

START HERE

A year plan for all four Grade 5 units, plus one complete lesson to try.

What is inside

p2

Year at a glance

All four units, their months, outcome codes and 40 lesson titles.

p3-8

Lesson 3, Air Pressure: Student Workbook

Wonder, a card-and-cup demonstration, build a jar barometer, real Winnipeg pressure data, questions and an exit ticket.

p9-16

Lesson 3: Accommodated Edition

The same lesson at a simpler reading level, large print, word banks and sentence starters.

p17-18

Lesson 3: Teacher Guide

The lesson plan with timings, the misconception move and a 30-minute version.

p19

Answer key

The key for the warm-up, the record and data tables, the questions, Go further and the exit ticket.

p20

The full Grade 5 year

The four units and the bundle, with links.

ZIP

Slides: Lesson-03-Air-Pressure.pptx

The lesson's teaching slides with speaker notes (separate file in the ZIP).

How to use it

Use the year plan to map your Grade 5 science year. Then teach Lesson 3, Air Pressure: open the slides (speaker notes on every teaching slide), print the Student Workbook pages or the Accommodated Edition pages (question numbers match, so one answer key marks both), and keep the Teacher Guide pages beside you. Materials: a glass jar, a balloon, a strong elastic band, a straw, tape, a toothpick, an index card, a ruler, and a cup of water with a stiff card.

ABOUT THIS EXCERPT

- The lesson pages and slides are reproduced exactly as they appear in the Weather & Climate unit, so their page and slide numbers are the unit's.
- The warm-up reviews Lessons 1 and 2, which are not included; its answers are on the answer-key page.
- The first Teacher Guide page ends Lesson 2's plan before Lesson 3 begins, and the answer-key page opens with the end of Lesson 2's key, because that is where the unit's pages break.
- The lesson's sources are listed on the last page of this sampler.
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Questions or a problem with a file: admin@milestoneteachers.ca. For use by the downloading teacher with their own students.

The Grade 5 Science Year

Four units, 40 lessons: every Scientific Knowledge outcome, SCI.5.E.1 to E.17.

UNIT 1

September to October

Forces & Simple Machines

SCI.5.E.5 to E.8

- 1 Pushes, Pulls and Twists
- 2 Forces Change Motion
- 3 Friction: The Force That Grips
- 4 Friction: Helpful or Harmful?
- 5 Levers: Lift More with Less
- 6 Ramps, Wedges and Screws
- 7 Wheels, Axles and Pulleys
- 8 Friction Makes Machines Less Efficient
- 9 Design Challenge: A Machine System
- 10 Machines in Our School: Taking Action

UNIT 2

November to December

Matter & Its Changes

SCI.5.E.1 to E.4

- 1 What Is Matter?
- 2 Measuring Mass and Volume
- 3 Solids, Liquids and Gases
- 4 Melting and Freezing
- 5 Evaporation, Condensation and Reversible Change
- 6 Mixtures and How to Separate Them
- 7 Physical or Chemical Change?
- 8 Is Any Matter Lost? Mixing and Melting
- 9 Is Any Matter Lost When Things React?
- 10 Taking Action: Better School Compost

UNIT 3

January to March

Weather & Climate

SCI.5.E.9 to E.12

- 1 What Is Weather?
- 2 The Sun Powers the Weather
- 3 Air Pressure
- 4 Wind: Direction and Speed
- 5 Water Vapour, Clouds and Precipitation
- 6 The Water Cycle
- 7 Groundwater and Living Things
- 8 Forecasting the Weather
- 9 Climate: Weather over Many Years
- 10 Taking Action: Our Changing Climate

UNIT 4

April to June

Cells & Body Systems

SCI.5.E.13 to E.17

- 1 What Is a Cell?
- 2 Seeing Cells with Microscopes
- 3 What Do Cells Need?
- 4 Cells Make More Cells
- 5 Tissues, Organs and Organ Systems
- 6 Digestion: Energy from Food
- 7 Circulation: Heart and Blood
- 8 Removing Wastes
- 9 Systems Working Together
- 10 Taking Action: Healthy Habits

Each unit: 10 lessons of about 60 minutes, a performance task and a unit assessment. Outcome codes are Manitoba's; titles are ours. Contains information from the Government of Manitoba, licensed under the OpenMB Information and Data Use License ([Manitoba.ca/OpenMB](https://www.manitoba.ca/OpenMB)).

