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# Lesson Plan

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| **Lesson Title: Introduction to the Solar System** | **Date: February 3, 2026** |
| **Grade Level: 9 (De-streamed, SNC1W)** | **Subject/Strand: Earth and Space Science** |
| **Topic: Distance and Size of the Planets in our Solar System** | **Length of Period: 75 Minutes** |

**Lesson Plan Description** -- *What do I want the learners to know and/or be able to do? What are the big ideas/enduring understandings for the lesson/unit? Indicate using 1-2 sentences.*

This lesson introduces students to the structure and scale of the solar system. Students will explore the relative sizes and positions of planets, learn key vocabulary such as planet names and astronomical units (AU), and use this language to describe distances and relationships within the solar system.

## STEP 1: CURRICULUM CONNECTIONS

| **Ontario Curriculum Overall Expectations** | **Ontario Curriculum Specific Expectations** |
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| **E2.** Demonstrate an understanding of the components, characteristics, and associated phenomena of the solar system and the universe, and the importance of the Sun to processes on Earth. | **E2.4** Describe major components of the solar system and the universe and compare their characteristics.<br><br>**E2.5** Quantify distances in the solar system and the universe by applying an understanding of relative distances and sizes and using appropriate units of measurement. |
| **Learning Goals**<br>*Discuss with learners: What will I be learning today? Clearly identify what learners are expected to know and be able to do.* | **Success Criteria**<br>*Discuss with learners: How will I demonstrate what I have learned? Teacher/learner identify 'look fors' in language that learners can readily understand.* |
| ***We are learning …*** | ***I can …*** |
| ● We are learning to identify the order of the planets from the Sun.<br>● We are learning to use astronomical units (AU) to measure distances in the solar system.<br>● We are learning to compare the relative sizes of planets in our solar system. | ● I can define an Astronomical Unit (AU) and explain what it represents.<br>● I can identify the names and basic characteristics of the planets.<br>● I can correctly order the planets by their distance from the Sun.<br>● I can rank the planets by size from largest to the smallest. |

## STEP 2: ASSESSMENT

**Indicate purpose of the assessment:** [ X ] FOR [ X ] AS [ ] OF

**Indicate Achievement Chart categories being assessed**
[X] Knowledge and Understanding [X] Thinking [ ] Application [X] Communication

**Indicate Learning Skills/Work Habits:**
[X] responsibility, [X] organization, [X] independent work, [X] collaboration,
[ ] initiative, [ ] self-regulation

| **Indicate Assessment Mode: Written, Oral, Performance (Write, Say, Do)** | **Indicate Assessment Strategy: What will learners do to demonstrate their learning?** | **Indicate Assessment Tool: Instrument used to record results/ document learning.** |
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| **Written:** Writing out the notes and assessing organization skills<br><br>**Performance:** Allowing students to collaborate to make discoveries while learning | **Independent Work:** Students will have an exit card at the end to demonstrate what they have learned in this class. This shows if students have stayed focused and met the learning goals for this lesson. | ● **Note Template (T.I.P. Chart)**<br><br>● **Exit Card** |

## STEP 3: CONSIDERATIONS FOR PLANNING

**Prior Learning**: *What prior experiences, knowledge and skills do the learners bring with them to this learning experience?*

Students may enter this lesson with a wide range of prior knowledge. Some may have only a basic understanding of the Sun and its role, while others may already be familiar with the planets. The Minds On activity will be used to assess students' prior knowledge and gauge their existing understanding of the solar system.

**IEP program implications:** *N/A*

**Differentiation**:

**Content**: Provide visual supports such as labelled diagrams, colour-coded planet charts, and sentence starters for students who need additional scaffolding

**Process**: Allow students to engage with the material through multiple modes (matching cards, video clips, discussion, TIP chart templates), and offer guided prompts or check-ins for students who benefit from structured support.

**Product**: Offer choice in how students demonstrate understanding on the exit card (e.g., short written responses, diagrams, or labelled sequences) while keeping success criteria consistent.

