

# D&T Conceptual Knowledge & Vertical Concepts



## Part 1 of 3

	Materials	Mechanisms
EYFS	<ul style="list-style-type: none"> <li>Materials can be artificial (man-made) or natural.</li> </ul>	
Y1	<ul style="list-style-type: none"> <li>Materials include woods, paper, card, rubber, plastics, metals, fabrics, glass, rock, water, plasticine/clay</li> <li><b>Science:</b> Materials have different properties and are used to make different objects.</li> <li><b>Science:</b> Physical properties of materials include hard / soft, dull / shiny, rough / smooth.</li> </ul>	<ul style="list-style-type: none"> <li>A mechanism makes changes movement or makes movement easier.</li> <li>A mechanism has an input and an output.</li> <li>A lever is a simple mechanism. It is a rigid beam that pivots (turns).</li> <li>A slider is a simple mechanism. It is a rigid beam that moves back and forth on a straight line.</li> <li>A linkage is a system of links that are joined together to control movement. A lever is an example of a linkage.</li> </ul>
Y2	<ul style="list-style-type: none"> <li><b>Science:</b> Physical properties of materials include the above plus malleable / not malleable, waterproof / not waterproof, heatproof / not heatproof, windproof / not windproof, absorbent / not absorbent.</li> <li>Materials - including different types of fabric - have different properties and are used to make different objects.</li> </ul>	<ul style="list-style-type: none"> <li>A moving buggy will include the body, wheels, axles, axle holders, and chassis.</li> <li>There are two types of axle: fixed and free.</li> <li>Fixed axles attach to the chassis.</li> <li>Free axles are not attached to the chassis and can spin within the chassis.</li> </ul>
Y3	<ul style="list-style-type: none"> <li><b>Science:</b> Physical properties of materials include the above plus transparent / translucent / opaque, magnetic / non-magnetic.</li> </ul>	
Y4	<ul style="list-style-type: none"> <li><b>Science:</b> Physical properties of materials include the above plus good electrical conductor / poor electrical conductor (insulator), good thermal conductor / poor thermal conductor (insulator)</li> <li><b>Science:</b> Chemical properties of materials include toxicity and flammability.</li> </ul>	<ul style="list-style-type: none"> <li>A pulley is a simple mechanism. It is a grooved wheel that spins on an axle.</li> <li>A drive belt transfers movement from one pulley to another.</li> <li>A cam changes the direction of movement from rotary to reciprocal.</li> <li>A spring is an energy store. It stores energy that can be transferred to a different energy store.</li> <li>Pulleys can redirect forces, or reduce the force required to lift heavy objects.</li> </ul>
Y5	<ul style="list-style-type: none"> <li>Explicit review of the above.</li> </ul>	<ul style="list-style-type: none"> <li>Explicit review of the above.</li> </ul>
Y6	<ul style="list-style-type: none"> <li>Explicit review of the above.</li> </ul>	



# D&T Conceptual Knowledge & Vertical Concepts



## Part 2 of 3

	Structures	Programming & Control
EYFS	To be added	
Y1	<ul style="list-style-type: none"> <li>• 2D shapes have a length and width.</li> <li>• 3D shapes have a length and width and height.</li> <li>• Free-standing structures can be made stronger with stiffer materials, thicker materials, or with more layers of material (laminating).</li> <li>• Free-standing structures can be made more stable by having a wider base or a heavier base.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Computing:</b> Electronic control systems have inputs, outputs and a central processor.</li> <li>• <b>Computing:</b> A process flow chart drives a programmable system.</li> <li>• <b>Computing:</b> Flow charts use key words of 'if', 'then', 'stop', 'start', 'repeat' and other command words (depending on software)</li> <li>• <b>Computing:</b> Programmes can run for a given number of loops or a set amount of time, or until something is no longer true.</li> <li>• <b>Computing:</b> A variable is something that be changed.</li> </ul>
Y2	<ul style="list-style-type: none"> <li>• Triangulation makes structures stronger and more stable.</li> </ul>	
Y3	<ul style="list-style-type: none"> <li>• Triangulation makes structures and joints stronger and more stable.</li> <li>• Free-standing structures can be made more stable by adding a stand.</li> <li>• Ties can make structures more stable.</li> </ul>	
Y4	<ul style="list-style-type: none"> <li>• Structures can be made by slotting items together.</li> <li>• A shell structure has a continuous outer 'shell' and do not have a frame, like an egg shell or a dome in a building.</li> <li>• A frame structure is made from separate pieces of material called members that form a frame, like a climbing frame or most houses.</li> <li>• Frame and shell structures can be made by folding 2D nets.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Science:</b> A complete circuit has at least one cell and at least one functioning component connected in a continuous loop. An incomplete circuit has components missing or is not connected in a continuous loop.</li> <li>• <b>Science:</b> A short circuit is a circuit with just a cell and no other components. They can be dangerous.</li> <li>• <b>Science:</b> Electrical components include: wire, lamp, buzzer, motor and switch.</li> <li>• <b>Science:</b> Electrical appliances should be switched off when not in use.</li> <li>• <b>Science:</b> Switches complete or break a circuit.</li> <li>• Apply the above to a D&amp;T context.</li> </ul>
Y5	<ul style="list-style-type: none"> <li>• Explicit review of the above.</li> </ul>	
Y6	<ul style="list-style-type: none"> <li>• Explicit review of the above.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Science:</b> A non-renewable energy source is one that is used much faster than it is created. Fossil fuels take millions of years to form but minutes to burn, so we will run out. Burning fossil fuels to transfer electrical energy is a non-renewable energy source.</li> <li>• <b>Science:</b> Renewable energy sources quickly replenish themselves, meaning that we can use them again and again and we will not run out. Wind, solar, geothermal and hydrological power are all examples of renewable energy sources.</li> <li>• Apply the above to a D&amp;T context.</li> </ul>