LESSON 3

Air Pressure

The weight of the air, and why it changes

Name _____

LEARNING GOAL

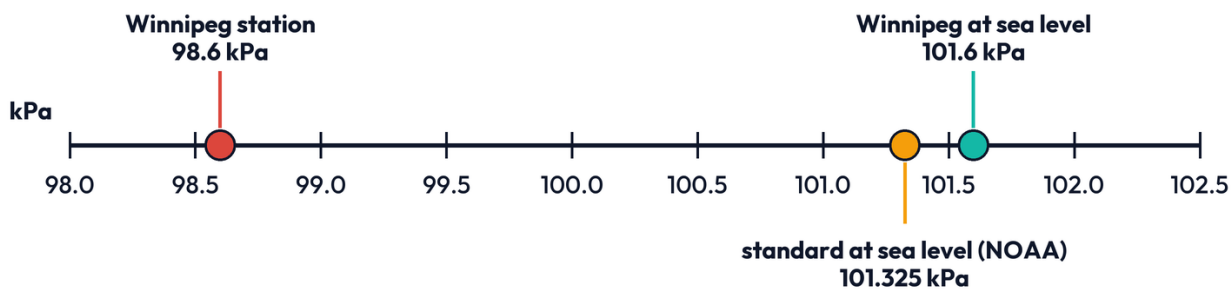
I can show that air presses on everything around it, and use a barometer to track changes in air pressure (SCI.5.E.9).

1 WONDER

What is going on?

HAPPENING IN MANITOBA

Winnipeg's airport weather station is 238.7 m above sea level. The normal air pressure measured there is 98.6 kPa; converted to sea level it is 101.6 kPa. The air above us is pressing down all the time. How can we feel it, and why does it change?



Normal yearly pressure, Winnipeg Richardson (Airport), 1991 to 2020 (ECCC); standard: NOAA (1013.25 hPa).

Source: ECCC; NOAA.

BIG QUESTION

Does air push on things, and how can we tell when air pressure changes?

RETRIEVAL WARM-UP Three quick questions from earlier lessons. No looking back!

W1 What gives our weather its energy?

W2 Which warms faster in sunlight, land or water?

W3 What does warm air do?

Words to know

Word	Meaning
air pressure	the push of the air on everything around it, caused by the weight of the air above
barometer	a tool that measures air pressure
kilopascal (kPa)	a unit for pressure; Environment Canada reports air pressure in kPa
sea level	the height of the ocean's surface; pressure readings are adjusted to it so places can be compared

2 INVESTIGATE**Investigation 3: Build a Jar Barometer**

Question: Can we see air pressure change from day to day? **Time:** about 30 minutes

You need

- a clean glass jar with a wide mouth
- a balloon, cut open to make a flat sheet
- a strong elastic band
- a drinking straw, tape and a toothpick
- an index card taped to a wall or box, and a ruler
- a cup of water and a stiff card (demonstration)

SAFETY

- Glass jars can break: keep them in the middle of the desk.
- Do the water-card demonstration over a tub.

What to do

1. Demonstration: fill a cup to the top with water, cover it with a stiff card, and turn it over the tub. Why does the card stay on?
2. Stretch the balloon sheet tightly over the jar. Hold it with the elastic band.
3. Tape the straw flat on the balloon so it sticks out over the edge. Tape the toothpick to its end as a pointer.
4. Stand the card behind the pointer. Mark where it points. Keep the jar away from heaters and windows.
5. Each day at the same time, mark the pointer. Up means pressure is rising; down means falling.

3 EVIDENCE

Record and look at the data

Record your results

Day	Pointer moved (up, down, same)	Pressure (rising, falling, steady)	Weather
1			
2			
3			
4			
5			

DATA

Air Pressure: Station or Sea Level?

