The Story of Numbers: Unit Overview

MTH1W, Grade 9 Mathematics (De-streamed), Unit 1. 11 classes of 75 minutes, plus one class for the unit test (about two and a half weeks).

The big question

Where do our numbers come from, how are they organized, and how do we use rational numbers to describe the world?

Students begin the course as a community of mathematicians: number talks, shared strategies and norms. They explore how different cultures built number systems (Babylonian base 60, Maya base 20, Indian rules for zero and negatives, Chinese counting rods and the Kaktovik numerals created by Iñupiaq students), sort numbers into sets, discover density, infinity and limits (including their first Python loops), and build fluency with integers and positive and negative fractions in real contexts such as temperatures, elevations, measuring tools, recipes and carpentry. The summative combines a Number Story research project with a set of real-world rational-number problems.

Lessons

#	Lesson	Classes	Question	Expectations	What's inside
1	**Number Talks**	1	How do mathematicians think about numbers?	A1, A2, B1.1	Norms, number talks, Which One Doesn't Belong?
2	**Where Numbers Come From**	1	How did different cultures write numbers?	B1.1, A2	Base 60, Maya base 20, zero, Kaktovik numerals
3	**Sorting Number Sets**	1	What kinds of numbers are there?	B1.2	Natural to real; rational vs irrational; subsets
4	**Between Any Two Numbers**	1	Is there always another number in between?	B1.3, B1.2	Density; zooming in; comparing sets
5	**Infinity and Limits**	1	Where do never-ending patterns go?	B1.3, C2.2, C2.3	Halving square; Python loops
6	**Integers in Context**	1	What do signs tell us?	B3.1	Elevation, temperature, money, final − initial
7	**Unit Fractions and Measuring**	1	How are fractions built?	B3.2	Fraction strips, imperial ruler, kitchen math
8	**Signs and Rational Numbers**	1	What does a negative sign do to a fraction?	B3.3	Equivalent forms, ordering, negative rates
9	**Adding and Subtracting Fractions**	1	How do we combine pieces of different sizes?	B3.4	Common denominators, mixed numbers, negatives

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10	**Multiplying and Dividing Fractions**	1	How do fractions work in formulas?	B3.4, B3.3	Area model, reciprocals, formulas, tables
11	**Number Story Share and Review**	1	What story does each number tell?	B1.1, A2, B3.1, B3.4	Gallery walk; unit review

Assessment

Type	In this unit
Assessment for learning	Number talks, Maya numbers, Sort It, Find a Number Between, Pattern Detective, Code It, integer stories, ruler and kitchen problems, fraction practice, quick checks and exit tickets
Assessment as learning	Math and Me, self-checks, gallery walk feedback, unit review
Assessment of learning	Summative task (Number Story and Numbers at Work) with a rubric, and a unit test with full solutions

Materials

Included:

- **Original problems and diagrams:** every problem, data set, number line, ruler, Maya numeral chart and code example was written or drawn for this unit
- **Code:** three short Python programs (no special software needed beyond a free Python editor, or trace on paper)
- **Start Here:** unit overview, summative task and rubric, unit test, and teacher solutions for both

Free tools only: any board-approved Python editor (or paper tracing), and Desmos or a spreadsheet for optional tables. Number Story research should respect the knowledge systems of the cultures studied; encourage community and family sources, with permission.

What's in each lesson

- Teacher lesson plan with expectations, timed sequence, differentiation, look-fors and answer guides
- Slides with speaker notes
- Student handouts and organizers
- Editable Word and PowerPoint files, plus PDFs

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