THE ADVENTURES WITH FRISBEE ROB

The Long Way Down

Adventure 001: Isaac Newton

COMPLETE TEACHER GUIDE SET

GRADE 4

ELAL	Math	Science	Social Studies	PE & Wellness

Wonder in Motion

Alberta K–6 Curriculum · Adventure 001

THE ADVENTURES WITH FRISBEE ROB

The Long Way Down

Adventure 001: Isaac Newton

GRADE 4

ENGLISH LANGUAGE ARTS and LITERATURE

Teacher Guide

Cause, Clue, Conclusion

GRADE	SUBJECT	TIME
Grade 4	ELAL	2 × 30 minutes

CENTRAL QUESTION

How can cause-and-effect relationships and multiple story clues help us infer an idea the author does not state directly?

Wonder in Motion

Lesson at a Glance

Teachers with a continuous 60-minute block may teach both sessions together.

Story connection	Rob's opening observation causes a chain of questions, tests, comparisons, and new attention. The Adventure invites readers to infer why the three different journeys matter and how they lead to the final Moon question.
ELAL focus	Tracing cause and effect, combining evidence across a text, drawing conclusions, synthesizing information, and self-monitoring when an inference needs repair.
Learning intention	We are learning to combine several connected clues, infer a larger idea, and check whether every part of our reasoning is supported.
Core experience	Students build a Cause–Clue–Conclusion chain in Session 1, then rehearse, challenge, repair, and share evidence-based syntheses in Session 2.
Flexible use	Session 1 is a complete core lesson and can be used independently. Session 2 continues the same Wonder Lab through rehearsal, repair, sharing, and deeper questioning.
Use after reading	Read Adventure 001 before beginning and keep it available for evidence checks.
Story context	Isaac Newton was a real historical person. Rob's visit, their conversation, and the events they experience together are imaginative parts of the story. The ELAL lesson interprets the narrative as written rather than using it as historical evidence about Newton.

Optional Teacher-Spoken Success Indicators

I can identify a cause-and-effect relationship supported by the story.
I can combine clues from different moments to draw a conclusion.
I can explain how my evidence connects to an inferred idea.
I can notice and repair a weak link in my comprehension.

How to Use This Guide

THE GUIDE IS A TOOL, NOT A SCRIPT

This guide is designed to support responsive teaching rather than prescribe every word or action.

Session 1 is a complete 30-minute Grade 4 Comprehension lesson and can be taught independently.

Session 2 continues the same synthesis and self-monitoring process through rehearsal, refinement, sharing, and questioning. It does not introduce additional curriculum.

Follow productive student thinking and conversation while protecting the central question, selected Comprehension KUSP, cause-and-effect reasoning, evidence synthesis, defensible conclusions, and self-monitoring, meaningful participation, and approximate lesson timing.

Adjust the amount of text, grouping, response mode, language support, and pacing to meet the needs of the learners in front of you while preserving the comprehension goal.

A broad conclusion is not automatically a stronger conclusion. Encourage students to narrow or repair a claim when part of the evidence does not fit.

The goal of the second session is not to do more. It is to give students enough time to think, try, improve, and communicate what they understand.

Curriculum Alignment

Organizing Idea	Comprehension: Text comprehension is supported by applying varied strategies and processes and by considering both particular contexts and universal themes.
Guiding Question	How do comprehension processes and strategies enhance understandings of texts?
Learning Outcome	Students investigate strategies and connections that support text comprehension.
Assessment Focus	Gather formative evidence through cause-and-effect inferencing, synthesis, evidence-based conclusions, summarizing, and self-monitoring.

Selected KUSP for These Lessons

KUSP element	Selected curriculum learning	What it looks or sounds like
Knowledge	Inferencing can involve considering cause-and-effect relationships, answering personal wonderings, combining information from various sources to draw conclusions, and reading between the lines to discover an author's meaning. Summarizing determines key ideas and specific details, logically orders ideas, and paraphrases. Synthesizing combines background knowledge and new information to create new understanding.	Students trace meaningful relationships among events, select clues from different story sections, and infer an idea broader than any single detail.
Understanding	Comprehension involves inferencing and relying on multiple critical-thinking skills. Comprehension is	Students explain how evidence works together, identify where meaning or reasoning breaks down, and select a

KUSP element	Selected curriculum learning	What it looks or sounds like
	enhanced when information is synthesized and summarized. The reading comprehension process involves checking for understanding, problem solving, and metacognition.	strategy to repair it.
Skills & Procedures	Infer cause-and-effect relationships in texts. Make inferences that reach beyond personal experiences. Combine information from various sources to draw conclusions. Infer ideas not explicitly stated. Synthesize information when creating summaries and personal responses. Apply self-monitoring and metacognitive strategies when comprehension breaks down.	Students build, test, revise, rehearse, and share a multi-link evidence chain supported by the text.

Curriculum source: Government of Alberta, English Language Arts and Literature (K–6) Curriculum, Comprehension, pp. 37–38. *View the Alberta program of study*

Teacher Preparation

STANDARD PATHWAY

Use these two 30-minute sessions after students have heard Adventure 001: The Long Way Down.

Session 1: Build the Chain is the core lesson. Students distinguish chronology from causality, combine clues from across the Adventure, and build a Cause–Clue–Conclusion chain.

Session 2: Test the Chain continues the same Wonder Lab. Students rehearse a synthesis, test individual links, repair weak reasoning, and communicate a more precise conclusion.

If only one 30-minute period is available, teach Session 1.

If a continuous 60-minute block is available, teach both sessions with a brief transition or movement break.

Flexible Use of the Guide

Core Pathway | 30 minutes

Teach Session 1: Build the Chain.

Students experience:

Get Curious → Model → Build → Think It Through

This is a complete Grade 4 Comprehension lesson and provides opportunities to gather formative evidence of the selected KUSP through cause-and-effect inferencing, synthesis, evidence-based conclusions, and self-monitoring.

Full Wonder Lab | 2 × 30 minutes

Teach both sessions.

Students experience the complete Wonder Lab cycle:

Model → Build → Rehearse → Share

Session 2 deepens the same learning rather than adding additional curriculum. Students test, repair, and communicate the same evidence chain rather than adding another comprehension target.

It also gives students time to deepen story-based questions through:

Puddle → Pond → Lake → Ocean

Continuous Block | ~60 minutes

If scheduling allows, Sessions 1 and 2 may be taught consecutively.

Take a brief transition after the first Think It Through. Reconnect may be shortened; preserve the time students need to rehearse and repair reasoning.

Materials

A copy of Adventure 001: The Long Way Down
Whiteboard or chart paper
Arrow cards or a drawn chain labelled Cause / Event / Effect
Space labelled Clues Across the Story → Conclusion
Optional excerpt cards
Optional strategy cards: reread, read ahead, visualize, question, word solve, check another clue

Before Students Begin

Prepare a four-link event chain with one link intentionally unclear.

Mark Rob's changing-attention passage and final Moon question.

Prepare one conclusion supported by several clues and one overreaching conclusion, such as "Rob completely understands gravity."

Keep the completed class chain available for Session 2.

Use professional judgment to choose the Session 2 grouping—partners, groups of three, or whole group—that best supports productive reasoning and participation.

Substitutions

Use event cards, arrows, short teacher-read excerpts, or images instead of requiring extended rereading. Reduce the number of links while preserving the expectation that students distinguish sequence from cause, combine evidence, draw a conclusion, and repair weak reasoning.

Useful Vocabulary

Pre-teach essential vocabulary through an explicit vocabulary routine, providing students with opportunities to build meaning, interact with the words, and use them in context before and throughout the lesson.

Comprehension words
cause • effect • relationship • explicit • implicit • inference • conclusion • synthesize • paraphrase • self-monitor • metacognition

Story and thinking words
observation • comparison • pattern • difference • curiosity • perspective • consequence • significance

To synthesize is to combine information and background knowledge to form a new understanding.

A conclusion is a judgment reached from information and reasoning.

To self-monitor is to notice whether meaning is clear and choose a strategy when it is not.

Supporting Our Diverse Learners

Use these supports proactively while preparing and teaching the two sessions.

Make it accessible	Use event cards, arrows, and short excerpts. Build the chain one relationship at a time before asking students to consider the full synthesis.
Support language	Model Because..., this leads to..., Together, these clues suggest..., and I repaired my thinking by.... Provide relationship words visually and rehearse them orally.
Offer response choices	Accept speaking, arranging cards, drawing arrows, annotating images, dictation, communication devices, or assistive technology.
Support participation	Offer roles such as event sequencer, cause checker, clue finder, conclusion writer, strategy reporter, or evidence challenger. Students can contribute one strong link without explaining the complete chain.
Reduce memory load	Keep the chain visible and work from selected moments. Colour coding or icons can distinguish sequence, cause-and-effect, clues, and conclusion when helpful.
Support rehearsal	Allow students to rehearse one cause-and-effect relationship or conclusion before explaining the complete chain. Students may use the visible chain and relationship words while practising.
Preserve the learning	Change the number of links, amount of text, language scaffold, grouping, or response mode—not the need to combine evidence and check reasoning. Students still make a defensible connection and monitor whether the conclusion fits.

KUSP Assessment: Evidence to Notice

FORMATIVE ASSESSMENT

Gather evidence through observations and conversations across both sessions.

Session 1 provides sufficient opportunities to gather evidence of the selected KUSP.

Session 2 gives students additional opportunities to demonstrate, refine, and communicate their understanding.

These lessons do not assess the complete learning outcome.

Evidence source	Listen or look for	Possible teacher note
Observation	Listen or look for: Student distinguishes sequence from cause and effect, selects evidence from different story locations, or repairs a weak relationship in the chain.	"Replaces an "after" relationship with "because this comparison changed Rob's attention.""
Conversation	Listen or look for: Student explains how two or more clues work together to support a conclusion and identifies where reasoning needs rereading, narrowing, or another strategy.	"Connects the three journeys and final Moon question to expanding curiosity, then narrows the claim when the ending shows continued uncertainty."
Class product	Listen or look for: The Cause–Clue–Conclusion chain shows connected evidence, a defensible synthesis, and repaired or clarified reasoning where needed.	"Uses evidence from the beginning and ending and revises the conclusion from "Rob understands gravity" to "Rob's questioning becomes deeper.""

The Two-Session Flow

Session 1 — Build the Chain | 30 minutes

Time	Section	Student experience
~5 min	**Get Curious**	Student experience Reconstruct important story events and distinguish chronology from causality. Teacher move Ask whether one event actually influences another or simply happens earlier.
~5 min	**Wonder Lab: Model**	Student experience Observe a cause-and-effect chain and see an overreaching

Time	Section	Student experience
		conclusion repaired. Teacher move Make self-monitoring visible by naming the clue that forces the claim to become more precise.
~15 min	**Wonder Lab: Build**	Student experience Build a class Cause–Clue–Conclusion chain using evidence from across the Adventure. Teacher move Require students to identify the relationship represented by each arrow and explain how multiple clues contribute to the conclusion.
~5 min	**Think It Through**	Student experience Reflect on how several clues create a larger understanding and where reasoning needed repair. Teacher move Distinguish synthesis from simply listing details and gather evidence of self-monitoring.

Session 2 — Test the Chain | 30 minutes

Time	Section	Student experience
~5 min	**Reconnect**	Student experience Reconstruct a missing link or clue in the class chain. Teacher move Use the missing information to make the relationship among events and meaning visible.
~8 min	**Wonder Lab: Rehearse**	Student experience Develop a concise evidence-based synthesis and test each link. Teacher move Use flexible grouping and encourage students to repair weak reasoning rather than start over.
~9 min	**Wonder Lab: Share**	Student experience Share conclusions, evidence, and repaired links. Teacher move Ask the audience to identify the conclusion, cause-and-effect relationship, evidence from more than one location, and any weak link.
~3 min	**Think It Through**	Student experience Explain how synthesis and self-monitoring improved

Time	Section	Student experience
		comprehension. Teacher move Return to the central question and reinforce that narrowing a claim can strengthen it.
~5 min	**Keep Wondering**	Student experience Generate and deepen questions about relationships and meaning within the Adventure. Teacher move Keep deeper questions anchored in relationships among story events and evidence.

Session 1 — Build the Chain

Get Curious | 5 minutes

Display these moments out of order:

Rob asks why the frisbee does not fall right away.
Rob meets Newton.
Rob and Newton compare the apple, frisbee, and leaf.
Rob begins paying closer attention.
Rob asks why the Moon does not fall.

Arrange them.

Then add arrows.

Ask:

- Does putting events in order prove one caused another?
- Which event influences the next change in Rob's thinking?
- Where do we need because, therefore, after, or as a result?
- Which arrow shows a strong cause-and-effect relationship?
- Which arrow may show sequence but needs more explanation?

Teacher move
Do not treat correct sequencing as proof of causality. Ask students to identify the relationship word that best describes each connection.

Model | 5 minutes

Model:

Cause
Rob throws the frisbee and notices it glides before returning.

Effect
He questions why it does not fall right away.

Further effect
The Wind carries him to Newton, where the question can be explored through comparison.

Then model an overreach:

> *"This proves Rob completely understands gravity."*

Think aloud:

> *"The ending shows Rob still has a question. My conclusion goes beyond the evidence."*

Revise:

> *"The opening observation begins a process of closer noticing and deeper questioning."*

Ask:

- Which link is explicit?
- Which relationship am I inferring?
- What clue challenges the first conclusion?
- What repair strategy did I use?
- Why is the revised conclusion more precise?

Teacher move
The model should show how a reader notices when a conclusion goes beyond the evidence and repairs it by rereading, adding a clue, or narrowing the claim.

Build | 15 minutes

Part 1: Trace narrative causes and effects

Possible links:

Rob notices the frisbee's delayed return → he asks an opening question.

The question stirs the Wind → Rob reaches Newton's orchard.

Newton and Rob compare an apple, frisbee, and leaf → they notice that all return along different paths.

The comparison draws Rob's attention to movement around him → he sees familiar things differently.

Newton says he never stopped asking questions → Rob's curiosity is validated as an ongoing practice.

Rob applies the idea of returning to Earth to the Moon → a new question emerges.

Part 2: Select clues across the Adventure

Rob's first question
the three journeys
Rob paying attention
Newton's "I never stopped"
the unanswered Moon question

Part 3: Draw a conclusion

Possible conclusions:

Comparing patterns and differences helps Rob move from ordinary observation to deeper curiosity.

The Adventure suggests that understanding often begins with careful attention and continues through new questions.

Rob's unanswered question shows that learning can expand wonder instead of ending it.

FACILITATION PROMPTS

- Does this arrow show cause, sequence, or both?
- What do these clues have in common?
- How does the ending change the meaning of the opening?
- Is our conclusion broader than one event but still supported?
- Where does our chain need rereading or more precise language?

Teacher move
During Build, keep returning to the meaning of each arrow. A shorter chain with clear relationships is stronger evidence than a long chain students cannot explain.

Think It Through | 5 minutes

- Which arrow represented the strongest cause-and-effect relationship?
- Where did we initially confuse sequence with cause?
- Which conclusion required evidence from the beginning and ending?
- How did combining clues create an understanding not stated in one sentence?
- Which clue caused us to revise?

Sample Response Guidance

Possible response
"Rob notices that the frisbee glides before returning, so he asks why it does not fall right away. That question begins the chain of events."
"The apple, frisbee, and leaf all return differently. Together with Rob paying closer attention afterward, those clues suggest that comparing patterns changes what Rob notices."
"The ending does not prove Rob understands gravity. His Moon question shows that his understanding is still developing, so I would narrow the conclusion."

