as necessary.</p> |
|   |   | •  |              |   |              |  |

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| Textiles |  |             |  |              |              |   |
|----------|--|-------------|--|--------------|--------------|---|
| EYFS     | KS1 Cycle A  | KS1 Cycle B | LKS2 Cycle A   | LKS2 Cycle B | UKS2 Cycle A | UKS2 Cycle B  |
|          | <u>Puppets - Spring 1</u><br>•Know that fabrics can be joined together using pins, staples or glue.<br>• <b>Know that a template is used to cut out the right shape.</b> |             | <u>Uggs Trousers - Autumn 2</u><br>•Know how to consider the purpose and audience for their product.<br>• <b>Know that sewing can be used to join materials but also to decorate them.</b> |              |              | <u>Stuffed Toys - Autumn 2</u><br>•Know that blanket stitch is a good way to join two pieces of fabric.<br>•Understand that it is easier to finish simpler designs to a high standard.<br>• <b>Know that small, neat stitches are important to ensure that the product is strong and holds the stuffing securely.</b> |
|          | Fabric, template, embellish, stitches  |             | Running stitch, cross stitch, purpose  |              |              | Accurate, blanket stitch, stuffing  |

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| EYFS | KS1 Cycle A   | KS1 Cycle B | LKS2 Cycle A  | LKS2 Cycle B | UKS2 Cycle A | UKS2 Cycle B   |
|------|---|-------------|---|--------------|--------------|--|
|      | <p><u>Puppets - Spring 1</u></p> <ul style="list-style-type: none"> <li>•Begin to develop design ideas through discussion, observation, drawing and modelling.</li> <li>•Design a puppet based on a character that they like.</li> <li>•<b>Use a template to cut out a puppet that fits their hand.</b></li> <li>•Join 2 pieces of fabric together using pins, staples or glue. Embellish the design using different techniques (simple stitches, glueing on features etc)</li> </ul> |             | <p><u>Uggs Trousers - Autumn 2</u></p> <ul style="list-style-type: none"> <li>•Design a product that is purposeful and attractive.</li> <li>•Use a range of stitches including running and cross stitch.</li> </ul> <p><b>Evaluate products for both their purpose and appearance and make suggestions for improvement.</b></p> |              |              | <p><u>Stuffed Toys - Autumn 2</u></p> <ul style="list-style-type: none"> <li>•Design a product that meets a design criteria.</li> <li>•Make a template that is proportional.</li> <li>•Use blanket stitch to join two pieces of fabric.</li> <li>•Use applique and/or stitches to decorate fabric.</li> <li>•<b>Stuff a toy, repairing any holes or gaps.</b></li> </ul> |