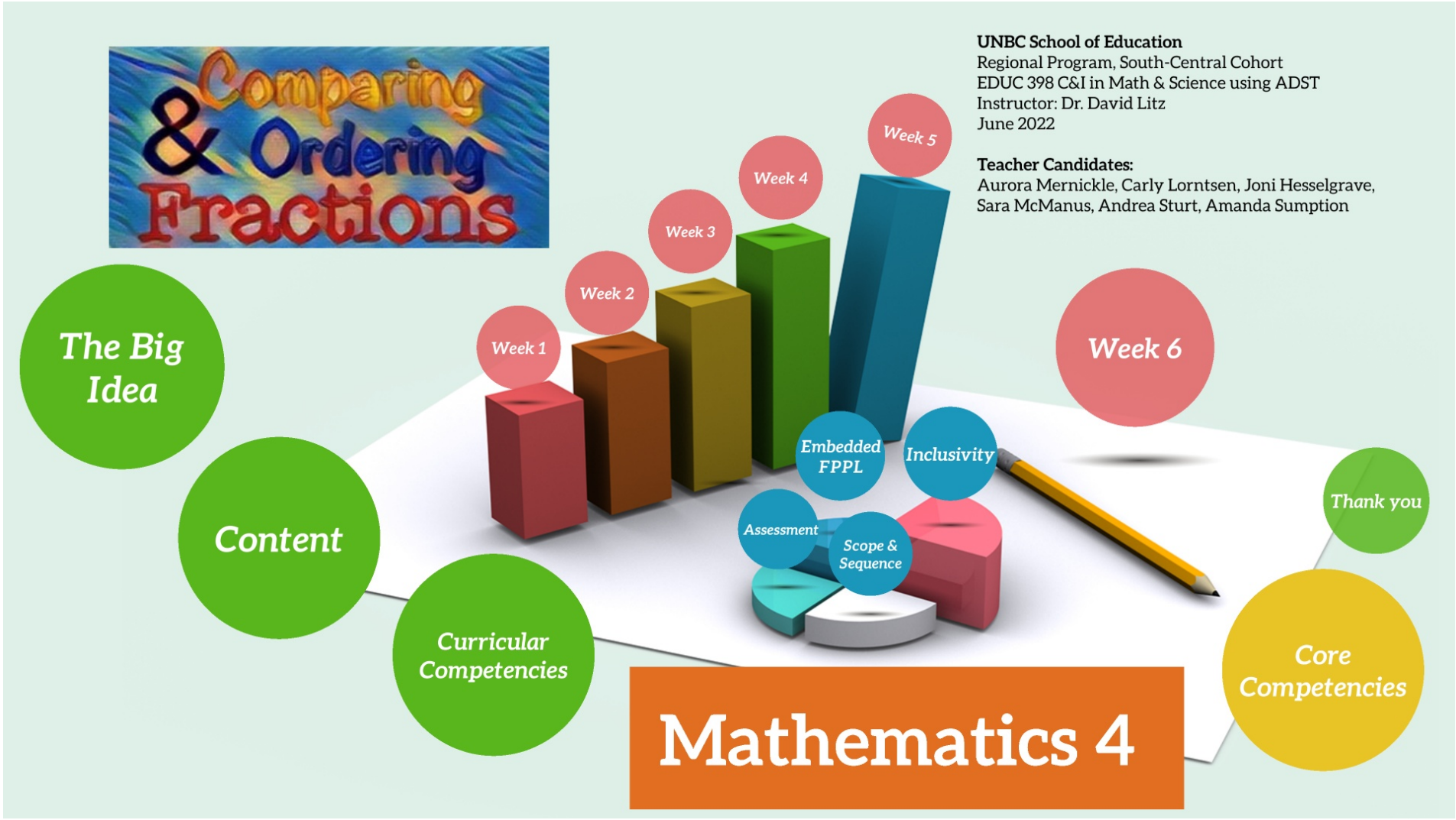

Comparing & Ordering Fractions
UNBC School of Education
Regional Program, South-Central Cohort
EDUC 398 C&I in Math & Science using ADST
Instructor: Dr. David Litz
June 2022
Teacher Candidates:
Aurora Mernickle, Carly Lorntsen, Joni Hesselgrave, Sara McManus, Andrea Sturt, Amanda Sumption
The Big Idea
Content
Curricular Competencies
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Embedded FPPL
Inclusivity
Assessment
Scope & Sequence
Thank you
Core Competencies
Mathematics 4

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

The Curricular Competencies:

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

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

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

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

This unit encompasses aspects of all Curricular Competencies of Mathematics 4. Individual lesson plans will specifically highlight how they apply to each lesson.

