

Department Name	Cranbrook School Physics Department	Year Group	Y5/6
Week 1 of 6	Unit 5E: Earth, Sun and Moon	Time period	6 Weeks (approx. 9 hours)

Topic	Children Should Learn	Teaching Strategies	Outcomes	Extension work	Teacher Note <i>Health and Safety & resources</i>
Discussion of current ideas		<ul style="list-style-type: none"> Find out what children know about the Earth, Sun and Moon by asking them to draw and explain a picture showing how these would look to a traveller in space. Ask children questions about their drawings eg <i>Is the Earth flat?</i> <i>Is the Sun bigger than the Moon?</i> <i>Does the Sun move?</i> <i>Make drawings or models or both of their current ideas. Encourage children to show ideas about shape, relative size and separation of Sun, Earth and Moon.</i> 		<ul style="list-style-type: none"> This unit may be best taught in the winter months when children can look at the direction of the shadows soon after the Sun has risen and just before it sets. 	<ul style="list-style-type: none"> Modify course and necessary according to current understanding!! Drawing materials or better still... modelling their ideas of the Sun, Earth and moon system with play dough, plasticene or "salt dough". I'll let you know how it goes....!
Flat or spherical	<ul style="list-style-type: none"> that the Sun, Earth and Moon are approximately spherical that it is sometimes difficult to collect evidence to test scientific ideas and that evidence may be indirect 	<ul style="list-style-type: none"> Following discussion, use secondary sources and models and ask children whether these suggest the bodies are flat or spherical. Point out to children that it is only in the last 40 years that we have photographic evidence from space about the Earth being spherical and ask them to find out some earlier ideas about whether the Earth was flat or spherical and what evidence people used to support their ideas. 	<ul style="list-style-type: none"> recognise that the Earth, Sun and Moon are spheres describe some indirect evidence that the Earth is spherical 	<ul style="list-style-type: none"> modelling the Sun, Earth and moon system with play dough, plasticene or "salt dough". 	<ul style="list-style-type: none"> globe, photographs of the Earth, Sun and Moon taken from space pictures of ships sailing round the world, ships appearing and disappearing over the horizon all on memory stick flat and spherical objects to show and a bright light source (old projector) in a darkened room? A copied table for children to complete if required.

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Week 2 of 6	Unit 5E: Earth, Sun and Moon	Time period	6 Weeks (approx. 9 hours)

	Topic	Learning Objectives	Teaching Strategies	Outcomes	Extension work	Teacher Note <i>Health and Safety & resources</i>
	Bigger or smaller	<ul style="list-style-type: none"> To be able to describe the relative sizes of the Sun, Moon and Earth 	<ul style="list-style-type: none"> ◆ Remind children of the pictures they drew earlier and the photographs they saw and ask them to put Earth, Moon and Sun in order of size by selecting from a range of spheres. Explain to children that if a pea represents the Earth then the beach ball represents the Sun and the bead the Moon. 	<ul style="list-style-type: none"> select three spheres to represent the Earth, Sun and Moon recognising which is largest and which is smallest and making a reasonable match to relative size 	In discussing the relative sizes of the Sun and Moon, it may be helpful to point out that an aeroplane on the ground nearby looks much bigger than an aeroplane in the sky and how this helps to account for the apparent similarity in size of the Sun and the Moon.	<ul style="list-style-type: none"> eg football, beach ball, tennis ball, pea, ball bearing, peppercorn, tiny beads about 1/4 size of pea, table tennis ball
	Near or far	<ul style="list-style-type: none"> Understand the relative distances apart of the Sun, Earth and Moon and that these distance are very large indeed 	<ul style="list-style-type: none"> Ask three children to hold the three spheres and position them in the classroom to give an idea of their relative distances apart. 	<ul style="list-style-type: none"> select three spheres to represent the Earth, Sun and Moon and use them to illustrate these relative distances 	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> 30m tape measure, chalk.

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Week 3 of 6	Unit 5E: Earth, Sun and Moon	Time period	6 Weeks (approx. 9 hours)

Topic	Learning Objectives	Teaching Strategies	Outcomes	Extension work	Teacher Note <i>Health and Safety & resources</i>
What makes a day?	<ul style="list-style-type: none"> that the Sun appears to move across the sky over the course of a day that evidence may be interpreted in more than one way 	<ul style="list-style-type: none"> Ask children about where the Sun shines into the school (or their homes) at different times of day. Remind them of earlier work on shadows and ask them to suggest what this evidence shows. If necessary observe the length and position of the shadow of a stick set up in the playground at different times of day over successive days. 	<ul style="list-style-type: none"> describe how the apparent position of the Sun changes over the course of a day and clarify that this does not mean that the Sun is moving 	<ul style="list-style-type: none"> 	<p>SAFETY – warn children NEVER to look directly at the Sun. Blindness can result. Explain that this is possible with the correct equipment and precautions.</p> <p>10 x 1 Metre rulers (hope for a sunny day!)</p>
What makes a day?	<ul style="list-style-type: none"> that it is the Earth that moves, not the Sun, and the Earth spins on its axis once every 24 hours that it is daytime in the part of the Earth facing the Sun and night-time in the part of the Earth away from the Sun 	<ul style="list-style-type: none"> Use secondary sources <i>eg video, CD-ROM</i> to illustrate the Earth spinning on its axis. Show children a model of the process. Ask children to show others <i>eg by modelling or using themselves as Sun and Earth or by drawing or using other models</i> how night and day arise from the Earth spinning on its axis. Talk with children about the different representations. 	<ul style="list-style-type: none"> illustrate <i>eg using models or drawings</i> that different parts of the Earth face the Sun during the course of the day and where it is day and night explain that the apparent movement of the Sun is a result of the Earth rotating or spinning 	<ul style="list-style-type: none"> It is helpful to point out to children that when they are travelling by car or train, houses seem to move. Some children may have had the experience of thinking they were moving when a train travelling in the opposite direction started to move but they stayed stationary. It is possible to fix a small object to the globe and demonstrate how the shadow changes as the globe rotates and the light source remains still. 	<ul style="list-style-type: none"> <i>eg</i> using a globe and a strong light source to represent the Sun Old slide projector, globe and white painted sphere (about football sized)

