

Our Solar System

Overview



Art of Learning

THEME
19



OVERVIEW OF THEME 19

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|----------------|--|
| GOALS | To get to know the Solar System. Students work with models of the Solar System using different scales, ratios and relative distances from the Sun. They measure, plan, complete models of the Sun and planets in the Solar System using a variety of materials. They will also draw and paint a huge Sun in 2D. Modelling clay, plaster strips, balloons, wool and glue can be used to create scale models of the planets in 3D. The students go outside in the vicinity of the school to place the planets at the correct distances from the sun. Philosophical conversations about the universe are also explored as part of the reflection. |
| SUMMARY | An animated film introduces the students to the Solar System and by assessing their sizes, colours and other facts for each planet, they work on placing the planets into their correct order from the Sun. The students work to create a huge Sun of 3.3 metres in diameter and also the planets in the Solar System using various craft techniques. They then place the planets the correct distance from the Sun in an outdoor location in the vicinity of the school. The adults decide on the content for session 6 based on the interests of the students. The students travel on a space mission in the warm-up, and they answer a quiz about the Solar System in their reflection of each session. |

GENERAL GUIDANCE ON THEME 19: In this theme, session 6 is free choice while sessions 3-4 are planned. This means that the adults work together to plan and implement the free choice session 6. In session 2, the students should be given freedom to plan and create a huge Sun in 2D. Discuss how to use this freedom whilst ensuring the safety of everyone involved. Take some risks and work with uncertainty about what might happen whilst providing support for those students who need it.

| THEME 19 | DAY 1 | DAY 2 | TEACHER LED DAY 3-4 | DAY 5 | DAY 6 |
|------------------------|--|---|--|--|---|
| Content Summary | <p>Trigger: Film about the Solar System.</p> <p>Warm-up: 'Aye, aye spaceship captain' – Mercury, Venus and Earth.</p> <p>Main activity: Matching the model planets together with their facts and placing them in the correct order from the Sun.</p> <p>Reflection: Solar System quiz Yes/No.</p> | <p>Warm-up: 'Aye, aye spaceship captain' – The Sun.</p> <p>Main activity: Work as a team to create a huge 2D Sun to scale.</p> <p>Reflection: Solar system quiz A/B.</p> | <p>Warm-up: 'Aye, aye spaceship captain' – Mars, Jupiter and Saturn, Uranus and Neptune.</p> <p>Main activity: Work in groups to create the planets in our Solar System in 3D to scale using various craft techniques.</p> <p>Reflection: Solar system quiz Yes/No.</p> | <p>Warm-up: 'Aye, aye spaceship captain' – asteroids, comets and moons.</p> <p>Main activity: Outside hanging up the planets at the correct distance from the sun.</p> <p>Reflection: Outdoor reflection.</p> | <p>Warm-up: 'Aye, aye spaceship captain' – free choice.</p> <p>Main activity: Free choice. See suggestions for activities.</p> <p>Reflection: Solar system quiz free choice.</p> |
| Space | Classroom with tables/open space. | Open space. | Open space or craft room. Group tables. | Outdoors. | Depending on choices made. |
| Materials | <ul style="list-style-type: none"> Golden Chest T1901 Trigger: Film about Paxi – the Solar System, T1901 Paxi – and Solar System poster. Speakers and PCs to play films. T19 Warm-up spaceship sound masking tape to create a spaceship outline on the floor T19 Photos and facts for the warm-up music player. | <ul style="list-style-type: none"> T19 Warm-up spaceship sound. Masking tape to create a spaceship outline on the floor. T19 Photos and facts for the warm-ups. Music player. T19 Solar System Quiz T19 Reflection Card – one set for each student. | <ul style="list-style-type: none"> T19 Warm-up spaceship sound. Masking tape to create a spaceship outline on the floor. T19 Photos and facts for the warm-ups. Music player. T1902 Solar system technique description T1902 Solar System table – 1 for each group | <ul style="list-style-type: none"> T19 Photos and facts for the warm-ups possibly bottled water. 50 m tape measure finished planets twine and scissors posters about the planets pins/other fasteners for the posters. Map of route to be walked (see T1905 Location of the planets in the landscape). | <ul style="list-style-type: none"> T19 warm-up spaceship sound T19 Warmup spaceship sound in reverse. Masking tape to create a spaceship outline on the floor. Music player. T19 reflection card – one set for each student. |

