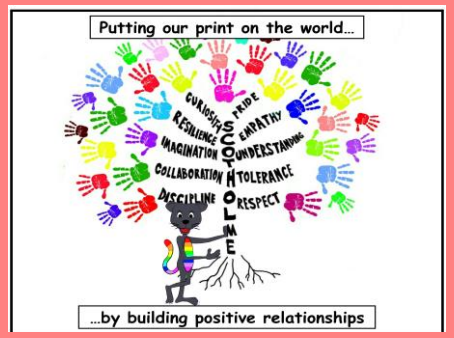

Scotholme Science

Year 5

Kate Hall

Subject- Science

CONTENTS

Threshold Concepts and Milestones

Threshold Concept	Year 5	Content
Work scientifically This concept involves learning the methodologies of the discipline of science.	• Plan enquiries when variables are given. • Use appropriate apparatus, and materials during fieldwork and laboratory work. • Take measurements, using a range of scientific equipment, whilst beginning to use accuracy and precision. • Record data and results of increasing complexity using classification keys, tables, bar and line graphs, and models. • Present findings in written form, displays and other presentations. • Use test results to make predictions to set up further comparative and fair tests.	Use these skills in all discussion and experiment sessions. Understand and develop the skills that help you to think like a scientist. Be curious and want to find out more. Understand the concept of fair and comparative tests. Carry out a range of fair tests, hypothesising, selecting equipment, measuring with accuracy, recording data and using it to draw evidence based conclusions. Select and use equipment to make a range of more complex measurements accurately, record the measurements in a variety of chosen ways including line graphs and use this to draw conclusions. Present the data collected to others using an appropriate method including the use of line graphs. Use the data collected to make further hypotheses and carry out further tests. Use appropriate vocabulary and scientific language when explaining. Use labelled diagrams and photographs. Create video explanations.

BIOLOGY 1 **Understand plants** This concept involves becoming familiar with different types of plants, their structure and reproduction.	• Relate knowledge of plants to studies of all living things.	Build on prior learning. Collect/grow a range of plants. Create a range of complex identification keys, using these species. Classify a range of plants by their characteristics. Carry out a self-designed experiment to illustrate the known conditions for growth of a plant.

BIOLOGY 2 **Understand animals and humans** This concept involves becoming familiar with different types of animals, humans and the life processes they share.	• Describe the changes as humans develop to old age. • Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. • Describe the simple functions of the basic parts of the digestive system and reproductive system in humans. • Recognise the importance of diet, exercise, drugs and lifestyle on the way the human body functions. • Describe the ways in which nutrients and water are transported within animals, including humans.	Using evidence, describe and give reasons for the changes from baby to old age. **Growth and change resource** Study, understand and explain the circulatory system, using the appropriate technical vocabulary Study, understand and explain the digestive system, using the appropriate technical vocabulary. Study, understand and explain the reproductive system, using the appropriate technical vocabulary. https://www.bbc.co.uk/bitesize/topics/zgssgk7/articles/z2msv4j Understand the effects of a healthy lifestyle on the body and explain how this affects the functions of the various organs. Understand how drugs affect the human body. Understand the role of vitamins and minerals – where they come from and how they affect the human body and animals Understand the role of water in keeping the body healthy in all mammals

BIOLOGY 3 **Investigate living things** This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.	• Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. • Describe how living things are classified into broad groups according to common observable characteristics.	**Animal gestation periods resource** Understand the definitions of the terms mammal, amphibian, insect and bird. Observe creatures in their natural habitats and look closely at their features. Create labelled sketches to show features. Collate information to study similarities and differences. Study the local environment to understand which species live there and why. Look at the lifecycles of mammals, amphibians, insects and birds. How are these similar and how are they different?
BIOLOGY 4 **Understand evolution and inheritance** This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.		Focusing on several chosen species, understand and chronicle how they have adapted to their respective environments over time. Understand the concept of extinction and develop an understanding of creatures who are critically endangered and the reasons for this.