Look for a meaningful cause-and-effect relationship, evidence from more than one part of the Adventure, and a conclusion precise enough to fit all of the selected evidence.

Session 1 Closing

Tell students:
"Today we connected story events instead of treating them as separate facts. We also checked whether our conclusion really fit the whole chain."

> *"Next time, we'll put the chain under pressure, repair weak links, and explain the strongest conclusion the evidence allows."*

If Session 1 is the only lesson being taught, finish by asking:
“What is one relationship in our chain that helps explain how Rob’s thinking changes?”

Session 2 — Test the Chain

Reconnect | 5 minutes

Remove one link or clue from the chain.

Ask:

- What is missing?
- What becomes harder to understand without it?
- Does the chain still work?
- Would a different link work better?

Teacher move
Reconnect should emphasize the relationship that the missing link creates, not only whether students remember the exact card or sentence.

Rehearse | 8 minutes

Pairs select one class conclusion or form a defensible alternative.

Rehearse:

State the conclusion.
Explain one cause-and-effect relationship.
Add a second clue from a different part.
Explain how the evidence works together.

Partner B checks:

Supported
Incomplete
Overreaching
Needs repair

Possible repair moves:

reread
add a clue
narrow the conclusion
change the relationship word

FACILITATION PROMPTS

- What is the conclusion?
- Which cause-and-effect relationship supports it?
- What second clue adds different information?
- Where might the reasoning be overreaching?
- What repair would make it more precise?

Teacher move
Use partners, groups of three, or whole-group rehearsal based on readiness. A useful repair may involve changing one relationship word or narrowing the conclusion rather than adding more evidence.

Share | 9 minutes

Invite pairs to share an explanation or one repaired link.

Audience listens for:

the conclusion
cause-and-effect relationship
evidence from more than one location
the synthesis

After each share, invite one evidence-based question.

Ask:

- Which clues were combined?
- How did they add different information?
- Is the conclusion precise enough?
- What additional clue could strengthen or challenge it?

Teacher move
Ask the audience to respond to the reasoning with evidence-based questions. Avoid turning Share into a vote for the most dramatic conclusion.

Think It Through | 3 minutes

- How did combining clues create new understanding?
- How did checking a weak link improve comprehension?
- Why is narrowing a claim sometimes stronger than keeping a broad one?

Teacher move
Return to the central question and ask students which strategy helped when the chain stopped making sense.

Keep Wondering | ~5 minutes

Questions can focus on one detail, connect several details, or invite deeper thinking across the Adventure.

PUDDLE

A question that can usually be explored by returning to one clear story detail.

- What event happens after Rob reaches Newton's orchard?
- What three objects do Rob and Newton compare?
- What does Newton say about asking questions?

POND

A question that connects a few story details.

- Which event causes Rob to begin comparing different kinds of movement?
- How does the frisbee's return affect the conversation?
- What clues show that Rob's attention changes?

LAKE

A question that requires thinking across several parts of the Adventure.

- How does the first frisbee question eventually lead to the final Moon question?
- How do several events work together to change what Rob notices?
- Why is the comparison of the three paths important to the Adventure?

OCEAN

A deeper story-based question that may support more than one thoughtful, defensible answer.

- What does the Adventure suggest about the relationship between answers and new questions?
- Why might the author structure the story as a chain of observation, comparison, and renewed wondering?
- Which event has the greatest effect on Rob's way of thinking, and what evidence supports your interpretation?

Invite Student Questions

Ask:
"What are you still wondering about this Adventure?"

Invite students to generate story-based questions. Choose several and ask:
"Does this feel like a Puddle, Pond, Lake, or Ocean question?"
There does not need to be one perfect classification.

FACILITATION PROMPTS

- Is the question about one event or a relationship among events?
- Which clues from different parts of the story would help?
- Does the question ask us to distinguish sequence from cause?
- Could two readers build different defensible chains?
- What evidence would challenge the first answer?
- How could we make the question deeper without leaving the Adventure?

Teacher move
A deeper question does not need to move into another subject or introduce information students have not encountered. Depth comes from noticing, connecting, interpreting, and wondering more deeply about the story itself.

Close with one student-generated question that the class would like to keep wondering about.

> *"Every adventure begins with a question. Keep wondering."*

Likely Misconceptions and Helpful Responses

If students...	Try this teacher response
If students treat every sequence as cause and effect:	"Did the first event influence the second, or did it simply happen earlier?"
If students list clues without synthesizing:	"What new understanding becomes possible when those clues are considered together?"
If students draw a conclusion from one vivid detail:	"Which clue from another part supports or challenges it?"
If students overstate certainty:	"What is the most precise conclusion the evidence allows?"
If students ignore conflicting evidence:	"Which clue does not fit yet? What strategy could help repair the reasoning?"
If students believe a longer chain is automatically better:	"Can you explain every arrow? Which links actually help us understand the conclusion?"
If students think changing a conclusion means the first thinking failed:	"Which evidence did you notice that made the revised conclusion stronger?"
If students move beyond the Adventure during Keep Wondering:	"What story relationship or clue can anchor the question?"

Use the Evidence Next

If a student identifies sequence but not causality:
Provide relationship words and test each arrow.

If a student offers one clue:
Ask for another clue that adds different information.

If a student lists evidence without a conclusion:
Use Together, these clues suggest....

If a student overreaches:
Preserve the strongest evidence and narrow the claim.

If a student can explain a cause-and-effect relationship:
Ask how it connects with the larger conclusion.

If a student self-monitors effectively:
Ask them to name the strategy and identify what problem it solved.

If a student generates primarily Puddle questions:
Ask which relationship between two story moments could become the focus of a deeper question.

If a student communicates strongly through a diagram:
Treat a clear, explainable chain as substantive assessment evidence and invite a brief oral or alternative-mode explanation of one link.

Optional ELAL Extensions

Use these only when they naturally support classroom learning. They are not required parts of the two-session experience.

Chain Comparison

Build two possible Cause–Clue–Conclusion chains using the same story evidence. Students compare the relationship words and decide which chain is better supported. Ask what one chain explains that the other does not.

Missing-Link Challenge

Remove one story event, clue, or arrow from the class chain. Students explain what becomes harder to understand, propose a replacement, and justify whether the missing piece affected sequence, cause, or the larger conclusion.

Strategy Reflection

Select one moment when the class had to repair its reasoning. Students identify whether rereading, checking another clue, changing a relationship word, narrowing the claim, or another strategy solved the problem and explain why.

One-Sentence Synthesis

Students condense a conclusion and its most important evidence into one precise sentence. Compare versions and ask which words make the relationship among clues and conclusion clear without overstating the evidence.

Every adventure begins with a question.
Keep wondering.

THE ADVENTURES WITH FRISBEE ROB

The Long Way Down

Adventure 001: Isaac Newton

GRADE 4

MATHEMATICS

Teacher Guide

Same Space, Different Arrangement

GRADE	SUBJECT	TIME
Grade 4	Mathematics	2 × 30 minutes

CENTRAL QUESTION

How can a region be decomposed and rearranged while preserving the same area?

Wonder in Motion

Lesson at a Glance

Story connection	Rob and Newton notice that the apple, frisbee, and leaf all return, but each follows a different path. Grade 4 students explore a mathematical "same but different" idea: regions can be arranged differently while still representing the same amount of two-dimensional space.
Math focus	Area as a measurable attribute, tiling, equal-sized square units, square centimetres, rectangular arrays, multiplication, decomposition, rearrangement, and conservation of area.
Learning intention	We are learning to measure and model area and explain why area remains the same when its pieces are rearranged without adding, removing, overlapping, or changing them.
Core experience	Across two 30-minute sessions, students construct rectangular Journey Mats from equal square units, determine area using arrays and multiplication, decompose and rearrange the same area, rehearse explanations of conservation, and share different representations that preserve equal area.
Flexible use	Session 1 is a complete core lesson and can be used independently. Session 2 continues the same Wonder Lab by giving students additional time to rehearse, refine, share, and deepen their mathematical thinking. Teachers with a continuous 60-minute block may teach both sessions together.
Use after reading	Read Adventure 001: The Long Way Down before beginning. The story reading is separate from the Mathematics sessions.
Story context	Isaac Newton was a real historical person. Rob's visit, their conversation, and the events they experience together are imaginative parts of the story.
Important mathematical distinction	The Journey Mats are a mathematical connection inspired by the story's comparison of different paths. Conservation of area does not explain why the apple, frisbee, or leaf moves as it does.

Optional Teacher-Spoken Success Indicators

- I can describe area as the amount of two-dimensional space inside a region.
- I can measure area using equal-sized square units.
- I can determine the area of a rectangle using rows and columns.
- I can explain why rearranging the same pieces can preserve area.

How to Use This Guide

THE GUIDE IS A TOOL, NOT A SCRIPT

This guide is designed to support responsive teaching rather than prescribe every word or action.

Session 1 is a complete 30-minute Grade 4 Measurement lesson and can be taught independently.

Session 2 continues the same learning through rehearsal, refinement, sharing, and questioning. It does not introduce additional curriculum.

Follow productive student thinking and conversation while protecting the central question, selected Measurement KUSP, meaningful participation, and approximate lesson timing.

Adjust target areas, manipulatives, grouping, response modes, and pacing to meet the needs of the learners in front of you.

Keep conservation central. Students should reason about what is changing and what is being preserved rather than simply memorize procedures.

The goal of the second session is not to do more.

It is to give students enough time to build, rearrange, verify, explain, improve, and communicate what they understand.

Curriculum Alignment

Organizing Idea	Measurement: Attributes such as length, area, volume, and angle are quantified by measurement.
Guiding Question	How can area characterize space?
Learning Outcome	Students interpret and express area.
Assessment Focus	Gather formative evidence of selected Grade 4 Measurement KUSP through students' use of equal-sized area units, rectangular arrays, multiplication, decomposition, rearrangement, and explanations of conservation of area. Session 1 provides sufficient opportunities to gather evidence of the selected KUSP. Session 2 offers additional opportunities for students to demonstrate and communicate their understanding. These lessons do not assess the complete learning outcome.

Selected KUSP for These Lessons

KUSP element	Selected curriculum learning	What it looks or sounds like
Knowledge	Tiling is the process of measuring an area with many copies of a unit, without gaps or overlaps. The unit can be chosen based on the area to be measured. Area can be measured with non-standard units or standard units. The area of a rectangle equals the	Students distinguish area from perimeter, use equal-sized square units to cover a region, and relate rectangular rows and columns to multiplication.

KUSP element	Selected curriculum learning	What it looks or sounds like
	product of its perpendicular side lengths. The perimeter of a polygon is the sum of the lengths of its sides.	
Understanding	Area is a measurable attribute that describes the amount of two-dimensional space contained within a region. Area may be interpreted as the result of motion of a length. An area remains the same when decomposed or rearranged. Area is measured with equal-sized units that themselves have area and do not need to resemble the region being measured. The area of a rectangle can be perceived as square-shaped units structured in a two-dimensional array.	Students explain that rearranging the same component pieces without adding, removing, overlapping, or changing them preserves total area.
Skills & Procedures	Model area by dragging a length, using hands-on materials or digital applications. Compare non-standard units that tile to non-standard units that do not tile. Measure area with non-standard units by tiling. Measure area with standard units by tiling with square centimetres. Visualize and model the area of various rectangles as two-dimensional arrays of square-shaped units. Determine the area of a rectangle, using multiplication. Solve problems involving area of rectangles.	Students tile or model rectangles, connect rows and columns with multiplication, rearrange the same square units, and verify that area remains equal.

Curriculum source: Government of Alberta, Mathematics (K–6) Curriculum, Measurement. *View the Alberta program of study*

Teacher Preparation

STANDARD PATHWAY

Use these two 30-minute sessions after students have heard Adventure 001: The Long Way Down.

Session 1: Build the Area is the core lesson. Students reconnect with the story's "different but connected" idea, compare different-looking regions, see area measurement modelled, and collaboratively build multiple rectangular Journey Mats with the same target area.

Session 2: Rearrange the Area continues the same Wonder Lab. Students return to the Journey Mats, rehearse decomposition and rearrangement, refine conservation explanations, share multiple representations, and explore questions of different depths about area.

If only one 30-minute period is available, teach Session 1.

If a continuous 60-minute block is available, teach both sessions with a brief transition or movement break.

Flexible Use of the Guide

Core Pathway | 30 minutes

Teach Session 1: Build the Area.

Students experience:

Get Curious → Model → Build → Think It Through

This is a complete Grade 4 Measurement lesson.

Full Wonder Lab | 2 × 30 minutes

Teach both sessions.

Students experience:

Model → Build → Rehearse → Share

Session 2 deepens the same learning rather than adding curriculum.

It also provides time for:

Puddle → Pond → Lake → Ocean

Continuous Block | ~60 minutes

If scheduling allows, teach both sessions consecutively with a brief movement or transition break.

Materials

- A copy of Adventure 001
- Square tiles or square paper units
- Optional centimetre grid paper
- Scissors if using paper
- Three labels: Apple Journey Mat, Frisbee Journey Mat, Leaf Journey Mat
- Whiteboard, chalkboard, or chart paper and marker
- Recording chart with:
  - Arrangement
  - Rows
  - Columns

    - Area
- Optional document camera or magnetic squares
- Optional pre-cut pieces for rearrangement

Before Students Begin

- Choose one target area appropriate to the class, such as 12 square units or 24 square units.
- Prepare enough equal-sized square units for students to make several rectangular arrangements.
- For 12 square units, possible rectangles include 1 × 12, 2 × 6, and 3 × 4.
- Create one incorrect area model containing a gap or overlap.
- Prepare one rectangular region that can be decomposed and rearranged.
- Keep Journey Mat materials and class records available for Session 2.
- Decide whether students will work in pairs or small groups.
- Use professional judgment to choose the Session 2 grouping—partners, groups of three, or whole group—that best supports student participation. Early in the year, whole-group practice may help students establish the routine, build confidence, and understand what successful participation looks and sounds like.
- Ensure students have enough physical space to manipulate units without accidental overlap.

Substitutions

Use digital tiles, magnetic squares, reusable grid boards, pre-cut pieces, or drawings instead of loose paper squares.

Useful Vocabulary

Pre-teach essential vocabulary through an explicit vocabulary routine, providing students with opportunities to build meaning, interact with the words, and use them in context before and throughout the lesson.

Mathematics words:

area • square unit • square centimetre • tile • rectangle • array • row • column • decompose • rearrange • preserve • perimeter

Story words:

apple • frisbee • leaf • path • orchard • compare • different • return

Area describes the amount of two-dimensional space contained within a region.

To decompose means to break a region into smaller parts.

To rearrange means to move those parts into a different arrangement.

Conservation of area means the total area remains the same when the same pieces are rearranged without adding, removing, stretching, or overlapping area.

Supporting Our Diverse Learners

Use these supports proactively while preparing and teaching the two sessions.

Make it accessible	Begin with physical square units before relying on abstract multiplication. Allow students to touch, move, count, and rearrange the area units.
Support language	Model: This rectangle has _____ rows of _____. The area is _____ square units.
The arrangement changed, but…	The area stayed the same because…
Offer response choices	Accept building, drawing, pointing, writing multiplication expressions, speaking, dictating, communication devices, or assistive technology.
Support participation	Offer roles such as tile placer, gap checker, row counter, column counter, recorder, decomposer, or area explainer.
Reduce memory load	Keep a visual reminder visible: Equal square units. No gaps. No overlaps. Measure the inside region. Rows × columns can help us count.
Support rehearsal	Allow students to rebuild and explain the same area after receiving feedback rather than continually changing examples.
Preserve the learning	Change the target area, number of arrangements, material, or response mode—not the expectation to represent and conserve area.