# D&T Conceptual Knowledge & Vertical Concepts



## Part 3 of 3

D&T Shaping the World	
EYFS	To be added
Y1	<ul style="list-style-type: none"> <li>• Examples of levers in everyday life include see-saws, wheelbarrows, door handles and scissors.</li> <li>• An artist makes something beautiful that has meaning. Designers make things that are useful and have a purpose, which may also look beautiful.</li> <li>• Designers and architects make models of spaces like towns to help them plan them.</li> </ul>
Y2	<ul style="list-style-type: none"> <li>• An artist makes something beautiful that has meaning. Designers make things that are useful and have a purpose, which may also look beautiful. Engineers are scientists who use their knowledge to make things that work like bridges and cars.</li> <li>• <b>History:</b> The wheel is a very important invention because it helped people to move heavy things more easily. They did not need to carry them or use animals to carry them.</li> </ul>
Y3	<ul style="list-style-type: none"> <li>• Free standing structures in the world around us have been made strong and stable with triangulation, using strong materials and having a wide base.</li> </ul>
Y4	<ul style="list-style-type: none"> <li>• <b>History:</b> Prehistoric Britons, Ancient Egyptians, Ancient Greeks and Ancient Maya used knowledge of strong structures to build Stonehenge, pyramids and temples a very long time ago.</li> <li>• Flat pack furniture has made it easier for people to buy and transport furniture to their home.</li> <li>• There are natural and artificial shell structures and frame structures all around us.</li> </ul>
Y5	<ul style="list-style-type: none"> <li>• Technology – and programmable technology – has had a huge impact on the world in living memory.</li> <li>• <b>History:</b> Prehistoric Britons, Ancient Egyptians, Ancient Greeks, Ancient Maya, Early Islamic Civilisation, and Romans used knowledge of mechanisms to make levers and pulleys.</li> </ul>
Y6	<ul style="list-style-type: none"> <li>• Designers and engineers have developed sustainable systems in agriculture, waste and electricity generation.</li> </ul>