**Grouping**: Use flexible grouping during Minds On and Think-Pair-Share activities, intentionally pairing students to support peer learning and varied readiness levels.

**Additional Considerations**

**Content** *(what learners are going to learn, and when)*
Guided by the learning goals, the following are the key concepts students are expected to understand and retain from this lesson:

- Order of the planets: Sun, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune
- Astronomical Unit (AU): the average distance from the Earth to the Sun (approximately 150 million km)
- Relative size of the planets: from largest to smallest — Jupiter, Saturn, Uranus, Neptune, Earth, Venus, Mars, Mercury

**Process** *(how instruction is organized towards a gradual release of responsibility)*
As this lesson places a strong emphasis on literacy, students will be guided through the core content. The Minds On and Consolidation activities provide opportunities for students to activate prior knowledge and demonstrate newly acquired understanding, allowing them to engage with the content with appropriate scaffolding before working independently.

**Product** *(how individual learners will demonstrate learning for assessment )*
The exit card will be used as a baseline assessment to familiarize students with the format and expectations of future assessments. This helps clarify learning targets and makes assessment criteria transparent. In addition, the note template serves as a structured study support, as it mirrors the types of questions students may encounter on future evaluations.

**Environment** *(the context and environment in which learners learn and demonstrate learning)*
As this is an introductory lesson, student responses will not be assigned a numerical grade. Instead, the focus will be on providing timely information and descriptive feedback to support student understanding and guide learning throughout the lesson.

**Resources and Materials & Technology Integration:** *List ALL items necessary for the delivery of the lesson. Include any attachments of learner worksheets used and teacher support material that will support communication of instruction.*

***All are attached to the lesson Plan***

- Minds On Cutouts
- Slideshow
- Bill Nye Video (https://www.youtube.com/watch?v=CCvHtK5SRAc)
- Blank TIPS Chart Template
- Exit Card Template

## Three Part Lesson

**Indicate Instructional Strategy:** *modelled*, *shared*, *guided*, *independent instruction*, *small group*, *conferencing*, *whole class*, *other* _____

******HITS are indicated by a number in the heading and are added to the specific part of the lesson where it occurs.******

**Minds on: Motivational Hook/engagement /Introduction (15 Minutes)**

*How will I engage the learners (motivational strategy, hook, activation of learners' prior knowledge, activities, procedures, compelling problem)?*

***HITS Covered: 1, 2, 4, 5, 7, 10***

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| **Intro** | **Prompting Questions and Possible Learner Responses:** |
| HITS 1 Learning Goals<br>HITS 2 Success Criteria<br>The lesson will begin with a brief slideshow that clearly introduces and reviews the learning goals for the day **(HITS 1: Learning Goals)** and the success criteria that describe what successful learning will look like **(HITS 2: Success Criteria)**.<br>These will be presented in student-friendly language and referenced verbally to ensure students understand both the purpose of the lesson and how their learning will be demonstrated. This establishes clarity and sets a shared focus for learning from the outset. | |
| **Matching Game: Small Groups Activity (Minds on Hook)**<br>HITS 10 Small Group Learning<br>Students will begin the lesson working in intentionally numbered small groups of 2–3 **(HITS 10: Small Group Learning)**. Each group will receive a set of cutouts containing planet names and various Astronomical Unit (AU) distances. Students will work collaboratively to match each planet to its distance from the Sun and to arrange the planets from closest (smaller AU) to farthest (larger AU). | How far do you think Earth is from the Sun?<br>▪ *"Really far… like millions of kilometres?"*<br>▪ *"About a million kilometres?"*<br>▪ *"I don't know the number, but way farther than the Moon."*<br>▪ *"Maybe a few thousand kilometres?"*<br>▪ *"Is it like halfway across the solar system?"*<br><br>Do you think a planet (Mars) is closer or farther than Earth to the sun?<br>▪ *"Farther, because Mars is after Earth."*<br>▪ *"Closer, because it's smaller."*<br>▪ *"I think it's closer because it looks red and hot."* |

