Grade 7 Mathematics: Data and Probability

Free sample lesson

Ontario curriculum: Mathematics (2020), Strand D: Data (D1 Data Literacy and D2 Probability). 17 days.

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This is Lesson 1 of 12 from the full unit, exactly as it appears in the Teacher Guide, followed by the student worksheet. The full unit is at unitplans.ca.

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Lesson 1: Why we use percentages

1 day · about 60 minutes · D1.1

Learning goal

- We are learning to explain why percentages make it easier to compare groups of different sizes.

Success criteria

- I can turn a count out of a total into a percentage.
- I can compare groups of different sizes using percentages.
- I can explain why a percentage can tell more than a count.

Materials

- Calculators
- Chart paper

Minds On (10 min)

1. Show two classes in a pizza vote: one class has 6 yes votes out of 24, another has 9 yes votes out of 40. Ask: "Which class liked pizza more? How could you tell fairly when one class is bigger?"
2. Take a quick hand vote, then let partners explain their thinking. Do not give the method yet.

Action (35 min)

1. Model changing a count to a percentage: divide the part by the total, then multiply by 100. Use one school example from the worksheet.
2. Discuss why the biggest count is not always the biggest share. Compare two schools of different sizes side by side.
3. Introduce large survey results (thousands of people) and show how a percentage makes the pattern easy to see.
4. Students complete the worksheet in pairs, then check with another pair.

Consolidation (15 min)

1. Discuss question 8: why do news reports and surveys use percentages?
2. Add the idea to the class anchor chart: counts tell how many, percentages tell how much of the whole.

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3. Exit: "A class of 20 and a class of 50 both have a favourite song. Why might a percentage be fairer than a count?"

Questions to ask

- What is the whole in this problem?
- Would the answer change if we only looked at the counts?
- Can you check your percentage by estimating first?

Watch for

- Students often think the group with the larger count has the larger share. Place the two schools side by side and compare the percents.
- Students sometimes divide the total by the part. Ask: "Is the part bigger or smaller than the whole? So should the answer be under 100%?"

Differentiation

Support	Extend
Provide a benchmark list (1/2 = 50%, 1/4 = 25%, 1/10 = 10%). Allow calculators and a fill-in template: part ÷ total × 100.	Find a news article with a survey. Rewrite two of its percentages as counts for a sample of your own size.

Answer key: Why percentages?

1. Maple Public School has 480 students and 312 take the bus. What percent of Maple students take the bus?

   > **Answer:** 65%
   > 312 ÷ 480 × 100 = 65

2. Oak Public School has 1250 students and 750 take the bus. What percent of Oak students take the bus?

   > **Answer:** 60%
   > 750 ÷ 1250 × 100 = 60

3. More students ride the bus at Oak than at Maple. Which school has the greater share of students on the bus? Explain.

   > **Answer:** Maple has the greater share (65% compared with 60%), even though Oak has more bus riders (750 compared with 312). Oak is the bigger school, so its count is larger, but a smaller part of it rides the bus.

4. A made-up survey asked 4500 people if they would try a new recipe. 3600 said yes. What percent said yes?

   > **Answer:** 80%
   > 3600 ÷ 4500 × 100 = 80

5. In the same survey, 45 people said maybe. What percent said maybe? (The rest said no.)

   > **Answer:** 1%
   > 45 ÷ 4500 × 100 = 1

6. In a made-up sample of 150 town residents, 42 wanted a new skatepark. If the sample matches the whole town of 3500 people, about how many people want the skatepark?

   > **Answer:** 980 people
   > 42 ÷ 150 = 28%, then 28% of 3500 = 980

7. Class A voted yes 6 out of 24 times. Class B voted yes 9 out of 40 times. Which class had the higher percent of yes votes?

   > **Answer:** Class A: 6 ÷ 24 = 25%. Class B: 9 ÷ 40 = 22.5%. Class A had the higher percent, even though Class B had more yes votes.

8. Write two or three sentences. Why do surveys and news reports often use percentages instead of counts?

   > **Answer:** Percentages compare parts of different-sized groups fairly, because each is out of 100. Large counts like thousands are hard to picture, but a percent such as 80% is easy to understand and compare. Percentages also let us compare samples of different sizes.

Student worksheet: Why percentages?

Success criteria

- I can turn a count out of a total into a percentage.
- I can compare groups of different sizes using percentages.
- I can explain why a percentage can tell more than a count.

Show your work. Use a calculator when you need one.

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