KUSP Assessment: Evidence to Notice

FORMATIVE ASSESSMENT

Gather evidence through observations and conversations across both sessions.

Session 1 provides sufficient opportunities to gather evidence of the selected KUSP.

Session 2 gives students additional opportunities to demonstrate and communicate their understanding.

Evidence source	Listen or look for	Possible teacher note
Observation	Student tiles a region without gaps or overlaps and relates the model to rectangular rows and columns.	“Builds a 3 × 4 array and identifies 12 square units.”
Conversation	Student explains why rearranging the same units does not change the total	“Explains that all 12 squares remain, so the area is still 12 square units.”

Evidence source	Listen or look for	Possible teacher note
	area.	
Product	Student creates or records multiple rectangular arrangements representing the same target area.	"Represents 12 square units as 1 × 12, 2 × 6, and 3 × 4."

The Two-Session Flow

Session 1 — Build the Area | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Get Curious**	Compare different-looking rectangular regions and question whether appearance reveals area.	Create a need for measurement with equal area units.
~5 min	**Wonder Lab: Model**	Observe tiling, array structure, multiplication, and one rearrangement.	Make square units, gaps, overlaps, rows, columns, and conservation visible.
~15 min	**Wonder Lab: Build**	Collaboratively construct multiple rectangles with the same target area.	Prompt students to verify area and distinguish what changes from what stays constant.
~5 min	**Think It Through**	Explain what area measures and why different arrangements can have equal area.	Connect physical models to multiplication and conservation.

Session 2 — Rearrange the Area | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Reconnect**	Reconstruct an equal-area arrangement from the previous session.	Ask students to state what must remain constant before manipulating.
~8 min	**Wonder Lab: Rehearse**	Decompose, rearrange, and explain conservation to a partner.	Prompt students to connect physical movement to unchanged area.
~9 min	**Wonder Lab: Share**	Compare multiple rearrangements representing equal area.	Focus the audience on evidence of conservation.

Time	Section	Student experience	Teacher move
~3 min	**Think It Through**	Reflect on what changed and what remained constant.	Return to the central question.
~5 min	**Keep Wondering**	Generate and deepen questions about area and rearrangement.	Use Puddle–Pond–Lake–Ocean.

Session 1 — Build the Area

Get Curious | ~5 minutes

Display two rectangles made from equal-sized square units.

For example:

3 × 4

2 × 6

Do not initially reveal that both contain 12 units.

Ask:

- Which looks as though it covers more space?
- How could we know?
- Is looking enough?
- What does area tell us?
- What could we use to measure the inside region?
- Could different-looking rectangles have equal area?

Invite initial claims.

Then show one irregular tiling with a gap.

Ask:

- “Would this give us an accurate measurement of area?”

TEACHER MOVE
Create a need for equal-sized units that cover a region without gaps or overlaps.

2. Wonder Lab

Model | ~5 minutes

Tile a 3 × 4 rectangle with equal square units.

Ask students to inspect:

- unit size
- gaps
- overlaps

- rows
- columns

Count the units one by one.

Then connect to the array:

3 rows of 4.

3 × 4 = 12 square units.

If using centimetre squares, identify the area as 12 cm^2.

Remove or move the same 12 squares into a 2 × 6 rectangle.

Ask:

- Did we add any squares?
- Did we remove any?
- Did any overlap?
- Did the amount of area represented change?
- What changed?

Think aloud:

> *"The arrangement changed."*
>
> *"The area did not."*

FACILITATION PROMPTS

- What does each square unit represent?
- Why should the units be equal-sized?
- Why can't there be gaps?
- Why can't there be overlaps?
- How do rows and columns help us count?
- What changed when we rearranged?
- What stayed the same?
- What evidence proves the areas are equal?
- Which multiplication expressions represent the two arrangements?

TEACHER MOVE

Keep the physical square units visible when connecting to multiplication.

The multiplication expression should represent the area model rather than replace it.

Build | ~15 minutes

Give each pair or group the same target number of square units.

Say:

> *"Build an Apple Journey Mat using every square."*

Record the first arrangement.

Then:

> *"Can you make a different rectangle using exactly the same squares?"*

Continue to find additional arrangements.

For 12 square units:

1 × 12

2 × 6

3 × 4

Label the different arrangements Apple, Frisbee, and Leaf Journey Mats if useful.

For each arrangement record:

Rows

Columns

Multiplication expression

Area

Ask:

- Do the mats have the same shape?
- Do they have the same dimensions?
- Do they contain the same number of square units?
- What is the area of each?

Next, decompose one rectangle into two or more pieces.

Rearrange the pieces into a new configuration without gaps or overlaps.

Ask whether total area is conserved.

FACILITATION PROMPTS

- How many square units must every mat use?
- What arrangements are possible?
- How do you know you used every unit?
- What multiplication expression matches the array?
- Can two different multiplication expressions produce the same area?
- What changes when the dimensions change?
- What remains constant?
- If we cut the region into pieces and move them, what must we protect?
- What would actually cause the area to change?

TEACHER MOVE

Do not let the task become simply "find factor pairs."

Students should continually connect numerical relationships to the measured space represented by the square units.

Think It Through | ~5 minutes

Keep several equal-area arrangements visible.

Ask:

- What does area describe?
- Why are square units useful?
- How did arrays make counting efficient?
- Why do 3 × 4 and 2 × 6 represent the same area?
- What changed when we rearranged?
- What remained constant?
- How can we know area stayed the same?
- Can two shapes look different and still have equal area?
- Is area the same thing as the distance around the outside?

Sample Response Guidance

Possible response
"Area is the space inside the region."
"We used the same 12 squares, so the area stayed 12 square units."
"The rows and columns changed, but the total number of square units stayed the same."
"Multiplication helped us count the array."
"The outside boundary can look different even when the area is equal." Look for understanding of area as a measurable quantity rather than recognition of an arithmetic fact alone.

Session 1 Closing

Tell students:

> *"Rob and Newton noticed three journeys that looked different while sharing something important. Today we found a mathematical version of that idea: regions can look different while representing the same area."*
>
> *"Next time, you will rearrange area and prove why the total has been conserved."*

If Session 1 is the only lesson being taught, finish with:

> *"What would you need to check before claiming that two different-looking regions have equal area?"*

Session 2 — Rearrange the Area

Reconnect | ~5 minutes

Show one target-area rectangle.

Ask:

- What is its area?

- How do you know?
- What other rectangle did we build with the same area?
- What must stay the same if we rearrange it?
- What are we allowed to change?

Remove the tiles or pieces.

Invite students to reconstruct another equal-area arrangement.

TEACHER MOVE
Require students to articulate the conservation condition before manipulating.

2. Wonder Lab

Rehearse | ~8 minutes

Students work in partners.

Partner A receives a rectangle or tiled region.

Partner A:

1. States the starting area.
2. Decomposes the region.
3. Rearranges the pieces.
4. Determines or verifies the new area.
5. Explains why the area was conserved.

Partner B checks:

- Were all pieces used?
- Was anything added?
- Was anything removed?
- Did any pieces overlap?
- Were any pieces stretched or changed?
- Does the new arrangement represent the same total area?

Suggested frame:

> *"Our original area was..."*
>
> *"We decomposed..."*
>
> *"We rearranged..."*
>
> *"The area stayed the same because..."*

Switch roles.

FACILITATION PROMPTS

- What is your starting area?
- Which pieces did you create?
- Did any piece disappear?
- Did you add any new material?
- Did any pieces overlap?

- How can you verify the new area?
- Could you rearrange the same pieces again?
- How can multiplication help confirm your result?
- What can you improve in your explanation?

TEACHER MOVE

Rehearsal should make the conservation reasoning clearer.

Do not accept “because it looks the same” when stronger evidence is available.

Share | ~9 minutes

Create a class gallery of rearrangements.

Invite pairs to show:

- original region
- decomposition
- new arrangement
- area before
- area after
- conservation explanation

After each share, ask the audience:

- What changed?
- What stayed constant?
- Was every piece accounted for?
- How do we know the area is equal?
- Which rearrangement looks most different from the original?
- Does looking more different make the area less equal?

If appropriate, compare a rectangle with a non-rectangular rearrangement made from the same pieces.

FACILITATION PROMPTS

- Which evidence is strongest?
- Can we verify by counting or calculation?
- Did the boundary change?
- Did the interior amount of space change?
- What does conservation mean here?
- Could another decomposition also work?
- How many different arrangements might be possible?

TEACHER MOVE

Share is about communicating the invariant mathematical quantity, not producing decorative designs.

Think It Through | ~3 minutes

Ask:

- What must remain constant for area to be conserved?
- Can shape change while area stays the same?
- Why is “looks bigger” not enough evidence?
- What role did the square units play in proving conservation?

Return briefly to the central question:

How can a region be decomposed and rearranged while preserving the same area?

Keep Wondering | ~5 minutes

PUDDLE

A small question about one area detail.

Examples:

- What is the area of this Journey Mat?
- How many rows does it have?
- How many square units cover it?

POND

A question connecting several area ideas.

Examples:

- How can 3 × 4 and 2 × 6 represent the same area?
- What happens to area when the same tiles are rearranged?
- How does multiplication help us determine area?

LAKE

A question requiring relationships across several representations.

Examples:

- How many different rectangles can represent the same whole-number area?
- Why can different-looking shapes cover the same amount of space?
- How does decomposition help reveal conservation of area?

OCEAN

A deep mathematical question about area and representation.

Examples:

- What must remain unchanged for rearrangement to preserve area?
- Why can appearance be misleading when comparing area?
- How can very different representations communicate the same mathematical quantity?

The purpose is not for Grade 4 students to classify every question mechanically.

The water language helps students recognize increasing depth of mathematical reasoning.

Invite Student Questions

Ask:

- "What are you still wondering about the Journey Mats as a mathematician?"
- Accept questions about area, tiling, arrays, decomposition, multiplication, or conservation.

Choose several and ask:

> *"Does this feel like a Puddle, Pond, Lake, or Ocean question?"*

FACILITATION PROMPTS

- Is your question about one area or a relationship among arrangements?
- Would rearranging help us investigate?
- Could there be several correct arrangements?
- What quantity would have to stay constant?
- Can this Puddle become a Pond?
- What would make this a Lake?
- What larger mathematical idea could make it an Ocean?

TEACHER MOVE

Keep questions anchored to Grade 4 area and the story-inspired models.

Close with one student-generated question worth preserving.

"Every adventure begins with a question. Keep wondering."

Likely Misconceptions and Helpful Responses

If students...	Try this teacher response
If students count the boundary instead of the interior:	"Are we measuring around the shape or the space it covers?"
If students leave gaps:	"Is every part of the region being measured?"
If students overlap tiles:	"Are we counting any space twice?"
If students believe a long narrow rectangle has greater area simply because it looks larger:	"How many equal square units does each contain?"
If students believe rearranging changes area:	"What was added, removed, stretched, or overlapped?"
If students think equal area requires identical shape:	"Can you build another arrangement from the same number of square units?"
If students begin focusing on perimeter:	"That is a useful observation. Which attribute is our lesson measuring right now?"
If students think an Ocean question means	"Ocean means deep mathematical thinking, not

If students...	Try this teacher response
an enormous shape:	physically large area.”

Use the Evidence Next

- If a student counts square units one by one, connect the array to multiplication.
- If a student multiplies correctly but cannot explain area, return to physical tiling.
- If a student confuses perimeter and area, physically trace the boundary and then cover the interior.
- If a student understands one rearrangement, ask them to create another.
- If a student understands conservation deeply, ask what kinds of changes would actually alter area.
- If a student independently relates multiple arrays to equal products, invite them to predict an arrangement before building.
- If a student generates mainly Puddle questions, invite comparison of two different arrangements.
- If a student demonstrates strong understanding through physical manipulation, document that evidence even if the verbal explanation is brief.

Optional Mathematics Extensions

Area Puzzle

Give students a fixed number of square units.

Challenge them to create every possible whole-number rectangle using all units.

Missing Arrangement

Provide a target area and one known arrangement.

Students predict another possible arrangement before building it.

Area Error Detective

Show regions containing unequal units, gaps, overlaps, or incorrect multiplication representations.

Students diagnose and correct the mathematical problem.

Adventure Display Design

Design three different rectangular display panels for the apple, frisbee, and leaf.

Each must have the same area but different dimensions.

Every adventure begins with a question.
Keep wondering.

THE ADVENTURES WITH FRISBEE ROB

The Long Way Down

Adventure 001: Isaac Newton

GRADE 4

PHYSICAL EDUCATION & WELLNESS

Teacher Guide

Physical Education & Wellness

GRADE	SUBJECT	TIME
Grade 4	Physical Education & Wellness	2 × 30 minutes

CENTRAL QUESTION

How can manipulating movement elements improve efficiency, accuracy, and control with a frisbee?

Wonder in Motion

Teacher Guide

Change One Thing: Aim for Control

Lesson at a Glance

Story Connection	Rob's frisbee movements in *The Long Way Down* combine several movement elements. His body has a position. He uses space. He faces and moves in particular directions. He manipulates the frisbee. Grade 4 students move beyond simply identifying these elements. They begin integrating movement elements and deliberately manipulating one of them to improve an intended outcome. The Adventure creates a natural movement question: **If Rob wanted more control, what could he change in his movement?** Grade 4 students investigate that question physically. They perform a familiar frisbee task, establish a starting movement, change one movement element deliberately, repeat the task, and compare what happens. The core process is: **BEFORE → CHANGE → AFTER**
Physical Education & Wellness Focus	Integrating movement elements during frisbee play and deliberately manipulating movement to improve: ● efficiency ● accuracy ● control Students use a simple **compare–change–compare** process. They do not attempt to change everything at once. The same physical task remains recognizable while one movement element is adjusted deliberately. Students then use repeated attempts and movement evidence to consider whether the change helped. Improvement may include: ● greater accuracy ● greater control ● more consistent movement ● more efficient action ● improved receiving position ● greater stability Do not default automatically to distance or power as the measure of success.

Learning Intention	**We are learning to manipulate movement elements deliberately and notice how those changes affect efficiency, accuracy, and control.**
Core Experience	Across two 30-minute sessions, students complete the companion **Grade 4 Adventures FlightPlan in Frisbee Playbook**.

Session 1 — Test the Change

Get Curious → Wonder Lab: Model → Wonder Lab: Build → Think It Through

Students establish a baseline movement, deliberately change one movement element, repeat the same task, and compare the result.

Session 2 — Refine the Change

Reconnect → Wonder Lab: Rehearse → Wonder Lab: Share → Think It Through → Keep Wondering

Students return to an adjustment that appeared useful, practise it repeatedly, refine it where necessary, and communicate what the movement evidence suggests.

- facilitation prompts
- teacher moves
- misconceptions
- next instructional steps
- reflection
- Adventure-based inquiry

Flexible Use

Session 1 is a complete Grade 4 Movement Skill Development lesson and can be taught independently.

Session 2 gives students additional opportunities to:

- repeat a useful adjustment
- refine the movement
- look for consistency
- communicate evidence
- explain whether an adjustment helped

Teachers with a continuous 60-minute block may teach both sessions together.

Use After Reading

Read Adventure 001 before beginning.

The story reading is separate from the two Physical Education & Wellness sessions.

Story Context

Isaac Newton was a real historical person.

Rob's visit, their conversation, and the events of the Adventure are imaginative.