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| | The inclusion of extra AU values is intentionally designed to challenge student thinking and surface common misconceptions. | |
| HITS 7 Scaffolding | Students will be asked to guess the distance of one Astronomical Unit (AU) without being explicitly told the value, allowing their initial ideas to serve as a starting point for learning. These estimates will later be revisited and refined during the Action portion of the lesson, supporting learning through built-in scaffolding rather than immediate correction **(HITS 7: *Scaffolding*).** | How far do you think one Astronomical Unit (AU) is?<br>▪ *"Maybe a few thousand kilometres?"*<br>▪ *"Is it the distance from Earth to the Moon?"*<br>▪ *"Maybe the distance between planets?"*<br>▪ *"Around 100 million kilometres?"*<br>▪ *"It's probably really far, like farther than anything we usually measure."*<br>▪ *"I think it's just a unit, not an actual distance."* |
| HITS 5 Questioning | As students work, the teacher will circulate to observe and pose open-ended, probing questions to assess prior knowledge and encourage deeper thinking, while students engage in discussion and respectfully challenge one another's ideas. Prompting students to justify their estimates of an AU further supports meaningful dialogue and prepares them for explicit instruction later in the lesson **(HITS 5: *Questioning*).** | |
| HITS 4 Descriptive Feedback | This activity serves as a diagnostic to identify students' existing understanding and highlight gaps that will be addressed during the Action portion of the lesson. Following the activity, answers will be revealed and discussed as a class, with the teacher providing timely, descriptive feedback to clarify misconceptions and reinforce accurate reasoning **(HITS 4: Descriptive Feedback)**. | |

**Action: During /Working on it (40 Minutes)**
*How will I provide practice of new concepts, and have them demonstrate new learning?*
***HITS Covered: 3, 5, 6, 7***

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| Building on the Minds On activity, students will revisit their initial estimates of how far one Astronomical Unit (AU) is. These estimates are expected to be significantly smaller than the actual value (150 million km). Rather than immediately revealing the correct distance, the lesson intentionally continues to build understanding through familiar reference points, supporting learning through gradual release **(HITS 7: *Scaffolding*).** | **Prompting Questions and Possible Responses:**<br><br>*What stands out to you about each planet?*<br><br>*What could lead to the further planets being larger?*<br>*What* |
| A series of slides will be used to establish a sense of relative scale, beginning with small, concrete examples (e.g., the height of a pop can) and progressing to larger, relatable distances such as the distance between Thunder Bay and Toronto, followed by the distance required to travel around the Earth. Throughout this sequence, the teacher will model thinking and guide students through comparisons before asking them to make independent estimates **(HITS 6: *Explicit Teaching*; HITS 7: *Scaffolding*).** | |
| Students will then be prompted with a guiding question—*How far do you think Earth is from the Sun?*—to elicit predictions and reasoning. The teacher will facilitate discussion and probe student thinking to surface understanding and misconceptions **(HITS 5: *Questioning*).** | |
| The next slide will explicitly introduce the concept of an Astronomical Unit, defining 1 AU as the average distance from Earth to the Sun, approximately 150 million kilometres. This clear, direct explanation ensures a shared understanding of key vocabulary and concepts **(HITS 6: *Explicit Teaching*; HITS 3: *Explicit Vocabulary Instruction*).** | |

