FREE RENEWED CURRICULUM

MANITOBA GRADE 6 SCIENCE

# FREE Year Plan + Complete Sample Lesson

Renewed curriculum, full implementation 2026/27 · Earth, Moon & Sun unit, Lesson 6

## START HERE

This free sampler has two parts: a year-at-a-glance planner for the 17 Scientific Knowledge outcomes of Manitoba's renewed Grade 6 Science curriculum, and one complete lesson from our Earth, Moon & Sun unit, Lesson 6, 'What Causes the Seasons? Testing an Idea.' Everything needed to teach the lesson is here: student pages at two reading levels, the teacher plan, the answer key and the slides.

- **Year-at-a-Glance Organizer (2 pages)**
  A suggested month-by-month order for the Strand E (Scientific Knowledge) outcomes, plus an outcome planner quoting every outcome SCI.6.E.1 to SCI.6.E.17.
- **Lesson 6 — What Causes the Seasons? Testing an Idea (19 pages)**
  The full lesson from the live Earth, Moon & Sun unit: Student Workbook pages, Accommodated Edition pages (easier reading level, large print), and Teacher Guide pages with the lesson plan and the complete answer key.
- **Lesson-06-What-causes-the-seasons.pptx**
  The lesson's 12-slide teaching deck, with speaker notes. Opens in PowerPoint or Google Slides.
- **The full Grade 6 year (1 page)**
  What the Earth, Moon & Sun, Forces & Energy, and Heredity, Diversity & Fossils units cover, and where to find them.

**FREE INTERACTIVE: SEASONS EXPLORER**

Test the same distance-vs-tilt question this lesson teaches at milestoneteachers.com/labs/seasons-explorer. Free, no login, runs in a current desktop browser. (The Earth, Moon & Sun unit also includes an offline copy for classroom use without internet.)

### ABOUT THIS EXCERPT

- The retrieval warm-up reviews Lessons 1 to 5 of the Earth, Moon & Sun unit, which are not included; the answers to Lesson 6's own three warm-up questions are on the Teacher Guide answer-key pages included here.
- Lesson 6 begins partway down the first Teacher Guide plan page, so the top of that page shows the end of Lesson 5's plan (a Go further task, the 30-minute version, and background for the teacher).
- The first Teacher Guide answer-key page opens with Lesson 5's full answer key before Lesson 6's begins partway down; the second page finishes Lesson 6's answer key and then continues into the start of Lesson 7's (its warm-up answers and first investigation items).
- Every lesson page is reproduced exactly as it appears in the Earth, Moon & Sun unit.

Questions or a problem with a file: admin@milestoneteachers.ca

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# Year-at-a-Glance Organizer

A suggested order for the Strand E (Scientific Knowledge) outcomes across the ten teaching months. This is a suggested order, not a required sequence: Manitoba encourages teachers to regroup and reorder these outcomes to fit their own class and calendar.

| MONTH | UNIT | OUTCOMES | FOCUS |
|---|---|---|---|
| **September** | Earth, Moon & Sun | SCI.6.E.8 | Day and night, sunrise and sunset, and Earth's rotation. Start a sunset log and the science notebooks you will use all year. |
| **October** | Earth, Moon & Sun | SCI.6.E.9, SCI.6.E.11 | Revolution and orbit: how a month and a year are set. Keep a month-long Moon phase diary. |
| **November** | Earth, Moon & Sun | SCI.6.E.10, SCI.6.E.11 | Tilt, orbit and daylight hours: what really causes the seasons. The Sun as a star. |
| **December** | Forces & Energy | SCI.6.E.1, SCI.6.E.2 | Gravity pulls toward Earth's centre, and the forces that oppose it: the normal force, tension and lift. |
| **January** | Forces & Energy | SCI.6.E.3 | Buoyancy: opposing forces, Archimedes Principle, volume, density and mass. A boat-building design challenge. |
| **February** | Forces & Energy | SCI.6.E.4, SCI.6.E.5 | Stored energy, and how transferring it makes events happen. |
| **March** | Forces & Energy | SCI.6.E.6, SCI.6.E.7 | Battery circuits and electrical safety. Choose an issue for the class action project, such as the classroom's energy use. |
| **April** | Heredity, Diversity & Fossils | SCI.6.E.12, SCI.6.E.13 | Offspring resemble parents, and traits come from a mix of genetic, environmental, social and learned components. |
| **May** | Heredity, Diversity & Fossils | SCI.6.E.14, SCI.6.E.15 | Classifying organisms with a dichotomous key; fossils as evidence of how organisms have changed. |
| **June** | Heredity, Diversity & Fossils | SCI.6.E.16, SCI.6.E.17 | Species, hybrids and viable offspring, and why offspring are similar but not identical. Share the action project. |

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# Outcome Planner: SCI.6.E.1 to SCI.6.E.17

Every Scientific Knowledge outcome, quoted from the curriculum document. Contains information from the Government of Manitoba, licensed under the OpenMB Information and Data Use License (Manitoba.ca/OpenMB).

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**SCI.6.E.1** **Gravity pulls toward Earth's centre**
"Demonstrate the understanding that the gravitational force of Earth pulls objects (near Earth's surface) toward the planet's centre."

