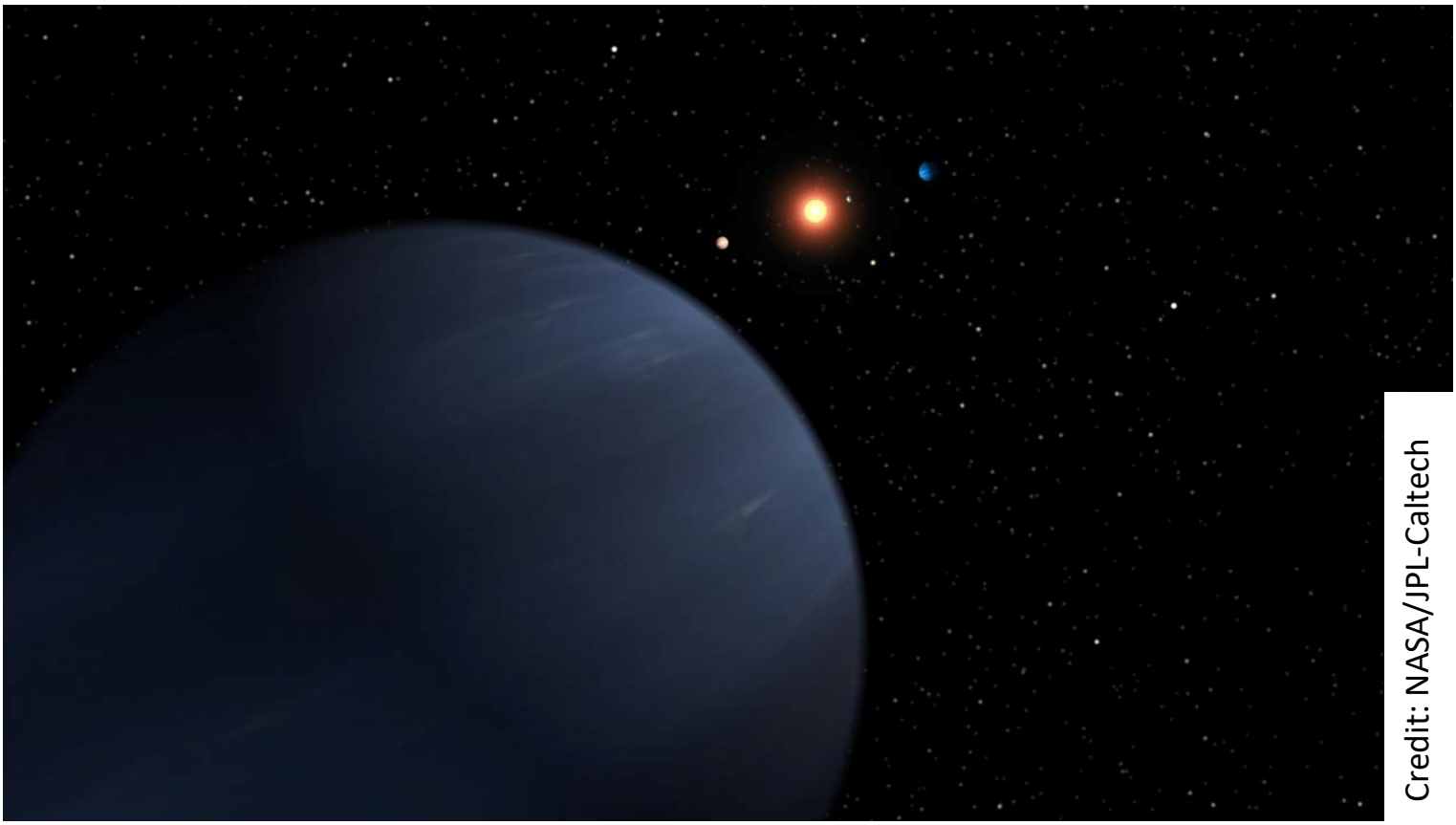
Into Our Skies
Space in Schools



Credit: NASA/JPL-Caltech

Orbits

Interactive Educational Video Teacher Notes

University of Central Lancashire
UCLan

UKRI Science and Technology Facilities Council

Key Information

Welcome to Into Our Skies: Space in Schools. This video is about spheres where pupils will explore the 3-dimensional shape of our Sun, Earth, and Moon. We hope you and your pupils have a fantastic time with this video!

Total Video Duration: 00:41:43 mins

If lesson time is short, you could deliver this in 2 shorter lessons:

- **Lesson 1:** Asteroid Dodge (1.20 mins), Orbits (10.35 mins), Cool Down (36.50 mins) = **Total 26.5 mins**
- **Lesson 2:** Asteroid Dodge (1.20 mins), The Planets (22.05 mins)**,** Cool Down (36.50 mins) = **Total 29 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.

- 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 Earth.

KS2 Dance/PE

- Explore and create circular movement pathway phrases, working with a prop.
- Develop rhythm, coordination, and control through learning a set sequence of movements.

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

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 each pupil will need their own prop such as a bean bag, tennis ball or piece of paper

Warm Up: Asteroid Dodge	
Time	Description
	Science. The asteroid belt lies between Mars and Jupiter, it is made up of millions of rocks of different shapes and sizes. Vesta is the largest asteroid at 530km in diameter, but many are just 10 meters in diameter. It is thought that the asteroid belt was a planet that was destroyed in a collision with Jupiter when the Solar System formed.
2:20 	**Dance:** **Encourage:** Help pupils to watch and re-create the 4 movements (Duck! As-ter-oid! Catch-the-big-one! Jump!) **Notice** how Lucy's knees are bending as she performs each movement. Make sure the knees and toes remain aligned all the time
8:05 	Not warm yet? Rewind and play again!

