Ashtree Primary School and Nursery Unit Progression Plan for Science

Materials

Year Group	Unit	Key Knowledge	Key Vocabulary
Nursery	Materials and Changing Materials	**Development Matters 2020 – Three & Four Year Olds – Understanding the World –** • Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about the differences between materials and changes they notice. **Expressive Art and Design** • Explore different materials freely, in order to develop their ideas about how to use them and what to make. • Develop their own ideas and then decide which materials to use to express them. • Join different materials and explore different textures.	Model and encourage children to use vocabulary such as: mix, stir, cook, hot, oven, microwave, change, burn, melt, hard, runny, set, freeze, freezer, cold, blended, hard, soft, bendy, stiff, wobbly, wood, plastic, paper, card, fabric Expose children to supplementary vocabulary such as: solid, liquid, rigid, stronger, weaker
Reception	Materials and Changing Materials	**Development Matters 2020 – Reception – Understanding the World –** · Explore the natural world around them. · Describe what they see, hear and feel whilst outside	**Model and encourage children to use vocabulary such as:** ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back **Expose children to supplementary vocabulary such as:** solid, liquid, gas, most suited
Year 1	Everyday Materials	• name some common materials • distinguish between an object and the material from which it is made • name some common objects around the school and home • identify some naturally occurring materials: wood, rock, water • identify some man-made materials: glass, metal, plastic • make observations of common objects and the different materials they are made of, • communicate these observations using descriptive words (e.g. *bendy, rough, hard)* • identify some properties of materials (e.g. see through, waterproof, absorbent) • compare and group together a variety of everyday materials on the basis of their simple physical properties.	Hard, stiff, rough, not bendy, opaque, strong, soft, shiny, smooth, waterproof, stretchy, material, transparent, dull, bendy, absorbent, wood, plastic, glass, magnetic, elastic, fabric, metal, water, rock,
Year 2	Uses of Everyday Materials	• identify uses of some common materials • give a reason why a material is suitable for its job • recognise that some materials will have more than one property which increases its suitability for its purpose (e.g. glass is transparent, rigid and weatherproof) • suggest several reasons why a material may or may not be suitable for a particular purpose • *explain why one material may be more suitable for a purpose than another by discussing properties* • identify materials that can be easily changed with force • identify materials that cannot be easily changed with force • describe pushes and pulls needed to change a material as big or small • describe changes in shapes because of the action of pushes, pulls, bends and twists	Brick, cardboard, transparent, waterproof, insulate, keep warm, hard, rigid, strong, flexible, squash, stretch, twist, bend
Year 3	Rocks and Soils	• understand that there are rocks under the Earths' surface • observe the characteristics of a variety of rocks • name and describe the characteristics of several rocks – sedimentary, igneous and metamorphic rock • classify rocks from the evidence of investigations • explain that different types of rock react differently to physical forces (e.g. water, rubbing) • explain that rocks are used for different purposes dependent on their physical properties – permeable, impermeable, crumbly • identify fossils in rocks • *explain why we do not see the soft parts of animals in fossils* • recognise that soil is a mixture of different materials and living things • recognise that soil contains dead plants and animals • recognise that there is rock under all surfaces and that soils come from rocks	Rock, soil, marble, granite, sand, stone, slate, chalk, clay, texture, absorbed, permeable, pebble, characteristic, surface, organic, impermeable, crystal, grains, crumbly, igneous, sedimentary, metamorphic, fossil,
Year 4	Solids, Liquids and Gases	• name some solids and liquids , state that air is a gas • state some differences between solids, liquids and gases • recognise everyday substances as mixtures of solids, liquids and/or gases • recognise that air is a material and that it is one of a range of gases which have important uses, recognise that gases flow from place to place, know that gases can be easily compressed, recognise that for a substance to be detected by smell, some of it must be in the gas state • describe the differences between solids and liquids, compares simple solids and liquids (e.g. in terms of ease of squashing or pouring) • observe what happens to a variety of materials when they are heated (e.g. chocolate, ice cream, butter, water) • identify a wide range of contexts in which changes of state take place, describe a few examples where these changes occur • state that ice, water and steam are the same material, identify the processes of melting, freezing, evaporation and condensation, • describe what happens to water when it is heated and cooled, recognise that these processes can be reversed • describe how when ice melts it turns to liquid and how when water freezes it becomes ice, describe how these processes can be reversed • describe how liquids evaporate to form gases and how gases condense to form liquids • sequence the changes that happen in the water cycle, describe the water cycle in terms of these processes • explain the relationship between liquids and solids in terms of melting and freezing, explain the relationship between liquids and gases in terms of evaporation and condensation • know that temperature can affect the rate of evaporation or condensation, describe the effect of temperature on evaporation, explain how changing conditions affects processes such as evaporation and condensation, identify a range of contexts in which changes take place (e.g. evaporation of puddles in the school playground or from clothes on a washing line, condensation in the bathroom)	Water, air, ice, milk, lemonade, juice, metal, solid, liquid, gas, pour, flow, change shape, squash, heat, cool, grain/granular, temperature, thermometer, freeze, melt, boil, evaporate, condense, steam, smoke, sea water, properties, melting point, degrees Celsius,

Year 5	Changes of Materials	• observe and explore the properties of materials (e.g. hardness, transparency, magnetism, electrical and thermal conductivity), suggest why particular materials are used for different jobs depending on their properties • identify some materials that are good thermal insulators and some everyday uses of these • recognise that metals are both good thermal and good electrical conductors • name some materials that will and some that will not dissolve in water, recognise that salt or sugar dissolves in water but sand won't • describe melting and dissolving and give everyday examples of each • identify and explore factors that affect the rate at which a solid dissolves • recognise that an undissolved solid can be separated from a liquid by filtering, describe the properties of mixtures which can be separated by filtration • recognise that a solid can be recovered from a solution by evaporation, explain that when solids dissolve they break up so small they can pass through the holes in the filter paper • describe some methods that are used to separate simple mixtures, use knowledge about how a specific mixture can be separated to suggest ways in which other similar mixtures might be separated • recognise that dissolving is a reversible change, recognise that some changes can be reversed and some cannot, recognise that changes of state are reversible • observe and explore a variety of chemical changes (e.g. burning), identify whether some changes are reversible or not • classify some changes as reversible (*e.g. dissolving)* and others as irreversible (*e.g. burning*) • recognise that irreversible changes often make new and useful materials, explain that in some cases the new materials made are gases and identify some evidence for the production of gases (e.g. vigorous bubbling)	Hardness, solubility, transparency, conductivity, thermal, insulation, dissolve, solution, separation, polymers, reversible, irreversible, evaporating, melting, evaporation, filtering, sieving, , dissolving, burning, rusting, vinegar, bicarbonate of soda, magnetism, insulators, conductors, soluble, insoluble
Year 6		Not covered in this year group	