Reading	Pressure (kPa)	Higher or lower than standard?
Winnipeg, measured at the station (year)	98.6	
Winnipeg, converted to sea level (year)	101.6	
Winnipeg, converted to sea level (January)	102.0	
Winnipeg, converted to sea level (July)	101.2	
Standard pressure at sea level (NOAA)	101.325	-

Normal pressure at Winnipeg’s airport, 1991 to 2020 (ECCC), and NOAA’s standard sea-level pressure.
Source: ECCC; NOAA.

4 EXPLAIN**Make sense of it**

1 Air is matter, and it has weight. NOAA explains that the weight of the gases in the air pushes down on Earth, creating air pressure. We do not feel it because it pushes on us from every side.

2 Air pressure changes. When warm air rises, it does not push down on Earth quite as much, so the pressure is lower. NOAA says air always flows from high pressure to low pressure.

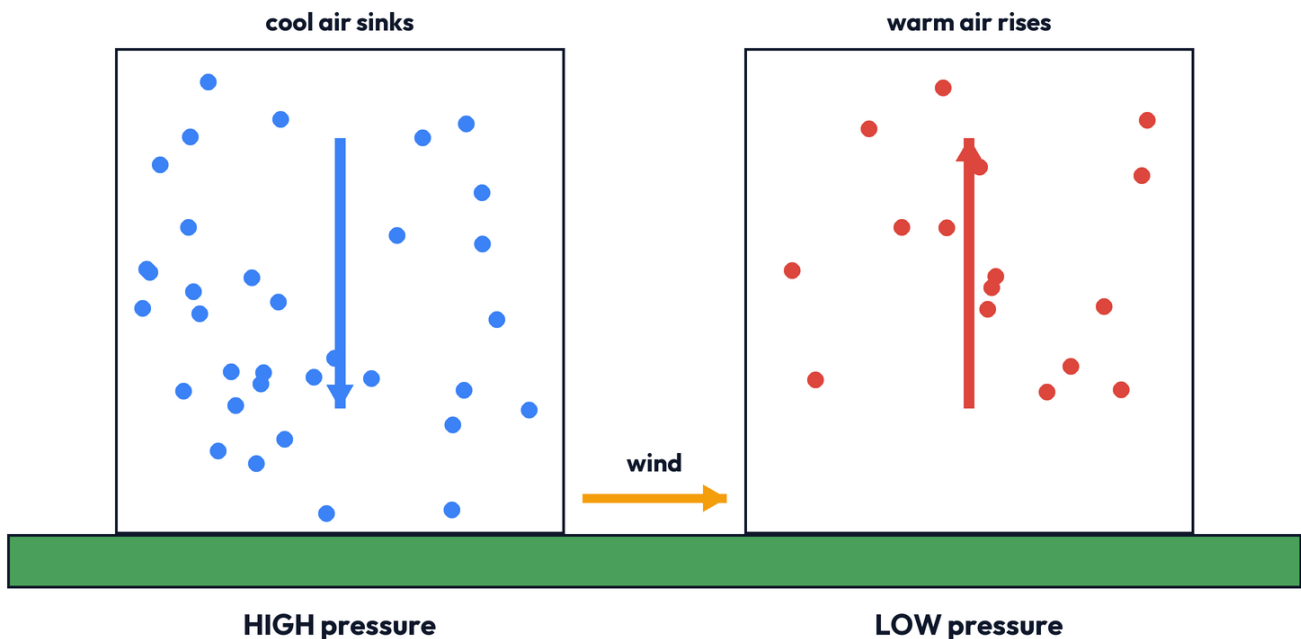
3 NOAA gives standard air pressure at sea level as 1013.25 hectopascals, which is 101.325 kilopascals. Weather stations convert their readings to what they would be at sea level, so places can be compared.

4 Winnipeg's airport weather station is 238.7 m above sea level. Its normal pressure is 98.6 kPa. Converted to sea level, the same readings average 101.6 kPa. There is less air above the station.

