Cambridge Primary Mathematics 0096 · Stage 3

CM3-U5

Data and chance

Statistics and Probability · 3 source-bound 30-minute lessons.

Unit overview

This unit teaches statistics and probability through 3 source-bound read-along lessons. Each lesson moves from concrete objects to a pictorial record and then an abstract record. Learners use the same maths question and evidence requirement across all three reading routes. The final task compares the representations learners made across the unit.

Guiding question

How can stories help us reason about data and chance?

Success criteria

- I can build the maths from each story with objects.
- I can draw or diagram the same maths.
- I can record a result and explain the story evidence.
- I can demonstrate TWM.03 while I work.

Learning objectives

3Ss.02	Record and show data in Venn and Carroll diagrams, tally charts, frequency tables, pictograms or bar charts, and explain the choice.
3Ss.03	Interpret data, spotting similarities and differences, and discuss conclusions.
3Sp.01	Describe events as will happen, will not happen or might happen.
TWM.03	Conjecturing: form a maths question or idea to test.

1 Bar charts

Let's Make a Bar Graph · 3Ss.02

Shared maths question

How does Let's Make a Bar Graph help us explore bar charts?

Evidence required

A concrete model, a pictorial record and a matching abstract record, all checked against the read-along.

Governed source lesson: The Four Parts of a Bar Graph · Representation · Naming and building the four parts of a bar graph

1 Find the maths in the story

4 min

3Ss.02

Read-along: Listen with highlighting and pause at the passage used by “The Four Parts of a Bar Graph”.

Teacher: Listen for the moment each part of Nan's graph appears and put a finger on the matching place on a blank sheet: the bottom edge, the side edge, the space above the bottom, the top. Say the part's name back with the book's word for it. Do not draw anything yet.

Learners: Notice the story evidence and say the maths question in their own words.

2 Model it with objects

5 min

3Ss.02

Read-along: Replay the source passage while building the quantities, shapes or measures it supplies.

Teacher: Write the kinds of pets along the bottom edge of your sheet, one word per space, leaving a hand's width between them. Say what the bottom edge tells a reader: it tells what kinds there are, not how many. Check a partner's sheet has a word in every space before moving on.

Learners: Build a concrete model and check that each part matches the read-along.

3 Try the concrete task

6 min

3Ss.02

Read-along: Keep the relevant story page visible as the class tests the model.

Teacher: Write the counting numbers up the side edge, starting at the bottom corner and going up, one number per line, evenly spaced. Say each number aloud as you write it. Then run a finger up the side and back down, counting, so the side is a ladder you can climb rather than a row of marks.

Learners: Change or compare the objects, then explain what stayed the same and what changed.

4 Draw the maths

5 min

3Ss.02

Read-along: Return to the same story evidence before learners make a pictorial record.

Teacher: Model a clear drawing, diagram or mark for the concrete work without adding a quantity the story does not supply.

Learners: Draw the model and label the important parts with maths language.

5 Record and solve

6 min

3Ss.02

Read-along: Use the read-along once more as the evidence check for the abstract record.

Teacher: Write a title across the top that says what the whole graph is about, then read your title to another pair and let them say what they expect to find inside. Fix the title if what they expected is not what your bottom edge lists. A title that surprises a reader is a title that needs another word.

Learners: Record the result with suitable numbers, words or symbols and link it back to the picture.

6 Reflect and convince

4 min

TWM.03

Read-along: Show the source passage and invite a final evidence-based check.

Teacher: Name the Thinking and Working Mathematically focus: Conjecturing: form a maths question or idea to test.

Learners: Use the concrete model, drawing and record together to justify the answer.

Solo

Read independently and mark the evidence used by the shared model.

Supported

Read with the audio, pause at the named source passage and use the response frame.

Listening

Listen with highlighting, build the same model and explain it orally.

Assessment check: The learner shows the objective with concrete, pictorial and abstract evidence and explains how the read-along supports the model.

2 What the chart tells us

Sir Cumference and the Off-the-Charts Dessert · 3Ss.03

Shared maths question

How does Sir Cumference and the Off-the-Charts Dessert help us explore what the chart tells us?

Evidence required

A concrete model, a pictorial record and a matching abstract record, all checked against the read-along.

Governed source lesson: One Mark, One Vote: Building the Towers · Representation · Building a count picture with one mark for one vote

1 Find the maths in the story

4 min

3Ss.03

Read-along: Listen with highlighting and pause at the passage used by “One Mark, One Vote: Building the Towers”.

Teacher: Each of you drops one bean into the bowl of the treat you like best out of four. Watch the recorder: every time a bean lands, she draws one short line under that treat's picture and says the number word she has reached. Say your treat aloud as you drop so the line and the bean happen together.

Learners: Notice the story evidence and say the maths question in their own words.

2 Model it with objects

5 min

3Ss.03

Read-along: Replay the source passage while building the quantities, shapes or measures it supplies.

