

# Into Our Skies Space in Schools



Credit: NASA

## Earth's Rotation

Interactive Educational Video Teacher Notes



Into Our Skies



Science and  
Technology  
Facilities Council

## **Key Information**

*Welcome to Into Our Skies: Space in Schools.* This video is about the rotation of the Earth where pupils will investigate shadows. We hope you and your pupils have a fantastic time with this video!

**Total Video Duration: 00:41:18 mins**

**Link to Video and Soundtrack:**

<https://bit.ly/3j1V0HI>

## **National Curriculum**

The national curriculum learning outcomes covered in this video are:

**KS2 Science: Earth & Space.**

- Use the idea of Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.

**KS2 Dance/PE**

- Explore contrasting body shapes and levels.
- Work with a partner to create and perform a duet phrase of movement, working to connect on musical timing and positional relationships.

**REMEMBER:** You can pause and rewind the video at any point.

**REMEMBER:** We should NEVER look directly at the Sun; it can severely damage our eyes.

## **Getting Ready to Dance**

We want you to have a great time, immerse yourself in dance and science. Here's a few things to check before the lesson.

1. **Check the channel:** The interactive educational videos are made available through a link to You Tube. Please check you can access these and check the sound is loud enough for all students to hear Lucy's instructions.

2. **Set up the space:**

- To follow Lucy, make sure that the pupils are spread out and that they can clearly see the white board/screen the videos are projected on to.
- Make sure the space allows social distancing to be maintained if this is a policy in your school.
- Make sure the space is large enough for all pupils to move, does any furniture need moving?

3. **Health and Safety:** Please make sure that you have carried out a risk assessment for the lesson. We have provided a template risk assessment to help. Please ensure you follow any Covid/social distancing guidelines in place at your school.

4. **Read the Teacher Notes:** These give you additional guidance on how to support the pupils' experience, learning and engagement from both a dance and science perspective.


5. **Join In:** The teacher's role as facilitator and observer is key throughout but that doesn't mean you can't get involved and dance too!

## Teaching Notes




These notes provide additional guidance covering:

- The science presented for each section.
- Suggestions for helping pupils with their dancing.
- Activities broken down with the video timings.

**Resources:** For this video you do not need any resources.

Warm Up: Energy Generator	
Time	Description
	<b>Science:</b> The Sun is the star at the centre of our Solar System. The Sun is a big ball of, mainly, hydrogen gas and is undergoing nuclear fusion in its core which generates energy and keeps the star stable. On the image, you see a time-lapse video of the Sun and you can see features like Sunspots (the dark regions), solar prominences (the loops you see) and solar flares (the bright streams you can see leaving the Sun).
1:50	<b>Dance:</b>  Within this focussed warm-up, pupils are invited to generate energy through friction and apply this heat to the joints and muscles of their bodies as a warm-up.  <b>Encourage</b> and motivate to see this task through. As pupils expel energy their muscles will tire. Use the arcing reach to extend the body and release tension. You've got this!  <b>Remember</b> stretch through the whole arm to the fingertips.
7:52 	Not warm yet? Rewind and play again!



## Exercise: 24-hour Rotation Dance

Time	Description
	<p><b>Science: How do we get day and night?</b>            Because only half of the Earth is in daylight at any one time, this means for some people on Earth it is daytime, whilst for others it is night-time. You can build on this idea in the classroom lesson on day and night to discuss time zones.</p>
10:25	<p><b>Dance:</b></p> <p> <b>Watch</b> how Lucy completes one rotation over 24 counts - 1 count for each hour of the day, a human 24hr clock.</p> <p><b>Encourage</b> the children turn in relation to the light of the TV/projector screen? Which body parts are in light or darkness at different points on the 24-hour clock?</p> <p><b>Challenge:</b> If the UK was on the front of your body and Australia on the back- when is the UK in light? darkness?</p> <p> <b>Notice:</b> Are they able to organise their body to be reach towards the screen whichever way they are facing?</p> <p> Music starts at 16.10 mins.</p> <p><b>Top Tip!</b> Support movement explorations by calling out different body parts to reach towards the screen. E.g., Hands, foot, hip, head, shoulder, wrist etc</p> <p><b>Perform:</b> Do the children have a clear starting position for their rotation dance – feet in parallel, hands by side, head lengthening towards the ceiling. Hold the final position until the music ends!</p>