CHEMISTRY **Investigate materials** This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	• Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Demonstrate that dissolving, mixing and changes of state are reversible changes.	Build on prior learning. **Dissolving resource** **Dissolving candy canes experiment resource** **Dissolving jelly experiment resource** **Growing crystals resource** Investigate dissolving using a range of materials. Hypothesise about how to recover materials from solution. Carry out practical experiments to see if it is possible. Discuss the properties of solids/liquids and gases. Experiment with them to develop greater understanding **Bath bombs resource** **Magic inflating balloons resource** **Separating mixtures resource** **Kitchen Chaos resource** **Kitchen Chaos interactive resource:** https://4157.stem.org.uk/kitchen_chaos/index.htm Carry out filtration, sieving and evaporation to understand how the process works. **How can we clean our dirty water? – experiment resource and video link:** https://www.stem.org.uk/resources/elibrary/resource/315596/how-can-we-clean-our-dirty-water

		Using a mixture of materials – paper clips, salt, sand, marbles etc design and carry out an experiment to separate each material using a range of techniques.

PHYSICS 1 **Understand movement, forces and magnets** This concept involves understanding what causes motion.	• Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing. • Notice that magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.	Magnets resource link: http://science-notebook.com/electricity03.html **Magnetism resources** Develop an understanding of poles, attraction and repulsion. Experiment with magnets. Design and carry out an experiment to test a range of materials to see if they are attracted by a magnet. Hypothesise and give reasons for this prior to working practically. Understand why somethings are magnetic and others are not?
PHYSICS 2 **Understand light and seeing** This concept involves understanding how light and reflection affect sight.		Understand how reflection works. Experiment with a range of materials to see how reflective they are DATA LOGGERS

PHYSICS 3 **Investigate sound and hearing** This concept involves understanding how sound is produced, how it travels and how it is heard.	• Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound source increases.	Experiment with the pitch of a sound and the features of the object that makes it. Draw evidence based conclusions. Understand sound as a series of vibrations and how this affects the human ear. Experiment with the volume of a sound and the strength of the vibrations that produced it. Draw evidence based conclusions. Experiment with sound over distance. Understand and explain why sounds get quiet the further away you are from a sound source. DATA LOGGERS
PHYSICS 4 **Understand electrical circuits** This concept involves understanding circuits and their role in electrical applications.	• Use recognised symbols when representing a simple circuit in a diagram. • Recognise some common conductors and insulators, and associate metals with being good conductors.	Understand the concept of conductance and electrical insulation. What are the practical applications of conductors and insulators? Design and carry out an experiment to see which materials conduct electricity. Use the results of this to form and evidence based conclusion. Using evidence from this experiment, hypothesise about what makes a good insulator and suggest some potential examples.

PHYSICS 5 **Understand the Earth's movement in space** This concept involves understanding what causes seasonal changes, day and night.	• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	**Earth and space resources** Discuss seasons and seasonal change. Understand how the movement of the Earth relative to the sun brings about these changes. Carry out observations and record findings to understand the relative positions in the sky of the moon and the Earth and how this affects the apparent size and shape of the moon. **Phases of the moon resource** Phases of the moon clip: https://www.stem.org.uk/elibrary/resource/29939 **Day moon viewing resource** Moonrise and moonset times link: http://www.timeanddate.com/worldclock/moonrise.html Understand the structure of the sun, moon and earth. Carry out observations of daylight and darkness to understand day and night. Observe the movement of the sun across the sky. Research dawn time data from around the world. Using our research and observations, explain, with the use of suitable equipment, day and night and why the sun appears to move across the sky. Day and night clock link: https://www.timeanddate.com/worldclock/sunearth.html Space explorer animations resource link: https://www.stem.org.uk/resources/collection/162650/paxi-animations

		Space activities resource link: https://www.stem.org.uk/resources/collection/4182/unawe