**SCI.6.E.2** **Forces that oppose gravity**
"Demonstrate an understanding of forces that oppose gravitational force."

**SCI.6.E.3** **Buoyancy**
"Demonstrate a conceptual understanding of the principles of buoyancy."

**SCI.6.E.4** **Stored energy**
"Demonstrate the understanding that objects can have stored energy."

**SCI.6.E.5** **Energy transfer makes things happen**
"Demonstrate the understanding that stored energy can be transferred, and this causes events to happen."

**SCI.6.E.6** **Energy in battery circuits**
"Demonstrate the understanding that in battery-powered circuits, as electricity flows, energy is transferred from the battery to components in the circuit and ultimately to the environment."

**SCI.6.E.7** **Electrical safety**
"Demonstrate an understanding of safety precautions associated with electricity."

**SCI.6.E.8** **Rotation and the length of a day**
"Demonstrate an understanding of the rotational motion of Earth, and its role in defining the length of a day."

**SCI.6.E.9** **Month, year and seasons**
"Demonstrate the understanding that the meaning of human time systems is tied to the motions of Earth around the Sun and the Moon around Earth."

**SCI.6.E.10** **Tilt, orbit, daylight and the seasons**
"Demonstrate an understanding of the relationship among the tilt of Earth's axis, revolution around the Sun, number of daylight hours, and seasonal change."

**SCI.6.E.11** **The Sun as a star**
"Demonstrate an understanding of the nature of the Sun as a star like billions of others, and as the central source of energy, light, and gravity in the Solar System."

**SCI.6.E.12** **Offspring resemble their parents**
"Demonstrate the understanding that organisms resemble their parents in both plants and animals because genetic information is passed from one generation to the next."

**SCI.6.E.13** **Genes, environment and learning shape traits**
"Demonstrate the understanding that the traits, skills, and behaviours exhibited by organisms result from some combination of genetic, environmental, social, and learned components."

**SCI.6.E.14** **Diversity and classification**
"Demonstrate the understanding that there is a wide variety of organisms in the world, which are systematically categorized by scientists."

**SCI.6.E.15** **Fossils as evidence of change**
"Demonstrate the understanding that fossils provide evidence of how organisms have changed over time."

**SCI.6.E.16** **What a species is**
"Demonstrate an understanding of the nature of plant and animal species."

**SCI.6.E.17** **Offspring are similar, not identical**
"Demonstrate the understanding that sexual reproduction of animals and plants produces offspring that are similar to but not identical to their parents."

LESSON 6

# What Causes the Seasons? Testing an Idea

Hypothesis testing: is it Earth's distance from the Sun?




Name _____

**WARM-UP** Three quick questions from earlier lessons

**W1** One revolution of Earth around the Sun gives us which unit of time? (Lesson 3)

**W2** At full Moon, where is the Moon compared with Earth and the Sun? (Lesson 4)

**W3** How many full Moons does NASA's table list for 2026? (Lesson 5)

**BIG QUESTION**

**Is Earth's distance from the Sun the cause of the seasons?**

Curriculum: SCI.6.E.10, SCI.6.D.3, SCI.6.D.4, SCI.6.D.1, SCI.6.D.2, SCI.6.E.9 (Manitoba Grade 6 Science)

## WORDS Words to know

| Word | Meaning |
|---|---|
| hypothesis | a prediction about what is happening, or what might happen, based on evidence or experience |
| evidence | facts or observations that support or go against an idea |
| perihelion | the point in Earth's orbit when it is closest to the Sun |
| aphelion | the point in Earth's orbit when it is farthest from the Sun |
| hemisphere | half of Earth: the Northern Hemisphere is north of the equator |

## READ Read

**1** Why is summer warm and winter cold? Many people believe that Earth is closer to the Sun in summer and farther away in winter. NASA says this idea makes sense, but it is incorrect. Scientists test an idea like this by turning it into a hypothesis and checking it against evidence.


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**2** If distance caused the seasons, two things would be true. First, Earth would be closest to the Sun during our summer. Second, the whole planet would have summer at the same time, because both halves of Earth are the same distance from the Sun.

