Jeavons Wood Primary School – Science Knowledge Organiser

Topic: Properties and changes of materials | **Year:5** | **Strand: Chemistry**

Big Question: How do we choose the materials needed for special jobs? Are all changes to materials reversible?

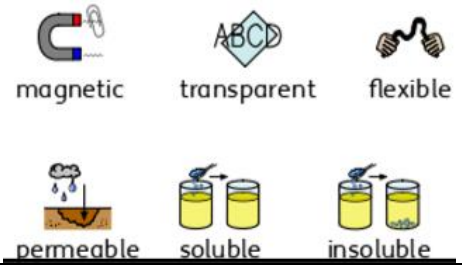
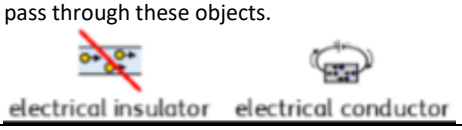
What should I already know?

*A variety of everyday materials including wood, plastic, glass, metal, water and rock.
*The physical properties of a variety of everyday materials (including those that are transparent) and to compare and group materials on the basis of these properties
*How materials are suitably used based on their properties.
*How magnets and electrical circuits work. Some materials which are magnetic.
*How shapes of solid objects can be changed by squashing, bending, twisting and stretching.
*Materials that are solids, liquids and gases and their particle structure.
*Some materials change state when they are heated or cooled and the temperature at which this happens.
*The roles of melting, evaporation and condensation in the water cycle and the role temperature has on the rate of evaporation.
*Some rocks are permeable.

Vocabulary

circuit	a complete route which an electric current can flow around
condensation	small drops of water which form when water vapour or steam touches a cold surface, such as a window
conductor	a substance that heat or electricity can pass through or along
dissolves	when a substance is mixed with a liquid and the substance disappears
electricity	a form of energy that can be carried by wires and in used for heating and lighting, and to provide power for devices
evaporation	to turn from liquid into gas; pass away in the form of vapour.
filtering	a device used to remove dirt or other solids from liquids or gases. A filter can be made of paper, charcoal, or other material with tiny holes in it.
flexible	an object or material can be bent easily without breaking
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.
insoluble	impossible to dissolve, esp. in a given liquid.
insulator	a non-conductor of electricity or heat
irreversible	impossible to reverse, turn back, or change.
liquid	in a form that flows easily and is neither a solid nor a gas.
magnetic	attracted to a magnet
melting	to change from a solid to a liquid state through heat or pressure
particles	a tiny amount or small piece
permeable	of a substance, being such that gas or liquid can pass through it
process	a series of actions used to produce something or reach a goal
properties	the ways in which an object behaves
rate	the speed with which something happens
resistance	the opposing power of one force against another.
solid	having a firm shape or form that can be measured in length, width, and height; not like a liquid or a ga
soluble	able to be dissolved.
solution	a mixture that contains two or more substances combined evenly
state	the structure or condition of something
temperature	a measure of how hot or cold something is
thermal	relating to or caused by heat or by changes in temperature
transparent	If an object is transparent, you can see through it
variable	something that can change or that has no fixed value

What will I know by the end of the unit?

How to group materials based on their properties using more complex vocabulary.	
What are thermal insulators and conductors	*Materials which are good thermal conductors allow heat to move through them easily. *Thermal conductors are used to make items that require heat to travel through them easily, such as a saucepan which requires heat to travel through to cook food. *Thermal insulators do not let heat travel through them easily. *Examples of thermal insulators include woollen clothes and flasks for hot drinks. 
What are electrical insulators and conductors	*Electrical conductors allow electricity to pass through them easily while electrical insulators do not. *Electrical insulators have a high resistance which means that it is hard for electricity to pass through these objects. 
What is dissolving	*When the particles of a solid mix with the particles of a liquid, this is called dissolving. *The result is a solution. *Materials that dissolve are soluble. *Materials that do not dissolve are insoluble. 
Can materials be separated after they have been mixed?	*Some materials can be separated after they have been mixed based on their properties - this is called a reversible change. *Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation. *When a mixture cannot be separated back into the original components, this is called an irreversible change. Examples of this include when materials burn or mixing bicarbonate of soda with vinegar.

Where will my learning go next?

Yr 7: The particulate nature of matter. Atoms, elements and compounds. Pure and impure substances. Chemical reactions.

Periodic table**.** Materials such as carbon, ceramics, polymers and composites.

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Big Question: How do we choose the materials needed for special jobs?
Are all changes to materials reversible?

Question 1: Thermal insulators...(tick two)	Start of unit:	End of unit:
do not allow heat to pass through easily		
allow heat to pass through easily		
keep heat contained and keep things warm		
do not keep heat contained and allow things to cool		

Q2: Examples of electrical conductors are....(tick all that apply)	Start of unit:	End of unit:
copper		
plastic		
wood		
iron		
rubber		

Question 3: Materials that dissolve are:	Start of unit:	End of unit:
insoluble		
soluble		
a solution		

Question 4: When solid particles mix with the particles of a liquid, this is called...	Start of unit:	End of unit:
evaporation		
filtering		
dissolving		
sieving		

Question 5: A synonym for the word 'permeable' is...	Start of unit:	End of unit:
waterproof		
absorbent		
magnetic		
transparent		

Question 6: Match these changes to the scientific name for the process.	Start of unit:	End of unit:
ice turns to water — condensation		
water turns to water vapour — evaporation		
water vapour turns to water — melting		

Question 7: Describe an efficient way of separating paper clips from rice and explain why you chose this method.	Start of unit:	End of unit:

Question 8: You conduct an experiment to investigate if some solids dissolve quicker than others. Name one thing you will do to make the test fair.	Start of unit:	End of unit:

Question 9: Match these mixtures to the most efficient methods of separation.	Start of unit:	End of unit:
salt and water — filtering		
rice and water — sieving		
sand and water — evaporating		

Question 10: Write an 'R' or an 'I' to indicate if these are examples of reversible or irreversible changes.	Start of unit:	End of unit:
frying an egg		
mixing paper clips and sand		
mixing sugar and water		
baking a cake		
mixing flour and water		
mixing coins and flour		
mixing bicarbonate of soda and vinegar		
mixing oil and water		