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| THEME 19 | DAY 1  | DAY 2 | TEACHER LED DAY 3-4  | DAY 5 | DAY 6 |
|--|--|--|--|---|--|
| Materials | <ul style="list-style-type: none"> • T1901 Solar System fact sheet – one set for each group • T1901 Solar System fact sheet ANSWERS – one copy • Solar System mini-models in bag – one bag for each group (see what the bags should contain in the T1901 Solar System mini model.) | <ul style="list-style-type: none"> • Materials for collage (magazines, newspapers, crepe paper, masking tape, other types of tape, sticky notes, other materials in golden colours, roll of paper, paint, brushes, markers, crayons, sheets of various colours and thicknesses, packing tape, glue, adhesive and step ladders. • Inspiration resources: T1902 Artwork inspiration (from famous artists who have worked with sun and light) • T1902 Technique inspiration (different ways to make create something on a wall) • T1902 Solar images (Various pictures of the real sun) in different versions) • large ruler and tape measure. | <ul style="list-style-type: none"> • T1901 Solar System fact sheet (from session 1) • a ruler for each group. | | |
| Preparations in advance | <ul style="list-style-type: none"> • Find T1901 Trigger: Film about Paxi – the Solar System. • Print the T1901 Paxi and Solar System poster in colour, and name all the planets on it. • Listen to the T19 warm-up spaceship sound. • Make a spaceship on the floor with masking tape. • Print T19 photos and facts for the warm-ups. Use photos and fact sheets about Mercury, Venus, and Earth. • Print and cut the fact sheets • Create Solar System mini models for each group and place them in separate bags. | <ul style="list-style-type: none"> • Make a spaceship on the floor with masking tape. • Find materials and print inspirational resources. • Agree on how much freedom to give the students and how their ideas can be supported with input along the way ensuring that the whole class is involved. | <ul style="list-style-type: none"> • Listen to the T19 warm-up spaceship sound. • Make a spaceship on the floor with masking tape • Refer to the document ‘Making our Solar System Techniques’. This can also be used to show examples in the session. • Source all the materials as described in the Making our Solar System Techniques documents and think about how the sessions can be structured so that as much time as possible is made available for the students to make the models. • Print out the T1902 Solar System tables and add these with examples in the Golden Chest. Include an example of the mini models (in the bag) from Session 1 as well as the fact sheets about the planets from Session 1. | <ul style="list-style-type: none"> • Create an outline of a space rocket outdoors with coloured water in snow or use existing boundaries to mark the area. • If possible, make laminated posters of the route which allows each of the planets to be placed in the correct location from the Sun (which avoids trespassing or crossing major roads etc). See T1905 Location of the planets In the landscape. • Print map or use a digital map application. | <ul style="list-style-type: none"> • Listen to the T19 warm-up spaceship sound in reverse. • Make a spaceship on the floor with masking tape. • Prepare questions and answer options. |
| WARNINGS | | | | | |
|  | preparations | | | | |

Our Solar System

Session 1

TIME

90 min.
including
break



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TRIGGER: FILM ABOUT THE SOLAR SYSTEM

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| This will happen: | The students watch a film about the solar system. |
| Materials needed: | Golden Chest, T1901 Trigger: Film about Paxi – the Solar System, T1901 Paxi – and Solar System poster. Speakers and PC to play movie clips. |
| Preparations in advance: | Find T1901 Trigger: Film about Paxi – the Solar System. Print the T1901 Paxi and Solar System poster in colour, and name all the planets on it. |
| Preparations in the space: | Connect PC, monitor, and speakers to play the movie clip. |
| The space looks like this: | Classroom. |

GUIDANCE:

Sit together next to the Golden Chest, near the screen.

1. Open the Golden Chest, remove the Paxi and the Solar System poster. Ask the students what they see. What do they know about what they see? Listen to their answers. Explain that during this topic – the Solar System – they will become astronauts and learn more about the planets in the Solar System and space.

2. Show the Film about Paxi – the Solar System (5 min) and ask the students to pay close attention. Tell them that Paxi is a small child from another planet and he knows a lot about space. Even so he is very young and still needs help from older children with important tasks.

WARM-UP: 'AYE, AYE SPACESHIP CAPTAIN' – MISSION TO MERCURY AND VENUS

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|-----------------------------------|---|
| This will happen: | The students embark on their first space mission visiting Mercury, Venus and Earth and follow orders from their captain. |
| Materials needed: | T19 Warm-up spaceship sound (resource bank). Use masking tape to create a spaceship outline on the floor. Photos and facts for the warm-ups (resource bank). Music player. |
| Preparations in advance: | Listen to the Warm-up spaceship sound. Make a spaceship on the floor with masking tape. Print photos and facts for the warm-ups (see resource bank). Use photos and fact sheets about Mercury, Venus and Earth. |
| Preparations in the space: | Check that the sound system works. Create a space rocket on the floor with masking tape (with room for the whole class to stand together with room to spread out). |
| The space looks like this: | Open space. |

GUIDANCE:

The students are going on a space mission in their spaceship (marked area on the floor). The adult is the 'Spaceship Captain' and the students are astronauts. The adult is at the front of the spaceship so everyone can see and hear their commands.

1. The mission begins by practising following the Captain's instructions carefully. Explain that all instructions are in English and are completely real concepts from space flight. The Captain says different commands, and the students follow. When the Spaceship Captain says, "Astronauts," the students answer, "Aye, Aye Captain!" and do a salute (they take the back of their hand up to their forehead) and stand up straight. Practise this and other commands: "We are ready for take off" – students put on fictional helmets and get themselves in a starting position (find a starting position). "Take off" – hands on the safety harnesses (over both shoulders) and respond by saying "bump-bump-bump" and shaking up and down. "Lean right" – students repeat the command, then lean right. "Lean left" – repeat the command, then lean left. "Lean back" – repeat the command, then lean back. "Lean forward" – repeat the command, then lean forward. "Landing" – respond by saying "bump, bump, bump" and put their heads between their legs and arms above their heads.