Teacher: Work in fours. Take the class's votes for your one treat and snap that many cubes into a tower, one cube for one vote, saying one number word per cube. Do not count the tally lines twice; touch each line as you snap so a line that has been used is behind your finger. Stand the finished tower on the treat's picture.

Learners: Build a concrete model and check that each part matches the read-along.

3 Try the concrete task

6 min

3Ss.03

Read-along: Keep the relevant story page visible as the class tests the model.

Teacher: Stand all four towers side by side on the same floor line, bases touching the tape. Check with a flat hand across the tops that no tower is propped up higher than it earned. Say aloud which tower is tallest and name the treat, then say how you know the bottoms are fair.

Learners: Change or compare the objects, then explain what stayed the same and what changed.

4 Draw the maths

5 min

3Ss.03

Read-along: Return to the same story evidence before learners make a pictorial record.

Teacher: Model a clear drawing, diagram or mark for the concrete work without adding a quantity the story does not supply.

Learners: Draw the model and label the important parts with maths language.

5 Record and solve

6 min

3Ss.03

Read-along: Use the read-along once more as the evidence check for the abstract record.

Teacher: Point at any single cube in any tower and say what it stands for: one vote from one person. Then point at the whole tower and say the number and the treat. Partner checks by counting that tower aloud and saying the same number back.

Learners: Record the result with suitable numbers, words or symbols and link it back to the picture.

6 Reflect and convince

4 min

TWM.03

Read-along: Show the source passage and invite a final evidence-based check.

Teacher: Name the Thinking and Working Mathematically focus: Conjecturing: form a maths question or idea to test.

Learners: Use the concrete model, drawing and record together to justify the answer.

Solo

Read independently and mark the evidence used by the shared model.

Supported

Read with the audio, pause at the named source passage and use the response frame.

Listening

Listen with highlighting, build the same model and explain it orally.

Assessment check: The learner shows the objective with concrete, pictorial and abstract evidence and explains how the read-along supports the model.

3 Will it, won't it, might it?

Bad Luck Brad · 3Sp.01

Shared maths question

How does Bad Luck Brad help us explore will it, won't it, might it??

Evidence required

A concrete model, a pictorial record and a matching abstract record, all checked against the read-along.

Governed source lesson: Lots of One Kind, Only Two of the Other · Concept · Deciding which kind you are more likely to draw by seeing which kind there is more of

1 Find the maths in the story

4 min

3Sp.01

Read-along: Listen with highlighting and pause at the passage used by “Lots of One Kind, Only Two of the Other”.

Teacher: Listen to the label on the bag, and then to what Brad counts a moment after it is shaken. Say which kind of bar there were lots of and which kind there were only two of. Hold up two fingers for the chocolate chip bars, then open and close both hands for the lemon lime ones.

Learners: Notice the story evidence and say the maths question in their own words.

2 Model it with objects

5 min

3Sp.01

Read-along: Replay the source passage while building the quantities, shapes or measures it supplies.

Teacher: Drop two red counters into the bag for the two chocolate chip bars, then a big handful of blue ones for the lemon lime bars, and shake it. Before anybody reaches in, both partners point at the colour they think will come out and say out loud why they picked it. No looking inside.

Learners: Build a concrete model and check that each part matches the read-along.

3 Try the concrete task

6 min

3Sp.01

Read-along: Keep the relevant story page visible as the class tests the model.

Teacher: Draw in the book's order: Lauren first, then Adam, then Brad. Reach in without looking, take one counter, keep it, and lay it on that name card. When all three cards have a counter on them, look along the row and say how many of the three are red.

Learners: Change or compare the objects, then explain what stayed the same and what changed.

4 Draw the maths

5 min

3Sp.01

Read-along: Return to the same story evidence before learners make a pictorial record.

Teacher: Model a clear drawing, diagram or mark for the concrete work without adding a quantity the story does not supply.

Learners: Draw the model and label the important parts with maths language.

5 Record and solve

6 min

3Sp.01

Read-along: Use the read-along once more as the evidence check for the abstract record.

Teacher: Pour the bag out and look at the two piles. Finish the sentence aloud for your partner: there were more blue, so blue was more likely to come out. Then listen to what Brad thought and what he got, and say whether the bag was against him or just fuller of one kind.

Learners: Record the result with suitable numbers, words or symbols and link it back to the picture.

6 Reflect and convince

4 min

TWM.03

Read-along: Show the source passage and invite a final evidence-based check.

Teacher: Name the Thinking and Working Mathematically focus: Conjecturing: form a maths question or idea to test.

Learners: Use the concrete model, drawing and record together to justify the answer.

Solo

Read independently and mark the evidence used by the shared model.

Supported

Read with the audio, pause at the named source passage and use the response frame.

Listening

Listen with highlighting, build the same model and explain it orally.

Assessment check: The learner shows the objective with concrete, pictorial and abstract evidence and explains how the read-along supports the model.

End-of-unit task

Choose one model from each read-along. Put the models in a useful order, compare them, and explain how the concrete, pictorial and abstract records show the unit's maths.