Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: Science Year: LKS2 year B

NC/PoS:

- compare and group materials together, according to whether they are solids, liquids or gases
- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Prior Learning (what pupils already know and can do)
Recognise a material and name its properties. Know a material is used because of its properties. Know the difference between a natural and manufactured material.

End Goals (what pupils MUST know and remember)
To know that materials can be solids, liquids or gases (the three states of matter)
To know the shape and volume of a solid doesn't change unless a bit is broken off
To know the shape of a liquid can change, depending on the container it is in, but its volume doesn't change
To know that most gases are invisible
To know the gas in a container completely fills the container so has the same shape and volume of the container it is in
To know liquids change into gases when they are heated – this is evaporation
To know liquids change into solids when they are cooled – this is freezing
To know gases change into liquids when they are cooled – this is called condensation
To know solids change into liquids when they are heated – this is called melting
To know the rate of evaporation depends on the temperature
To know evaporation is slow when it is cold and fast when it is hot
To know the water on Earth is constantly recycling using evaporation and condensation
To know the heat from the sun makes the water from the sea, lakes and rivers evaporate into water vapour
To know as the water vapour rises, it cools and condenses to form clouds, then falls as rain

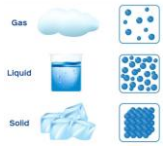
Key Vocabulary
water cycle, evaporation, water vapour, condensation, precipitation, property, matter, states, particles, mass, shape, volume, heat, melting, melting point, evaporating, evaporation, boiling points, process, condensing, condensation, freezing, freezing point, temperature, rate of evaporation

Session 1: review prior learning
What is a material? What is a property of a material?
Give children a group of materials and ask them to group in different ways. Tease out magnetic, transparent, opaque, malleable, stiff/rigid, etc
Look at career scientist:
https://pstt.org.uk/application/files/1116/2851/6355/Materials_scientist_-_Pearl_Agyakwa.pdf
https://pstt.org.uk/application/files/4616/2851/6691/Water_Scientist_-_Zoe_Ayres.pdf

Session 2:
Recap: uses of materials Why are some tables made of wood, wood and metal or plastic? Materials are chosen because of their properties and what they are being used for

Lo: to compare and group solids liquids and gases
Watch https://www.youtube.com/watch?v=wclY8F-UoTE
Give children a variety of solids, liquids and gases to group. Include things like rice, sugar and sand which can appear to act like a liquid as can be poured. Use a hand-held microscope to look at the structure of sugar etc. to prove it is a solid.

Discuss arrangement of particles in a solid, liquid, gas



Children write about groupings, giving reasons why using the properties of solids, liquids, gases
Vocabulary: property, matter, states, particles, mass, shape, volume

Session 3:
Recap: the 3 states of matter and their properties

Lo: to research the effects of heating solids and liquids
https://www.youtube.com/watch?v=pVTZySPJh5w melting points
https://www.youtube.com/watch?v=gZBt4_Ds3lI boiling points up to 2.03
Melt chocolate, butter and wax (use oil burner and a tealight)

Children research melting and boiling points of different substances
e.g. gold, leather, silver, rubber are some examples for melting

Vocabulary: heat, melting, melting point, evaporating, evaporation, boiling points, process

Session 4:
Recap: what are the processes called when we heat solids and liquids?
LO: to research the effects of cooling gases and liquids

Children research the freezing points of different liquids

Vocabulary: condensing, condensation, freezing, freezing point

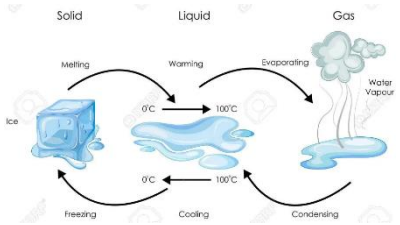
Session 5:
Recap: what are the processes called when we cool gases and liquids?

LO: to observe how temperature affects the rate of evaporation
What is evaporation? Watch https://www.youtube.com/watch?v=Z4qgBT48NaU
Experiment evaporation: using hand prints on paper towels, where in the playground would the hand print disappear more quickly? Why? Place towels in different locations.

Set up class experiment: Set up 2 glass jars with the same amount of liquid in, add food colouring then mark the level of the water. Put a lid on one jar and place both on a windowsill in the sun. over next few days mark any differences in water levels in preparation for next week's lesson

Vocabulary: temperature, rate of evaporation

Session 6:
Recap the processes to change states of matter
Model the changes of state for water



<u>Lo: to research the processes within the water cycle</u>
the water cycle
https://www.youtube.com/watch?v=y5gFI3pMvoI
nb.video has great real life images but spells vapour incorrectly

Vocabulary: water cycle, evaporation, water vapour, condensation, precipitation

Link to career scientist:
https://pstt.org.uk/application/files/1116/2851/6355/Materials_scientist_-_Pearl_Agyakwa.pdf
https://pstt.org.uk/application/files/4616/2851/6691/Water_Scientist_-_Zoe_Ayres.pdf

Scientists who have helped develop understanding in this field: the ancient Greeks