"Briefing" – everyone sits down on the floor with their hands under their chin. Explain that they will now hear about their mission.

2. Begin the mission: Get their attention by saying, "Astronauts" and wait for the answer, "Aye, Aye Captain!" Explain that they are now on Earth. Show the pictures and fact sheet about Earth. Explain where the trip will go (in a voice that is very recognisable as the Captain's voice). They are going out into the Solar System. Explain that the mission will be in the direction of Mercury and Venus, the planets closest to the Sun, and that their spaceship is equipped with a special shield.

3. Tell them to be ready for take off. Play the T19 Warm-up spaceship music (resource bank). Start by counting down from 10 in English and then together say, "Lift off". Continue to do commands (as in Part 1 above) until they are in space (this should take approximately 1:30 minutes).

4. Arrive at Mercury. Explain that they will soon see Mercury. Show pictures and fact sheets about Mercury.

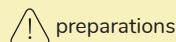
5. Do a few more commands before arriving at Venus. Finish with the last command, "Landing!" Explain that they have landed on the planet Venus. They should be grateful that they have a special shield that ensures they do not burn up otherwise they would have turned to ashes. Then open the Golden Chest and show the pictures and fact sheets about Venus.

6. Ask the students to leave the spaceship and divide them into table groups for the main activity (make an even number of groups).

Our Solar System

Session 1

WARNINGS



preparations

TIME

90 min.
including
break



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REFLECTION: OUR SOLAR SYSTEM QUIZ ENGLISH YES/NO

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|-----------------------------------|---|
| This will happen: | Students use yes/no reflection cards to show answers to statements about the solar system. |
| Materials needed: | T19 reflection card (resource bank) – one set for each student. |
| Preparations in advance: | T19 reflection cards are printed on thick paper (resource bank), cut out and put into a set in an envelope or with a ring binder through a hole in the corner, one set for each student. Print out 1 copy of the T19 Solar System quiz (resource bank). |
| Preparations in the space: | |
| The space looks like this: | Classroom. |

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| GUIDANCE: | <p>Open the Golden Chest. Hand out a set of reflection cards to each student. Explain that some statements will be read out and that students need to listen carefully. If the statement is correct, they should choose the Yes card... if it is wrong, they should choose the No card. Count up to five. When it gets to five, the students should hold up the card they think is correct. Practise first with a simple statement, for example, We live on Earth – Yes/No. In the middle of the quiz is a philosophical question that should not be answered, only thought about.</p> <p>Do the Solar System Quiz:</p> <ol style="list-style-type: none"> 1. I want to go into space for real – Yes or no 2. A day on Mercury lasts almost two months – Yes or No 3. A day on Earth lasts for 24 minutes – Yes or No 4. The language of the International Space Station is Norwegian – Yes or No <p>Philosophical question: How big is space? (each student should think about this for a moment before the quiz continues but they do not answer it)</p> <ol style="list-style-type: none"> 5. Mercury is warmer than Earth – Yes or No 6. Mercury is hotter than Venus – Yes or No 7. I think the group work today has gone well – Yes or No 8. I think there is life on other planets – Yes or No 9. I know what to do when the spaceship Captain says “Astronauts” – Yes or No |
|------------------|---|

MAIN ACTIVITY: RESOLVE PAXI'S PLANETARY MESS

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| This will happen: | The students use critical thinking skills to match the planets with their facts and then put the planets in the correct order from the sun. |
| Materials needed: | T1901 Solar System fact sheet (resource bank) – one set for each group (resource bank), T1901 Solar System fact sheet answers (resource bank) – one copy of the answers, Solar System mini-models in a bag – one bag for each group (see what the bags should contain in the T1901 Solar System mini model (resource bank). If time T1901 Mini-model table (resource bank). |
| Preparations in advance: | Print and cut up the fact sheets, prepare the Solar System mini models for each group and put them in separate bags. |
| Preparations in the space: | |
| The space looks like this: | Classroom with tables for small groups. |

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| GUIDANCE: | <ol style="list-style-type: none"> 1. Paxi knows a lot about space. Even though he is a very young child, he has made measurements of the planets and the sun. He wanted to share these facts with the students but when Paxi landed on Mercury, all the notes and all the models were mixed up in the bumpy landing. So all the models and the facts are here but they are all muddled up 2. Give each group one set of cut-out fact sheets. They read these together (helping each other). 3. They are then given a bag containing Paxi's scaled model of the sun and all the planets. Important: No one should look inside the bag! Each student in the group gets to close their eyes, feel inside the bag and compare the sizes of what is inside, using only their hands. 4. Once everyone has had a turn, they can open the bag and take out what's inside. 5. Explain the task. Each group should find out which model belongs to each fact sheet and which planet it is. Then the models and fact sheets must be assembled in the correct order from the sun outwards. Ask them how they will work in their groups? Remind them of the benefits of good cooperation and helping each other. 6. Let students work through the challenge on their own. Offer help only if absolutely necessary and then ask them questions that support critical thinking, rather than giving them correct answers. 7. If there is time, groups who have finished the T1901 Mini-model table (resource bank) can be asked to lay the planets at the correct distance from the Sun. 8. Pair groups up and ask them to share their results with each other. |
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Our Solar System