HITS 7 Scaffolding

HITS 6 Explicit Teaching

HITS 7 Scaffolding

HITS 5 Questioning

HITS 6 Explicit Teaching

HITS 3 Explicit Vocabulary Instruction

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| HITS 7 Scaffolding | The lesson will then transition to a “Video Time” slide linking to a Bill Nye video, which will be played until the 8:10 mark. The video provides a visual model of planetary distances using Astronomical Units and reinforces the newly learned concept through an additional representation **(HITS 7: *Scaffolding*).**<br><br>Following the introduction of Astronomical Units, the lesson will continue with an explicit teaching sequence focused on each of the eight planets, presented in order from the Sun. A series of slides will guide students through key characteristics of each planet, with the teacher modelling how to extract and organize important information **(HITS 6: *Explicit Teaching*).**<br><br>Students will be provided with a *modified* **T.I.P. (Term–Information–Picture) chart** to support note-taking and vocabulary development **(HITS 3: *Explicit Vocabulary Instruction*).** As each planet is introduced, students will record key details, including:<br>• order from the Sun<br>• distance from the Sun in Astronomical Units (AU)<br>• additional identifying information<br>• colour<br>• relative surface area (size)<br><br>This structured note-taking approach supports students in making connections between descriptive features and visual representations of each planet. Throughout the sequence, the teacher will encourage questions and facilitate discussion to clarify understanding and deepen conceptual grasp, allowing students to collaboratively construct meaning as new information is introduced **(HITS 5: *Questioning*; HITS 7: *Scaffolding*).** | |

HITS 6 Explicit Teaching

HITS 3 Explicit Vocabulary Instruction

HITS 5 Questioning

HITS 7 Scaffolding

**Consolidation & Connection (Reflect and Connect) (15 Minutes)**
*How will I bring all the important ideas from the learning experiences together for/with learners? How will I check for understanding?*
***HITS Covered: 8, 9***

HITS 8 Spaced Practice

HITS 9 Metacognition

To consolidate learning, students will complete an exit card that requires them to apply key concepts from the lesson, including planet order, relative size, and the meaning of an Astronomical Unit. The questions are intentionally structured in a format similar to a quiz or test to help students become familiar with assessment expectations while keeping the task low-stakes **(HITS 8: *Spaced Practice*).**

As students work independently, the teacher will circulate to provide clarification, respond to questions, and offer timely feedback to support understanding (HIT 4: *Descriptive Feedback*). Students will be encouraged to refer to their notes and TIP chart, reinforcing effective study strategies and helping them recognize how classroom learning tools connect directly to assessment success **(HITS 9: *Metacognition*).**

This exit card serves as a formative check for understanding, allowing both students and the teacher to reflect on progress toward the learning goals and identify any areas that may require further instruction in subsequent lessons.

**Prompting Questions:**

How far is an AU?

- *"About 150 million kilometres."*
- *"It's the distance from Earth to the Sun."*
- *"Really far—way more than distances on Earth."*

Which characteristic of a planet sticks out to you? Why?

- *"The size, because Jupiter is way bigger than all the others."*
- *"The colour, because some planets look really different from each other."*
- *"The distance from the Sun, because some planets are much farther apart than I expected."*
- *"The surface area, because I didn't realize how small Earth is compared to gas giants."*
- *"The fun facts, because they help me remember each planet."*

**Extension Activities:** *What will learners do when work is completed? What will learners do if they finish early?*

Students who complete the exit card early will be encouraged to extend their learning in low-pressure, meaningful ways. One option is to **read ahead in the textbook** to preview upcoming concepts, such as additional components of the solar system or new scientific vocabulary. As they read, students may **note unfamiliar terms or questions they have**, which can be brought forward and addressed in the following lesson.

Additional extension options may include **revisiting the TIP chart to add one new fact** about a planet of interest, sketching a simple visual representation of planetary distances using AU, or reflecting on how today's learning connects to real-world space exploration. These activities allow students to deepen understanding without introducing new assessment expectations.

**Note**: A five-minute flex period is built into the lesson to support thoughtful completion of exit cards, encourage peer discussion, and provide time for enrichment activities. This flexibility ensures students can engage meaningfully with the content at their own pace while maintaining a calm and productive learning environment.

**Next Steps:** *Where will this lesson lead next?*

This lesson lays the foundation for further study of the solar system. In upcoming lessons, students will explore additional components such as moons, asteroids, comets, and dwarf planets, as well as other astronomical phenomena. The concepts of planetary order, size, and Astronomical Units will be revisited and applied as students develop a more complete understanding of the solar system.