Important Physical Education & Wellness Distinction

The Grade 4 goal is **not** to discover one universal "correct" way to throw a frisbee.

Students are learning that movement elements can be deliberately manipulated to improve an intended outcome.

A movement adjustment useful for one student, distance, target, partner, or task may not produce the same result for another.

Do not assume:

- **more effort = better performance**
- or
- **more power = more control**
- Students may discover that less effort produces greater accuracy.

A different body position may help one student but not another.

A change that appeared useful during one task may need to be adjusted when the context changes.

The core Grade 4 thinking is:

- **What am I trying to improve?**
- **What did I change?**
- **What evidence did I notice?**
- **Would I keep, refine, or replace the adjustment?**

An unsuccessful adjustment can still provide strong curriculum evidence when the student understands what happened and makes a purposeful next decision.

Optional Teacher-Spoken Success Indicators

I can integrate movement elements during a frisbee task.

I can change one movement element deliberately.

I can compare movement before and after the change.

I can notice evidence of accuracy, control, or efficiency.

I can explain whether an adjustment helped.

I can decide whether to keep, refine, or change an adjustment.

Frisbee Playbook FlightPlan

The FlightPlan Is the Physical Lesson

This Teacher Guide is designed to be used with the companion **Grade 4 Adventures FlightPlan in Frisbee Playbook**.

Open the FlightPlan before teaching these PE sessions.

A FlightPlan is a ready-to-use PE lesson sequence showing what students physically do, in what order, and for how long.

For this Adventure, the Grade 4 FlightPlan contains both 30-minute sessions.

The FlightPlan provides the practical information needed to run the physical lesson, including:

- session and activity sequence
- phase and activity timing
- educator notes
- Drill instructions
- coaching cues
- frisbee and equipment information
- grouping and activity-specific setup
- modifications where applicable

When a Drill appears in the FlightPlan, select **Details** when you need its complete instructions, coaching cues, equipment information, or additional resources.

Grade 4 FlightPlan

Direct access

https://frisbeeplaybook.com/flightplan/newton/grade-4

Or navigate:
Frisbee Playbook → Build → Adventures with Frisbee Rob → The Long Way Down → Grade 4

Keep the FlightPlan open on a phone, tablet, or computer during class, or select **Print** before teaching.

Standard and Quick Launch

Use **Standard** to view the complete two-session experience.

When only one short block is available, select **Quick Launch**.

For the Newton Adventures FlightPlans, Quick Launch contains the four activities from Session 1:

Get Curious → Model → Build → Think It Through

Quick Launch displays the activities intentionally selected as the essential short-block pathway.

It does not automatically shorten every activity.

How the Two Resources Work Together

FlightPlan = what students physically do.

Teacher Guide = what the teacher is looking for and why it matters.

The FlightPlan is required to deliver the physical portion of these lessons.

This Teacher Guide is designed to be used alongside the FlightPlan, not instead of it.

The public Adventures FlightPlan focuses primarily on lesson delivery.

Curriculum interpretation, assessment evidence, learner supports, misconceptions, reflection, and deeper questioning remain in this Teacher Guide.

How to Use This Guide

THE GUIDE IS A TOOL, NOT A SCRIPT

Before teaching, open the Grade 4 Adventures FlightPlan and review both sessions.

During class: use Frisbee Playbook to run the physical activities and use this Teacher Guide to interpret the movement learning, comparison, and evidence and The FlightPlan should provide enough repetition for a meaningful comparison.

This Guide intentionally does not repeat every:

- target location
- partner arrangement
- distance
- repetition
- physical setup
- technical cue

Session 1 provides sufficient opportunities for the selected KUSP.

Session 2 gives students more time to refine a useful adjustment and communicate the reasoning behind it.

Avoid making a judgment from one attempt.

Students need enough repeated attempts to notice whether a movement modification may be helping.

At the same time, avoid turning PE into a formal data-collection exercise.

Simple movement evidence is enough.

Students may say:

- “The frisbee reached the area more often.”
- “I felt more stable.”
- “I could repeat the movement more consistently.”
- “I was ready earlier.”
- “That change didn’t help me.”

The goal is not mathematical precision.

The goal is purposeful movement adjustment supported by reasonable evidence.

The goal of the second session is not to do more. It is to give students enough time to think, try, improve, and communicate what they understand.

Curriculum Alignment

Organizing Idea	**Movement Skill Development:** Developing physical literacy through movement and active living supports well-being across a lifespan.
Guiding Question	**How can elements of movement support active living?**
Learning Outcome	**Students integrate and experiment with elements of movement to support physical activity.**
Assessment Focus	Gather formative evidence through students’:

	• movement integrations • deliberate adjustments • repeated attempts • comparisons • observations • explanations Look for students who: • integrate more than one movement element • send, receive, or retain a frisbee using equipment • manipulate a movement element deliberately • compare movement before and after a change • connect a modification with accuracy, control, or efficiency • revise an adjustment when it does not help • explain what evidence influenced the decision Session 1 provides sufficient evidence opportunities. Session 2 adds refinement and communication. These lessons do not assess the complete Learning Outcome.

Selected KUSP for These Lessons

KUSP element	Selected curriculum learning	What it looks or sounds like
Knowledge	**Selected Curriculum Learning** Locomotor movements include: • dodging • crossover Non-locomotor movements include: • lifting • extending • flexing Object-manipulation movements involve: • sending objects, including volleying • retaining objects, including dribbling • receiving objects, including catching and collecting	Students recognize that physical activity can combine several types of movement. The specific curriculum examples are broader than frisbee and are not intended to imply that students must dribble or volley a frisbee during this lesson. The selected FlightPlan uses the frisbee as equipment through which students can integrate: • body movement • object manipulation • movement elements • purposeful adjustment A student may move, position the body, send, receive, or retain the frisbee while also manipulating a movement element. The important curriculum evidence is not whether every named movement example appears.

KUSP element	Selected curriculum learning	What it looks or sounds like
		The important evidence is that students integrate movement and deliberately alter part of it to support the physical task.
Understanding	**Selected Curriculum Learning** Elements of movement are integrated through various combinations to create movement. Elements of movement can be manipulated to improve accuracy and control.	Students recognize that a frisbee action is created through several movement elements working together. They begin understanding that changing one part of the movement can alter the result. Students may say: ● "I changed the direction I faced." ● "I changed how much effort I used." ● "I moved into a different position before receiving." ● "I felt more controlled after the change." ● "The change did not improve my accuracy." They also begin recognizing that a movement adjustment does not need to work for everyone in exactly the same way.
Skills & Procedures	**Selected Curriculum Learning** Integrate elements of movement in various physical activities. Perform elements of movement when receiving, sending, and retaining an object using various parts of the body and equipment. Manipulate movement elements to improve efficiency, accuracy, and control.	Students perform a frisbee task, establish a starting approach, deliberately change one movement element, repeat the task, and compare the effect. They may: ● change body position ● change facing direction ● adjust effort ● adjust spacing ● change receiving position ● alter another FlightPlan-relevant movement feature They then use evidence from repeated attempts to decide whether the adjustment: helped, did not help, or needs refinement.

Curriculum source: Government of Alberta, Physical Education and Wellness (K–6) Curriculum, Movement Skill Development, p. 22. *View the Alberta program of study*

Teacher Preparation

STANDARD PATHWAY

Use these sessions after students have heard Adventure 001.

Before teaching, open the Grade 4 Adventures FlightPlan:

https://frisbeeplaybook.com/flightplan/newton/grade-4

Review both sessions and the relevant Drill details.

Session 1 — Test the Change

Students establish a starting movement, deliberately change one movement element, and compare.

The instructional focus is:

BEFORE → CHANGE → AFTER

Students learn to make one purposeful adjustment and gather enough movement experience to consider its effect.

Session 2 — Refine the Change

Students return to a useful adjustment, practise it repeatedly, and communicate what the evidence suggests.

The instructional focus is:

repeat → refine → compare → explain

If only one 30-minute period is available, teach Session 1 or use Quick Launch.

If a continuous 60-minute block is available, teach both sessions with a brief transition.

Flexible Use of the Guide

Core Pathway | 30 minutes

Open the Grade 4 Adventures FlightPlan and teach Session 1:

Get Curious → Model → Build → Think It Through

The FlightPlan provides the physical experience.

This Teacher Guide provides the movement-analysis, curriculum, evidence, questioning, and assessment lens.

Session 1 independently provides sufficient opportunities to gather the selected KUSP.

Full Wonder Lab | 2 × 30 minutes

Teach both sessions through the companion FlightPlan:

Model → Build → Rehearse → Share

Session 2 deepens the same movement-adjustment learning through: repetition, refinement, comparison, evidence, and communication.

Students also deepen Adventure-based inquiry through:

Puddle → Pond → Lake → Ocean

Continuous Block | ~60 minutes

Teach both sessions consecutively with a brief transition.

Reconnect may be shortened when Session 1 remains fresh.

Protect the repetition needed to establish a baseline, make a change, compare, refine, and communicate.

Do not turn the continuous block into a longer game simply because more time is available.

The curricular progression remains:

BEFORE → CHANGE → AFTER → REFINE

Materials

Required

Companion Grade 4 Adventures FlightPlan in Frisbee Playbook

Adventure 001

The FlightPlan identifies the frisbees, targets, partner locations, markers, equipment, grouping, setup, and physical-delivery requirements for the activities.

Optional Teacher Guide Supports

Comparison cards:

- BEFORE
- CHANGE
- AFTER

Outcome cards:

- ACCURACY
- CONTROL
- EFFICIENCY
- Optional movement-element cards
- These are instructional supports.

They are not additional FlightPlan activities.

Before Students Begin

Open the Grade 4 FlightPlan.

Review:

- Session 1 and Session 2
- Standard and Quick Launch
- **One Change Test** Drill details
- **Movement Detective** Drill details
- activity timing
- target or partner setup
- equipment
- educator notes
- coaching cues
- Use professional judgment to choose the Session 2 grouping—partners, groups of three, or whole group—that best supports student participation. Early in the year, whole-group practice may help students establish the routine, build confidence, and understand what successful participation looks and sounds like.
- activity-specific modifications

Prepare the recurring prompt:

What did you change, and what effect did it have?

Make sure students understand what improvement means in the selected physical task.

If **accuracy** is the focus, help students recognize the intended area or result.

If **control** is the focus, identify what controlled movement might look or feel like.

If **efficiency** is the focus, keep the comparison accessible rather than turning it into formal biomechanics.

Avoid defaulting to:

> *"Throw farther."*

Students need to understand the intended outcome before they can meaningfully judge an adjustment.

Useful Vocabulary

Pre-teach essential vocabulary through an explicit vocabulary routine, providing students with opportunities to build meaning, interact with the words, and use them in context before and throughout the lesson.

Physical Education & Wellness Words

integrate • manipulate • movement element • accuracy • control • efficiency • sending • receiving • retaining • adjustment • comparison • evidence

Story Words

Rob • Newton • frisbee • Adventure • movement • question

To integrate means to combine parts so they work together.

To manipulate means to deliberately change.

Accuracy means increasingly reaching the intended location or result.

Control means managing movement effectively.

Efficiency means performing movement purposefully and effectively.

An **adjustment** is a deliberate movement change.

A **comparison** looks at what is similar or different between attempts.

Evidence is information from the movement experience that helps support an explanation or decision.

Supporting Our Diverse Learners

Make It Accessible	Use the FlightPlan's physical modifications as the primary source for adapting the live task. Use distances, targets, and physical conditions that allow meaningful comparison. A task that is too difficult gives students very little useful information about the movement adjustment. If necessary: ● increase target size ● reduce distance ● use a more accessible disc ● simplify locomotor demands ● allow collecting where appropriate ● use a stationary version before adding movement ● Preserve the **compare–modify–evaluate** process.
Support Language	Use sentence frames such as: ● "I changed _____." ● "Before, _____." ● "After, _____." ● "The change affected my _____." ● "I noticed _____." ● "I would keep/change it because _____." ● "The evidence was _____." Students may demonstrate the difference physically before explaining it verbally.
Offer Response Choices	Accept: physical demonstration, comparison cards, oral response, simple diagram, gesture, AAC, partner-supported explanation, and teacher-recorded observation.

	Students do not need lengthy technical explanations to demonstrate movement reasoning.
Support Participation	Meaningful roles may include mover, observer, target checker, element detective, feedback partner, recorder, and reporter. Use Frisbee Playbook as the primary source for the physical grouping and activity organization.
Reduce Memory Load	Ask students to manipulate **one primary movement element at a time**. Keep: ● BEFORE ● CHANGE ● AFTER ● visible when useful. Use the same recurring questions: ● What am I trying to improve? ● What did I change? ● What happened? ● Would I keep the adjustment? Avoid adding several technical corrections at once.
Support Rehearsal	Provide several comparable attempts before and after a change. Let students retain the same physical task while refining the movement. If a student changes something after every attempt, the comparison becomes difficult. Encourage enough consistency for the student to notice a pattern.
Preserve the Learning	Scale: target size, distance, disc type, speed, locomotor demand, and physical intensity. Do not remove the requirement to deliberately manipulate an element, compare attempts, and judge the effect. **Change the access pathway—not the learning goal.**

KUSP Assessment: Evidence to Notice

FORMATIVE ASSESSMENT

Gather evidence naturally while students complete the FlightPlan.

Avoid creating a separate formal throwing test.

Session 1 provides sufficient opportunities to gather selected KUSP evidence.

Session 2 adds refinement, consistency, observation, and explanation.

Evidence source	Listen or look for	Possible teacher note
Observation	Student integrates multiple movement elements. Student makes a deliberate movement adjustment. Student maintains the same basic task before and after the change. Student repeats the task enough to compare. Student demonstrates changed or increased accuracy, control, or efficiency. Student revises an adjustment when appropriate.	"Changes body position and facing direction; subsequent sends reach the intended partner area more consistently." Or: "Reduces effort and demonstrates greater control across several attempts." Or: ● "Changes receiving position before the next attempt and appears ready earlier."
Conversation	Student names the adjustment. Student identifies the intended outcome. Student explains the observed effect. Student distinguishes between an adjustment and simply trying harder. Student provides movement evidence to support the decision.	"Says, 'I changed where I faced and had more control sending toward the target area.'" Or: ● "Says, 'I tried using more effort, but it was less accurate, so I went back to the first way.'"
Product / Class Product	● An optional **Before–Change–After** board can provide supporting evidence. Students may record: ● the original movement ● the adjustment ● the observed effect ● the outcome they were trying to improve Students may contribute through: words, movement cards, simple diagrams, teacher-recorded comments, and physical demonstrations. Physical movement and student interpretation remain the primary evidence.	

The Two-Session Flow

Session 1 — Test the Change | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Get Curious**	Complete **Get Curious** in the Grade 4 Adventures FlightPlan. Students reconnect with Rob's frisbee movement and consider what he could deliberately adjust if he wanted greater accuracy, control, or efficiency.	Frame movement improvement as the manipulation of movement elements rather than simply: **"Try harder."** Introduce the comparison process: **BEFORE → CHANGE → AFTER** Use the FlightPlan for the physical direction. Use this Guide to establish the movement-investigation lens.
~5 min	**Wonder Lab: Model**	**FlightPlan activity: One Change Test** Observe a baseline version of the FlightPlan movement and then a version with one visible element changed.	Model a fair before-and-after comparison. Keep the task and relevant conditions as consistent as possible while changing one movement element. Do not declare the second version automatically better. Ask whether repeated attempts would provide stronger evidence.
~15 min	**Wonder Lab: Build**	**FlightPlan activity: One Change Test** Complete the Build experience. Students establish a starting movement, choose one adjustment, repeat the task, and compare what happens.	Ask: ● What changed? ● What were you trying to improve? ● What stayed the same? ● What evidence did you notice? ● Would you keep the adjustment? Treat unsuccessful adjustments as legitimate learning when students interpret what happened.
~5 min	**Think It Through**	Explain how manipulating a movement element affected: accuracy, control, or efficiency.	Connect students' movement evidence with the central question.