Session 2

TIME

90 min.
including
break



Art of learning

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WARM-UP: "AYE, AYE SPACESHIP CAPTAIN" – MISSION TO THE SUN

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| This will happen: | The students embark on their second space mission with a spotlight on the Sun and follow orders from their Captain. |
| Materials needed: | T19 Warm up spaceship sound (resource bank). Use making tape to create a spaceship outline on the floor. T19 Photos and face for the warm-up (resource bank). Music player. |
| Preparations in advance: | Make a spaceship on the floor with masking tape. |
| Preparations in the space: | Check that the sound system works. Create a spaceship on the floor with masking tape (with room for the whole class to stand together with room to spread out). |
| The space looks like this: | Open space. |

GUIDANCE:

The adult is the "Spaceship Captain" and the students are astronauts. Explain that they are going on a space mission in their spaceship. The adult brings the Golden Chest and asks everyone to line up and then step into the spaceship. The spaceship captain stands at the front leading the astronauts.

- In the space rocket, the Captain says "Briefing." Explain that in the centre of the Solar System is the Sun. Show the pictures and fact sheet about the Sun. On their 'mission' they cannot travel all the way to the Sun because it is so hot that they would burn up. But they will go as near as possible to it. It is a risky trip so it is important that they follow all the instructions to the letter and that they do not end up outside the spaceship (highlight the marked lines of tape on the floor). If they do then they will fall into the black nothing!
- Practise: Ask students what instructions they remember and review them. Introduce a couple of new instructions.
"Astronauts" – students answer "Aye, Aye Captain!" and they bring the back of their hand up to their forehead and stand up straight.
"We are ready for take off" – students put on fictional helmets and get themselves in the starting position.
"Take off" – hands on the safety harnesses (over both shoulders) and respond by saying "bump-bump-bump" and shaking up and down.
"Lean right" – repeat the command, then lean right.
"Lean left" – repeat the command, then lean left.
"Lean back" – repeat the command, then lean back.

"Lean forward" – repeat the command, then lean forward.

"Landing" – respond by saying "bump, bump, bump" and put their heads between their legs and arms above their head.

New commands:

"Solar flare" (eruption from a solar storm) – everyone must quickly gather in a corner of the spacecraft (which is protected by lead).

"Solar flare has passed" – all quickly back in place.

During launch: "Deploy rocket" – Hands straight out to the sides with spread fingers and say the sound "pchhh".

This can be repeated up to 3 times during the launch – three different rockets can be deployed.

In space: "Weightless" – students turn to another student, they lean forward towards each other, hold hands and put one foot up in the air.

3. Begin the mission: "We are ready for take off". Play the T19 Warm-up spaceship music (resource bank). Start by counting down from 10 in English and then together say "lift off".

4. Do a variation of the rehearsed commands interspersed with some information about the Sun. Let this mission be a little 'scary'. Play with the pace and order of the commands and then say "landing" and arrive back on Earth.

5. Ask the students to leave the spaceship for the debrief.

NOTES

Our Solar System

Session 2

TIME

90 min.
including
break



Art of learning

THEME
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REFLECTION: OUR SOLAR SYSTEM QUIZ ENGLISH A OR B

This will happen: Students use A or B reflection cards to show answers to statements about the Solar System.

Materials needed: T19 reflection card (resource bank) – one set for each student.

The space looks like this: Classroom.

GUIDANCE:

Open the Golden Chest. Hand out a set of reflection cards to each student. Explain that some statements will be read out and that students need to listen carefully. They should choose to answer with card A or B. Count up to five. When it gets to five, the students should hold up the card they think is correct. Practise first: the sun is:

A) **Hot** or B) **Cold**

Do the Solar System Quiz:

1. Solar storm in English is A) solar flare B) **solar storm**
2. The huge sun was mostly made by A) **us** or B) **the adults**
3. The sun is surrounded by A) **corona** B) **karaoke**
4. Agreeing on how to make the sun was A) **yellow** or B) **red**

Philosophical question: How did the Sun and our Solar System come about? (each student should think about this for a moment before the quiz continues but they do not answer it)

5. Our moon rotates around A) **the Earth** or B) the Sun
6. To make the sun you would need A) 1,000 earths or B) **1 million earths**
7. If I were to throw a dice about the AOL session today what number would it be? A) **1,2 or 3** or B) **4, 5 or 6**
8. Our Sun is A) a planet or B) **a star**
9. If the sun is 3.3 metres in diameter, I think the Earth is A) as big as a football or B) **as big as a 50 pence** 10. I think that going to the bathroom in a spaceship is A) just as it is normally or B) **requires special equipment**

MAIN ACTIVITY: CREATE A HUGE SUN AT SCALE AS A CLASS.