KEY FACTS

- Air pressure is the weight of the air pushing down (NOAA).
- Standard sea-level pressure: 1013.25 hPa = 101.325 kPa (NOAA).
- Air flows from high pressure to low pressure (NOAA).

Sources for this reading: NOAA; ECCC. Full titles and web addresses: Credits page.

The weight of the air

A model: dots stand for air. Air flows from high to low pressure (NOAA).

Air pushes down on everything. Warm, rising air pushes down less. That is low pressure.

Show what you know

1 FIND IT What causes air pressure?

2 EXPLAIN In the demonstration, why did the card stay on the upside-down cup?

3 DATA Use the table. Is Winnipeg's sea-level pressure higher in January or in July? By how much?

4 EXPLAIN Why is the pressure measured at Winnipeg's station lower than the sea-level number?

5 WHAT IF Your barometer pointer drops two days in a row. What is happening to the air pressure? What might the weather do?

6 NATURE OF SCIENCE Why must the jar barometer stay away from heaters and sunny windows?

5 REFLECT**Check and look back****GO FURTHER** For scientists ready for more.

For five days, compare your jar barometer with the air pressure ECCC reports for your town. Do they rise and fall together?

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EXIT TICKET • LESSON 3 Name _____**E1** Air flows from _____ pressure to _____ pressure.

E2 Name the tool that measures air pressure.

REFLECT When have you felt air pushing on you? What was happening?

LESSON 3

Air Pressure

The weight of the air, and why it changes

Name _____

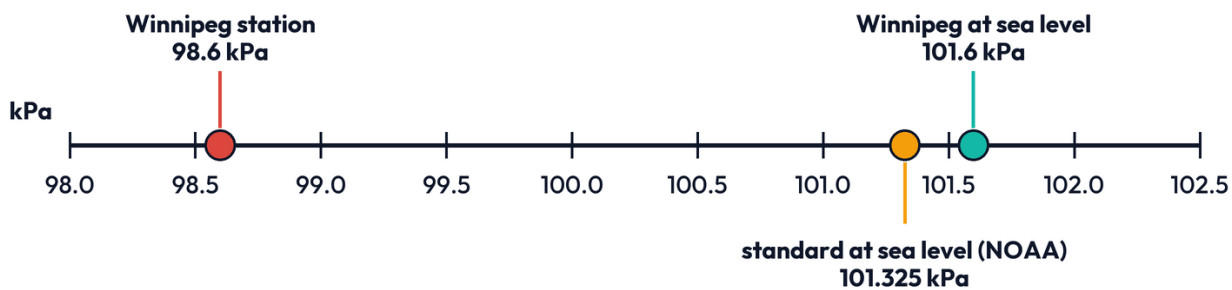
LEARNING GOAL

I can show that air pushes on things, and track air pressure. (SCI.5.E.9)

1 WONDER What is going on?

HAPPENING IN MANITOBA

The air pushes down on Winnipeg all the time. The push is about 98.6 kPa. How can we see it?



Normal yearly pressure, Winnipeg Richardson (Airport), 1991 to 2020 (ECCC); standard: NOAA (1013.25 hPa).

Source: ECCC; NOAA.

BIG QUESTION

Does air push on things, and how can we tell when air pressure changes?

RETRIEVAL WARM-UP Answer 3 questions from past lessons.**W1** What gives our weather its energy?

W2 Which warms faster in sunlight, land or water?

W3 What does warm air do?

Words to know

Word	Meaning
air pressure	the push of the air on everything
barometer	a tool that measures air pressure
kilopascal (kPa)	a unit for pressure
sea level	the height of the ocean's surface

2 INVESTIGATE**Investigation 3: Build a Jar Barometer****Question:** Can we see air pressure change from day to day? **Time:** about 30 minutes**You need**

- a clean glass jar with a wide mouth
- a balloon, cut open to make a flat sheet
- a strong elastic band
- a drinking straw, tape and a toothpick
- an index card taped to a wall or box, and a ruler
- a cup of water and a stiff card (demonstration)

SAFETY

- Glass jars can break: keep them in the middle of the desk.
- Do the water-card demonstration over a tub.

