Grade 8 Mathematics: Number

Free sample lesson

Ontario curriculum: Mathematics (2020), Strand B: Number. 18 days.

From unitplans.ca. For classroom use by the purchasing teacher. Please do not share or resell.

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.

unitplans.ca

Lesson 1: Scientific notation

1 day · about 60 minutes · B1.1

Learning goal

- We are learning to use scientific notation to write and compare huge and tiny numbers.

Success criteria

- I can write a number in scientific notation and in standard form.
- I can compare numbers written in scientific notation.

Materials

- Calculators
- Cards with large and small real-world numbers (population of Canada, width of a hair)

Minds On (10 min)

1. Show: "Canada has about 41 000 000 people. The world has about 8 100 000 000." Ask: "About how many Canadas would fit in the world population?"
2. Students estimate in pairs, then share strategies.

Action (35 min)

1. Introduce scientific notation: a number from 1 to less than 10, times a power of ten.
2. Model large numbers ($45\,000\,000 = 4.5 \times 10^{7}$) and small numbers ($0.000\,36 = 3.6 \times 10^{-4}$).
3. Show how to compare: first compare the powers of ten, then the leading numbers.
4. Students complete the worksheet in pairs.

Consolidation (15 min)

1. Return to the Minds On question and solve it with scientific notation.
2. Exit: "Write a number from science or the news in scientific notation and explain what it describes."

Questions to ask

- Why must the first number be less than 10?
- Which matters more when comparing, the power of ten or the first number?

unitplans.ca

Watch for

- Writing 23 × 10^4 (the first number must be from 1 to less than 10).
- Thinking a negative exponent makes the number negative.

Differentiation

Support	Extend
Use a place-value chart to count how many places the decimal moves.	Multiply two numbers in scientific notation without a calculator and explain the rule for the exponents.

Answer key: Scientific notation

1. Write 45 000 000 in scientific notation.

   > **Answer:** 4.5 × 10^7

2. Write 0.000 36 in scientific notation.

   > **Answer:** 3.6 × 10^{-4}

3. Write 2.07 × 10^5 in standard form.

   > **Answer:** 207 000

4. Canada has about 41 000 000 people and the world has about 8.1 × 10^9. About how many times larger is the world population? Round to the nearest whole number.

   > **Answer:** 198 times

5. Order from least to greatest: 3.2 × 10^{-3}, 4.1 × 10^{-4}, 2.9 × 10^{-3}.

   > **Answer:** 4.1 × 10^{-4}, 2.9 × 10^{-3}, 3.2 × 10^{-3}

6. Ava says 23 × 10^4 is in scientific notation. Is she correct? Explain.

   > **Answer:** No. The first number must be at least 1 and less than 10. Written correctly it is 2.3 × 10^5.

Student worksheet: Scientific notation

Success criteria

- I can write a number in scientific notation and in standard form.
- I can compare numbers written in scientific notation.

Show how many places the decimal point moves.

1. Write 45 000 000 in scientific notation.

2. Write 0.000 36 in scientific notation.

3. Write 2.07×10^{5} in standard form.

4. Canada has about 41 000 000 people and the world has about 8.1×10^{9}. About how many times larger is the world population? Round to the nearest whole number.

5. Order from least to greatest: 3.2×10^{-3}, 4.1×10^{-4}, 2.9×10^{-3}.

6. Ava says 23×10^{4} is in scientific notation. Is she correct? Explain.

unitplans.ca