This will happen: Working together, the students create a Sun with a diameter of 3.3 metres, in an accessible location using art materials and artworks as inspiration.

Materials needed: Materials for collage (magazines, newspapers, crepe paper, masking tape, other types of tape, sticky notes, other things in golden colours). Roll of paper, paint, brushes, markers, crayons, sheets of various colours and thicknesses, packing tape, glue, adhesive, set of steps. Artwork inspiration resources: T1902 Artwork inspiration (from famous artists who have worked with sun and light – resource bank), T1902 Technique inspiration (different ways to make something on a wall – resource bank), T1902 Solar images (Different pictures of the actual sun – resource bank), long ruler and tape measure.

Preparations in advance: Find materials and print inspirational resources. Agree on how much freedom the students can have, how their ideas can be supported and get their input along the way, ensuring that all the class is involved.

Preparations in the space: Prepare materials needed.

The space looks like this: Open space.

GUIDANCE:

1. Debrief the astronauts after the mission and say that they now have a very important task. They must now work on a model of the Sun and scale it up from the small version they created in Session 1 (which was a ball/balloon). They have to create a giant Sun with solar storms and lots more besides.
2. Together the class will create a Sun with a diameter of 3.3 metres that will be hung on a wall at the school (either in the classroom, or find a place that has enough space, for example the gym, stairway or hall). Let the students have as much control over the process as much.

Suggested tasks (feel free to divide the students into groups):

- Discover how high and wide 3.3 metres in diameter is. Where can this be placed in school?
- Tape together paper from a roll into the correct size (3.3 metres in diameter) and cut out the circle.

- Create artwork/collage/make things in golden colours that can be attached to the roll of paper. How much/many are needed to cover the entire surface of the Sun? (Refer to maths that the students know (addition, subtraction, multiplication etc)
- Make everything necessary.
- Agree where it is going to be placed and how to hang it safely and securely. If it's going to be hung in the classroom, ask what can be done with any parts that cannot fit on the wall.

Specific requirements:

- The Sun should have golden colours (show the student example images from the real sun).
- It must be finished during the session today.
- It must have a diameter of 3.3 metres/330 cm.
- It must be hung on a wall at school.

Our Solar System

Session 3-4

TIME

90 min.
including
break



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WARM-UP: "AYE, AYE SPACESHIP CAPTAIN" – MISSION TO MARS, JUPITER, SATURN, URANUS AND NEPTUNE

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|-----------------------------------|--|
| This will happen: | The students embark on further space missions focusing on Mars, Jupiter and Saturn (Session 3) and Uranus and Neptune (Session 4) and follow orders from their Captain. |
| Materials needed: | T19 Warm up spaceship sound (resource bank). Use making tape to create a spaceship outline on the floor. T19 Photos and facts for the warm-up (resource bank). Music player. |
| Preparations in advance: | Make a spaceship on the floor with masking tape. |
| Preparations in the space: | Check that the sound system works. Create a spaceship on the floor with masking tape (with room for the whole class to stand together with room to spread out). |
| The space looks like this: | Classroom. |

GUIDANCE:

1. The mission starts with a practice following the Spaceship Captain's instructions carefully.
2. "Astronauts" – students answer "Aye, Aye Captain!" and they bring the back of their hand up to their forehead and stand up straight. Practise some new commands and repeat some of the familiar ones:

"We are ready for take off" – students put on fictional helmets and get themselves in the starting position.

"Take off" – hands on the safety harnesses (over both shoulders) and respond by saying "bump-bump-bump" and shaking up and down.

"Lean right" – repeat the command, then lean right.

"Lean left" – repeat the command, then lean left.

"Lean back" – repeat the command, then lean back.

"Lean forward" – repeat the command, then lean forward.

"Landing" – respond by saying "bump, bump, bump" and put their heads between their legs and arms above their heads.

"Briefing" – everyone sits down on the floor with their hands under their chin. (explain the description of the mission).

"Solar flare" (eruption from a solar storm) – everyone must quickly gather in a corner of the spacecraft (which is protected by lead).

"Solar flare has past" – all quickly back in place.

During launch: "Deploy rocket" – Hands straight out to the sides with spread fingers and the sound "pchhh". Can be repeated up to 3 times during launch – three different rockets are deployed.

In space: "Weightless" – students turn to another student, they lean forward towards each other, hold hands and put one foot up in the air.

New commands (all given in space during the quiet part of the music):

"Stir the oxygen tanks" – spinning around themselves

"Life support" (means grab everything necessary for people to survive on board, including pressure, oxygen, water and toilet) – two people use their arms to make a chair and a third person sits on it

"Sleep" – one student places their arms around another from behind, like a belt. The one in front drops their head and closes their eyes.

