SW9 Partnership SCIENCE Medium Term Plan: Year Group: 5 Term: Teacher:

TOPIC	NATIONAL CURRICULUM	KEY VOCABULARY	POSSIBLE TRIP
EARTH & SPACE	• 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.	**TIER 2 (Academic):** Describe, model, observe, compare, explain, demonstrate, calculate, rotate. **TIER 3 (Topic Specific):** Solar system, Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, dwarf planet, Moon, celestial body, orbit, axis, rotation, spherical bodies, day, night, shadow, time zones, moon phases, vacuum, gravity, astronomer.	**Royal Observatory Greenwich (Planetarium):** Offers dedicated Key Stage 2 planetarium shows and workshops (such as Searching the Solar System) that visually demonstrate planetary orbits, Earth's rotation causing day and night, moon phases, and historical space models. **Wonderdome / Immersive Experiences** (In-School Provider): Brings a mobile digital planetarium dome directly into your school hall to project 360-degree models of the solar system, planet sizes, and moon orbits without travel costs.
PRIOR LEARNING	**Y3 & Y4:** Light & shadow changes, non-contact gravitational forces.		

	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6
ENQUIRY QUESTION	What are the celestial bodies that make up our Solar System?	How do planets orbit around the central star of our Solar System?	How does Earth's rotation on its axis cause day, night, and time zones?	How do shadows track the apparent movement of the Sun across the sky?	Why does the Moon appear to change shape as it orbits the Earth?	How did historical scientists debate geocentric vs heliocentric Solar System models?
LEARNING OBJECTIVES	To identify the Sun, 8 planets, dwarf planets, and moons as spherical bodies.	To describe planetary orbits around the Sun driven by gravitational pull.	To explain day and night using Earth's 24-hour rotation on its axis.	To track and analyse shadow length and direction throughout the daytime.	To model and explain the 8 phases of the Moon during its 28-day orbit.	To evaluate historical scientific evidence for Earth and space models.
ACTIVITY **WORKING SCIENTIFICALLY SKILLS**	**RESEARCHING & MODELLING:** Construct scale models of the Sun and 8 planets (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune).	**MODELLING:** Roleplay planetary orbits around a central Sun star; calculate relative orbital times (Earth 365 days).	**MODELLING:** Shine torches on rotating globes; demonstrate how Earth's spin creates light (day) and shadow (night) zones.	**OBSERVING OVER TIME:** Measure shadow sticks on school grounds every hour; plot shadow angle and length changes on line graphs.	**MODELLING:** Use lamps and polystyrene moon balls to observe light reflection changes creating 8 lunar phases.	**RESEARCHING:** Evaluate historical evidence supporting Ptolemy's Geocentric model vs Copernicus/Galileo's Heliocentric model.

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ASSESSMENT	Order 8 planets from the Sun and state that stars produce light while planets reflect light.	Explain that gravity keeps planets in elliptical orbits around the high-mass Sun.	Explain that 24-hour Earth rotation creates day/night and global time zone differences.	State pattern: shadows are shortest at solar noon when the Sun is highest.	Sequence lunar phases (New Moon, Crescent, Quarter, Gibbous, Full Moon).	Cite telescope evidence used by Galileo to refute the Geocentric model.
END POINT ASSESSMENT	Pupils can name and order the 8 planets in the Solar System, model Earth and planetary orbits around the Sun, explain Moon phases via its 28-day orbit, prove Earth's rotation creates day/night and shadow tracks, and describe celestial spherical structures.					
HIGHER ORDER QUESTIONS	Why was Pluto reclassified from a main planet to a dwarf planet in 2006?	Why do outer gas giant planets take many decades to complete one single orbit around the Sun?	If Earth spins at high speed, why don't humans feel themselves moving through space?	How can an ancient sundial be used to tell precise time without batteries or gears?	Does the Moon actually change shape or produce its own light beams?	Why did people historically believe the Earth was flat and at the centre of the universe?
FURTHER OPTIONAL QUESTIONS/BIG QUESTIONS FOR DISPLAY	Why does the Sun appear to move across our sky when it is Earth that is actually spinning? Why does the Moon seem to change its shape from a thin crescent to a full bright circle? What stops all the planets in our Solar System from flying off into deep dark space?					
INCLUSION & ADAPTATION	3D tactile planet sphere set ordered by size with visual name tags.	Human solar system walking orbit floor tracks with central Sun lamp.	Globe with sticky person figurine and flashlight showing Day/Night side split.	Pre-set outdoor shadow stick mat with pre-drawn hourly outline shapes.	Visual Moon phase Oreo cookie matching mat (Black base=Shadow, White cream=Lit).	Visual cards matching historical figures (Ptolemy vs Galileo) to orbit diagrams.
GREATER DEPTH	Calculate distance scale ratios (AU) for planet placements across the Solar System.	Analyze orbital speed mathematics and gravitational inverse-square relationships.	Calculate time zone conversions - $+1$ hr per 15° longitude across global cities.	Construct precision sundials calibrated to local latitude magnetic north.	Diagram solar and lunar eclipses showing umbra and penumbra shadow cones.	Analyze astronomical observation data supporting modern expand-universe models.