First Peoples Principles of Learning

Throughout lessons, students are encouraged to be patient and kind to themselves and each other as they learn new concepts.

Lessons within the unit are delivered via open, non-judgmental group discussions, built on positive teacher/student and student/student relationships and connections.

Ideas and concepts are learned experientially, through a mixture of explicit instruction, modeling, 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!

Inclusivity Strategies

Through this unit, it was essential that all students were included in a classroom that was Universally Designed for Learning.

Effective UDL strategies used in this 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 were designed for a lively pace including explicit instruction and were interwoven with hands-on activities and/or technology to engage all learners.

Each of the lessons are 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.

This unit is designed to allow students to demonstrate their learning and understanding of ordering and comparing 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.

Starting in Week 3, students begin to complete summative assessments within the lessons which will be used as a collection of evidence of each students learning of the content, curricular competencies, big idea, and core competencies covered within this unit.

Assessment Philosophy

Scope & Sequence

This unit plan has been designed to be taught over six weeks.

Each of the weekly lessons are approximately 1.5 hours starting with a review of Grade 3 content and working towards a culminating unit outdoor, Indigenous experience where students are able to practically able to apply fractions.

Most of the lesson plans are 2 x 45 minute blocks with flexibility built in for teachers to modify, as needed. The 6th lesson is a two-hour lesson, including field trip.

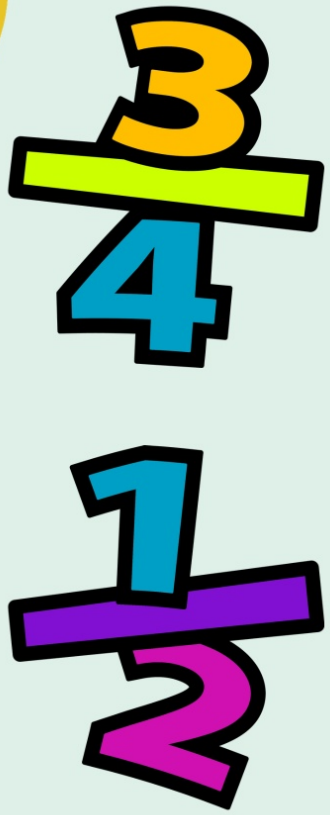
Week 1

The Lesson Plan

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 including a manipulative. Becoming proficient with fractions is important because it will build a solid foundation for learning more advanced mathematics in the students' future learning journey.

Activities




Tickets please
Exit Tickets
Play-Doh
Worksheets

Name: _____ Date: _____

Identifying Fractions

DIRECTIONS: Write the fractions for the shaded area.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

Name: _____ Date: _____

Identifying Fractions

DIRECTIONS: Write the fractions for the shaded area.

1. 4/12 or 1/3
2. 2/5
3. 6/6 or 1 whole
4. 1/6
5. 1/9
6. 1/4
7. 4/4 or 1 whole
8. 3/4
9. 3/4
10. 6/6
11. 2/6 or 1/3
12. 3/4