3. Begin the mission, the Captain says, "Astronauts," waits for an answer, then says, "Briefing."

4. Session 3:

Describe the mission's goal, which is an orbit around Jupiter and Saturn, before landing on Mars. Describe the facts about the first planet on the mission: Jupiter.

Session 4:

Describe the facts about the mission which is a very long journey to two gas planets they can't stop at, Uranus and Neptune. Describe the facts about the first planet on the mission: Uranus.

5. Begin the mission, say, "We are ready for takeoff." Play the T19 Warm up spaceship music (resource bank). Start by counting down from 10 in English and then together say, "Lift off."

6. Do a variation of the rehearsed commands.

7. Session 3:

Travel to Jupiter and then Saturn (Session 3). Describe the facts about Saturn. Land on Mars. Describe the facts about Mars.

Session 4:

Travel past Uranus and then Neptune. Describe the facts about Neptune.


8. Return to Earth.

NOTES

Our Solar System

Session 3-4

WARNINGS

 preparations

TIME

90 min.
including
break



Art of learning

THEME
19



REFLECTION: OUR SOLAR SYSTEM QUIZ ENGLISH YES/NO AND YES/A

This will happen: Students use Yes/No and Yes/B reflection cards to show answers to statements about the Solar System.

Materials needed: T19 reflection card – one set for each student.

The space looks like this: Classroom.

GUIDANCE: Open the Golden Chest. Hand out a set of reflection cards to each student. Explain that some statements will be read out and that students need to listen carefully. Count up to five and when it gets to five, the students should hold up the card they think is correct.

Do the Solar System Quiz:

Session 3: If the statement is correct, they should choose the Yes card and if it is wrong, they should choose the No card. Do a practice: I've made the planet Jupiter today. Yes or No.

Session 4: Instead of Yes/No, use YES for Yes and A for no. Do a practice: We live on Mars: Yes card for yes or A card for no.

Session 3

1. I know what happens when you spill water inside a spaceship in space – **Yes or No**
2. 'Life support systems' on spaceships means, among other things, going to the bathroom – **Yes or No**
3. Jupiter is the largest planet in the solar system – **Yes or No**
4. I can't wait to burst the balloons inside the yarn planets – **Yes or No**
5. Saturn is a rocky planet – **Yes or No**
6. **Philosophical question: Is there life on other planets?** (this should not be answered just thought about)
7. When you are 1 year old, on Saturn you are 29 Earth years old – **Yes or No**

8. There have been humans on Mars – **Yes or No**
9. Martians live on Mars – **Yes or No**
10. I have contributed well to the group work today – **Yes or No**

Session 4

1. Uranus is my favourite planet – **Yes or A**
2. Uranus is a rocky planet – **Yes or A**
3. Uranus spins the opposite way to Earth – **Yes or A**
4. I've enjoyed making planets – **Yes or A**
5. **Philosophical question: What is a human being in the universe?** (this should not be answered)
6. Astronauts float around in the spaceship – **Yes or A**
7. Neptune is the planet furthest from the Sun – **Yes or A**
8. Neptune is dark, cold and windy – **Yes or A**
9. I like the soundtrack we hear in the warm-up – **Yes or A**
10. I would like to be an astronaut – **Yes or A**

MAIN ACTIVITY: WORKING IN GROUPS TO MAKE A SCALE MODEL OF THE SOLAR SYSTEM USING A RANGE OF TECHNIQUES

This will happen: Working in groups the students will create a model of the Solar System to the correct scale.

Materials needed: T1902 Solar System technique description (see detailed list of material here! resource bank), T1902 Solar system table – 1 copy for each group (resource bank), T1901 Solar System fact sheet (from Session 1 – resource bank), a ruler for each group.

Preparations in advance: Refer to the document Making our Solar System Techniques (resource bank). This can also be used to show examples in the session. Source all the materials as described in the Making our Solar System Techniques documents and think about how the sessions can be structured so that as much time as possible is made available for the students to make the models. Print out the T1902 Solar System tables (resource bank) and add these with examples in the Golden Chest. Include an example of the mini models (in the bag) from Session 1 as well as the fact sheets about the planets from Session 1.

Preparations in the space: Prepare materials, set up group tables.

The space looks like this: Classroom/craft room with students working on group tables.

GUIDANCE: This task goes over both sessions 3 and 4:

- Put the students into groups who will work together to make a complete set of planets in the Solar System to scale relative to each other and the Sun created in Session 2. Explain what scale means, referring to the mini models in Session 1. Give each group a Solar System table and demonstrate how to measure diameter and how to tick off each planet on the table as it is finished. Explain the different techniques they will use: yarn, balloons and self-drying clay.
- Let each group agree on a group name (which will be used to label all their planets as they are made) and how they will distribute the work needed to make the planets among themselves. Ask them if everyone should begin by working together on one planet, or should they divide themselves up? Who's going to

make what planet? Offer support only if necessary and allow the groups to work through the challenges by themselves as much as possible.

