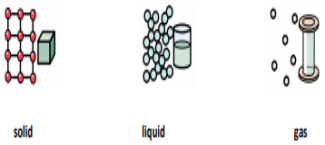
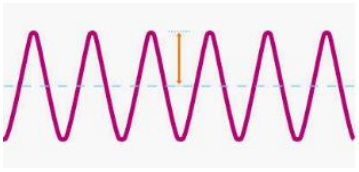
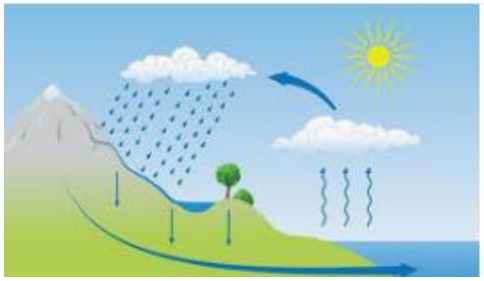
Topic Knowledge Organiser KS2 – Design it, Make it, Test it!
(STEAM-Science, Technolgy, Engineering, Art and Maths)
Hazel Class – Year 4

Changing Materials, Sound.	
What Should I Already Know? *(Science knowledge from Early Years and Key Stage 1)*  	• I know that the shape of some solid materials can be changed when they are **stretched, twisted, bent** and **squashed** • I can name a variety of sources of sound • I know we hear with our ears • I know that hearing is one of my five senses • I know that sounds can be combined using musical instruments • I know what an axle, pulley and chassis is • I know how to attach wheels to a chassis using an axle • I know how to construct a simple pulley 
Key Vocabulary	
Condensation	Small drops of water which form when water vapour or steam touches a cold surface, such as a window.
Cooling	Lowering the temperature of something.
Evaporation	To turn from liquid into gas; pass away in the form of vapour.
Freezing	If a liquid or a substance containing a liquid freezes, it becomes solid because of low temperatures.
Freezing point	The freezing point of a particular substance is the temperature at which it freezes. The freezing point of water is 0o C.
Gas	A form of matter that is neither liquid nor solid. A gas rapidly spreads out when it is warmed and contracts when it is cooled.
Heating	Raising the temperature of something.
Liquid	In a form that flows easily and is neither a solid nor a gas.
Melting	To change from a solid to a liquid state through heat or pressure.
Melting point	The melting point of a particular substance is the temperature at which it melts.
Particles	A tiny amount or small piece.
Precipitation	Rain, snow, sleet, dew, etc, formed by condensation of water vapour in the atmosphere.
Properties	The ways in which an object behaves.
Solid	Having a firm shape or form that can be measured in length, width, and height; not like a liquid or a gas.
Temperature	A measure of how hot or cold something is.
Water cycle	The process by which water on the earth evaporates, then condenses in the atmosphere, and then returns to earth in the form of precipitation.
Water vapour	Water in the gaseous state, especially when due to evaporation at a temperature below the boiling point.
Frequency	A measure of how many times per second the sound wave cycles.
Medium	Something that makes possible the transfer of energy from one location to another.
Sound waves	Invisible waves that travel through air, water, and solid objects as vibrations.
Source	Where something comes from.
Transmit	To pass from one place or person to another.
Travel	How something moves around.
Vibrations	Invisible waves that move quickly.
Volume	How loud or quiet a sound is. 

What will we investigate?	Key Questions/Lesson Focus
• Investigate the difference between solids and liquids • Observe that some materials change state when they are heated or cooled • Measure and research the temperature at which materials change state in degrees Celsius °C • Investigate the effect of temperature on the rate of ice melting • What would make it a fair test? • Explore the three states of matter • Recognise the characteristics of each of them • Present the data found in an experiment in different ways • Explore the effect of temperature on substances such as chocolate, butter, cream • Compare their melting points and place them in a table • Observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting • Investigate how the wind affects how much time fabric takes to dry • Investigate how temperature affects how much time fabric takes to dry • Observe evaporation and condensation in action by creating mini 'Water Cycles' • Layer different liquids in a tube and discover how and why they settle in a certain order • Investigate how to make a paper clip float on water • Make a lava lamp • Make and race a balloon car • Explore different materials that can be used to muffle sounds • Fill identical jars with different volumes of water. Which one creates the highest pitch? • Which material would make the best sound defender? • Make musical instruments How do their pitches differ? How does the volume differ? • During cookery sessions, explore physical and chemical changes that take place when food is cooked • Use a range of materials to make joints e.g., card strips, elastic bands, thread and ties, and plastic tubing. • Describe the way in which an axle and chassis help a vehicle to move • Identify, describe and evaluate products that contain pulleys and drive belts • Create pulleys and drive systems	• What materials are solids or liquids? • What is melting and freezing? • Are spaces really empty? • What affects drying time of a material? • What is evaporation? • What is condensation? • What is boiling? • Where does rain come from? • How does a thermometer work? • Why do we use graphs in Science? • How can we make the best string telephone? • How are sounds made? • How do sounds travel? • How can we make a sound louder and quieter? • How do sounds change as we move away from the source? • How can we change the pitch of a note? • How can we use air to make music? • Can we muffle sounds? • What is an echo? • What factors affect the pitch and the volume of sound? • How does changing proportions within a recipe affect the recipe? • What physical and chemical changes take place when food is cooked? e.g. heated and cooled • How does an axle and chassis help a vehicle to move? • What different ways can I attach an axle to a chassis, e.g. card triangles, drilled holes, cable clips and clothes pegs. • How do pulleys help movement? • How do axles help movement? • How well can an object slide on different materials? • How do things slow down? • How fast can you go? • What is making it move? 
What I will know by the end of the topic?	
• Sounds are made when something vibrates • Sounds get fainter the further they are further away from the source • The volume and pitch of a sound can be changed • The pitch of the note is affected by the length, thickness and tautness of a string or band • Explore different instruments to compare the volume of sound that they produce • Explore and test how sounds travel through different materials • Particles behave differently in solids, liquids and gases • Liquids have particles which are close together but random • In the gas state, particles can escape from open containers • Gases have particles which are spread out and move in all directions • Some materials change state when heated or cooled • Heating causes melting and evaporation • Removing heat causes condensing and solidifying (freezing) • Different materials melt at different temperatures • I will know how to define melting and freezing • I know that the temperature at which a material melts is called the melting point • I know that gases are materials with substance and weight • I understand that gases are lighter than liquids and solids	• I will know about the chemical and physical changes that happen when food is cooked • Detailed designs and plans can help my designing • Models, research and prototypes and templates can help my designing • A pulley allows a load to travel horizontally along a rope • Gears can work at right angles • How to produce a well-finished product that fulfils the design criteria • How to evaluate and assess my products against design criteria