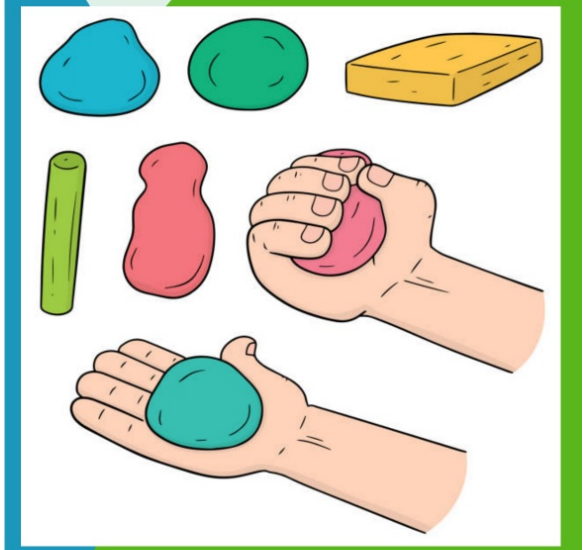
EXPLORE WITH PLAY DOUGH

Name _____ Date _____

Playdough Partitioning

Directions: create a circle, rectangle, or square with your playdough. Then, carefully partition into halves, thirds, or fourths. Draw your playdough, then describe the partitioned shape.

Draw your playdough	Describe the partitioned shape
	_____ _____
	_____ _____



What was your favorite part about today's review lesson and activities?

Are there any concepts within mathematics and fractions that you wish to spend more time on before moving on with our unit?

The Lesson Plan Continued

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

DRAFT LESSON PLAN (REVISED 2021)

Candidate's name: Carly Lorntsen

Grade/Class/Subject:	Grade 3 – Mathematics	School:	Elementary
Date:	June 10, 2022	Allotted Time:	60 minutes
Topic/Title:	Fractions Exploration		

1. LESSON ORIENTATION
Key resources: Instructional Design Map

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.
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). Becoming proficient with fractions is important because it will build a solid foundation for learning more advanced mathematics in the students' future learning journey.

2. CORE COMPETENCIES
Key resources: https://curriculum.gov.bc.ca/competencies

Core /Sub-Core Competencies *(check all that apply):*	*Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.*
☐ COMMUNICATION – Communicating ☐ COMMUNICATION – Collaborating ☐ THINKING – Creative Thinking ☐ THINKING – Critical Thinking ☐ THINKING – Reflective Thinking ☐ PERSONAL AND SOCIAL – Personal Awareness and Responsibility ☐ PERSONAL AND SOCIAL – Positive Personal and Cultural Identity ☐ PERSONAL AND SOCIAL – Social Awareness and Responsibility	Throughout this lesson, students will communicate their ideas while collaborating with others to help solve problems and will use effective forms and strategies. Students will engage in creative and critical thinking by gaining ideas during play and thinking 'outside the box' to achieve the formation of innovative ideas and persevere to develop these ideas. Students will explore, use solid evidence to make judgements, ask questions, consider all options, and use observations and experience to draw conclusions and make judgments. By using reflective thinking, students will use prior content and background knowledge which will in result, improve students' conceptual understanding and retention. Building reflective thinking with mathematics will increase the confidence of each individual student by empowering a sense of a more positive attitude towards new math challenges in future learning.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES
Key resources: First Peoples Principles of Learning (FPPL); Aboriginal Worldviews and Perspectives in the Classroom

FPPL to be included in this lesson *(check all that apply):*	*How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?*
☐ Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. ☐ Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). ☐ Learning involves recognizing the consequences of one's actions. ☐ Learning involves generational roles and responsibilities. ☐ Learning recognizes the role of Indigenous knowledge. ☐ Learning is embedded in memory, history, and story. ☐ Learning involves patience and time. ☐ Learning requires exploration of one's identity. ☐ Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.	This lesson allows for continuous learning and practice over time while at different rates, supporting the well-being of each individual student. Throughout the learning experience, students will gain the opportunity to learn in holistic, reflexive, reflective, experiential, and relational ways to enhance the learning of exploring fractions and making it a richer experience. The continuous practice of fractions through patience and time will become embedded in memory for each student.

4. BIG IDEAS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?
Students are expected to understand that fractions are a type of number that can represent quantities.

5. LEARNING STANDARDS/INTENTIONS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum)

Curricular Competencies: *What are students expected to do?*	**Content:** *What are students expected to learn?*
Students are expected to reason and analyze through exploring and making connections, develop mental math strategies and abilities to make sense of quantities while modeling mathematics in contextualized experiences. Additionally, students are expected to understand and solve through developing, demonstrating, and applying mathematical understanding through play, inquiry, and problem solving. Students are also expected to visualize to explore mathematical concepts and use various strategies to engage in problem solving. Through communicating, representing, connecting, and reflecting, students are expected to use mathematical vocabulary and language to contribute to critical mathematical discussions, and represent mathematical ideas in concrete, pictorial, and symbolic forms. Through explaining and justifying mathematical ideas and decisions, students are expected to reflect on mathematical thinking and theory.	Students are expected to learn fraction concepts including defining fractions in which they are numbers that represent a number or quantity, and fraction parts are equal shares or equal-sized portions of a whole or unit. While being provided with rich opportunities to explore, students are expected to learn how to create fractions with concrete materials and connect to symbolic notation through recording pictorial representations of fraction models.