## Exercise: Sun Pathway

Time	Description
	<p><b>Science: The Sun's apparent pathway and shadows:</b></p> <p>The Sun only appears to move in the sky, really it is because Earth is rotating on its axis. Earth rotates at a constant speed; this is why the Sun and the shadows it makes can be used as a clock to tell the time. Maybe the pupils could look where their shadows are at the start and end of the school day?</p> <p>The length of our shadow changes during the day because the Sun appears to change position. The length and shape of the shadow will change with the object being used, the pupils can explore this using different shapes with arms and legs if they wish.</p>
17:55	<p><b>Dance:</b></p> <p><b>Top Tip!</b> Point out interesting shapes that pupils are finding for the pause moments in this exercise. Give positive, specific praise to support their choice making – e.g. Imran, I like how you are bending one knee and twisting your body in your shape.</p> <p><b>Encourage</b> the group to find stillness with each pause shape.</p> <p><b>Connect</b> with the science: 3 counts - sunrise to mid-morning, a further 3 counts - midday, 3 counts - mid-afternoon and then 3 counts -sunset representing 12 hours of daylight.</p> <p><b>Ask</b> the children to remember their 'Sun Pathway' movements as we will return to these later.</p>


## Exercise: Shadow Solo

Time	Description
22:30	<p><b>Dance:</b></p> <p>Lucy asks the pupils to have fun, imagine and create the different shapes that shadows might make on the floor. If you don't wish to use the floor you could explore long lunging shapes whilst still exploring different shapes.</p>
	<p><b>Notice:</b> Lucy asks the group to think about different surfaces of their body touching the floor whilst exploring the different shadow shapes— front, back and side body. Encourage variety.</p>
22:30	<p><b>Explore:</b></p> <p><b>a)</b> the long shadow shapes of early morning/evening - extended, long shapes, reaching through fingers, toes, head.</p>
23:40	<p><b>b)</b> the short shadows of overhead midday sun- small, compact, curled shapes.</p>
24:52	<p><b>c)</b> the shadows of mid-morning/afternoon - mid-length, partially contracted/extended shapes. <b>Notice:</b> how Lucy supports her weight on her hands and feet at this midlevel.</p>
	<p><b>Notice:</b> Are the children able to work with the rhythm of move for 3 counts and pause? 3 counts and pause...?</p>
26:00	<p><b>Compose</b> a phrase of movement (<b>Shadow Solo</b>): long – medium – short – medium – long shapes progressing from sunrise to sunset. Music to practice starts at 27.27 mins.</p>

## Exercise: The Sun/Shadow Loop


Time	Description
27:53	<p><b>Dance:</b></p> <p>Children join their 'Sun Pathway' sequence (17.55) and their 'Shadow Solo' sequence (26.00) together, to create a movement loop.</p>

## Composition: The Human Sundial

Time	Description
29:25	<p><b>Dance:</b></p> <p><b>Rehearse:</b> Find a partner and label themselves A and B. A's start their Sun/shadow loop tracking the 'Sun's Pathway'. A's start holding their ball of energy, shining it low along the ground at sunrise.</p> <p>B's start with the shadow solo part of the Sun/shadow loop starting low on the floor in a long shadow shape.</p> <p><b>Remember:</b> the shadow is <u>opposite</u> where the Sun is, so when the Sun is rising in the East, the shadow extends to the West.</p> <p><b>Encourage</b> a clear relationship between partners in the pauses, showing the direction of light from the sun and the corresponding length and direction of the shadow.</p> <p><b>Remind</b> the group that A and B will alternate roles in the loop. i.e., A = Sun pathway, B = Shadows and then change over, B = Sun Pathway, A = Shadows. Can you change over smoothly?</p>
32:45	<p><b>Perform</b> the duets for others to watch. Don't forget to hold your starting and ending positions.</p>
	<p><b>Rewind</b> to 32.45 mins if you need more music.</p>



## Cool Down: A 6-minute winddown

Time	Description
34:35	<b>Dance:</b> <b>Encourage</b> focus in the cool down movements.
	<b>Notice</b> how well are the children able to balance and control their movements?
	<b>Science:</b> The Earth feels like it is still, stationary, but really it is rotating at over 1000mph. The Sun is not the only star we see move across the sky; we also see the stars in the night sky move as the Earth rotates. The pupils could see what constellations they can see on a clear night and where they are at different times of the night. Constellations, like the Orion constellation, are relatively easy to detect because of their bright stars.
40:03	<b>Well Done Everyone!</b>