# Food Conceptual Knowledge & Vertical Concepts



## Part 1 of 2

	Food Sources	Nutrition & Eating
EYFS	To be added	
Y1	<ul style="list-style-type: none"> <li>• <b>Science:</b> A plant is a living thing that grows in one place. A tree is a type of plant.</li> <li>• <b>Science:</b> The basic parts of plant include leaves, flowers, roots, stem (or trunk).</li> <li>• Fruits and vegetables come from plants (including trees).</li> <li>• Fruits contain a plant's seeds. Vegetables are part of the plant.</li> <li>• Food can come from farms, allotments and gardens.</li> <li>• Fruits and vegetables are usually harvested in a particular season. Different foods are in season at different times of the year.</li> </ul>	<ul style="list-style-type: none"> <li>• We should eat 5 portions of fruit or vegetables each day.</li> <li>• 'Eating a rainbow' means to different types of fruits and vegetables, that might have lots of different colours.</li> <li>• Fruits and vegetables both contain lots of good things for our bodies. Fruits contain more sugar, so we should eat less of them</li> </ul>
Y2	<ul style="list-style-type: none"> <li>• <b>Science:</b> Many plants make fruits or vegetables. Some of these grow below ground.</li> <li>• <b>Science:</b> Some plants grow from bulbs. A bulb is a resting stage for certain plants.</li> <li>• Foods come from a range of sources, including plants (fruits and vegetables) and animals (meat).</li> <li>• Milk comes from animals like cows, sheep, and goats.</li> <li>• Foods made from animal milks are called dairy products.</li> <li>• Some foods are eaten as they are (e.g. milk; fruits and vegetables). Some foods are processed in some way before we eat them (e.g. cheese is made from milk).</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Science:</b> Humans need to eat a healthy and balanced diet. This should include all the nutrients that we need, should be high in fruits and vegetables and low in fats, salt and sugars.</li> <li>• Vegetarians choose not eat animal meat.</li> <li>• Vegans do not eat any animal product. They eat milks/cheeses made from plants.</li> <li>• Some foods are sweet, and some are salty.</li> <li>• Texture is about how food feels in our mouths. Food textures include hard, soft, rough, smooth, crunchy, crispy, chewy and creamy.</li> <li>• Food is more interesting to eat if it has more than one texture at a time.</li> </ul>
Y3	<ul style="list-style-type: none"> <li>• Bread is made from flour, which is ground seeds of the wheat plant.</li> <li>• Sources of meat include chicken, sheep (lamb), pigs (pork products), tuna and other fish.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Science:</b> The main food groups are carbohydrates (starch and sugars), proteins, fats, fibre, vitamins and minerals. Humans need a balanced diet.</li> <li>• Some people are allergic to certain types of food, like nuts or gluten. This means their body reacts when the eat or are in contact with these foods. Some food allergies are mild, and some can be very serious.</li> </ul>
Y4	<ul style="list-style-type: none"> <li>• Beans and lentils are edible seeds from plants.</li> <li>• Seasoning adds to the taste of food. Seasoning can include salt, spices (like pepper), herbs, and sugar.</li> <li>• Spices are usually made from the seeds, roots, stem or fruits of a plant and add flavour to food.</li> <li>• Herbs are usually the leaves of a plant and add flavour to food.</li> <li>• Mushrooms are not plants nor animals. They are a type of fungus.</li> </ul>	<ul style="list-style-type: none"> <li>• Some people are intolerant to certain types of food, like gluten or dairy products. This means their bodies cannot digest the foods. It can cause discomfort.</li> </ul>
Y5	<ul style="list-style-type: none"> <li>• Pasta is made from wheat flour and water (and sometimes egg).</li> <li>• Couscous is a type of pasta.</li> </ul>	<ul style="list-style-type: none"> <li>• Explicit review and application of the above.</li> </ul>
Y6	<ul style="list-style-type: none"> <li>• Foods can be minimally processed (like fresh fruit and vegetables); moderately processed (like cheese and flour); significantly processed (like baked beans); or ultra-processed (like ready meals; sugary cereals and crisps).</li> </ul>	<ul style="list-style-type: none"> <li>• A healthy diet is made up of mostly minimally and moderately processed foods. Too many ultra-processed foods should be avoided.</li> </ul>



# Food Conceptual Knowledge & Vertical Concepts



## Part 2 of 2

Food Safety & Hygiene	
EYFS	To be added
Y1	<ul style="list-style-type: none"> <li>• Store dairy products in the fridge.</li> <li>• Wash hands and tie hair back to stop the tiny living things on our hands getting onto the food and into our bodies.</li> <li>• Wear an apron to protect our clothes and stop the tiny living things on them getting into food and into our bodies.</li> </ul>
Y2	<ul style="list-style-type: none"> <li>• Tie hair back and wash hands after sneezing, coughing and going to the toilet to stop the tiny living things on our hands getting into our bodies.</li> </ul>
Y3	<ul style="list-style-type: none"> <li>• Food should not be eaten after the 'use by' date. Foods can be eaten after the 'best before' date, but we should check them first.</li> <li>• High risk foods with a 'use by' date should be kept in the fridge.</li> <li>• Hands should be washed after handling raw eggs to stop the tiny things living in there getting into our bodies, because they can make us unwell.</li> </ul>
Y4	<ul style="list-style-type: none"> <li>• Hobs and hand blenders need to be used with care, keeping our fingers away.</li> <li>• When blending hot liquids, the blender should be on and/or it is kept well away from the user.</li> <li>• Food preparation sources should be wiped down before and after use to stop the tiny living things on the surfaces getting onto food.</li> <li>• Food preparation areas should be left clean so that food pests are not attracted.</li> </ul>
Y5	<ul style="list-style-type: none"> <li>• High risk foods that are cooked and ready to eat should be served immediately or kept in the fridge for 2-4 days.</li> <li>• <b>Science:</b> Use a material that is a poor thermal conductor (thermal insulator) when stirring hot food or removing food from the oven.</li> </ul>
Y6	<ul style="list-style-type: none"> <li>• <b>Science:</b> The tiny living things that we need to stop getting into food are bacteria and viruses. They can sometimes make us unwell.</li> </ul>