6. ASSESSMENT PLAN
Key resources: Instructional Design Map and https://curriculum.gov.bc.ca/classroom-assessment

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?
Students will demonstrate their learning and achieve the learning intentions by relying on background knowledge from previous fraction lessons in grade three and participating in completing a fractions identification worksheet first. Here, this will be a formative type of assessment that will ultimately monitor the students' learning progression to provide consistent feedback from both teacher and student. This formative assessment will effectively monitor the

Continued

students and their strengths and weaknesses regarding fraction practice. The teacher and student will have the opportunity to address any struggles that the student is having with the practice of fractions immediately with this worksheet practice. Afterwards, students will have the opportunity to engage in hands-on learning with playdough in which they will participate in playdough partitioning. Students will be provided with a sheet in which they will create a circle, rectangle, or square with their playdough. Students will then carefully partition into halves, thirds, or fourths. Students will have the opportunity to then draw the playdough, and successfully describe the partitioned shape. This creative, hands-on, and formative assessment will be calming, engaging, and motivating for students as they demonstrate their learning and prior knowledge of fractions before moving towards advanced grade four fraction learning as the unit progresses. After the lesson and each activity is completed, exit slips will be provided for students in order to provide feedback to the teacher. This fast and easy informal assessment will simply enable the teacher to assess the students' understanding of the content and material. In result, this will serve as a powerful benefit for the teacher and students. Gathering and reflecting upon feedback will help increase engagement and motivation within students and the teacher.

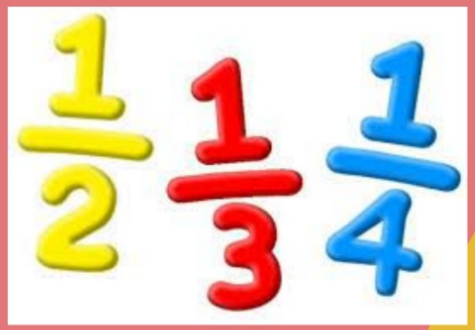
7. DESIGN CONSIDERATIONS

Key resources: Instructional Design Map

Make brief notes to indicate how the lesson will meet needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.
This lesson is designed for all learners. Some learners are more 'hands-on' learners and prefer having an activity shortly after a lesson and/or a worksheet that provides experiential learning while it can help make the material appear quicker, simpler, and more intriguing and motivating. Here, this lesson and activities are targeting the multiple intelligences model in which there are different ways students learn and acquire information. Some students may indeed prefer practicing with worksheets and others may prefer practicing with hands-on experience. This lesson demonstrates both learning styles. Students who have learning differences or barriers can collaborate with other learners at their table while being provided with as much time as they need to complete the activity.
Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*
The resources and material that must be ready prior to the lesson beginning includes an appropriate amount of copies of the IdentifyingFractionsActivityWorksheet-1.pdf and the PartitioningwithPlaydoughFREEBIEAsuperengagingmathlesson-1.pdf activities including the appropriate amount of playdough for each individual student to serve as manipulatives.