Time	Section	Student experience	Teacher move
			Reinforce that different students may reach different conclusions about the same type of adjustment.

Session 2 — Refine the Change | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Reconnect**	Complete **Reconnect** in the FlightPlan. Students revisit: BEFORE, CHANGE, and AFTER. and recall one deliberate adjustment.	Reactivate purposeful movement adjustment rather than individual technique rules. Ask students to distinguish between changing something randomly and changing it to improve a specific outcome.
~8 min	**Wonder Lab: Rehearse**	**FlightPlan activity: One Change Test** Repeat the familiar task using one adjustment that appeared useful. Students practise the adjustment enough to consider whether the effect becomes more consistent.	Focus on repetition, consistency, small refinements, and evidence. Do not introduce new tricks or unrelated physical challenges.
~9 min	**Wonder Lab: Share**	**FlightPlan activity: Movement Detective** Students demonstrate or describe a baseline and refined version. Movement Detectives observe the comparison.	Ask observers to identify: • the movement element • the adjustment • the intended outcome • the visible or reported evidence Keep Share focused on movement reasoning rather than performance ranking.
~3 min	**Think It Through**	Explain how manipulating movement supported the task.	Return to the central question. Ask what repeated practice revealed that one attempt could not.
~5 min	**Keep Wondering**	Complete the FlightPlan Keep Wondering transition, then use the Puddle–Pond–Lake–Ocean	Keep questions focused on Rob's movement, purposeful adjustment, accuracy, control,

Time	Section	Student experience	Teacher move
		prompts in this Teacher Guide.	efficiency, and evidence. Do not allow the inquiry to become advanced frisbee physics.

Session 1 — Test the Change

Get Curious | ~5 minutes

Open the Grade 4 Adventures FlightPlan and run Get Curious.

Use the FlightPlan for the physical directions.

Return to Rob with the frisbee.

Ask:

> ***"If Rob wanted to send the frisbee where he intended more consistently, what could he do?"***

Students may initially answer:

- "Try harder."
- "Throw harder."
- "Practise."

Ask:

> ***"Could changing how his body moves help?"***

Introduce:

BEFORE → CHANGE → AFTER

Say:

> *"Today we're going to act like movement investigators."*
>
> *"We will keep the task mostly the same, change one movement element, and notice what happens."*

Introduce the central question:

How can manipulating movement elements improve efficiency, accuracy, and control with a frisbee?

FACILITATION PROMPTS

- What are you trying to improve?
- What could you change?
- What should stay the same?
- What would control look or feel like?
- What would accuracy look like?
- What might efficiency look like?

- How will you know what happened?
- Would one attempt give enough information?

TEACHER MOVE

Frame movement adjustment as **purposeful investigation**.

Do not turn the lesson into a formal scientific experiment.

The comparison should remain physical, accessible, and curriculum-driven.

2. Wonder Lab

Model | ~5 minutes

Open the FlightPlan and run One Change Test — Model.

The FlightPlan provides the physical activity directions and coaching cues.

Demonstrate or draw attention to:

- a baseline attempt
- then
- the same basic task with one visible movement element changed

Ask:

- “What changed?”
- “What stayed the same?”
- “What happened to the outcome?”

Ask:

> ***“Would we need more than one attempt to decide?”***

FACILITATION PROMPTS

- Which element was manipulated?
- Was the target or partner condition the same?
- Was the distance the same?
- What evidence of accuracy did you notice?
- What evidence of control did you notice?
- Did the movement appear more efficient?
- Did the change help?
- Would another movement adjustment also be possible?

TEACHER MOVE

Model a **fair and cautious comparison**.

Avoid telling students:

“This one is better.”

Instead ask:

“What evidence did you notice?”

The goal is for students to become movement investigators, not imitate one teacher-approved solution.

Build | ~15 minutes

Open the FlightPlan and run One Change Test — Build.

Use Frisbee Playbook for activity instructions, partner or target setup, equipment, distance, timing, repetitions, coaching cues, and activity-specific modifications.

Use this Teacher Guide as the curriculum and assessment lens.

Students first establish a baseline.

Then they select one movement adjustment.

Circulate and ask:

- “What are you changing?”
- “What are you trying to improve?”
- “What are you keeping the same?”
- “What happened?”
- “Did that happen more than once?”
- “Would you keep the adjustment?”

If a change does not help, ask:

> ***“What did you learn from that?”***

FACILITATION PROMPTS

- Did accuracy change?
- Did control change?
- Did the movement feel more efficient?
- What evidence are you using?
- Could your adjustment be smaller?
- Would another adjustment be worth trying later?
- Are you changing one thing or several things?
- Did the same adjustment affect every attempt the same way?
- Do you need more repetitions before deciding?

TEACHER MOVE

An unsuccessful adjustment is legitimate learning when students can interpret what happened.

Avoid rescuing students immediately by giving them the "correct" adjustment.

Whenever possible, ask:

"What does the movement evidence suggest you should do next?"

Think It Through | ~5 minutes

Run Think It Through from the FlightPlan, then deepen the reflection using the prompts below as appropriate.

Ask:

- "What movement element did you manipulate?"
- "What were you trying to improve?"
- "What effect did you notice?"
- "Did every student benefit from the same type of change?"
- "Why might different bodies need different adjustments?"
- "Why is one attempt usually not enough to know?"
- "Did anyone make a change that did not help?"
- "What did that teach you?"

Return to:

How can manipulating movement elements improve efficiency, accuracy, and control with a frisbee?

Sample Response Guidance

Possible response:
"I changed the direction I faced."
"I used less effort and had more control."
"I changed where I stood before receiving."
"My first change did not help, so I would try something different."
"The change helped me reach the target area more consistently."
"I needed several attempts before I could tell." Look for: ● **deliberate modification + interpretation** ● rather than technical perfection.

Session 1 Closing

Tell students:

> *"Movement elements work together."*
>
> *"When we change one element deliberately, we can notice what happens to accuracy, control, or efficiency."*
>
> *"Not every change improves the movement."*
>
> *"An adjustment can still teach us something even when we decide not to keep it."*
>
> *"Next time, we'll refine the changes that seem useful."*

If Session 1 is taught alone, ask:

> ***"Tell me one thing you changed and one thing you noticed afterward."***

Session 2 — Refine the Change

Reconnect | ~5 minutes

Open the Grade 4 FlightPlan and run Reconnect.

Display or say: BEFORE, CHANGE, and AFTER.

Ask:

- "What made a change purposeful?"
- "What did we need to notice afterward?"

Invite students to recall one movement element they changed.

Then ask:

> ***"What is the difference between changing something randomly and changing it because you are trying to improve a specific outcome?"***

TEACHER MOVE

Reconnect with the **reasoning process**, not merely the previous physical task.

Students should return to:

What am I trying to improve?

What am I changing?

What evidence will I notice?

2. Wonder Lab

Rehearse | ~8 minutes

Open the FlightPlan and run One Change Test — Rehearse.

Students select one useful adjustment from Session 1 or a teacher-supported adjustment.

Ask:

- "What adjustment are you keeping?"

- “What outcome are you watching?”
- “Is the result becoming more consistent?”
- “Do you need to refine the adjustment?”

FACILITATION PROMPTS

- What are you practising?
- What feedback are you using?
- Are you seeing similar results across attempts?
- Could the adjustment be too large?
- Could a smaller adjustment work?
- What are you keeping consistent?
- What evidence would make you keep the change?
- What evidence would make you revise it?

TEACHER MOVE

Rehearsal is about **refining and repeating**, not adding tricks or new physical challenges.

Students need enough repetition to begin distinguishing:

one lucky attempt

from

a movement adjustment that appears consistently useful

Do not require formal statistics.

Simple repeated movement evidence is sufficient.

Share | ~9 minutes

Open the FlightPlan and run Movement Detective — Share.

Students demonstrate or describe:

- the baseline
- the adjustment
- the refined version
- Movement Detectives observe.

Ask:

- “What changed?”
- “What stayed the same?”
- “What was the intended outcome?”
- “What evidence did you notice?”

FACILITATION PROMPTS

- Which movement element was manipulated?
- How did you know?
- Was accuracy affected?
- Was control affected?
- Was efficiency affected?
- Would this adjustment necessarily work for everyone?
- What evidence did the mover provide?

- Did the adjustment become more consistent?
- Could another adjustment also be reasonable?

TEACHER MOVE

Encourage **evidence-based explanation from movement experience**.

The student does not need to prove that the adjustment is universally better.

A strong explanation may be:

"This adjustment worked better for me in this task because..."

Think It Through | ~3 minutes

Run Think It Through from the FlightPlan.

Ask:

- "How can manipulating movement elements support physical activity?"
- "What did repeated practice teach you?"
- "What makes a movement adjustment useful?"
- "How do you know whether to keep, refine, or replace a change?"

Return to the central question.

Keep Wondering | ~5 minutes

The FlightPlan transitions students into Keep Wondering.

Use the questions below to deepen the inquiry.

PUDDLE

- What movement does Rob use before throwing?
- Which direction is Rob facing?
- What part of Rob's movement could change?
- What movement element can you notice?

POND

- How could Rob change one movement element without changing the whole action?
- What might happen if Rob changed his position before throwing?
- Why might using more effort not always improve control?
- How could Rob change his direction while keeping the same frisbee task?

LAKE

- How could Rob decide which movement element to change first?
- Why might an adjustment improve accuracy in one situation but not another?
- How do several movement elements work together in one frisbee action?
- How could Rob use repeated attempts to decide whether a change is useful?

OCEAN

- How could Rob decide whether an improvement came from a movement change or from continued practice?
- Why might a skilled performer still need to adjust movement elements?

- How could accuracy and control require different adjustments in different frisbee situations?
- Why might two skilled movers make different adjustments and both improve?

Invite Student Questions

Ask:

> ***"What are you still wondering about how Rob could adjust his movement in the Adventure?"***

FACILITATION PROMPTS

- What movement element would change?
- What outcome are you thinking about?
- What part of the Adventure made you wonder?
- Could another adjustment work?
- What evidence could Rob notice?
- Can your question connect more than one part of his movement?
- Could two movers make different successful adjustments?
- How could Rob decide whether the change helped?

TEACHER MOVE

A deeper question does not need to move into another subject or introduce information students have not encountered.

Depth comes from:

noticing

connecting

comparing

interpreting

evaluating

wondering more deeply about the story itself

Keep the inquiry centred on **movement decision making** rather than advanced frisbee physics.

If students move toward questions about disc design or aerodynamics, redirect:

"What could Rob change in his body movement?"

Close with one student-generated question worth preserving.

Likely Misconceptions and Helpful Responses

- **If students change several movement elements at once**

Try:

- **"Which one change would make the comparison clearer?"**
- **If students treat accuracy and power as the same**

Try:

- **"What was the intended outcome—distance, accuracy, or control?"**
- **If students assume one movement adjustment fits everyone**

Try:

- **“Do different bodies or situations sometimes need different adjustments?”**
- **If students think an unsuccessful modification is failure**

Try:

- **“What did the attempt tell you about that adjustment?”**
- **If students judge improvement from one attempt**

Try:

- **“What would repeated attempts tell you?”**
- **If students focus on frisbee design instead of body movement**

Try:

- **“What did you change in the movement?”**
- **If students make a claim with no movement evidence**

Try:

- **“What did you notice that supports your conclusion?”**
- **If students think every adjustment must be large**

Try:

> ***“Could a smaller change produce a clearer result?”***

If students...	Try this teacher response
If students think more effort always improves performance	Try: ● **“Did the extra effort improve the outcome you were actually watching?”**

Use the Evidence Next

If a student cannot identify a movement element

Return briefly to the Grade 3 language and provide choices.

Ask:

- “Was the change about direction, position, effort, or something else?”
- **If a student can modify movement but cannot evaluate the result**
- Clarify one intended outcome.

Ask:

- **“Are you looking for accuracy, control, or efficiency?”**
- **If a student improves accuracy**

Ask whether control or efficiency also changed.

Do not assume all three outcomes improved together.

If a student makes too many changes

Return to a one-variable comparison.

If a student demonstrates consistency

Ask:

- **"What evidence makes you think the adjustment is working?"**
- In a future FlightPlan, the physical context can be changed slightly.
- **If task difficulty prevents meaningful analysis**

Use the FlightPlan adaptations to simplify:

- target
- distance
- disc
- object-control demand
- Preserve the movement-adjustment learning.

If a student's questions remain factual

Ask:

- **"What movement adjustment might change the outcome?"**
- **If a student generates a strong movement hypothesis**

Preserve it for future FlightPlan practice.

If a student recognizes that an adjustment did not help

Ask:

- **"What would you test next?"**
- Recognizing an ineffective change is valid evidence.

Optional Physical Education & Wellness Extensions

These extensions are optional.

They do not replace the core Grade 4 Adventures FlightPlan.

Target Tune-Up

Use a familiar target-based frisbee activity.

Students deliberately change one movement element while keeping the target and distance as consistent as possible.

Ask:

- "What did you change?"
- "What happened to accuracy?"
- "Did the same thing happen more than once?"
- "Would you keep the change?"

Avoid ranking students by total hits.

The focus remains purposeful adjustment and interpretation.

Receiving Adjustment

Shift attention from sending to receiving.

Students deliberately manipulate: body position, spacing, direction, or readiness before receiving.

Ask:

- "What did you change?"
- "What helped you feel more ready?"
- "Did the adjustment improve control?"

This reinforces that movement manipulation applies to more than throwing.

Same Task, Different Distance

Repeat a familiar task at two developmentally appropriate distances.

Ask:

- "Does the same movement adjustment remain useful?"
- "What changed when the distance changed?"
- "Would you keep the same adjustment or refine it?"

The purpose is not to determine one ideal distance.

The purpose is to recognize that context can affect whether an adjustment remains useful.

What Would Rob Change?

Return to an illustration or moment from the Adventure.

Students select one visible or plausible movement element Rob could adjust.

Ask:

- "What would Rob change?"
- "What outcome might he be trying to improve?"
- "What should stay the same?"
- "How could he know whether the adjustment helped?"
- "Would one attempt be enough?"

Keep the inquiry on Rob's movement choices rather than frisbee aerodynamics.

Every adventure begins with a question.
Keep wondering.

THE ADVENTURES WITH FRISBEE ROB

The Long Way Down

Adventure 001: Isaac Newton

GRADE 4

SCIENCE

Teacher Guide

The Invisible Pull

GRADE	SUBJECT	TIME
Grade 4	Science	2 × 30 minutes

CENTRAL QUESTION

How can gravity affect an object without direct contact?

