EASTRY C OF E PRIMARY SCHOOL KNOWLEDGE ORGANISERS

YEAR GROUP	5
SUBJECT	Science
KEY VOCABULARY	**Materials – mixtures and separation** control variable (Y4), dissolve, evaporation, filtering, insoluble, mixture, sieving, soluble, solution, stopwatch (Y3), variable (Y3) **Materials – properties and changes** Burning, control variable (Y4), conductor, electrical conductivity (Y4),hardness (Y3),hazard, insulator, irreversible, change, method (Y3), reversible change, rust, rusting, safety, thermal conductivity, transparency, trustworthy (Y3) variable (Y3) **Forces and space – Earth and space** celestial bodies, data, day (daytime), degrees Celsius (Y4), discovery, Earth, evidence, gravity, Jupiter, line graph, line of best fit, Mars, Mercury, model, moon, Neptune, night (nighttime), orbit, phase, planet, Pluto, Saturn, season (Y1), solar system, spherical, star, temperature (Y4) **Living things – Lifecycles and reproduction** Adolescence, amphibian (Y1),asexual reproduction, bird (Y1), characteristic, data, estimate, fertilisation, gestation, gills, incubation, insect, life cycle (Y2), line graph, line of best fit, lungs, mammal (Y1), mating, metamorphosis, offspring, ovule, pollen, pollination, reproduction (Y3), sexual reproduction, testable **Forces and space – unbalanced forces** air resistance, anomaly, balanced, control variable (Y4), data, force (Y3),friction Gear, gravity, lever, line graph, line of best fit, pivot, pulley, relationship, surface area, trustworthy (Y3), unbalanced variable (Y3), water resistance **Animals – human time line** anomaly, evidence, foetus, gestation period, hormones, life cycle, line graph, old age period (menstruation), puberty, rate (Y3), relationship
END POINTS KNOWLEDGE	**Materials – mixtures and separation** Define the term **mixture** and name some common examples. Define the term **sieving** and explain how sieving separates mixtures. Define the term **filtering** and explain how filtering separates mixtures. Define the terms **solution** and **dissolve** and name some common examples of solutions. Recall some factors that affect the time taken to dissolve. Describe the effect of temperature on the time taken to dissolve. Define the term **evaporating** and explain how evaporating separates solutions. Identify when sieving, filtering and evaporating should be used.

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Materials – properties and changes

Determine the hardness of different materials and link this to their uses.
Determine the transparency of different materials and link this to their uses.
Determine the thermal and electrical conductivity of different materials and link this to their uses.
Demonstrate, identify and describe reversible and irreversible changes.

Forces and space – Earth and space

Describe the geocentric and heliocentric models.
Name and describe the shape of celestial bodies.
Describe the orbits of celestial bodies in the Solar System and name the force that keeps them in their orbits.
Describe the orbit of the Moon around the Earth and its phases.
Explain how day and night occur.
Explain how the seasons occur.
Explain how a sundial works.
List some of the uses of satellites and explain why space junk poses a problem to them.

Living things – Lifecycles and reproduction

Describe the life cycle of a plant, including the reproductive stage.
Describe the life cycle of a mammal.
Describe the life cycle of a bird and compare it with that of a mammal.
Describe the life cycle of an amphibian.
Describe the life cycle of an insect and compare it with that of an amphibian.
Describe asexual reproduction in plants.

Forces and space – unbalanced forces

Describe gravity and its effects.
Describe the relationship between mass and gravity.
Describe air resistance and its effects.
Describe friction and its effects.
Describe water resistance and its effects.
Describe the relationship between surface area and air and water resistance.
Explain how to make an object aerodynamic or streamlined.
Describe the effects of levers, pulleys and simple machines on movement.

Animals – human time line

	Order the stages in growth and development from birth to old age. Describe physical and developmental changes from a baby through to old age. Describe changes that occur in males and females during puberty. Suggest ways to manage the changes that occur during puberty. Recall what is meant by a gestation period. Describe how gestation varies across animals and compare this to humans.
Working Scientifically Begin in yr 5 consolidate in yr 6	**Posing questions** Raising questions throughout the enquiry process. Identifying testable questions. Selecting the most appropriate enquiry method to answer questions and give justification. **Planning** Suggesting which variables will be changed, measured and controlled. Making and explaining decisions about what observations to make and how long to make them for. Writing a method including detail about how to ensure control variables are kept the same. Writing a method that considers reliability by planning repeated readings. Suggesting the most appropriate equipment to make observations and measurements and justifying their choices. **Predicting** Making increasingly scientific predictions by: Using previous scientific knowledge and evidence to inform their predictions. Using scientific language to describe a potential outcome or explain why they think something will happen. Making links between topics to evidence a prediction. **Observing (qualitative data)** Using their senses to describe, in detail and with a broader range of scientific vocabulary, what they notice or what has changed. **Measuring (quantitative data)** Using standard units to measure and compare with increasing precision (decimals). Reading a wider variety of scales with unmarked intervals between numbers. **Researching** Gathering answers to open-ended questions from a variety of sources. **Recording (diagrams)** Drawing scientific diagrams by:

	Using a wider range of standard symbols. Drawing with increasing accuracy. Labelling with a broader range of scientific vocabulary. Annotating diagrams to explain concepts and convey opinions. **Recording (tables)** Using tables with columns that allow for repeat readings. Suggesting headings to tables, including units. Designing results tables with increasing independence with consideration of variables where applicable. Calculating the mean average **Grouping and classifying** Grouping in a broader range of contexts. Organising the layout of number and branching keys. Formulating appropriate questions for classification keys. **Graphing** Representing data by using line graphs and scatter graphs. Plotting points with greater accuracy. Reading the value of plotted points with greater accuracy. **Analysing and drawing conclusions** Writing a conclusion to summarise findings using increasingly complex scientific vocabulary. Suggesting with increasing independence how one variable may have affected another. Quoting relevant data as evidence of relationships. Identifying anomalies in repeat data and excluding results where appropriate. Comparing individual, class and/or model data to the prediction and recognising when they do not match. Using identified patterns to predict new values or trends **Evaluating** Identifying steps in the method that need changing and suggesting improvements. Identifying which variables were difficult to control and suggesting how to control them better. Commenting on the degree of trust by also reflecting on: Accuracy (human error with equipment). Reliability (repeating results). Sources of information (e.g. websites, books). Posing new questions in response to the data that would extend the enquiry. Deciding what data to collect to further test direct relationships.

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IT HELPS IF I ALREADY KNOW	**Materials- properties and change, mixtures and separation** To know that all substances around us can exist as solids, liquids and gases. To know that a property of a solid is that it keeps its shape unless a force is applied to it. To know that a property of a liquid is that it can flow freely and take on the shape of a container. To know that a property of a gas is that it does not have a fixed shape and can escape from an unsealed container.To know that heating causes solids to turn into liquids (melting) and liquids to turn into gases (evaporating). To know that cooling causes gases to turn into liquids (condensing) and liquids to turn into solids (freezing). To know that water can exist as a solid, a liquid or a gas. To know that the melting point of water is zero degrees Celsius and the boiling point of water is 100 degrees Celsius. To know that water flows around the world in a continuous process called the water cycle.To know that in the water cycle, evaporation is when bodies of water are heated and turn into water vapour.To know that in the water cycle, condensation is the process of water vapour cooling to form water droplets in clouds, which can result in precipitation. To know that the rate of evaporation increases as temperature rises. **Animals – humans** To know the main organs of the human digestive system (mouth, teeth, tongue, oesophagus, stomach, small and large intestines) and describe their simple functions.To know the different types of human teeth (incisor, canine, premolar and molar) and their simple functions. To know that it is important to brush teeth twice a day, make good food choices and visit the dentist regularly. To describe the teeth of carnivores and herbivores, and understand why they are different. To know that predators hunt for their food and prey are the animals being hunted. To know that producers make their own food. To know that food chains begin with a producer followed by consumers, and arrows to show the energy passed on. **Forces and space – unbalanced forces** To know some examples of contact and non-contact forces.To know that some forces are a result of contact between two surfaces, but some forces can act at a distance (e.g. magnetism). To know the North and South poles of a magnet. To know some examples of magnetic materials, including iron and nickel, and how they react to a magnet and each other. To know some different examples of magnets, including bar, horseshoe, button and ring, To know some uses of magnets.To know that friction is a contact force that acts between two surfaces to slow an object down. To know that magnetism is a non-contact force that affects objects containing magnetic metal. To understand that the opposite poles of a magnet attract one another and like poles repel one another.To know that rougher surfaces have more friction between them than smoother surfaces.

	To understand that the strength of different magnets may vary. **Living things – lifecycles** To know that living things can be grouped in different ways. To know that a classification key can be used to group and identify plants and animals. To know that vertebrates are animals which have a backbone and invertebrates are animals which do not have a backbone. To know that plants can be grouped into flowering or non-flowering varieties. To know that flowering plants include grasses and non-flowering plants includes ferns and mosses. To know that there are five main vertebrate groups: birds, mammals, reptiles, amphibians and fish. To know that invertebrate groups include snails, slugs, worms, spiders and insects. To know that habitats can change throughout the year and this can be dangerous for living things. To know that humans can have both a positive and negative impact on the environment. **Forces and space – Earth and space** This is an introductory unit