

Mathematics 4

A Six-Week British Columbia Curricular Unit

UNBC School of Education, Regional Cohort
EDUC 398 Curriculum & Instruction in Math and Science Using ADST
Instructor: Dr. David Litz

South-Central Campus Group

Andrea Sturt, Sara McManus, Joni Hesselgrave
Carly Lorntsen, Amanda Sumption, Aurora Mernickle



The Big Idea:

Fractions are types of numbers that can represent quantities.

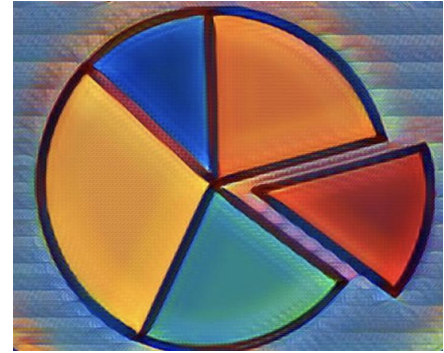
The Content Focus:

Ordering and Comparing Fractions

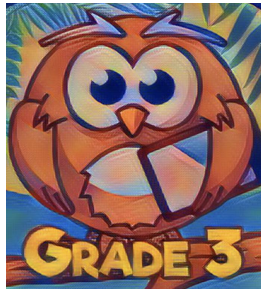
- with common denominators
- estimating fractions with benchmarks
- using concrete and visual models
- equal partitioning

Scope & Sequence:

This unit is designed to be taught over the course of six weeks, approximately 1.5 hours per week. This could be spread over a few smaller blocks or one longer block to meet the needs of diverse classrooms. Some examples of different structure styles will be laid out in the individual lesson plans.



Week 1



Grade 3 Fractions Exploration

This lesson will launch an introduction to fractions by way of reviewing the curriculum covered in Grade 3: defining what a fraction is, how to read a fraction, and practicing the skills required to represent a fraction using numbers, pictures, and a variety of objects (i.e., manipulatives).

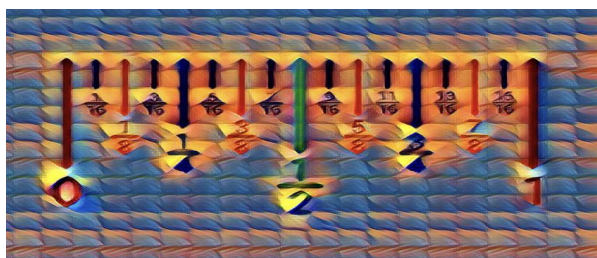
Week 2



Beginning with Common Denominators

This set of lessons will introduce the vocabulary of numerator, denominator (common and uncommon), and greater than/less than. It will then introduce the concept of comparing and ordering fractions with common denominators.

Week 3



Estimating Fractions with Benchmarks

In this lesson, students will be introduced to the "Benchmark Strategy": a concept that has students visualize fractions on a number line and estimate which fraction is greater than/less than the

other by comparing them to “benchmark” fractions (e.g., zero, half, whole). In addition to number lines and visualization, students will create and use fraction strips to help them master the skill of estimating fractions using benchmarks. Students will understand that the Benchmark Strategy is especially helpful when comparing fractions that have unlike denominators (i.e., since it eliminates the need to find a common denominator and perform multiplication before comparing).

Week 4

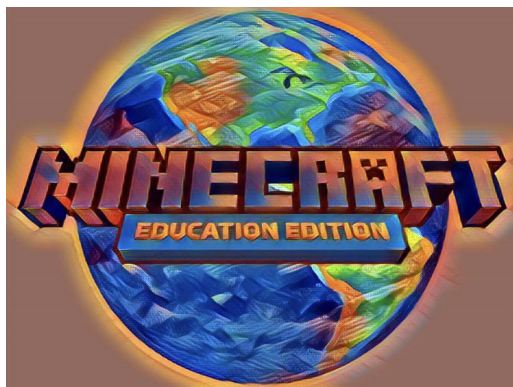


Using Concrete and Visual Models

This Lesson will explore how fractions are everywhere. Students will look at, and play with, many examples (both inside and outside the classroom). A hands-on approach will better connect students to the unit of study and will lead to a fuller understanding of fractions. Concrete visual examples reinforce concepts and

foster the inclusivity of visual and tactile learners. Regardless of age or ability, students benefit from a hands-on approach that allows them to construct personal meaning and solidify content understanding.