Wonder in Motion

Lesson at a Glance

Story connection	Newton releases an apple. Rob watches his frisbee eventually return toward Earth. A leaf also moves toward the ground, although its pathway may be very different. These observations lead naturally into the Grade 4 Science idea that a force can affect an object without direct contact.
Science focus	Non-contact forces, gravity on Earth, observable effects of gravity, distinguishing force from movement, comparing several released objects, and using evidence to explain the effect of an invisible force.
Learning intention	We are learning to identify gravity as a non-contact force and use observations to explain how it affects objects on Earth.
Core experience	Across two 30-minute sessions, students investigate several released objects. They collaboratively build a Gravity Evidence Board, distinguish the contact of a hand holding an object from the non-contact force acting after release, rehearse evidence-based explanations, and share how different pathways can still provide evidence of gravity.
Flexible use	Session 1 is a complete core lesson and can be used independently. Session 2 continues the same Wonder Lab by giving students additional time to observe, rehearse, explain, share, and deepen their scientific thinking. Teachers with a continuous 60-minute block may teach both sessions together.
Use after reading	Read Adventure 001: The Long Way Down before beginning. The story reading is separate from the two Science sessions.
Story context	Isaac Newton was a real historical person. Rob's visit, their conversation, and the events they experience together are imaginative parts of the story. The familiar story of Newton and an apple has many later retellings. This Adventure uses the apple as an imaginative story element rather than claiming that one falling apple alone produced Newton's theory of gravity.
Important scientific distinction	The lesson investigates gravity as a **non-contact force that pulls objects toward the ground**. It is not designed to compare which object falls fastest. Students should not infer from these classroom demonstrations that heavier objects necessarily fall faster, or that gravity is the only force influencing the complete pathway of a leaf or frisbee.

Optional Teacher-Spoken Success Indicators

I can explain what non-contact means.

I can identify gravity as a non-contact force.

I can describe an observable effect of gravity.

I can use evidence from more than one object to support an explanation.

How to Use This Guide

THE GUIDE IS A TOOL, NOT A SCRIPT

This guide is designed to support responsive teaching rather than prescribe every word or action.

Session 1 is a complete 30-minute Grade 4 Energy lesson and can be taught independently.

Session 2 continues the same learning through rehearsal, refinement, sharing, and questioning. It does not introduce additional curriculum.

Follow productive student thinking and conversation while protecting the central question, selected Energy KUSP, meaningful participation, and approximate lesson timing.

Adjust demonstration objects, grouping, response modes, and pacing to meet the needs of the learners in front of you.

Different released objects may follow visibly different pathways. The scientific focus is the evidence that gravity on Earth pulls toward the ground, not whether every object falls in an identical way.

Use several objects so students can look for a shared pattern rather than treating one demonstration as the entire evidence base.

The goal of the second session is not to do more.

It is to give students enough time to observe, compare, reason, improve, and communicate their scientific understanding.

Curriculum Alignment

Organizing Idea	Energy: Understandings of the physical world are deepened by investigating matter and energy.
Guiding Question	How can forces affect objects from a distance?
Learning Outcome	Students investigate how forces can act on objects without contact.
Assessment Focus	Gather formative evidence of selected Grade 4 Energy KUSP through students' descriptions of non-contact force, demonstrations and observations of gravity, and explanations of how evidence supports gravity's effect on objects. Session 1 provides sufficient opportunities to gather evidence of the selected KUSP. Session 2 offers additional opportunities for students to demonstrate and communicate their understanding. These lessons do not assess the complete learning outcome.

Selected KUSP for These Lessons

KUSP element	Selected curriculum learning	What it looks or sounds like
Knowledge	Non-contact forces occur between objects that are not in direct contact. Gravity on Earth is a non-contact force that pulls objects toward the ground.	Students distinguish the direct contact of a hand holding or releasing an object from gravity acting on the object without that direct contact. They identify gravity as the force and downward movement as an observable effect.
Understanding	Non-contact forces are invisible forces that can affect objects, materials, and substances.	Students recognize that not seeing a force directly does not mean no force is acting and use observable changes in movement as evidence.
Skills & Procedures	Describe how non-contact forces affect objects. Demonstrate the effect of gravity on an object.	Students observe an object before and after release, record its movement toward the ground, compare several objects, and use the pattern as evidence in an explanation of gravity.

Curriculum source: Government of Alberta, Science (K–6) Curriculum, Energy, p. 22. *View the Alberta program of study*

Teacher Preparation

STANDARD PATHWAY

Use these two 30-minute sessions after students have heard Adventure 001: The Long Way Down.

Session 1: Release and Observe is the core lesson. Students reconnect with the apple, frisbee, and leaf, see contact and non-contact distinguished through a release demonstration, and collaboratively build a Gravity Evidence Board using several objects.

Session 2: Explain the Invisible Force continues the same Wonder Lab. Students return to the evidence board, rehearse a gravity explanation with a partner, refine the distinction between force and movement, share evidence across different objects, and explore questions of different depths about gravity in the Adventure.

If only one 30-minute period is available, teach Session 1.

If a continuous 60-minute block is available, the two sessions can be taught together with a brief transition or movement break between them.

Flexible Use of the Guide

Core Pathway | 30 minutes

Teach Session 1: Release and Observe.

Students experience:

Get Curious → Model → Build → Think It Through

This is a complete Grade 4 Energy lesson and provides opportunities to gather formative evidence of the selected KUSP.

Full Wonder Lab | 2 × 30 minutes

Teach both sessions.

Students experience the complete Wonder Lab cycle:

Model → Build → Rehearse → Share

Session 2 deepens the same learning rather than adding additional curriculum.

It also provides time for students to reflect on and question the Science of the Adventure through:

Puddle → Pond → Lake → Ocean

Continuous Block | ~60 minutes

If scheduling allows, Sessions 1 and 2 may be taught consecutively.

Take a brief movement or transition break after the first Think It Through before beginning Reconnect.

Materials

A copy of Adventure 001: The Long Way Down

An apple or substitute

A frisbee

A leaf or paper leaf

Several additional classroom objects suitable for controlled release

Whiteboard, chalkboard, or chart paper and marker

Gravity Evidence Board with:

OBJECT

BEFORE RELEASE

AFTER RELEASE

WHAT WE OBSERVED

WHAT THE EVIDENCE SUGGESTS

Optional downward arrow cards

Optional Contact / Non-Contact cards

Before Students Begin

Choose several objects that provide clear observations when released from a modest, consistent classroom height.

Include at least one lightweight object, such as a paper leaf, whose pathway may be more complicated.

Prepare a visible release position.

Plan the first demonstration so students can clearly distinguish:

Before release:

the hand is in direct contact with the object.

After release:

the hand is no longer in direct contact.

The object still changes position.

Prepare the Gravity Evidence Board.

Do not structure the activity as a race between objects or ask students to determine which falls fastest.

- Use professional judgment to choose the Session 2 grouping—partners, groups of three, or whole group—that best supports student participation. Early in the year, whole-group practice may help students establish the routine, build confidence, and understand what successful participation looks and sounds like.

Keep the evidence board and selected objects available for Session 2.

Substitutions

Use other classroom objects, slow-motion teacher-recorded video, photographs of sequential positions, or a suitable digital simulation when direct release demonstrations are impractical.

Students may contribute as observers, evidence recorders, diagrammers, or reporters rather than releasing the objects themselves.

Useful Vocabulary

Pre-teach essential vocabulary through an explicit vocabulary routine, providing students with opportunities to build meaning, interact with the words, and use them in context before and throughout the lesson.

Science words:

force • contact • non-contact • gravity • release • downward • effect • evidence • invisible • interaction

Story words:

apple • frisbee • leaf • Earth • ground • Moon • fall • return • Newton

A non-contact force occurs between objects that are not in direct contact.

Gravity on Earth is a non-contact force that pulls objects toward the ground.

An effect is an observable result or change.

Evidence is information gathered through observation or investigation that can support an explanation.

Invisible means the force itself cannot be seen directly; its effects can still be observed.

Supporting Our Diverse Learners

Use these supports proactively while preparing and teaching the two sessions.

Make it accessible	Use large, easy-to-see objects and repeat selected releases. Provide visual downward arrows and before/after positions.
Support language	Model sentence frames such as: Before release, _____. After release, _____. The object moved _____. Gravity is a _____ force. Our evidence is _____.
Offer response choices	Accept speaking, pointing, positioning arrows, arranging before/after images, drawing, written recording, gesture, communication devices, or assistive technology.
Support participation	Offer roles such as object observer, before/after recorder, direction checker, gravity-arrow placer, evidence recorder, comparison checker, or science reporter.
Reduce memory load	Keep Before Release / After Release visible. Leave previous object observations on the Gravity Evidence Board so students can compare the pattern directly.
Support rehearsal	Allow students to explain one object fully before asking them to generalize across several. Let students use the evidence board as a visual support during partner rehearsal.
Preserve the learning	Change the object, number of demonstrations, language demand, grouping, or response mode—not the scientific goal. Students still identify gravity as a non-contact force and use observable evidence of its effect.

KUSP Assessment: Evidence to Notice

FORMATIVE ASSESSMENT

Gather evidence through observations and conversations across both sessions.

Session 1 provides sufficient opportunities to gather evidence of the selected KUSP.

Session 2 gives students additional opportunities to demonstrate and communicate their understanding.

Evidence source	Listen or look for	Possible teacher note
Observation	Student attends to the object before and after release and identifies movement toward the ground.	"Tracks the object downward after hand contact ends and places the downward arrow correctly."
Conversation	Student identifies gravity as non-contact and distinguishes the force from the observed movement.	"Explains that the hand was no longer touching the apple but gravity still pulled it toward the ground."
Product	Contribution to the Gravity Evidence Board or diagram represents gravity's downward effect and uses evidence from the demonstration.	"Draws the object after release with a downward gravity arrow and labels gravity as non-contact."

The Two-Session Flow

Session 1 — Release and Observe | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Get Curious**	Reconnect with the apple, frisbee, and leaf returning toward Earth and wonder what can affect an object without touching it.	Create a need to distinguish visible movement from an invisible non-contact force.
~5 min	**Wonder Lab: Model**	Observe one object before and after release and compare direct contact with non-contact gravity.	Make the moment when hand contact ends explicit.
~15 min	**Wonder Lab: Build**	Observe several released objects and collaboratively build the Gravity Evidence Board.	Keep attention on the shared downward effect while acknowledging different pathways.
~5 min	**Think It Through**	Explain what the observations provide as evidence of gravity.	Connect the repeated pattern to gravity as a non-contact force.

Session 2 — Explain the Invisible Force | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Reconnect**	Revisit before-and-after evidence and reconstruct the contact/non-contact distinction.	Ask students to identify the force separately from its observable effect.
~8 min	**Wonder Lab: Rehearse**	Work with a partner to build and improve an evidence-based gravity explanation.	Prompt students to account for both the force and the observation.
~9 min	**Wonder Lab: Share**	Present explanations for different objects and compare the evidence.	Focus audience attention on the shared pattern rather than identical pathways.
~3 min	**Think It Through**	Reflect on how an invisible force can have observable effects.	Return to the central question.
~5 min	**Keep Wondering**	Generate and explore questions of different depths about gravity in the Adventure.	Use Puddle–Pond–Lake–Ocean language to deepen story-based scientific wondering.

Session 1 — Release and Observe

Get Curious | ~5 minutes

Reconnect students to three moments from the Adventure.

Newton releases the apple.

Rob's frisbee eventually returns toward Earth.

The leaf also returns toward the ground along a different-looking path.

Ask:

- "What do these three movements make you wonder?"
- "What is touching the apple after Newton opens his hand?"
- "Does the apple stay exactly where it was?"
- "What about the leaf?"
- "What about the frisbee?"

Introduce the Grade 4 scientific problem:

> *"Can a force affect an object even when nothing is directly touching and pulling it?"*

Do not answer immediately.

TEACHER MOVE

Use the Adventure to create the question rather than retelling the apple story as scientific proof. Students should investigate observable effects before building the explanation.

2. Wonder Lab

Model | ~5 minutes

Hold the apple or another object at the release point.

Ask:

- "What is touching this object right now?"
- Students identify the hand.

Say:

> *"There is direct contact between my hand and the object."*

Open the hand and release the object.

Ask:

- "Is my hand still touching it?"
- "What happened to the object?"
- "Which overall direction did it move?"

Introduce the curriculum statement:

> *"Gravity on Earth is a non-contact force that pulls objects toward the ground."*

Place a downward arrow on the Gravity Evidence Board.

Think aloud:

> *"I cannot see gravity itself."*
>
> *"I can observe an effect."*
>
> *"My hand stopped touching the object, but the object still moved toward the ground."*

FACILITATION PROMPTS

- What was touching the object before release?
- What changed when I released it?
- Was my hand still touching it?
- Which direction did the object move overall?
- What is the force we are investigating?
- Is gravity contact or non-contact?
- What evidence did we actually observe?

TEACHER MOVE

Keep force and movement distinct.

"Falling" describes movement.

"Gravity" names the non-contact force being investigated.

Build | ~15 minutes

Observe several objects.

For each:

Identify the object.

Describe its position before release.

Release.

Observe the pathway.

Describe where it moves overall.

Record the evidence.

Begin with the apple.

Continue with the frisbee.

Then use the paper leaf or lightweight object.

The leaf may flutter, drift sideways, rotate, or follow a curved path.

Ask:

- "Does the path look exactly like the apple's?"
- "No."
- "Does the leaf still move toward the ground overall?"
- Record both the difference and the shared pattern.
- Use one or two additional classroom objects if time permits.
- Compare the completed observations.

FACILITATION PROMPTS

- What happened after this object was released?
- Did its path look exactly like the previous object?
- Where did it move overall?
- Was anything directly touching and pulling it toward the ground?
- What pattern appears across several objects?
- Does a curved or drifting pathway mean gravity disappeared?
- What is the force?
- What is the observable effect?
- What can our investigation support?
- What should we avoid claiming from these observations?

TEACHER MOVE

Repeatedly separate **gravity's downward pull** from the entire movement pathway.

The frisbee and leaf are especially useful because their movement can be more complicated while still returning toward the ground.

Think It Through | ~5 minutes

Step back from the Gravity Evidence Board.

Ask:

- What is a non-contact force?
- What does gravity do on Earth?
- What evidence did we collect?
- Why did we observe more than one object?
- Did every object follow the same pathway?
- Did every object still move toward the ground overall?
- Why does a complicated path not mean gravity is absent?
- How can we have evidence for a force we cannot see directly?

Return to the central question:

How can gravity affect an object without direct contact?

Sample Response Guidance

Possible response:
"Gravity is a non-contact force."
"My hand stopped touching the object, but it still moved toward the ground."
"The leaf drifted sideways too, but it still came down."
• "We looked at several objects and saw a similar downward pattern." • Look for the distinction among contact, force, and observable movement.

Session 1 Closing

Tell students:

> *"Rob's Adventure begins with one kind of movement question and ends with an even bigger one about the Moon."*
>
> *"Today we investigated an important Grade 4 idea connected to those questions: gravity is a non-contact force that pulls objects toward the ground."*
>
> *"Next time, you will use the evidence from our objects to explain how we can know an invisible force is affecting them."*

If Session 1 is the only lesson being taught, finish by asking:

> *"What evidence from today supports the idea that gravity can act without direct contact?"*

Session 2 — Explain the Invisible Force

Reconnect | ~5 minutes

Show an object held in your hand.

Ask:

- Where is the direct contact?
- What happens when the object is released?
- What contact ends?
- What movement do we observe?
- What non-contact force are we investigating?

Then point to the Gravity Evidence Board.

Cover the force column.

Ask students to reconstruct what belongs there.

TEACHER MOVE

Reconnection should rebuild the relationship:

before release → contact is visible

after release → hand contact ends

gravity remains relevant

observable movement provides evidence

2. Wonder Lab

Rehearse | ~8 minutes

Students work with partners.

Each pair chooses one object from the Gravity Evidence Board.

Partner A explains:

> *"Before release..."*
>
> *"After release..."*
>
> *"We observed..."*
>
> *"Gravity..."*
>
> *"Our evidence is..."*

Partner B checks:

- Did you identify what was directly touching before release?
- Did you identify that hand contact ended?
- Did you name gravity as a non-contact force?
- Did you describe what was actually observed?