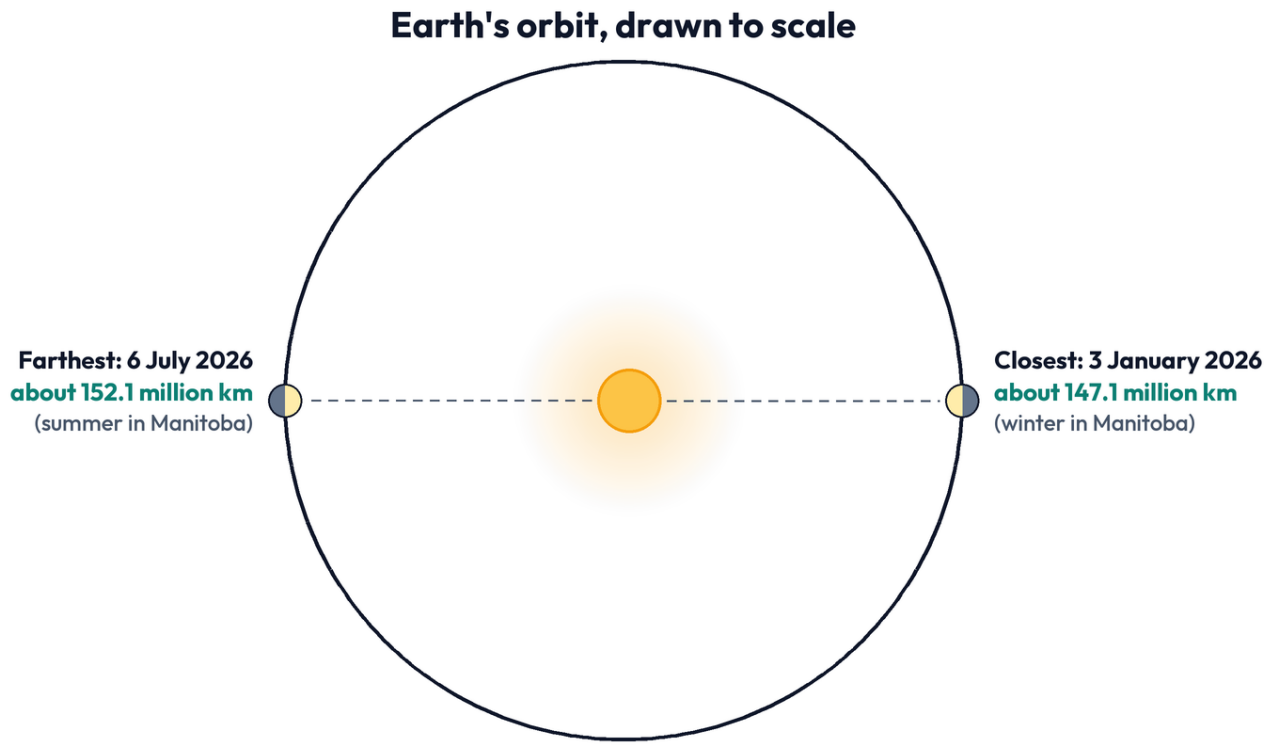
**3** Evidence 1: Earth's orbit is not a perfect circle, so its distance from the Sun does change. The U.S. Naval Observatory lists Earth's closest point to the Sun (perihelion) in 2026 on 3 January 2026, and its farthest point (aphelion) on 6 July 2026. NASA gives these distances as 91.4 million miles (about 147.1 million km) and 94.5 million miles (about 152.1 million km). In Manitoba, January is winter and July is summer.

**4** Evidence 2: NASA explains that because the poles are on opposite ends of Earth, the two hemispheres have opposite seasons. When it is winter in Manitoba, it is summer in the Southern Hemisphere, on the same day, at the same distance from the Sun.

**5** The evidence does not support the distance hypothesis: it refutes it. NASA's answer is that Earth's tilted axis causes the seasons. In the next lesson, you will find out how.

### KEY FACTS

- In 2026 Earth was closest to the Sun on 3 January 2026: winter in Manitoba.
- The Northern and Southern Hemispheres have opposite seasons.
- Earth's tilted axis causes the seasons.




Shape and Sun position to scale (distances: NASA; dates: U.S. Naval Observatory). The Sun and Earth are drawn much larger than scale.

Earth's real orbit, drawn to scale from NASA's distances: closest on 3 January 2026, farthest on 6 July 2026 (USNO). The Sun and Earth are enlarged so you can see them.

Sources for this reading: NASA Space Place; U.S. Naval Observatory. Full titles and web addresses: Credits page.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Name _____

HYPOTHESIS TEST + SCALE MODEL

## Investigation 4: Test the Distance Hypothesis

**Question:** Does the evidence support or refute the idea that distance causes the seasons?

### You need

- masking tape and a metre stick or measuring tape
- a small ball (Earth) and a large yellow circle (Sun)
- the evidence table in this lesson

**SAFETY**

- Keep the floor model out of walkways.

### What to do

1. Write your own hypothesis in the If … then … frame.
2. Build a scale model on the floor: 1 cm stands for 1 million km. Tape the Sun at 0.
3. Put a tape mark for Earth at perihelion (147 cm) and at aphelion (152 cm).
4. Stand back. How different do the two distances look?
5. Use the evidence table to decide: support or refute?

### My hypothesis

If …

then …

### My floor model: how different do the two distances look?


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Name _____

## DATA Evidence Table: Earth's Distance and Manitoba's Seasons, 2026

| Point in orbit | Date | Distance from the Sun | Winnipeg daylight | Season in Manitoba |
|---|---|---|---|---|
| Perihelion (closest) | 3 January 2026 | about 147.1 million km | 8.23 h | winter |
| Aphelion (farthest) | 6 July 2026 | about 152.1 million km | 16.17 h | summer |

Distances: NASA Space Place, converted from miles (1 mile = 1.609344 km). Daylight: NRC, Winnipeg.
Source: U.S. Naval Observatory, Earth's Seasons and Apsides 2026 (UTC-6, no daylight saving); NASA Space Place, What Causes the Seasons?; National Research Council Canada, Sunrise/sunset calculator: Winnipeg MB, full year 2026.