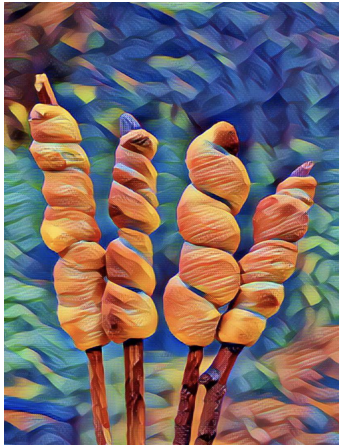
Week 5



Equal Partitioning in Minecraft

This lesson will allow students to explore partitioning shapes into equal parts (the creation of fractions). Students will utilize Minecraft's Education Edition to create 3D representations of their learning on the concept Equal Partitioning in Ordering and Comparing Fractions.

Week 6



Bannock by Fractions

This lesson will conclude the unit by giving students the opportunity to practice and solidify their learning. The final day of the unit will provide students with hands-on, outdoor learning, where they will explore fractions through experiential activities including measuring, mixing and finally baking bannock over a campfire.

Inclusivity Strategies:

Throughout this unit, it is essential that all students are included in a classroom that is Universally Designed for Learning. Effective UDL strategies within the unit include enriching group work opportunities, engaging activities that break composite tasks into steps/parts, and robust discussions geared toward intensified understanding and academic growth.

Lessons will aim for a lively pace with explicit instruction interwoven with hands-on activities and/or technology to engage all learners.

Each of the lessons will be accessible to all learners indoors and outdoors; where necessary additional adult support will be requested in the form of Education Assistants/Youth Care/Indigenous Support Workers/Parents.



Accommodations will be made for students where necessary.

First Peoples Principles of Learning:

Throughout our lessons, we encourage students to be patient and kind to themselves and each other as they learn new concepts. Lessons within the unit will be delivered via open, non-judgmental group discussions, built on positive teacher/student and student/student relationships and connections. Ideas and concepts will be learned experientially, through a mixture of explicit instruction, modelling, scaffolded support, practice, and student-doing — both inside and outside the walls of the classroom: under the sun, amidst the wind, in the dirt, and around the fire!



Curricular Competencies:

This unit encompasses aspects of all Curricular Competencies of Mathematics 4. Individual lesson plans will specifically highlight how they apply to each lesson. At the end of this Unit, students will gain experience in the following competency areas:

1. Reasoning and analyzing

- Use reasoning to explore and make connections
- Estimate reasonably
- Develop mental math strategies and abilities to make sense of quantities
- Use technology to explore mathematics
- Model mathematics in contextualized experiences

2. Understanding and solving

- Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem-solving
- Visualize to explore mathematical concepts
- Develop and use multiple strategies to engage in problem-solving
- Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant

to local First Peoples communities, the local community, and other cultures

3. Communicating and representing

- Communicate mathematical thinking in many ways
- Use mathematical vocabulary and language to contribute to mathematical discussions
- Explain and justify mathematical ideas and decisions
- Represent mathematical ideas in concrete, pictorial, and symbolic forms

4. Connecting and reflecting

- Reflect on mathematical thinking
- Connect mathematical concepts to each other and to other areas and personal interests
- Incorporate First Peoples worldviews and perspectives to make connections to mathematical concepts

Core Competencies:



Communication		Thinking		Personal & Social		
Communicating	Collaborating	Creative	Critical & Reflective	Personal Awareness & Responsibility	Positive Personal & Cultural Identity	Social Awareness & Responsibility
- I can use technology to help me learn and to communicate what I have learned. - I can represent mathematical ideas and concepts in concrete, pictorial, and symbolic forms.	- I can collaborate with a partner to practice a new math concept.	- I can be creative in my thinking and find different ways to demonstrate my learning.	- I can explore with a purpose in mind and use what I learn.	- I can interact with others and the environment respectfully and thoughtfully.	- I can identify ways in which my strengths can help me meet challenges, and how my challenges can be opportunities for growth. - I understand that I will continue to develop new skills, abilities, and strengths	- I can work well with my partner and stay on task.

Assessment Philosophy:

Throughout this unit, students will demonstrate their learning and understanding of Fractions in several ways: in the responses they provide during large and small group discussions; in the feedback they give during self-assessed thumbs up/down polls; in their ability to manipulate various objects in fractional form; in their accuracy of measuring during outdoor play and bannock-making; in their responses to pencil-to-paper questions, etc. Students will receive formative feedback at each stage of learning. Student responses to practice questions, if applicable, will be handed in at the end of the lesson/block, so that the teacher can review and provide feedback to students on where they are at in their learning (vs. where they need to be) before the next lesson. This way, instruction can be adjusted and the teacher can review and/or re-teach when necessary, with whomever necessary (working toward mastery of the concept). Throughout the unit, students will have ample opportunities to practice, gain teacher feedback, and receive extra support.