- Did you accidentally say every object followed the same path?

Partner A makes one improvement.

Switch roles.

FACILITATION PROMPTS

- What was the direct contact?
- When did that contact end?
- What movement did we observe?
- What is the force?
- Why do we call it non-contact?
- Which part of your statement is evidence?
- Could your explanation account for a drifting leaf?
- What could you improve before sharing?

TEACHER MOVE

A strong Grade 4 explanation can be concise.

The important improvement is the relationship among non-contact force, observable effect, and evidence.

Share | ~9 minutes

Invite explanations for several different objects.

Include at least one simple downward path and one more complex path such as the paper leaf.

After each share, ask:

- What evidence did they use?
- Did they distinguish force from movement?
- How is this object similar to the others?
- How is its pathway different?
- What shared pattern remains?

Then ask:

> *"How can an invisible force produce evidence we can observe?"*

Invite several responses.

FACILITATION PROMPTS

- What part of the explanation names the force?
- What part describes the effect?
- Why is the leaf useful evidence even though it does not move straight down?
- What pattern appears across the examples?
- Does invisible mean imaginary?
- How can evidence support something we cannot see directly?

TEACHER MOVE

Use the variety of pathways to strengthen rather than complicate the central concept.

Think It Through | ~3 minutes

Ask:

- How can scientists know a force is acting if the force itself is invisible?
- Why was it useful to observe several objects?
- Why must we separate the force from the complete movement pathway?

Return to the central question.

Keep Wondering | ~5 minutes

PUDDLE

A small question about one detail.

Examples:

- What happens when the apple is released?
- Which direction does gravity pull on Earth?
- Is gravity a contact or non-contact force?

POND

A question connecting several observations.

Examples:

- How can gravity affect the frisbee when Rob's hand is no longer touching it?
- How does the drifting leaf still provide evidence of gravity?
- What shared pattern did we observe across several released objects?

LAKE

A question requiring connections across the evidence.

Examples:

- Why is observing several objects stronger evidence than observing only one?
- How can one object follow a complicated pathway while gravity still pulls toward the ground?
- What information would we need before making a claim about which object falls fastest?

OCEAN

A deep scientific question about evidence and an invisible force.

Examples:

- How can scientists gather evidence for a force they cannot see directly?
- Why should we separate the effect of gravity from the complete pathway of a moving object?
- How does Rob's final Moon question grow from the earlier observations of things returning toward Earth?

The purpose is not for students to classify questions for the sake of classification.

The framework helps them deepen from identifying gravity to reasoning about evidence and unanswered questions.

Invite Student Questions

Ask:

- "What are you still wondering about gravity in Rob and Newton's Adventure?"
- Accept questions about the apple, frisbee, leaf, Earth, Moon, falling, or non-contact force.

FACILITATION PROMPTS

- Can our classroom evidence answer this question?
- Would we need evidence from more than one object?
- Does your question ask about gravity on Earth or something beyond our investigation?
- What observation from the Adventure made you wonder that?
- Can we make this Puddle a little deeper?
- What could turn this Pond into a Lake?
- Could this be a question scientists would need new evidence to investigate?

TEACHER MOVE

Keep the assessed learning anchored to gravity on Earth as a non-contact force.

The Moon question is intentionally valuable because the lesson does **not** fully answer it.

Preserve unanswered questions rather than prematurely introducing orbital mechanics.

Close with one student-generated question worth preserving.

"Every adventure begins with a question. Keep wondering."

Likely Misconceptions and Helpful Responses

If students...	Try this teacher response
If students say gravity and falling are the same thing:	Try: "Falling describes movement. What is the force we are investigating?"
If students think the hand continues pushing the object downward:	Try: "Is the hand still touching it after release?"
If students think gravity exists only while an object is falling:	Try: "Would gravity disappear just because the object is resting on a table, or could another force also be affecting it?"
If students think a drifting leaf has no gravity acting on it:	Try: "Look at the complete movement. Where does it move overall?"
If students assume heavier objects always fall faster:	Try: "Did our investigation measure falling speed accurately enough to support that claim?"

If students...	Try this teacher response
If students think non-contact means there is no interaction:	Try: “Non-contact means no direct touching. Can a force still affect the object?”
If students think invisible means imaginary:	Try: “What observable evidence did we collect?”
If students try to completely solve the Moon question:	Try: “That is a powerful next question. What does our Grade 4 investigation actually tell us about gravity on Earth?”
If students think an Ocean question must involve outer space:	Try: “Ocean means deep scientific thinking. A question about one falling object can still be deep.”

Use the Evidence Next

If a student identifies downward movement but not gravity:

Connect the observed effect with the curriculum term gravity.

If a student names gravity but cannot explain non-contact:

Return to the moment before and after hand contact ends.

If a student confuses the pathway with the direction of gravity:

Use the drifting leaf and distinguish the complex path from the overall downward pull.

If a student explains one object accurately:

Invite them to compare evidence from a second object.

If a student overgeneralizes from one demonstration:

Ask what the full evidence board shows.

If a student understands gravity as non-contact:

Ask how an invisible force can still have observable effects.

If a student asks about the Moon or orbit:

Preserve the question without expanding the assessed curriculum beyond the selected Grade 4 KUSP.

If a student generates primarily Puddle questions:

Invite comparison of two objects or ask what counts as evidence.

If a student communicates understanding through diagrams:

Use correctly placed gravity arrows and before/after representations as assessment evidence.

Optional Science Extensions

Use these only when they naturally support classroom learning. They are not required parts of the two-session experience.

GRAVITY ARROW GALLERY

Display several objects in different positions.

Students add an arrow showing the direction gravity acts on each object.

Discuss why changing the object's orientation does not change gravity's downward direction on Earth.

CONTACT OR NON-CONTACT SORT

Provide familiar force examples.

Students sort them as contact or non-contact and explain what must be touching in the contact examples.

Keep gravity as the main non-contact example connected to the lesson.

COMPLICATED PATH

Observe a paper leaf, tissue, or other lightweight object.

Trace its complete pathway.

Then separately add an arrow representing gravity.

Discuss why the two representations are not the same thing.

EVIDENCE DETECTIVE

Make the claim:

> *"Gravity is a non-contact force that pulls objects toward the ground."*

Ask students:

- Which observations from our investigation support this?
- Which observations do not answer the claim?
- What additional evidence might strengthen it?

Every adventure begins with a question.
Keep wondering.

THE ADVENTURES WITH FRISBEE ROB

The Long Way Down

Adventure 001: Isaac Newton

GRADE 4

SOCIAL STUDIES

Teacher Guide

Widen the Lens: Colonies and the Formation of Canada

GRADE	SUBJECT	TIME
Grade 4	Social Studies	2 × 30 minutes

CENTRAL QUESTION

How did the establishment of colonies contribute to the historical formation of Canada?

Wonder in Motion

Lesson at a Glance

Story connection	*The Long Way Down* imaginatively carries Rob into the past to meet one historical person. Grade 4 uses that experience to widen the historical lens. Understanding the formation of Canada requires more than meeting one famous individual. Students need to examine events, settlements, imperial goals, Indigenous presence, migration, resources, and relationships across time.
Social Studies focus	French permanent settlements, New France, colonies, colonization, European imperial expansion on lands already occupied by Indigenous peoples, motivations of colonists, relationships between colonies and home countries, and the way connected historical events contributed to the formation of Canada.
Learning intention	We are learning to connect settlements, colonization, migration, resources, and relationships between groups with significant historical events in the formation of Canada.
Core experience	Across two 30-minute sessions, students collaboratively build a Colonies-to-Canada Historical Connections Board. They sequence selected French settlements, connect them with New France and the larger process of colonization, examine the relationship between home countries and colonies, preserve Indigenous presence in the historical account, rehearse relationship explanations, and share evidence-based historical reasoning.
Flexible use	Session 1 is a complete core lesson and can be used independently. Session 2 continues the same Wonder Lab by giving students additional time to connect, rehearse, explain, share, and deepen their Social Studies thinking. Teachers with a continuous 60-minute block may teach both sessions together.
Use after reading	Read Adventure 001: *The Long Way Down* before beginning. The story reading is separate from the two Social Studies sessions.
Story context	Isaac Newton was a real historical person. Rob's visit and the events of the Adventure are imaginative.
Important Social Studies distinction	The Adventure is **not** a historical source for Canadian colonial history. Its role is to create the imaginative experience of entering another time. The Grade 4 historical learning comes from the Alberta Social Studies curriculum and appropriate classroom sources. Colonization should not be described as Europeans arriving on empty land. The curriculum explicitly states that colonies were established on land already occupied by Indigenous peoples.

Optional Teacher-Spoken Success Indicators

I can identify selected French settlements named in the curriculum.

I can explain colonization using the historical context provided.

I can describe a relationship between a colony and a home country.

I can connect several historical events and relationships with the formation of Canada.

How to Use This Guide

THE GUIDE IS A TOOL, NOT A SCRIPT

This guide is designed to support responsive teaching rather than prescribe every word or action.

Session 1 is a complete 30-minute Grade 4 Time and Place lesson and can be taught independently.

Session 2 continues the same learning through rehearsal, refinement, sharing, and questioning. It does not introduce additional curriculum.

Follow productive historical thinking while protecting the central question, selected Time and Place KUSP, meaningful participation, historical accuracy, and approximate lesson timing.

The activity is not intended to cover the complete story of Canadian colonization or Confederation.

Use the selected events to help students understand **relationships and processes**, not simply memorize dates.

Keep Indigenous presence visible whenever discussing settlement and colonization.

Use wording such as **the land now known as Canada** where appropriate and consistent with the curriculum.

The goal of the second session is not to do more.

It is to give students enough time to connect events, examine relationships, improve explanations, and communicate historical understanding.

Curriculum Alignment

Organizing Idea	Time and Place: Exploring the dynamic relationships between people, place, and time supports understanding of perspectives and events to make meaning of the world.
Guiding Question	How did colonies influence the formation of Canada?
Learning Outcome	Students examine significant historical events that contributed to the formation of the country of Canada.
Assessment Focus	Gather formative evidence of selected Grade 4 Time and Place KUSP through students' ability to connect permanent settlements, colonization, migration, resources, Indigenous presence, and relationships between colonies and

	home countries. Session 1 provides sufficient opportunities to gather evidence of the selected KUSP. Session 2 offers additional opportunities for students to demonstrate and communicate their understanding. These lessons do not assess the complete learning outcome.

Selected KUSP for These Lessons

KUSP element	Selected curriculum learning	What it looks or sounds like
Knowledge	France established permanent settlements on the land now known as Canada, including Port-Royal (1605) Quebec City (1608) Trois-Rivières (1634) Montreal (1642) Samuel de Champlain, who established Quebec City, became the governor of New France and made alliances with the First Nations of the area. France founded the colonies of Acadia, New France, and Louisiana, and Britain founded the Thirteen Colonies. Colonization involved European monarchs expanding empires by claiming land and establishing colonies on land already occupied by Indigenous peoples around the world, including in North America (imperialism). Colonists came to the colonies for a variety of opportunities, for example, access to farmland business religious freedom quality of life adventure France and Britain imported natural resources from the colonies in North America, for example, furs	Students connect selected settlements with France and New France and describe colonization within the wider context of European imperial expansion onto lands already occupied by Indigenous peoples. Students recognize that colonists had multiple motivations and that colonies were connected economically and politically with home countries.

KUSP element	Selected curriculum learning	What it looks or sounds like
	lumber	
Understanding	The establishment of New France began European colonization of Canada.	Students explain that permanent settlements were part of a larger process rather than isolated events and recognize that this process affected lands and peoples already present.
Skills & Procedures	Research French settlements in the land that is now known as the province of Quebec and explore the challenges in establishing settlements. Examine the challenges and contributions of immigrants before Confederation. Assess the relationship between home countries and colonies.	Students use selected historical information to construct and explain relationships among settlements, colonists, Indigenous peoples, home countries, resources, and the developing colonies.

Curriculum source: Government of Alberta, Social Studies (K–6) Curriculum, Time and Place. *View the Alberta program of study*

Teacher Preparation

STANDARD PATHWAY

Use these two 30-minute sessions after students have heard Adventure 001: *The Long Way Down*.

Session 1: **Build the Historical Connections** is the core lesson. Students use the Adventure's single-person focus to consider why historians widen the lens, see one settlement-to-colonization relationship modelled, sequence selected events, and collaboratively build the Colonies-to-Canada Historical Connections Board.

Session 2: **Explain the Relationship** continues the same Wonder Lab. Students return to the board, reconstruct missing arrows, rehearse one historical relationship with a partner, refine cause-and-context explanations, share several relationship types, and explore questions of different depths about how countries are formed through complex historical processes.

If only one 30-minute period is available, teach Session 1.

If a continuous 60-minute block is available, the two sessions can be taught together with a brief transition or movement break.

Flexible Use of the Guide

Core Pathway | 30 minutes

Teach Session 1: **Build the Historical Connections**.

Students experience:

Get Curious → Model → Build → Think It Through

This is a complete Grade 4 Time and Place lesson and provides opportunities to gather formative evidence of the selected KUSP.

Full Wonder Lab | 2 × 30 minutes

Teach both sessions.

Students experience:

Model → Build → Rehearse → Share

Session 2 deepens the same learning rather than adding additional curriculum.

It also provides time for:

Puddle → Pond → Lake → Ocean

Continuous Block | ~60 minutes

Teach both sessions consecutively with a brief transition after the first Think It Through.

Materials

A copy of Adventure 001: *The Long Way Down*

Whiteboard, chalkboard, or chart paper and marker

A Colonies-to-Canada Historical Connections Board with:

EVENT / DEVELOPMENT

- WHO OR WHAT WAS INVOLVED?
- HOW DOES IT CONNECT?
- WHY DOES IT MATTER?

Settlement cards:

Port-Royal — 1605

Quebec City — 1608

Trois-Rivières — 1634

Montreal — 1642

Additional cards:

France

Britain

Acadia

New France

Louisiana

Thirteen Colonies

Indigenous peoples

First Nations

Samuel de Champlain

colonists

home country

natural resources

furs

lumber

Optional arrows labelled:

ESTABLISHED

CONTROLLED

ALLIED WITH

MOVED TO

IMPORTED FROM

PART OF

Optional map or timeline already used in classroom instruction

Before Students Begin

Prepare the four settlement cards and dates.

Prepare a visual reminder:

LAND ALREADY OCCUPIED BY INDIGENOUS PEOPLES
Keep this visible before adding European settlements.

Prepare one relationship chain for modelling:

France

→ established Quebec City

→ part of New France

→ part of European colonization

Prepare one example of the colony/home-country relationship:

Colony in North America

→ natural resources

→ imported by France or Britain

Do not attempt to represent the entire colonial period in one lesson.

Choose enough evidence to help students understand relationships.

- Use professional judgment to choose the Session 2 grouping—partners, groups of three, or whole group—that best supports student participation. Early in the year, whole-group practice may help students establish the routine, build confidence, and understand what successful participation looks and sounds like.

Keep the Historical Connections Board available for Session 2.

Substitutions

Use a projected map, digital timeline, teacher-selected textbook excerpts, approved historical images, or prepared relationship cards.

Students who need reduced reading demands can use symbols and arrows while contributing orally.

Useful Vocabulary

Pre-teach essential vocabulary through an explicit vocabulary routine, providing students with opportunities to build meaning, interact with the words, and use them in context before and throughout the lesson.

