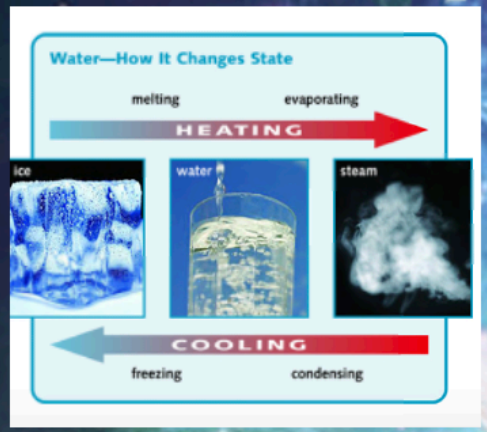
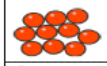
Magic Matters

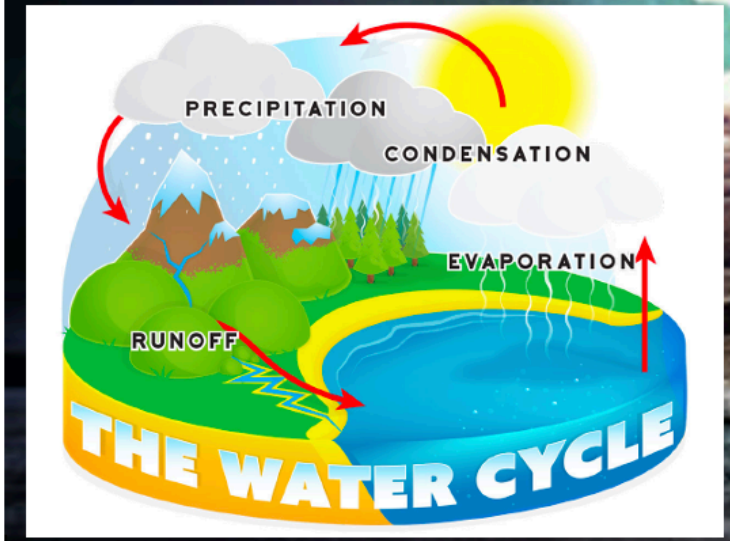
Spring Term 1

Who: Scientific Influences

Name/Picture	Why significant
 Antoine Lavoisier 1743 - 1794	Most noted for his discovery of the role oxygen plays in combustion. He recognized and named oxygen (1778) and hydrogen (1783).
 Robert Boyle 1627-1691	Boyle discovered that the volume of a gas decreases with increasing pressure and vice versa—the famous Boyle's law
 John Dalton 1766 - 1844	In 1803 he proposed matter is made up of atoms that are indivisible and indestructible.



Key Knowledge	
Types of Materials	
Solids 	Stays the same shape Can be held in your hands Can be cut into a new shape Examples – wood, metal, rock, ice
Liquids 	Flows and can be poured Changes shape to its container Volume never changes Examples – water, juice, oil
Gases 	Often invisible Always fills its container Shape & volume change Examples – oxygen, hydrogen, carbon dioxide
What does changes of state mean?	**When a material changes from one material type to another, we say 'it has changed state.'**



Sticky Knowledge

- Know that things are composed of a material in one of three states of matter: solid, liquid or gas
- Know that things are made of particles (tiny building blocks) and that these are organised differently in different states
- Know that materials can change state when temperature changes
- Know that when solids turn into liquids, this is called melting and the reverse process is called freezing
- Know that when liquids turn into gases, this is called evaporation and the reverse process is called condensation
- Know that when a solid turns into a gas without passing through the liquid state, this is called sublimation
- Know that the melting point of water is 0°C and the boiling point 100°C
- Know that water flows around our world in a continuous process called the water cycle
- Know that, along with evaporation, water on the Earth's surface moves to the air in a process called transpiration, where water turns into water vapour (gas) on the surface of leaves on plants
- Know that there are bonds between particles in a solid; as temperature increases, these bonds are partially overcome as the particles absorb energy and solids can change into liquids; with a further increase in temperature the particles become even more energetic and the bonds are overcome entirely so the liquid changes into a gas

Extended Specialist Vocabulary

Word	Definition
New Vocabulary	
bond	joined securely to something else
condensation	turn a gas into a liquid.
evaporation	turn a liquid into a gas.
precipitation	liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.
boiling point	the temperature at which a liquid boils and turns to vapour
melting point	the temperature at which a given solid will melt
states of matter	materials can be one of three states: solids, liquids or gases. Some materials can change from one state to another and back again.
liquid	a substance that flows freely but is of constant volume
gas	a substance which will expand freely to fill a whole container and has no fixed shape or volume
thermometer	an instrument for measuring and indicating temperature
water cycle	the cycle of processes by which water circulates between the earth's oceans, atmosphere, and land
transpiration	the exhalation of water vapour in plants
sublimation	When a substance changes from a solid to a gas, without going through the liquid change

Magic Matters

Spring Term 2

SOUND

VIBRATIONS

Sound is made when an object vibrates and therefore causes the air around it to vibrate too. These vibrations are carried to your ear for you to hear them.

Sound vibrations can travel through different materials:

SOLIDS: metals, stone, wood
LIQUIDS: water
GASES: air

Sound travels better through some materials than others. It travels very well through metal pipes for example.

The louder the volume, the bigger the vibrations. The size of the vibration is called the *amplitude*. Quieter volumes have smaller amplitudes and louder sounds have larger amplitudes.

Sounds travel in a *wave*. The vibrations make *air particles* closest to the object vibrate, which then passes the vibrations to the particle next to it and so on – like dominoes falling!

Outer Ear

Middle ear bones which include the hammer, anvil and stirrup. (The smallest bones in the human body!)

Nerve sends electrical signals to the brain.

Cochlea contains thousands of tiny hair cells which change the vibrations to electrical signals.

Ear drum which passes vibrations to the middle ear bones.

DID YOU KNOW?
Sounds get fainter (quieter) as the distance from the sound source increases.

DID YOU KNOW?
Soundproofing is when a material is used to absorb loud sounds. Recording studios or night clubs might use them to stop sound escaping the room! Soft, spongey or pliable material is often best for this.

PITCH

The pitch of a sound is how high or how low it sounds. A high pitch has a high sound and a low pitch has a low sound.

Stringed Instruments
Tighter, thinner or shorter strings make higher pitches. Faster vibrations make pitches high and slower vibrations make pitches low.

Wind Instruments
The column of air inside the instrument causes it to vibrate. Shortening this makes a higher sound, lengthening it makes a lower sound.

Percussion Instruments
The surface is struck and it therefore vibrates. Smaller instruments have higher sounds (smaller keys of a xylophone, hand bells etc.). The tighter or thinner the skin on a drum, the higher the pitch.