Part 1. Orbits

Exercise: Anti-clockwise Orbits	
Time	Description
	Science. The Moon orbits Earth which makes it a satellite of Earth, rather than a planet which would orbit the Sun. It takes the Moon 28 days to orbit Earth once and the Moon moves anti-clockwise in its orbit. As the Moon orbits Earth, it doesn't always look like a circle. Look into the phases of the Moon more with the "Why does the Moon look different?" classroom investigation.
11:30  16:30 	**Dance:** **Top Tip!** This exercise encourages pupils to physically experience different orbits. To be scientifically correct we want the pupils to orbit in an anti-clockwise direction. it might be useful to pause the video and establish this. **Emphasise** the skill of the task in order to distract attention from the potential for props to be dropped/thrown etc. The skill of this exercise is to be able to orbit the object as a smooth, continuous, controlled movement – who is achieving this in the group? **Notice** how Lucy uses all her body (feet, knees, hips, shoulders) to achieve an effective orbit. Also see how her arms extend to make the orbit as large as possible. **Time** to practice. **Encourage** the pupils to recall and practise all the different ways of orbiting they have just learnt with Lucy.
15:10 	Need more time? Rewind and play again if needed!

Exercise: Orbiting Sequence 1	
Time	Description
	Science: Some planets have no moons (e.g., Mercury) and other like Jupiter have many (95!). Jupiter's moon Ganymede is the largest moon in our Solar System and is larger than Mercury. Because it orbits Jupiter rather than the Sun, Ganymede it is a moon, not a planet. Pupils can think of different planets/moons as they create their dance sequence.
17:00	**Dance:** Pupils are required to engage in decision making here to independently re-order the 4 orbiting movements and create a repeatable sequence. **Encourage**: Positive specific praise encourages children to commit to their choice making. E.g., *'Amir - I like how you started moving around your prop and then slowly transitioned to orbiting with two arms. What movement next?'* **Top Tip!** Some children may find it useful to have the 4 movement choices written out to refer to and remind them to use all 4 movements. **Differentiation**: Ready for an additional creative challenge? If so, proceed on to Exercise 2c): Orbiting below. If not, return to this another week as a development task.
17:23 	Need longer to create and practise their phrase of 4 movements? Pause and play again if needed!

Exercise: Orbiting Sequence 2	
Time	Description
18:25	**Dance: Get Creative.** This task develops the orbiting sequence further and encourages the children to work with a partner to explore and create a sequence of their own orbiting moves. This task could also be completed as solo tasks if preferable. **Encourage** variety in the children's movements. How can your prop orbit your…knee? hips? shoulder? wrist? What's the biggest orbit you can create? What's the smallest?
19:11	**Top tip!** You might find it useful to give the children 30 secs to explore different body part orbits, then rewind the video, giving additional time to select and sequence their 4 favourite moves

Exercise: Orbiting Super Sequence	
Time	Description
20:10 20:50	**Dance:** The children are tasked with joining together Orbiting Sequence 1 with Orbiting Sequence 2, creating a dance of 8 movements. **Top Tip!** Give the children time to recall Sequence 1 first. Once happy with that ask them to recall sequence 2. Then give them time to practise the complete sequence. **Perform:** Split the group into audience and performers. Performer's hold your starting /finishing position. **Encourage** the audience to watch for, and name, the different body parts used in the orbit sequences. Swap over. Rewind the video if needed, music for performance starts at 20:50.
	Time running short for your lesson? Go to the Cool Down 36.53 m

Part 2: Planets

Exercise: Planet Phrase	
Time	Description
	Science: All the planets orbit the star at the centre of our Solar System, the Sun. The order of the planets from the Sun: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune (Pluto was reclassified as a dwarf planet in 2006 so isn't included here). Look how the planets are spaced out on the floor in the video, notice how they aren't all evenly spaced. The rocky planets are much closer to the Sun than the gas giants (Jupiter and Saturn) and Ice giants (Uranus and Neptune).
23:50 23:50 25:30 29:40 33:50    35:05	**Dance:** In this task Lucy carefully breaks down the teaching of this phrase of movement encouraging recall of the order of planets. **Differentiation:** Can pupils master the levels, all the way to Grand Master Level 4? **Level 1:** The spoken phrase to the beat. **Level 2:** Arms only. **Level 3:** Add in the legs. **Grand Master Level 4:** Double the speed! **Notice:** Anyone really struggling? Suggest they try to include some of the moves (e.g., Jump and skip) whilst reciting the whole rhyme. They can gradually add others in. **Time** to practice, maybe with a partner? This allows them to support each other in learning the movements and gives time for you to support those that need it. **Practice** music can be found at 28.38 mins and 33.00 mins. **The Ultimate Challenge**! Can they repeat the sequence 8 times with Lucy? Requires amazing concentration–give it a go!!

Cool Down	
Time	Description
	Science. All the planets orbit the Sun at different speeds. Neptune is the most distant planet from our Sun and takes 165 years to complete one orbit, and it is moving much slower in its orbit than the other planets… but "slow" for Neptune is still over 12,000 miles per hour! Mercury completes one orbit of the Sun in just 88 days travelling at a speed of 107,000 miles per hour!
36:50 !	**Dance:** Follow Lucy to cool down and stretch out the muscles of the body. **Encourage** the group to move in a slow and controlled manner. **Encourage** the pupils to share what they have learnt in the session. About science and dance! What surprised them, interested them. What do they want to find out more about? **Remember**: there is lots of benefit from the children revisiting and repeating this lesson. It consolidates learning and allows pupils to develop their coordination and control. Enjoy!
40:38	**Well Done Everyone!**