- The groups make their planets and hang the finished models to dry as they go.

As the groups finish, ask the students to create posters with information about each of the planets. These will be hung together with the planets outdoors in Session 5. These can be laminated so that they are more durable for outdoors. Ask how far from the Sun do they think this planet will be when the Sun is this size? (ask if the students can make a hypothesis).

Otherwise, refer to Session 5 for other preparations that can be carried out in Sessions 3 and 4 if there is time available.

Our Solar System

Session 5

TIME

90 min.
including
break



Art of learning

THEME

19



WARM-UP: "AYE, AYE SPACESHIP CAPTAIN" – ASTEROIDS, COMETS AND MOONS

| | |
|-----------------------------------|---|
| This will happen: | The students continue on further space missions focusing on asteroids, comets and moons and follow orders from their captain. |
| Materials needed: | T19 Photos and facts for the warm-up (resource bank). Coloured water to make the outside of the spaceship in the snow or use an existing boundary such as a fence or a corner in the school to make the outline of the spaceship. |
| Preparations in advance: | Make a spaceship outdoors with coloured water in the snow or use existing boundaries to mark the areas. |
| Preparations in the space: | |
| The space looks like this: | Outdoors. |

GUIDANCE:

1. The mission starts outside without the sound track. Focus on the students getting their bodies warmed up so work with instructions that encourage them to work closely together. Include elements which explore comets, asteroids and moons from the fact sheet.
2. Follow the familiar instructions from previous warm-ups and include the following new commands:
"Asteroid ahead!" – everyone throws themselves down on the floor with their hands above their heads (Asteroids are made of stone, so they need to protect their heads).
"Comet ahead – Freeze!" – everyone freezes in a strange pose (Comets are made of ice and are like dirty snowballs) – note this is used again in the reflection.
3. Return to Earth.

REFLECTION: FREEZE FRAME OUTDOORS

| | |
|-----------------------------------|---|
| This will happen: | Students put themselves into a 'freeze frame' position in response to the reflection questions. |
| Materials needed: | |
| Preparations in advance: | |
| Preparations in the space: | |
| The space looks like this: | Outdoors. |

GUIDANCE:

1. Use the "Freeze frame – Comet ahead" command as a starting point. Call out some of the other familiar commands used in previous sessions to engage the students.
2. Explain that a question will be asked and then count to 5 (like in the reflection during Sessions 1, 2, 3 & 4) but say "Freeze frame– Comet ahead" instead of saying 5, and that they will then be in a freeze position in response to the statement.
Suggested statements:
What I liked most about the session today.
What I liked least about the session today.
The warm-up with the soundtrack, the warm-up without a soundtrack.
My favourite planet.
How I feel right now.
What is most exciting about space?

NOTES

Our Solar System

Session 5

TIME

90 min.
including
break



Art of learning

THEME

19



MAIN ACTIVITY: STUDENTS GO OUTDOORS AND LOCATE THEN HANG ALL THE SOLAR SYSTEM PLANETS AT THE CORRECT DISTANCE FROM THE SUN

| | |
|-----------------------------------|--|
| This will happen: | The students go to a suitable outdoor location and locate the planets in order from the Sun using the scale of the Sun from Session 2 (3.3 metres). |
| Materials needed: | Long tape measure (50 metres), a set of the planets in the Solar System, twine and scissors, posters about the planets (if these have been made in Sessions 3 & 4) and something to ensure they can be securely displayed (pins etc). Scale map which shows the distance of each planet from the Sun (T1905 location of the planet from the sun (resource bank). |
| Preparations in advance: | If possible, make laminated posters of the route which allows each of the planets to be placed in the correct location from the Sun (which avoids trespassing or crossing major roads etc. (see T1905 Location of the planets in the landscape). Print map or use a digital map application. |
| Preparations in the space: | |
| The space looks like this: | Outdoors. |

GUIDANCE:

1. Start at the Sun (completed in Session 2). Ask: If the sun is here and is so big, where should Mercury, the closest planet to the Sun, be located? Ask for suggestions from the students. View the route/map and explain the destination of the trip.
 2. Each group should have all their planets (completed in the previous sessions), the planet poster (Paxi The Solar System poster from resource bank) and any materials that have been displayed previously.
 3. Start at the Sun and ask the students to use the measuring tape (or count the steps with their feet) to identify where Mercury should be located. Hang up all the Mercury models and possibly the poster at the correct location.
 4. Measure the correct distance from the Sun to Venus and plot the correct location and directions to Venus.
 5. Move on beyond the landscape. Hang the planets (and associated posters) at the correct distance from the Sun. The outermost planets can either be reached by bus, or if it's difficult, maybe someone at school can help to hang them in the right place and then take a photograph of them?
- Feel free to take photographs of the Solar System displays/planets so that they can be used by the class/school to document the process.