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Week 4 of 6	Unit 5E: Earth, Sun and Moon	Time period	6 Weeks (approx. 9 hours)

Topic	Learning Objectives	Teaching Strategies	Outcomes	Extension work	Teacher Note <i>Health and Safety & resources</i>
Sun rise and Sun set	<ul style="list-style-type: none"> that the Sun rises in the general direction of the East and sets in the general direction of the West to make observations of where the Sun rises and sets and to recognise the patterns in these to present times of sunrise and sunset in a graph and to recognise trends and patterns in the data 	<ul style="list-style-type: none"> Ask children to use a compass to observe and record, on several days in the winter, the direction of the Sun or of shadows from the Sun when it has just risen and just before it sets. Provide children with secondary data about times of sunrise and sunset and help them to present this data as a graph and to identify patterns in the data. Discuss with children whether it is dark or light when they get up in the winter and summer and what sorts of activities they can do on winter and summer evenings. 	<ul style="list-style-type: none"> generalise that the Sun rises in the East and sets in the West draw simple graphs and identify patterns <i>eg sunrise gets earlier and earlier up to June and then it starts getting later; when sunrise gets earlier, sunset gets later so it is daylight longer</i> 	Times of sunrise and sunset throughout the year can be found in diaries, newspapers and HMSO publications. It may be helpful to simplify this data before presenting it to children.	
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Week 5 of 6	Unit 5E: Earth, Sun and Moon	Time period	6 Weeks (approx. 9 hours)

Topic	Learning Objectives	Teaching Strategies	Outcomes	Extension work	Teacher Note <i>Health and Safety & resources</i>
What is a year?	<ul style="list-style-type: none"> that the Earth takes a year to make one complete orbit of the Sun, spinning as it goes that it is not always easy to gain information about phenomena <i>eg the length of a year</i> using first-hand experience 	<ul style="list-style-type: none"> Ask children to use secondary sources <i>eg CD-ROM, reference books</i> to find out what a 'year' is. Discuss with children their understanding of a 'year' <i>eg from birthday to birthday, through all the seasons</i>. Model the Earth's orbit of the Sun <i>eg a child moving round a central 'Sun' ie either a lamp or a large group of children, rotating at the same time</i>. 	<ul style="list-style-type: none"> state that a year is the time taken for the Earth to make one complete orbit of the Sun showing that they know this from secondary sources <i>eg reference books, CD-ROMs, information provided by the teacher</i> 	The relationship of the seasons to the tilt of the Earth is not a requirement of the programme of study for Key Stage 2. Teachers will need to decide whether it is appropriate to discuss this with some children.	•
What is a month?	<ul style="list-style-type: none"> that the Moon takes approximately 28 days to orbit the Earth that the different appearance of the Moon over 28 days provides evidence for a 28-day cycle 	<ul style="list-style-type: none"> Use secondary sources <i>eg video, CD-ROM, reference books</i> to illustrate that the appearance of the Moon changes in a regular manner over a period of approximately 28 days. Model the Moon's orbit round the Earth <i>eg by asking a child to walk round a group of children representing the Earth so that the child representing the Moon always faces the Earth</i>. Ask children to describe the movement of the Moon <i>eg as it goes round the Earth it turns so that the same side always faces the Earth</i>. 	<ul style="list-style-type: none"> explain that the pattern and time-scale of the changes in the Moon's appearance over 28 days is evidence that the Moon orbits the Earth once every 28 days 	Children do not always understand that the Moon revolves on its axis as it orbits the Earth so that the same side of the Moon always faces the Earth. Children should be encouraged to look at the Moon both at night and during the day. At this stage they are not expected to recall or explain the appearance of the Moon at different stages of its cycle.	•

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Week 6 of 6	Unit 5E: Earth, Sun and Moon	Time period	6 Weeks (approx. 9 hours)

	Topic	Learning Objectives	Teaching Strategies	Outcomes	Extension work	Teacher Note <i>Health and Safety & resources</i>
	Topic review and assessment	<ul style="list-style-type: none"> 	<ul style="list-style-type: none"> Brief review of topic (power point or Q & A session) followed by quiz Quizdom assessment on topic 	<ul style="list-style-type: none"> Quizdom game, check handset batteries, check quizdom dedicated laptop and enter class list data for teacher records 	<ul style="list-style-type: none"> Extra qs available Ask children to pose questions to each other and help them to judge the appropriateness of the answers. 	<ul style="list-style-type: none"> Get class lists form partner schools and enter data