Social Studies words:

colony • colonization • settlement • empire • imperialism • resource • immigrant • alliance • home country • Indigenous • First Nations • New France • Acadia

Story words:

Isaac Newton • Rob • Adventure • historical • past • question • evidence

A **colony** is a territory controlled by another country.

Colonization in this curriculum involved European monarchs claiming land and establishing colonies on land already occupied by Indigenous peoples.

A **settlement** is a place where people establish a community.

An **empire** includes territories controlled by a powerful state or ruler.

Imperialism involves extending power or control over other lands and peoples.

A **home country** is the country connected with the establishment or control of a colony.

An **alliance** is a relationship in which groups agree to support or work with one another.

Supporting Our Diverse Learners

Use these supports proactively while preparing and teaching the two sessions.

Make it accessible	Use a timeline and relationship arrows alongside written information. Place dates directly on cards rather than requiring recall.

Support language	Model sentence frames such as: The event was _____. _____ established _____. This was part of _____. The relationship between _____ and _____ involved _____. An important context is _____. This contributed to the formation of Canada because _____.
Offer response choices	Accept oral explanation, map placement, timeline sequencing, card linking, diagramming, writing, pointing, communication devices, or assistive technology.
Support participation	Offer roles such as timeline placer, map reader, relationship connector, context checker, evidence reader, arrow placer, recorder, or Social Studies reporter.
Reduce memory load	Keep settlement names and dates visible. Use consistent arrows. Leave previous relationship chains displayed while students build new ones.
Support rehearsal	Allow students to explain one settlement or colonial relationship completely before asking them to connect multiple factors. Use the same four questions repeatedly: ● What happened? ● Who was involved? ● How does it connect? ● Why does it matter?
Preserve the learning	Change the number of events, reading demand, amount of written output, or response mode—not historical accuracy or the required relationships. Indigenous presence must remain visible even when the task is simplified.

KUSP Assessment: Evidence to Notice

FORMATIVE ASSESSMENT

Gather evidence through observations and conversations across both sessions.

Session 1 provides sufficient opportunities to gather evidence of the selected KUSP.

Session 2 gives students additional opportunities to demonstrate and communicate their understanding.

Evidence source	Listen or look for	Possible teacher note
Observation	Student accurately places or connects a settlement, colony, home	“Places Quebec City under New France and connects it with France.”

Evidence source	Listen or look for	Possible teacher note
	country, or relationship.	
Conversation	Student describes colonization with appropriate historical context.	"Explains that European colonies were established on lands already occupied by Indigenous peoples."
Product	Student contribution to the Historical Connections Board links an event or development with a meaningful relationship.	"Creates France → colony → furs/lumber → France to show part of the home-country relationship."

The Two-Session Flow

Session 1 — Build the Historical Connections | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Get Curious**	Reconnect with the Adventure's close focus on Newton and consider what historians miss when they examine only one person.	Create a reason to widen the lens from biography to larger historical events and relationships.
~5 min	**Wonder Lab: Model**	See one settlement linked with a colony, home country, and the broader context of colonization.	Model how historical events become meaningful when connected with context.
~15 min	**Wonder Lab: Build**	Sequence selected settlements and collaboratively build relationships among colonies, colonists, Indigenous peoples, resources, and home countries.	Keep Indigenous presence and the larger process of colonization visible.
~5 min	**Think It Through**	Explain how connected events and relationships contributed to the formation of Canada.	Move students beyond memorized dates toward historical cause, context, and relationship.

Session 2 — Explain the Relationship | 30 minutes

Time	Section	Student experience	Teacher move
~5 min	**Reconnect**	Return to the Historical Connections Board and reconstruct missing arrows.	Ask students whether a connection represents sequence, control, movement,

Time	Section	Student experience	Teacher move
			alliance, resource flow, or another relationship.
~8 min	**Wonder Lab: Rehearse**	Choose one historical relationship and practise explaining it.	Prompt students to identify event, people or places, context, and significance.
~9 min	**Wonder Lab: Share**	Share different relationship types and compare how each contributes to understanding the formation of Canada.	Focus audience attention on complexity rather than a single-event origin story.
~3 min	**Think It Through**	Reflect on why countries form through connected historical processes.	Return to the central question.
~5 min	**Keep Wondering**	Generate and deepen questions about whose experiences and relationships matter when telling national history.	Use Puddle–Pond–Lake–Ocean language to deepen story-anchored historical wondering.

Session 1 — Build the Historical Connections

Get Curious | ~5 minutes

Show Newton from the Adventure.

Ask:

- "When Rob meets Newton, we zoom in very closely on one person."
- "What can we learn by studying one person?"
- Invite answers.

Then ask:

> *"What might we miss?"*

Possible responses:

- Other people
- The wider community
- Important events
- Different perspectives
- What happened before or after

Introduce the Grade 4 challenge:

> *"Today we are going to widen the lens."*
>
> *"Instead of asking only about one person, we are going to connect events and relationships that contributed to the formation of Canada."*

Show the four settlement cards.

Ask:

- "What can dates help historians do?"
- Sequence events.

Then place the reminder:

LAND ALREADY OCCUPIED BY INDIGENOUS PEOPLES

Say:

> *"This context belongs on our board before we begin adding European colonies."*

TEACHER MOVE

Do not imply that the Canadian colonial events happened in Newton's immediate setting or that his Adventure provides historical evidence for them.

The story supplies the historical-thinking metaphor: zoom in, then widen the lens.

2. Wonder Lab

Model | ~5 minutes

Place:

Quebec City — 1608

Ask:

- "Who established this settlement?"
- France.

Connect:

France → Quebec City

Then:

Quebec City → New France

Ask:

> *"Does this settlement stand alone, or is it part of something larger?"*

Add:

European colonization

Return to the context card:

Land already occupied by Indigenous peoples.

Think aloud:

> *"If I tell the story only as 'France built Quebec City,' I leave out important context."*
>
> *"The settlement was part of a larger colonial process on lands where Indigenous peoples were already living."*

Add Samuel de Champlain and the curriculum statement about alliances with First Nations of the area.

FACILITATION PROMPTS

- What happened?
- Who was involved?
- When did it happen?
- Which colony does it connect with?
- What larger process does it belong to?
- Who was already on the land?
- What relationship does the curriculum identify with First Nations?
- What does this connection help us understand?

TEACHER MOVE
Historical understanding requires both event and context.

Build | ~15 minutes

Sequence:

Port-Royal — 1605

Quebec City — 1608

Trois-Rivières — 1634

Montreal — 1642

Ask:

- “What does sequencing tell us?”
- Then add colony cards.

France founded:

Acadia

New France

Louisiana

Britain founded:

Thirteen Colonies

Connect colonies with home countries.

Next add motivations of colonists.

Possible cards:

farmland

business

religious freedom

quality of life

adventure

Ask:

- “Did every colonist necessarily come for exactly the same reason?”
- No.
- Add the relationship with resources.
- France and Britain
- ← furs / lumber
- ← colonies in North America

Ask:

> *“How does this show a relationship between colony and home country?”*

Return regularly to:

Land already occupied by Indigenous peoples.

Add:

Samuel de Champlain → alliances → First Nations of the area

Ask students to identify different kinds of relationships:

- sequence
- control
- migration
- resource flow
- alliance
- colonization

FACILITATION PROMPTS

- Which events belong in chronological order?
- Which connections show control?
- Which show movement of people?
- Which show movement of resources?
- Why were colonies established?
- Why did colonists come?
- How did home countries benefit from colonies?
- Who already lived on these lands?
- Why does one settlement not explain the whole formation of Canada?
- What does connecting several events reveal?

TEACHER MOVE

The goal is not to fit every Grade 4 event on the board.

A smaller number of well-understood relationships is more useful than a dense timeline students cannot interpret.

Think It Through | ~5 minutes

Step back from the Historical Connections Board.

Ask:

- What is a colony?
- What is colonization?
- What permanent settlements did France establish?
- How were colonies connected with home countries?
- Why did colonists come?
- What resources moved from colonies toward France and Britain?
- Why must Indigenous peoples remain part of the historical context?
- What relationship did Champlain build with First Nations of the area?
- Why is the formation of Canada better understood as a process rather than one event?

Return to the central question:

How did the establishment of colonies contribute to the historical formation of Canada?

Sample Response Guidance

Possible response:
"France established permanent settlements that became part of New France."
"Colonization happened on lands already occupied by Indigenous peoples."
"Colonies were connected with home countries through control and resources."
"People came for different opportunities."
• "Many events and relationships contributed to Canada's formation." • Look for connected historical reasoning rather than date recall alone.

Session 1 Closing

Tell students:

> *"History becomes clearer when we connect events instead of leaving them as separate facts."*
>
> *"Today we widened the lens beyond one historical person and built relationships among settlements, colonies, peoples, resources, and empires."*
>
> *"Next time, you will choose one historical relationship and explain why it matters."*

If Session 1 is the only lesson being taught, finish by asking:

> *"What is one relationship on our board that helps explain the development of colonies?"*

Session 2 — Explain the Relationship

Reconnect | ~5 minutes

Remove several arrows from the Historical Connections Board.

Leave the cards in place.

Ask:

> *"What relationship belongs here?"*

For example:

France ___ New France

Colony ___ furs/lumber ___ home country

Champlain ___ First Nations of the area

Ask:

- "Does every arrow mean the same thing?"
- No.

Identify possible relationship words:

established

controlled

imported from

allied with

moved to

part of

TEACHER MOVE
Reconnection should emphasize relationship, not only card placement.

2. Wonder Lab

Rehearse | ~8 minutes

Students work with partners.

Each pair chooses one relationship.

Partner A explains:

> *"The historical event or development was _____."*
> *"The people or places involved were _____."*
> *"The relationship was _____."*
> *"An important context is _____."*

> *"This matters because _____."*

Partner B checks:

- Did the speaker identify what actually happened?
- Did the speaker explain a relationship?
- Did the speaker include necessary context?
- Did the explanation treat colonization as occurring on empty land?
- Did the conclusion say more than the evidence supports?

Partner A revises.

Switch roles.

FACILITATION PROMPTS

- Is this an event or a relationship?
- Who was involved?
- What changed?
- Was this about settlement, control, resources, migration, or alliance?
- What historical context matters?
- Why does the connection matter?
- What could make the explanation more accurate?

TEACHER MOVE

Students should not be rewarded for adding unsupported details.

Historical precision matters more than narrative flourish.

Share | ~9 minutes

Invite different relationship types.

Possible shares:

Settlement → colony

Colony → home country

Resources → home country

Colonists → motivations

Champlain → First Nations alliances

Colonization → already occupied lands

After each share, ask:

- What relationship did the speaker explain?
- What evidence supported it?
- What context mattered?
- How did this relationship contribute to our larger understanding?

At the end, ask:

> *"Why can't we explain the formation of Canada with one date?"*

FACILITATION PROMPTS

- Was the relationship clear?
- What does this add to the larger picture?
- How is this relationship different from the previous one?
- Which people or perspectives are involved?
- What might be missing if we told only the European settlement story?

TEACHER MOVE

Keep the class focused on historical complexity without trying to complete the entire national narrative in one lesson.

Think It Through | ~3 minutes

Ask:

- Why is the formation of a country a process rather than one event?
- Why does historical context matter?
- How does connecting events help us understand the past differently from memorizing them separately?

Return to the central question.

Keep Wondering | ~5 minutes

PUDDLE

Examples:

- What settlement was established in 1608?
- What was New France?
- What is a colony?
- What resource did France and Britain import from colonies?

POND

Examples:

- Why did colonists come to colonies?
- How were France and its colonies connected?
- Why must Indigenous peoples be included when discussing colonization?
- What did an alliance between Champlain and First Nations represent?

LAKE

Examples:

- How did settlements, resources, migration, and imperial goals interact?
- Why might different groups experience the same colonial event differently?
- How does studying relationships reveal more than memorizing dates?
- What would be missing from our explanation if we removed the “land already occupied” context?

OCEAN

Examples:

- How can the way a country's beginnings are told include some experiences while leaving others out?
- How should historians describe national formation when different peoples experienced the process differently?
- How can one event be viewed differently depending on whose perspective is considered?
- What questions would Rob need to ask if the Wind carried him into a historical community rather than only to one famous person?

The depth comes from perspective, context, and relationships—not from adding more dates.

Invite Student Questions

Ask:

> *"What are you still wondering about entering the past and understanding the larger world around historical people?"*

Invite questions connected to:

settlements

colonies

Indigenous peoples

resources

migration

historical perspectives

formation of Canada

FACILITATION PROMPTS

- Is the question about one event or a relationship?
- Whose perspective could matter?
- Would one source be enough?
- What historical information would we need?
- What part of the Adventure made you think about looking beyond one person?
- Can we deepen this question by asking why or how?

TEACHER MOVE

Keep the Adventure as an inquiry frame.

Historical answers must come from evidence, not imagination.

Close with one student-generated question worth preserving.

"Every adventure begins with a question. Keep wondering."

Likely Misconceptions and Helpful Responses

- **If students treat settlement and colonization as identical**

Try:

- "How does one settlement fit within the larger process of colonization?"
- **If students think Canada was formed in 1608**

Try:

- "Is Quebec City one event in the story, or the entire process?"
- **If students think colonies and home countries were independent equals**

Try:

- "What does the word colony tell us about control?"
- **If students see resources only as local products**

Try:

- "Where does the curriculum say France and Britain imported resources from?"
- **If students omit First Nations alliances**

Try:

- "What relationship does the curriculum identify involving Champlain?"
- **If students treat every colonist as having the same motivation**

Try:

- "What different opportunities does the curriculum list?"
- **If students use the Adventure as evidence for Canadian colonial history**

Try:

- "Is Rob's visit historical evidence or imaginative story context?"
- **If students think an Ocean question must involve the oldest date**

Try:

> *"Ocean means deeper historical reasoning."*

If students...	Try this teacher response
If students say Europeans discovered empty land	Try: • "What does our curriculum say about who already occupied these lands?"

Use the Evidence Next

If a student remembers dates but cannot connect them

Add relationship arrows.

If a student understands settlements but not colonization

Return to the empire / occupied-land context.

If a student understands colonization but omits Indigenous presence

Return to the curriculum wording and context card.

If a student explains the colony/home-country relationship

Ask how resources fit into it.

If a student explains resources accurately

Ask what the movement of resources tells us about power or control.

If a student gives a strong cause-and-context explanation

Ask what other perspective might complicate the story.

If a student asks for more detail about one settlement

Use the Grade 4 research skill as an optional extension.

If a student generates mostly Puddle questions

Ask:

- “Why did this event matter?”
- or
- “What relationship did it create?”
- **If a student communicates strongly through diagrams**
- Treat an accurate timeline or relationship map as assessment evidence.

Optional Social Studies Extensions

SETTLEMENT RESEARCH

Choose one curriculum-named French settlement.

Using approved resources, students investigate:

location

date

challenges

people involved

relationship with the wider colony

Add findings to the Historical Connections Board.

HOME COUNTRY / COLONY RELATIONSHIP

Create a two-way diagram showing:

control

movement of people

resources

decisions

Ask what the diagram reveals about power.

TIMELINE WITH CONTEXT

Extend the four-settlement timeline.

Under each event, students add one brief context statement rather than another date.

Discuss why context changes what a timeline communicates.

STORY OR SOURCE?

Compare one statement from the imaginative Adventure with a teacher-selected historical source about colonial Canada.

Ask:

- Which can support a historical claim about Canada?
- What purpose can imaginative historical fiction still serve?

Every adventure begins with a question.
Keep wondering.