Science and technology – learning sequence

## Resource considerations

This lesson sequence allows for continuity of student learning and could be adapted to fit in with your existing teaching and learning program. Students will be supported to meet outcomes from a Key Learning Area. Each task has a duration of 30 minutes and could be used in conjunction with your [framework, designed using the K-6 template](https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-from-home/teaching-and-learning-resources/k-6-resources). This lesson sequence uses a balance of synchronous and asynchronous learning strategies. The tasks provide options for students with and without technology. They can be used with any online platform. Suggestions about how your school will plan students’ learning from home and ways to communicate with students can be found through the [Learning at home, school planning page.](https://education.nsw.gov.au/teaching-and-learning/curriculum/learning-from-home/school-planning) Assessment strategies are included to ensure evidence of learning is monitored and collected.

## Stage 3 learning sequence

### Strand: Earth and Space

**Outcome**

**ST3-10ES-S** explains regular events in the solar system and geological events on the Earth’s surface

**Learning sequence overview** – students explore the solar system through research to complete a product and or presentation as evidence of learning.

**Key concepts** – compare the key features of the planets of our solar system, for example:

* time it takes for the planets to revolve around the Sun
* size of the planets
* distance of the planets from the Sun

**Key language** – distance, time, rotation, interrelation, system, planets, meteorites, comets, asteroids

**Key inquiry question – How does Earth compare to other planets in the solar system?**

### Aim of lesson sequence

* To develops students’ understanding of the Earth and its position in the solar system.

### Teacher notes

* Students will investigate our solar system through research. They will use the information they learn to create a representation of their knowledge to demonstrate their learning. This may take the form of an infographic, model, report, prototype, data table or a PowerPoint presentation.
* Teacher background: The solar system is the gravitationally bound system of the Sun and the objects that orbit it, either directly or indirectly. Of the objects that orbit the Sun directly, the largest are the eight planets, with the remainder being smaller objects, the dwarf planets and small solar system bodies.

### Activities

**Introduction to planets in our solar system**

* 1. **Digital:**

1. Share the question: ‘What is a planet?’ Using this website students navigate, investigate and research answers for the following questions. <https://www.nasa.gov/topics/solarsystem/index.html>

* What is a planet?
* Name some planets.
* Which planets in our solar system are rocky planets?
* Which planets in our solar system are gas giants?
* What do all planets in our solar system have in common?
* What are dwarf planets?
* What is Kepler?

Students can choose how they wish to record their answers as they will need them for the second activity.

1. In the second activity students use the information they have found and recorded to demonstrate their understandings by describing what they have understood to a new learner. It could be in the form of an infographic, artwork, data table, written report, video, Power Point, speech, model or in a multi-modal form. Giving students the opportunity to demonstrate their knowledge and understanding to others, allows them to refine their product for review with their peers back at school or uploaded to a shared space for review by their peers and teacher. Below is an example of a simple rubric that teachers may choose to use with students.

**Research Product Rubric: Earth and the solar system**

Choice of infographic, artwork, data table, written report, video, Power Point, speech, model, prototype or in a multi-modal form.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Category | Awesome | Great | Good | Need some help |
| **Organisation** | Information is very organised with well-constructed content easily seen in your chosen product. | Information is organised where content helps convey the information. | Information is organised, but some content is missing. | The information appears to be disorganised. |
| **Creativity** | Diagrams and illustrations are creative in their design, neat, accurate and add to the reader\'s understanding of the topic. | Diagrams and illustrations are accurate and add to the reader\'s understanding of the topic. | Diagrams and illustrations are neat and accurate and sometimes add to the reader\'s understanding of the topic. | Diagrams and illustrations are not accurate OR do not add to the reader\'s understanding of the topic. |
| **Quality of Information** | Information clearly relates to the solar system. It includes several supporting details and/or examples. | Information clearly relates to the solar system. It provides 1-2 supporting details and/or examples. | Information clearly relates to the solar system. No details and/or examples are given. | Information has little or nothing to do with the solar system. |
| **Mechanics** | No grammatical, spelling or punctuation errors. | Almost no grammatical, spelling or punctuation errors | A few grammatical, spelling, or punctuation errors. | Many grammatical, spelling, or punctuation errors. |
| **Completed product**  *Infographic, artwork, data table, written report, speech or model* | Product is complete and shows clear, logical relationships between all content and annotations. | Product is complete and shows clear, logical relationships between most of the content and annotations. | Product is complete and shows, logical relationships between some of the content and annotations. | Product has not been completed. |

1. Once students have completed their project, they could complete the following reflections:

• I really enjoyed...

• I learned a lot about...

• I could improve...

• I’m still wondering about...

* 1. **Non-digital:**

1. Share the question: ‘What is a planet?’ Students read the background information and record their responses on page 1 of the student workbook.

2. In the second activity students use the information they have found and recorded to demonstrate their understandings by describing what they have understood to a new learner. It could be in the form of an infographic, artwork, data table, written report, speech, prototype or model. Giving students the opportunity to demonstrate their knowledge and understanding to others, allows them to refine their product for review with their peers back at school. Students use the rubric to ensure that their project includes important features.

3. Once students have completed their project; they could complete the following reflections:

• I really enjoyed...

• I learned a lot about...

• I could improve...

• I’m still wondering about...

### Differentiation

Differentiation is a targeted process recognising that individuals learn at different rates and in different ways. Differentiation refers to deliberate adjustments to meet the specific learning needs of all students.

Here are some questions that you might consider when adapting the learning sequence to meet the needs of your students:

* What adjustments might you put in place for students who require additional support to access the task? For example, how will they get help when needed?
* Do you need to adjust the content to ensure it is adequately challenging and allows students to operate at their own level of thinking, skill and knowledge?
* Will you adapt the instructions so they are provided in a way that EAL/D students can easily interpret them? For example, using visuals, checklists, diagrams or flow charts.
* Could you suggest ways that home language can be used as a tool to support learning? For example, bilingual dictionaries.
* Can you demonstrate that you value the Identity, culture, heritage and language of your Aboriginal students through your teaching practices?

### Assessment

Students demonstrate through their product and/or presentations their ability to:

* construct and use a range of representations, including tables, to represent and describe observations, patterns or relationships in information researched
* employ appropriate technologies to represent information
* present data as evidence in developing explanations

### Activity resources

* Digital - access to a device and the internet, resources chosen by student to demonstrate learning. Differentiated for student choice and or availability of resources.
* Non-digital - Student printed workbooks and resources chosen by student to demonstrate learning. Differentiated for student choice and or availability of resources.

Parent/caregiver advice - Students will be investigating the solar system and beyond. They will conduct some investigations and research in order to develop a representation of their understanding, choosing a preferred option. e.g. infographic, artwork, data table, written report, speech or model. If your student has access to a device and the internet this would be ideal but not necessary to complete the tasks. If possible, viewing the night sky and discussing what students see and link back to the research would be ideal. Students are required to present their product to you or another adult in the household, so they can refine it after some feedback to demonstrate their new understandings.