What to do

1. Watch the card stay on the cup of water.
2. Stretch a balloon over a jar.
3. Tape a straw on top as a pointer.
4. Mark where it points.
5. Mark it every day. Up or down?

3 EVIDENCE Record and look at the data

Record your results

Day	Pointer moved (up, down, same)	Pressure (rising, falling, steady)	Weather
1			
2			
3			
4			
5			

DATA**Air Pressure: Station or Sea Level?**

Reading	Pressure (kPa)	Higher or lower than standard?
Winnipeg, measured at the station (year)	98.6	
Winnipeg, converted to sea level (year)	101.6	
Winnipeg, converted to sea level (January)	102.0	
Winnipeg, converted to sea level (July)	101.2	
Standard pressure at sea level (NOAA)	101.325	-

Two ways to report Winnipeg's air pressure.

Source: ECCC; NOAA.

4 EXPLAIN**Make sense of it**

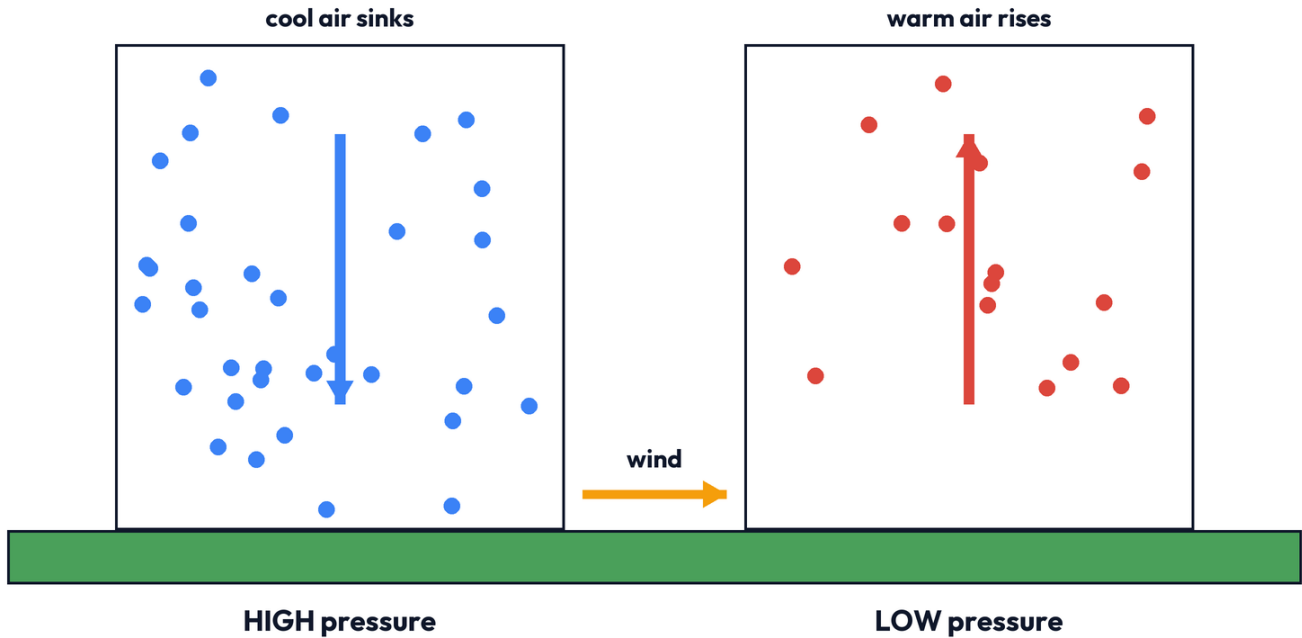
- 1 Air has weight. It pushes on everything. This push is called air pressure.
- 2 Warm air rises. It pushes down less. The pressure is lower.
- 3 Air moves from high pressure to low pressure.
- 4 Normal air pressure at sea level is about 101.3 kPa.

KEY FACTS

- Air has weight. It pushes on everything.
- Air moves from high pressure to low pressure.

Our sources are listed on the last page.

The weight of the air



A model: dots stand for air. Air flows from high to low pressure (NOAA).