## QUESTIONS Show what you know

**1** FIND IT **What is a hypothesis?**

**2** HYPOTHESIS **Write the distance idea as a hypothesis: If ... then ...**

**3** DATA **When was Earth closest to the Sun in 2026? What season was it in Manitoba?**

**4** DATA **When was Earth farthest from the Sun in 2026? What season was it in Manitoba?**

**5** CALCULATE **How much farther from the Sun is Earth at aphelion than at perihelion? What percent of the average distance (150 million km) is that?**

**6** MODEL **In your floor model (1 cm = 1 million km), how far apart are the perihelion and aphelion marks?**


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Name _____

**7** EXPLAIN **When it is winter in Manitoba, what season is it in the Southern Hemisphere? Why is this evidence against the distance hypothesis?**

**8** CONCLUDE **Does the evidence support or refute the distance hypothesis?**

## CER Claim, Evidence, Reasoning

**Is Earth's distance from the Sun the cause of the seasons?**

**CLAIM** Answer the question in one sentence.

**EVIDENCE** Give facts or data from this lesson. Use numbers.

**REASONING** Explain how your evidence supports your claim, using science ideas.


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Name _____

**GO FURTHER** For scientists who are ready for more

Southern Hemisphere check: Winnipeg and Churchill are both in the Northern Hemisphere. Sketch what a daylight graph for a city in the Southern Hemisphere would look like through the year, and explain it with the evidence that the hemispheres have opposite seasons.

**Notes and sketches**

cut here

## EXIT TICKET · LESSON 6 Name _____

**E1** True or false: Earth is closest to the Sun in July. Correct it if it is false.

**E2** Give one piece of evidence that distance does not cause the seasons.


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LESSON 6

# What Causes the Seasons? Testing an Idea

Hypothesis testing: is it Earth's distance from the Sun?




Name _____

## WARM-UP Three quick questions from earlier lessons

**W1** One trip of Earth around the Sun is one … (Lesson 3)

**Word bank:** day | month | year

**W2** At full Moon, where is the Moon? (Lesson 4)

**Word bank:** opposite | same side

**W3** How many full Moons were there in 2026? (Lesson 5)

**Word bank:** 12 | 13

## BIG QUESTION

**Is Earth's distance from the Sun the cause of the seasons?**

Curriculum: SCI.6.E.10, SCI.6.D.3, SCI.6.D.4, SCI.6.D.1, SCI.6.D.2, SCI.6.E.9 (Manitoba Grade 6 Science)


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Name _____

## WORDS Words to know

| Word | Meaning |
|---|---|
| hypothesis | a prediction about what is happening, or what might happen, based on evidence or experience |
| evidence | facts or observations that support or go against an idea |
| perihelion | the point in Earth's orbit when it is closest to the Sun |
| aphelion | the point in Earth's orbit when it is farthest from the Sun |
| hemisphere | half of Earth: the Northern Hemisphere is north of the equator |

## READ Read

**1** Why is summer warm? Many people think Earth is closer to the Sun in summer. NASA says this idea makes sense, but it is wrong. Let's test it.

**2** If distance made the seasons, Earth would be closest to the Sun in our summer. Also, all of Earth would have summer at the same time.

**3** Evidence 1: Earth was closest to the Sun on 3 January 2026 (winter in Manitoba). It was farthest on 6 July 2026 (summer in Manitoba). The distances were about 147.1 and 152.1 million km.

**4** Evidence 2: The top and bottom halves of Earth have opposite seasons. When it is winter here, it is summer in the south, on the same day.

**5** So the evidence goes against the distance idea. NASA says Earth's tilted axis causes the seasons.

### KEY FACTS

- In 2026 Earth was closest to the Sun on 3 January 2026: winter in Manitoba.
- The Northern and Southern Hemispheres have opposite seasons.
- Earth's tilted axis causes the seasons.

Sources for this reading: NASA Space Place; U.S. Naval Observatory. Full titles and web addresses: Credits page.