8. LESSON OUTLINE

Instructional Steps	Student Does/Teacher Does *(learning activities to target learning intentions)*	Pacing
OPENING: *e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge*	Cue students that it is "Learning about Fractions Time", and have students locate to the appropriate location for learning. When students are settled and all eyes are on you, state the following or a close comparison: *Today, we are going to begin our fractions unit by reviewing our background knowledge on fractions from Grade Three. By a show of hands, can anyone tell me what a fraction is and give me a definition to write on the white board for you all?* **(Take a few voluntary responses and record them on the white board) Explaining further to the students that as review, a fraction is a numerical quantity that is not a whole number (i.e., ½).** *We can also describe a fraction as a significantly small part, amount, or proportion of something. Now, I will draw a few pictures onto the white board, while shading in some parts with a marker. By a show of hands, I would like voluntary responses on what the fraction is for each photo I draw as review and practice.*	Responsive and lively pace. **10 minutes**
BODY: • *Best order of activities to maximize learning -- each task moves students towards learning intentions* • *Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback* • *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modelling* • *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	I DO: Explain to the students their task after the review of fractions interactive lesson. Say the following: *Now, I will hand out a IdentifyingFractionsActivityWorksheet-1.pdf review worksheet on fractions in which you will identify the fractions while writing the fraction for each shaded area under each shape. This will help in refreshing your memory of identifying fractions to assist you with further learning on expanding knowledge of fractions throughout our unit. If any assistance is needed, I am here to help. It is encouraged to help classmates around you in a quiet manner if needed, as well.* I DO: Explain to the students their task after they have completed their identifying fractions review worksheet. Say the following: *Now, I will hand out a PartitioningwithPlaydoughFREEBIEAsuperengagingmathlesson-1.pdf sheet in which all of you will have the opportunity to engage in hands-on learning with playdough in which you will participate in playdough partitioning. Each student will be provided with a sheet in which you will create a circle, rectangle, or square with the individual playdough you are given. Students will then carefully partition into halves, thirds, or fourths. Each of you will then have the opportunity to draw the playdough, and successfully describe the partitioned shape. This creative, hands-on, and enriching experience will give you all a brand-new look at working with fractions that will be enjoyable and calming!*	Responsive and lively pace. **40 minutes**
CLOSING: • *Closure tasks or plans to gather, solidify, deepen or reflect on the learning* • *review or summary if applicable* • *anticipate what's next in learning* • *"housekeeping" items (e.g. due dates, next day requirements*	I DO: Walk around and observe each student, ensuring that each student is on task and offer any help if needed. I DO: When students have completed each activity, ask the following reflective questions for feedback: **(exit slips to be handed in to the teacher when lesson and activities are completed)** 1) *What was your favorite part about today's review lesson and activities?* 2) *Are there any concepts within mathematics and fractions that you wish to spend more time on before moving on with our unit?*	Responsive and lively pace. **10 minutes**



	3) *What type of concepts are you looking forward to learning about with fractions as we proceed into the next lessons in this unit?*	

9. REFLECTION *(anticipate if possible)*

• *Did any reflection in learning occur, e.g. that shifted the lesson in progress?* • *What went well in the lesson (reflection on learning)?* • *What would you revise if you taught the lesson again?* • *How do the lesson and learners inform you about necessary next steps?* • *Comment on any ways you modelled and acted within the Professional Standards of BC Educators and BCTF Code of Ethics?* • *If this lesson is being observed, do you have a specific observation focus in mind?*
To be completed after the lesson.

Reflection

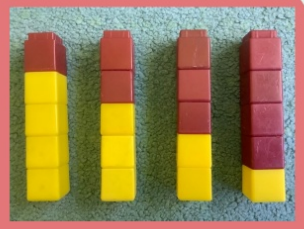
This lesson and engaging activities will build reflective thinking in students which will increase the confidence of each individual student by empowering a sense of positive attitudes towards new math challenges throughout this unit and future learning. This lesson addresses the Multiple Intelligences Theory in which students who enjoy worksheet practice and those who enjoy hands-on experience will simply benefit to result in a successful lesson.

Week 2

Common Denominators:

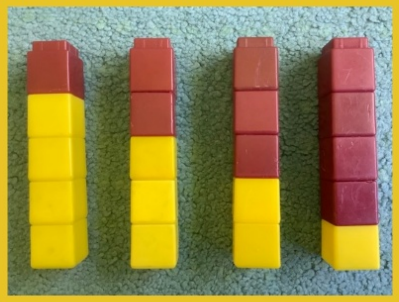
Lesson Specifics

Introduction to Common Denominators for Ordering and Comparing Fractions



Beginning with Common Denominators

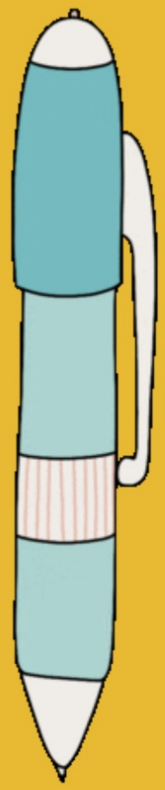
This set of lessons will introduce the vocabulary of numerator, denominator (common and uncommon), and greater than/less than. The lessons focus on comparing and ordering fractions, focusing on critical discernments, and allowing time for practice along the way to work towards mastery of these foundational fraction concepts.