NOTES

Our Solar System

Session 6

TIME

90 min.
including
break



Art of learning

THEME
19



WARM-UP: "AYE, AYE SPACESHIP CAPTAIN" – FREE CHOICE MISSION

| | |
|-----------------------------------|---|
| This will happen: | The students embark on a further space mission and follow orders from their captain. |
| Materials needed: | T19 Warm-up spaceship music reverse (resource bank). Use masking tape to create a spaceship outline on the floor. Music player. |
| Preparations in advance: | Listen to the T19 Warm-up spaceship music in reverse. Make a spaceship outline on the floor with masking tape. |
| Preparations in the space: | Check that the sound system works. Create a spaceship on the floor with masking tape (with room for the whole class to stand together with room to spread out). |
| The space looks like this: | Open space. |

GUIDANCE:

1. The adult is the 'Spaceship Captain' and the students are astronauts. Explain that they are going on a space mission in their spaceship. The adult brings the Golden Chest and asks everyone to line up and then step into the spaceship. The Spaceship Captain stands at the BACK of the spaceship so the astronauts can only hear their voice and they can't see any of their movements (see after part 3.)
2. In the space rocket, the Captain says, "Briefing". Ask the students where they would like to go on this final mission. Those who don't want to make a suggestion, squat down. Choose a mission from the students' suggestions.
3. Ask the students for suggestions for new commands, select some to practice and then use them along with other familiar commands in the main part of the warm-up.
4. Say, "Astronauts" and wait for students to answer "Aye, Aye Captain!" and bring the back of their hand up to their forehead and stand up straight.
5. Say, "We are ready for take-off" – students put on fictional helmets and get themselves in the starting position. Continue with the commands as previously.

Variation: Play the warm-up in reverse (T19 Warm-up spaceship music reverse) and then launch the spaceship. Ask if they can make the movements backwards? Say the commands backwards?

REFLECTION: SOLAR SYSTEM QUIZ – FREE CHOICE FOR QUESTIONS AND ANSWERS (FROM ALL THE ALTERNATIVES AVAILABLE)

| | |
|-----------------------------------|---|
| This will happen: | Students use reflection cards to show answers to statements about our solar system. |
| Materials needed: | T19 reflection card – one set for each student |
| Preparations in advance: | Prepare questions and answers. |
| Preparations in the space: | |
| The space looks like this: | Classroom. |

GUIDANCE:

Open the Golden Chest. Hand out a set of reflection cards to each student. Explain that some statements will be read out and that students need to listen carefully. They should choose to answer with one of the cards (as confirmed by the adult). Count up to five. When it gets to five, the students should hold up the card they think is correct.

Ensure that not all statements have one correct answer, but that the quiz makes space for different opinions and experiences to emerge.

NOTES

Our Solar System

Session 6

TIME

90 min.
including
break



Art of learning

THEME
19



FREE CHOICE SESSION 6. SUGGESTED ACTIVITIES:

The adults should decide where the final session should land!

Suggestions include:

- Do further work with scale and comparison of sizes and quantities, or measurement of length – starting with the Solar System.
- Philosophical questions: follow up on the philosophical questions from the reflection quiz:
 - Where does the world come from?
 - How big is space?
 - How and when did the Sun and the Solar System appear?
 - Is there life on other planets?
 - How big is a human?
 - In the bigger context of the Solar System how important are human beings?
- Watch this animation! The Scale of the Universe 2 <https://htwins.net/scale2/>

htwins.net



- Continue to explore the topic 'Life on other planets' 2 suggestions to consider are given below:
 - 1) Explore Voyager which is a space ship that was sent out into space. It broadcasts music and the voices/ languages of people from different places on Earth
 - 2) Explore Europa which is a moon that orbits Jupiter. It is widely considered to be the best candidate for hosting life as we know it in this Solar System. It contains a lot of salt water, just like the Earth and is 5 times larger than the Earth.
- Explore space travel with space shuttles, satellites, space stations and space rockets.
- The international space station.

Vocabulary: Weightlessness, pen friend language expressions.

How to cook in space? How to wash your hair in space? How to go to the bathroom in space? (See proposed video clips in T1906 Proposal)

Videos from spacecraft, spacecraft:

- (1) Astronauts: How to wash your hair in space? <https://www.youtube.com/watch?v=kOlj7AgonHM>
- (2) Astronauts: How do astronauts eat and drink in space? <https://www.youtube.com/watch?v=8R7cOISkay0>
- (3) Brushing teeth in space: <https://www.youtube.com/watch?v=3bCoGC532p8>
- (4) Going to the bathroom: <https://www.youtube.com/watch?v=5WSIGRBTFNI>

youtube.com (1)



youtube.com (2)



youtube.com (3)



youtube.com (4)



- Stellarium: Digital planetarium with the ability to explore the planets and the universe. Stellarium Web. See what planets they can see at night from school. See what constellations they can see.
- The Moon is the only place in the Solar System (other than Earth) that humans have actually visited. Explore missions to the Moon.
- See other ideas for activities in the AOL own Solar System board on Pinterest: <https://pin.it/2Fpxy5O>

Pinterest



- Ask students to work on creating the questions for the Solar System quiz.

NOTES