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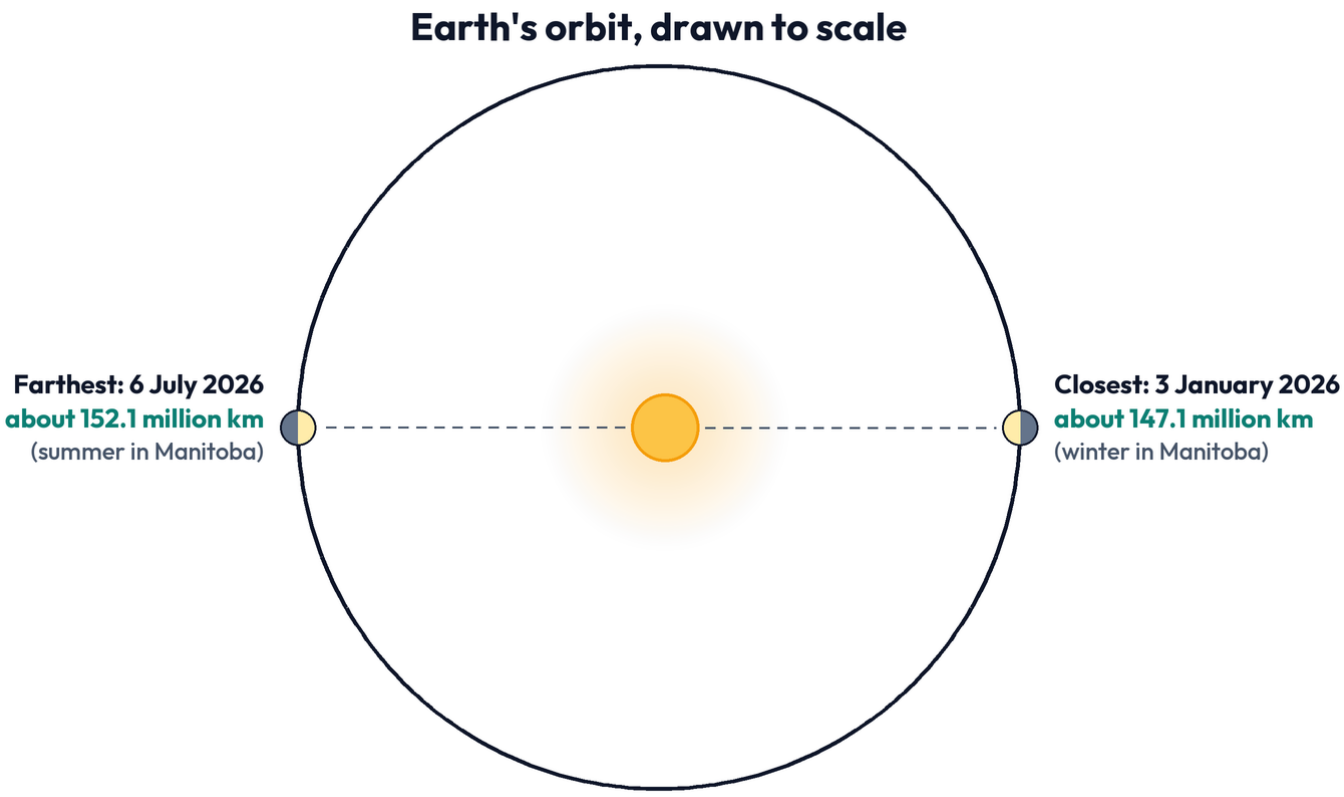
Name _____




Shape and Sun position to scale (distances: NASA; dates: U.S. Naval Observatory). The Sun and Earth are drawn much larger than scale.

Earth's real orbit, drawn to scale from NASA's distances: closest on 3 January 2026, farthest on 6 July 2026 (USNO). The Sun and Earth are enlarged so you can see them.

HYPOTHESIS TEST + SCALE MODEL

## Investigation 4: Test the Distance Hypothesis

**Question:** Does the evidence support or refute the idea that distance causes the seasons?

### You need

- masking tape and a metre stick or measuring tape
- a small ball (Earth) and a large yellow circle (Sun)
- the evidence table in this lesson

### SAFETY

- Keep the floor model out of walkways.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 Name _____

## What to do

1. Write your guess (If ... then ...).
2. Tape the Sun on the floor.
3. Put Earth at 147 cm and at 152 cm.
4. Look. Is there a big difference?
5. Use the evidence to decide.

## My hypothesis

If ...

then ...

## My floor model: how different do the two distances look?

DATA

### Evidence Table: Earth's Distance and Manitoba's Seasons, 2026

| Point in orbit | Date | Distance from the Sun | Winnipeg daylight | Season in Manitoba |
|---|---|---|---|---|
| Perihelion (closest) | 3 January 2026 | about 147.1 million km | 8.23 h | winter |
| Aphelion (farthest) | 6 July 2026 | about 152.1 million km | 16.17 h | summer |

Distances: NASA Space Place, converted from miles (1 mile = 1.609344 km). Daylight: NRC, Winnipeg. Source: U.S. Naval Observatory, Earth's Seasons and Apsides 2026 (UTC-6, no daylight saving); NASA Space Place, What Causes the Seasons?; National Research Council Canada, Sunrise/sunset calculator: Winnipeg MB, full year 2026.


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Name _____

## QUESTIONS Show what you know

### 1 FIND IT What is a hypothesis?

**Word bank:** prediction | evidence

A hypothesis is ...

### 2 HYPOTHESIS Write the distance idea as a hypothesis: If ... then ...

If Earth's distance causes the seasons, then ...

### 3 DATA When was Earth closest to the Sun in 2026? What season was it in Manitoba?

Earth was closest on ...

### 4 DATA When was Earth farthest from the Sun in 2026? What season was it in Manitoba?

Earth was farthest on ...


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Name _____

**6** **MODEL** **In your floor model (1 cm = 1 million km), how far apart are the perihelion and aphelion marks?**

The marks are ... cm apart.

**7** **EXPLAIN** **When it is winter in Manitoba, what season is it in the Southern Hemisphere? Why is this evidence against the distance hypothesis?**

**Word bank:** summer | same distance | opposite

It is ... This shows ...

**8** **CONCLUDE** **Does the evidence support or refute the distance hypothesis?**

**Word bank:** supports | refutes

The evidence ...