Air pushes down on everything. Warm, rising air pushes down less. That is low pressure.

Show what you know

1 FIND IT What makes air pressure?

Word bank: weight air pushing

Air pressure is caused by ...

2 EXPLAIN Why did the card stay on the cup?**Word bank:** air pushes up strongerThe air ...

_____**3 DATA** Look at the table. Is the pressure higher in January or July? By how much?January is ... kPa

_____**4 EXPLAIN** Why is the pressure lower at Winnipeg's station?**Word bank:** above less airWinnipeg is ...

5 REFLECT**Check and look back****GO FURTHER** Try this if you want more.

Check your jar for five days. Look up the air pressure for your town too. Do they go up and down together?

----- cut here -----

EXIT TICKET • LESSON 3 Name _____**E1** Air flows from _____ pressure to _____ pressure.

E2 Name the tool that measures air pressure.

REFLECT When have you felt air pushing on you? What was happening?

I noticed ...

- Students read at eye level every 2 minutes.

Differentiation

- Accommodated edition: the first two points of the graph are plotted for you.
- Challenge: test light and dark soil, or wet and dry sand.

Thinking routine

Hypothesis and evidence: 'I predicted _____. The data show _____, so my hypothesis was supported / not supported.'

30-minute version

Warm-up (3 min); lamp test as a teacher demonstration, every 2 minutes (12); example table and Q2 (8); exit ticket (7).

Lesson 2: background for the teacher

NOAA NDBC: the land surface absorbs and gives off heat faster than water. NOAA (GOES-R): the Sun does not heat Earth equally, and warm air rises. ECCC normals: Winnipeg's July normal daily maximum and minimum are in the reading. The example lamp results are invented for practice; the soil cup rises about 8 degrees and the water cup about 2.5 degrees in 10 minutes, which fits a desk lamp about 20 cm away. LED lamps warm more slowly: allow 15 minutes.

Sources: Manitoba Education, Science: Grade 5 (2026); NOAA (GOES-R), Why Does the Wind Blow?; NOAA (NDBC), Sea Breeze; ECCC Climate Normals 1991 to 2020, Winnipeg Richardson (Airport).

LESSON 3 Air Pressure

Learning goal: I can show that air presses on everything around it, and use a barometer to track changes in air pressure (SCI.5.E.9).

Big question: Does air push on things, and how can we tell when air pressure changes?

Big idea: Air has weight, so it presses on everything; air pressure changes as air warms, cools and moves, and air flows from high to low pressure.

Focus outcomes: SCI.5.E.9 **Supporting:** SCI.5.C.2, SCI.5.D.2, SCI.5.C.3 **Time:** 60 min, plus 2 min a day

Lesson flow (matches the slides and the workbook)

Slide	Stage	Activity	Time
title	1 Wonder	Retrieval warm-up (3 questions; key on the answer-key pages)	4 min
1	1 Wonder	The air is pressing on you right now	5 min
2	1 Wonder	Key words (4)	4 min
3	2 Investigate	Investigation 3: Build a Jar Barometer	30 min
4	3 Evidence	Data: Air Pressure: Station or Sea Level?	6 min
5	4 Explain	The weight of the air	5 min
6	5 Reflect	Exit ticket and reflection	6 min
		Total guided time	about 60 min

Formative check: misconception, probe and next move

Likely misconception: Air has no weight, so it cannot push.

Ask: What holds the card on the upside-down cup of water?

If students say “Suction holds the card on.” **do this:** Repeat the card demonstration, then poke a pinhole in the cup’s bottom (over the tub): air gets in above the water and the card falls. The air outside was pushing.

Other misconceptions to listen for

- Suction pulls the card up (the air pushes it).
- High pressure always means good weather (it is a pattern, not a rule).

Look for

- The balloon sheet is tight and sealed.
- Pointer marks are made at the same time each day.

Differentiation

- Accommodated edition: word banks and sentence starters on the questions.
- Challenge: compare your jar’s daily movement with Environment Canada’s reported pressure for your town.