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Name _____

## CER Claim, Evidence, Reasoning

### Is Earth's distance from the Sun the cause of the seasons?

**Word bank:** tilt | axis | evidence | hemisphere | daylight | distance | Sun

**CLAIM** Answer the question in one sentence.

I claim that ...

**EVIDENCE** Give facts or data from this lesson. Use numbers.

My evidence is ...

**REASONING** Explain how your evidence supports your claim, using science ideas.

This evidence shows ... because ...


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Name _____

**GO FURTHER** For scientists who are ready for more

Draw a daylight graph for a city in the south half of Earth. When is its longest day?

cut here

## EXIT TICKET · LESSON 6 Name _____

**E1** True or false: Earth is closest to the Sun in July. Correct it if it is false.

**E2** Give one piece of evidence that distance does not cause the seasons.


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## Go further (workbook box)

**Task:** Land journal: from one full Moon to the next, record one change you notice on the land each week (birds, plants, weather, ice). At the next full Moon, give that moon your own name for what you observed, and explain how careful watching over time is a way of knowing.

**What to look for:** Students' names are their own observations, not Ininew names; remind them not to borrow or invent names for a community's moons.

## 30-minute version

Warm-up (3); learning with respect (4); read the Thirteen Moons page together (10); full-Moon count and question 5 (8); exit ticket (5). Complete the comparison chart next time.

## Lesson 5: background for the teacher

This lesson does not reproduce the thirteen moons or any star story. Project the Canadian Space Agency page and read it together; students record from the page. The page's own caution is worth reading aloud: these are not the only names, and the names depend on the environment each moon is seen from. For star knowledge, the Manitoba First Nations Education Resource Centre publishes Tipiskawi Kisik: Night Sky Star Stories by Wilfred Buck, which MFNERC describes as rooted in an Ininew (Cree) perspective; use the published book rather than retelling. Métis and Inuit perspectives, and the knowledge of the Nation whose land your school is on, are best learned from local Knowledge Keepers (see the Knowledge Keeper page of this guide).

Sources: Manitoba Education and Early Childhood Learning, Science: Grade 6 (2026); Canadian Space Agency, Nisto Osap Tiposkawi Pisimuk - Thirteen moons, by Wilfred Buck, Researcher and Knowledge Keeper, Opaskwayak Cree Nation; NASA Goddard (F. Espenak), Phases of the Moon: 2001 to 2100 (Universal Time); NASA Space Place, Moon Phases.

# LESSON 6 What Causes the Seasons? Testing an Idea

**Big question:** Is Earth's distance from the Sun the cause of the seasons?

**Big idea:** Scientists test ideas against evidence. The popular distance explanation of the seasons is refuted by the timing of perihelion and by opposite seasons in the two hemispheres.

**Focus outcomes:** SCI.6.E.10, SCI.6.D.3, SCI.6.D.4 **Supporting:** SCI.6.D.1, SCI.6.D.2, SCI.6.E.9 **Time:** About 70 minutes, or two shorter periods


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## Lesson flow (matches the slides)

| Slide | Activity | Time |
|---|---|---|
| 1 | Retrieval warm-up (three questions from earlier lessons) | 3 min |
| 2 | Why is summer warm? | 5 min |
| 3 | Key words (5) | 4 min |
| 4 | If distance causes the seasons, then … | 5 min |
| 5 | Earth's orbit, drawn to scale | 8 min |
| 6 | Seasons Explorer interactive, on screen (optional) | 6 min (optional) |
| 7 | Opposite seasons, same distance | 5 min |
| 8 | Investigation 4: Test the Distance Hypothesis | 15 min |
| 9 | Data: Evidence Table: Earth's Distance and Manitoba's Seasons, 2026 | 6 min |
| 10 | Claim, evidence, reasoning | 12 min |
| 11 | Exit ticket | 5 min |
| | Total guided time (not counting optional slides) | about 68 min |

The slide deck has one title slide per lesson in addition to these; speaker notes on each slide give the words to say, the question to ask and what to listen for.

## Common misconceptions

- Earth is closest to the Sun in summer (NASA: incorrect).
- Earth's orbit is a long, stretched oval. (Drawn to scale it looks like a circle: the distance changes by about 3.3%.)
- The side of Earth tilted toward the Sun is 'closer' and that is why it is warmer. (The tilt changes the angle and hours of sunlight, not the distance in any meaningful way; Lesson 7.)

## Look for

- Hypotheses are written as testable predictions (If … then …).
- Students say 'refutes' or 'does not support', not 'proves wrong forever'.

## Differentiation

- Accommodated edition: the CER has sentence frames and a word bank.
- Challenge: find a city in the Southern Hemisphere and predict its daylight on 21 June.

## The likely misconception, and the question that surfaces it

**Misconception:** Earth is closest to the Sun in summer.

**Ask:** When do you think Earth is closest to the Sun: January or July? Why?

**Listen for:** "July, because it's hot." This is the hypothesis the lesson tests.


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## Go further (workbook box)

**Task:** Southern Hemisphere check: Winnipeg and Churchill are both in the Northern Hemisphere. Sketch what a daylight graph for a city in the Southern Hemisphere would look like through the year, and explain it with the evidence that the hemispheres have opposite seasons.

**What to look for:** A mirror image of Winnipeg's graph, with the most daylight around December and the least around June, because the hemispheres have opposite seasons.

## 30-minute version

Warm-up (3); vote and hypothesis (5); evidence table and orbit diagram (10); CER claim and one piece of evidence (8); exit ticket (4). Skip the floor model or show it as a demonstration.

### Distance-versus-tilt check (no screen needed)

When: After the Evidence 1 orbit diagram; allow about six minutes if time permits.

1. Find 3 January in the evidence table: Earth is closest to the Sun. Ask what season Winnipeg has then.

2. Find 6 July: Earth is farthest away. Compare Winnipeg daylight: 8 h 14 min in January and 16 h 10 min in July.

3. Ask: If closeness caused summer, would these observations make sense? Use the scale orbit and opposite hemispheres to explain why tilt fits better.

## Lesson 6: background for the teacher

Distances are NASA Space Place's perihelion (91,400,000 miles) and aphelion (94,500,000 miles) converted at 1.609344 km per mile: 147.1 and 152.1 million km. The 2026 dates are from the U.S. Naval Observatory (UTC-6): perihelion 3 January 2026, aphelion 6 July 2026. Many diagrams draw Earth's orbit as a strongly stretched oval because they are drawn in perspective; this unit's scale diagram shows the orbit's true shape.

Sources: NASA Space Place, What Causes the Seasons?; U.S. Naval Observatory, Earth's Seasons and Apsides 2026 (UTC-6, no daylight saving); National Research Council Canada, Sunrise/sunset calculator: Winnipeg MB, full year 2026.

**QUICK CLASSROOM PROMPT**

Does the closest day give Winnipeg the most daylight? Point to both dates and daylight values, then defend your answer with a claim and two pieces of evidence.


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## Lesson 5: Thirteen Moons: Ininew Knowledge of Time

**Warm-up W1.** It is sunlight reflected off the Moon.
**Warm-up W2.** About 29.5 days.
**Warm-up W3.** The North Pole.

**Learning Activity: Two Ways of Watching the Moon (sample record)**

| Moon (English name, as written on the page) | What happens on the land | Season in Manitoba |
|---|---|---|
| Goose Moon (Niska Pisim) | The geese begin to return from the South. | spring |
| (answers vary) | (must match the Canadian Space Agency page) | (reasonable season) |
| (answers vary) | (must match the Canadian Space Agency page) | (reasonable season) |

**[A] 1.** A Researcher and Knowledge Keeper from Opaskwayak Cree Nation.
**[A] 2.** How some Ininew communities in Northern and Central Manitoba see events, weather patterns, animal behaviour and plants/medicines in relation to the full Moon.
**[A] 3.** The names depend on the environment each moon is seen from; his list is one interpretation of many.
**[A] 4.** 13 full Moons.
**[A] 5.** 12 x 29.5 = 354 days. 365 - 354 = 11 days short.
**[A] 6.** Alike: both follow the full Moon through the whole year. Different: the thirteen moons connect each full Moon with events on the land in a particular place and are shared by a Knowledge Keeper; NASA's table gives exact dates and times from measurement and calculation.
**[A] 7.** Answers vary. Look for open, respectful questions, for example: "What does your community notice on the land at this time of year?" or "How did you learn about the moons?"
**Exit E1.** Example: the Goose Moon (Niska Pisim) marks when the geese begin to return from the South.
**Exit E2.** Moon names depend on the environment each moon is seen from, so communities on different lands notice different things.

## Lesson 6: What Causes the Seasons? Testing an Idea

**Warm-up W1.** A year.
**Warm-up W2.** On the opposite side of Earth from the Sun.
**Warm-up W3.** 13.
**[A] 1.** A prediction about what is happening, or what might happen, based on evidence, research or past experience.
**[A] 2.** If Earth's distance from the Sun causes the seasons, then Earth will be closest to the Sun during our summer (and both hemispheres will have summer at the same time).
**[A] 3.** 3 January 2026 (perihelion): winter.
**[A] 4.** 6 July 2026 (aphelion): summer.
**5.** 152.1 - 147.1 = 5.0 million km. 5.0 / 150 x 100 = about 3.3%: a small change.
**[A] 6.** About 5 cm (147 cm and 152 cm from the Sun).
**[A] 7.** Summer. Both hemispheres are the same distance from the Sun on the same day, yet they have opposite seasons, so distance cannot be the cause.
**[A] 8.** It refutes it.


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**Model CER: Is Earth's distance from the Sun the cause of the seasons?**

**Claim:** No. Earth's distance from the Sun does not cause the seasons.

**Evidence:** Earth was closest to the Sun on 3 January 2026, during Manitoba's winter, and farthest on 6 July 2026, during our summer. The Northern and Southern Hemispheres have opposite seasons on the same day. The distance changes by only about 5.0 million km, about 3.3%.

**Reasoning:** If distance were the cause, we would have summer when Earth is closest and both hemispheres would share a season. The evidence shows the opposite, so the hypothesis is refuted. Something else, Earth's tilted axis, must cause the seasons.