Thinking routine

Claim-support-question: ‘I claim air _____. My support is _____. I still wonder _____.’

30-minute version

Warm-up (3 min); card demonstration (5); build one class barometer (10); pressure table (6); exit ticket (6).

Lesson 3: background for the teacher

NOAA (GOES-R): the weight of the air creates air pressure; warm rising air lowers it; air flows from high to low pressure. NOAA JetStream: standard sea-level pressure 1013.25 hPa (101.325 kPa); stations convert readings to sea level. ECCC normals: Winnipeg’s station and sea-level pressures in the table. A jar barometer also responds to temperature, so keep it in a steady place; treat its readings as rising/falling/steady only.

Sources: NOAA (GOES-R), Why Does the Wind Blow?; NOAA JetStream, Air Pressure; ECCC Climate Normals 1991 to 2020, Winnipeg Richardson (Airport).

Go further. Open-ended. Wet sand usually warms more slowly than dry soil, because the water in it warms slowly and some evaporates; test it to find out.

Exit E1. Land.

Exit E2. rises, and cooler air moves in (wind).

Lesson 3: Air Pressure

W1. The Sun.

W2. Land.

W3. It rises.

Investigation 3: Build a Jar Barometer (sample record)

Day	Pointer moved (up, down, same)	Pressure (rising, falling, steady)	Weather
1	depends	depends	depends
2	depends	depends	depends
3	depends	depends	depends
4	depends	depends	depends
5	depends	depends	depends

Air Pressure: Station or Sea Level? (completed)

Reading	Pressure (kPa)	Higher or lower than standard?
Winnipeg, measured at the station (year)	98.6	lower
Winnipeg, converted to sea level (year)	101.6	higher
Winnipeg, converted to sea level (January)	102.0	higher
Winnipeg, converted to sea level (July)	101.2	lower
Standard pressure at sea level (NOAA)	101.325	-

[A] 1. The weight of the air above pushing down.

[A] 2. The air pressure pushing up on the card was stronger than the weight of the water pushing down.

[A] 3. January: $102.0 - 101.2 = 0.8$ kPa higher.

[A] 4. The station is 238.7 m above sea level, so there is less air above it pushing down.

5. The pressure is falling; falling pressure often comes before cloudy, wet or windy weather (students test this with their log in Lesson 8).

6. Heat makes the air inside the jar expand, which moves the pointer even when the outside pressure has not changed; that would spoil the measurement.

Go further. Open-ended. The jar should usually move the same way; differences can come from temperature changes near the jar.

Exit E1. High; low.

Exit E2. A barometer.

Keep going

This lesson comes from Weather & Climate, one of four Manitoba Grade 5 Science units.



Forces & Simple Machines

SCI.5.E.5 to E.8 · 10 lessons, slides, workbook, accommodated edition, guide

milestoneteachers.com/store/products/17944334



Matter & Its Changes

SCI.5.E.1 to E.4 · 10 lessons, slides, workbook, accommodated edition, guide

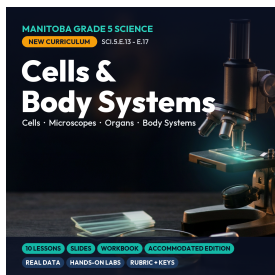
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Weather & Climate

SCI.5.E.9 to E.12 · 10 lessons, slides, workbook, accommodated edition, guide

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Cells & Body Systems

SCI.5.E.13 to E.17 · 10 lessons, slides, workbook, accommodated edition, guide

milestoneteachers.com/store/products/17946114

All four units together: the Manitoba Grade 5 Science Bundle

milestoneteachers.com/store/products/17946175

More Manitoba resources: milestoneteachers.com/manitoba

Sources for Lesson 3

Manitoba Education, Science: Grade 5 (2026); NOAA (GOES-R), Why Does the Wind Blow?; NOAA JetStream, Air Pressure; ECCC Climate Normals 1991 to 2020, Winnipeg Richardson (Airport). Their web addresses are on the Credits page at the end of each Student Workbook in the Weather & Climate unit, and on its Teacher Guide's Sources and licence page.