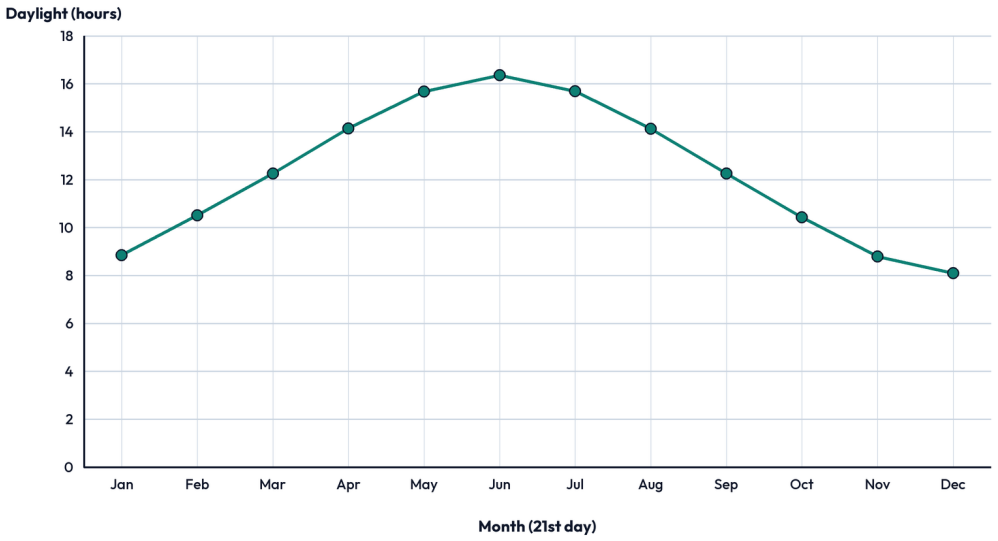
**Exit E1.** False. In 2026 Earth was closest to the Sun on 3 January 2026.
**Exit E2.** Earth is closest to the Sun in our winter; or, the hemispheres have opposite seasons at the same time.

## Lesson 7: Tilt, Sunlight and Daylight

**Warm-up W1.** 3 January 2026 (perihelion): winter.
**Warm-up W2.** The evidence goes against the prediction, so the hypothesis is not supported.
**Warm-up W3.** Longer, because the Sun gets lower in the sky.

**Investigation 5: Direct and Spread-Out Sunlight (sample record)**

| Flashlight angle | Squares covered | Brightness (bright / dim) |
|---|---|---|
| straight down (90°) | fewer squares | bright |
| low (about 20°) | more squares | dim |




Answer key graph: Winnipeg daylight through 2026

**[A] 1.** 23.4 degrees (often rounded to 23.5). Yes, it always points in the same direction.
**[A] 2.** The North Pole: summer in Manitoba.
**[A] 3.** The straight-down spot was smaller and brighter. At a low angle the same light spreads over more area, so each part of the ground gets less energy; the low winter Sun heats less.
**[A] 4.** Most: June (16.35 h). Least: December (8.09 h).
**[A] 5.** March and September (12.25 h each): the equinoxes, when neither pole is tilted toward the Sun.
**6.** Most: March to April (+1.89 h). Least: accept May to June (+0.67 h) or June to July (-0.66 h); the two changes are almost equal, on either side of the June solstice. Daylight changes fastest near the equinoxes and slowest near the solstices.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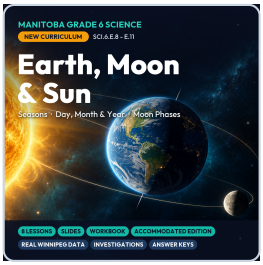
## THE FULL GRADE 6 YEAR

This sampler's lesson comes from one of three units. Manitoba's renewed Grade 6 Science curriculum's 17 Scientific Knowledge outcomes are covered across three full Milestone Teachers units:




### EARTH, MOON & SUN

SCI.6.E.8 to E.11: day and night, how a month and a year are set, Moon phases, the Sun as a star, and what causes the seasons (this sampler's lesson).

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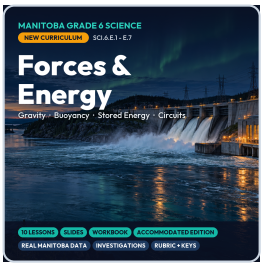


### FORCES & ENERGY

SCI.6.E.1 to E.7: gravity and the forces that oppose it, buoyancy, stored energy, energy transfer, battery circuits and electrical safety.

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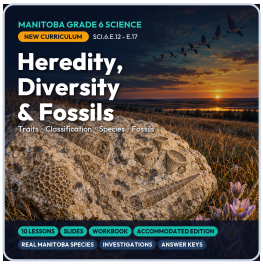


### HEREDITY, DIVERSITY & FOSSILS

SCI.6.E.12 to E.17: why offspring resemble their parents, classification and dichotomous keys, fossils as evidence of change, and what makes a species.

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**FREE INTERACTIVE**

Seasons Explorer (free online, no login, runs in a current desktop browser) lets students test what really causes the seasons, the same question this sampler's lesson teaches. The Earth, Moon & Sun unit also includes an offline copy.

milestoneteachers.com/labs/seasons-explorer