The Lesson Plan

Cross-Curricular Connection: Visual Art

Useful Resources



UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Candidate's name: Andrea Sturt

Grade/Class/Subject:	Grade 4 Mathematics	School:	Somewhere in Quesnel, BC
Date:	May 2022	Allotted Time:	2 x 45-50 mins.
Topic/Title:	Introduction to Common Denominators in Fractions - Ordering and Comparing		

1. LESSON ORIENTATION
Key resources: Instructional Design Map

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.
We have reviewed fraction concepts from Grade 3, and are ready to start learning Grade 4 fraction skills, starting with Common Denominators.

2. CORE COMPETENCIES
Key resources: https://curriculum.gov.bc.ca/competencies

Core /Sub-Core Competencies *(check all that apply):*	*Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.*
☑ COMMUNICATION – Communicating ☑ COMMUNICATION – Collaborating ☐ THINKING – Creative Thinking ☑ THINKING – Critical Thinking ☐ THINKING – Reflective Thinking ☑ PERSONAL AND SOCIAL – Personal Awareness and Responsibility ☐ PERSONAL AND SOCIAL – Positive Personal and Cultural Identity ☑ PERSONAL AND SOCIAL – Social Awareness and Responsibility	The lesson will be interactive, requiring **Communication** through active listening so as to engage with the practice opportunities and communicate understanding to the teacher on small whiteboards. The lesson will require **Critical Thinking** throughout as learners scaffold skills from one critical discernment to the next. Learning math requires **Personal Awareness and Responsibility** to engage with, understand and apply new skills. Learners will have the opportunity to collaborate with a partner on Day 2 which will involve **Social Awareness and Responsibility**.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES
Key resources: First Peoples Principles of Learning (FPPL); Aboriginal Worldviews and Perspectives in the Classroom

FPPL to be included in this lesson *(check all that apply):*	*How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?*
☐ Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). ☑ Learning involves recognizing the consequences of one's actions. ☑ Learning involves generational roles and responsibilities. ☐ Learning recognizes the role of Indigenous knowledge. ☐ Learning is embedded in memory, history, and story. ☑ Learning involves patience and time. ☐ Learning requires exploration of one's identity. ☐ Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.	The content of this math lesson does not explicitly tie in with Indigenous content, though understanding of fractions would be applicable in most cultures. A number of the FPPL apply in the manner in which the lesson will unfold. The teacher will convey the message that all students are capable of learning these new skills about fractions, and some people will need more time and practice. The teacher as the guide demonstrates the generational responsibility to pass on this knowledge to the next generation. The teacher will encourage learners to follow along and do the practice questions on their whiteboards as the lesson unfolds, so as to check understanding for all learners and support them as needed. Throughout the study of Math, it is important for learners to recognize the consequences of their actions and take responsibility for their learning.

4. BIG IDEAS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?
Fractions are types of numbers that can represent quantities.

5. LEARNING STANDARDS/INTENTIONS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum)

Curricular Competencies: *What are students expected to do?*	**Content:** *What are students expected to learn?*
-recognize when two fractions share a common denominator, and when they do not. -put fractions with a common denominator in order from smallest to largest, and largest to smallest. -recognize and represent fractions with common denominators in different forms (pattern blocks, images, on a screen) and translate into numerical symbols.	• Fractional parts are equal shares or equal-sized portions of a whole or unit • comparing and ordering of fractions with common denominators **Vocabulary to work with:** ***Denominator*** - represents the total number of pieces in the whole (the number on the bottom of the fraction) eg. 1 / **4** ***Numerator*** - represents the specific number of pieces in the whole that are indicated (coloured in, eaten, remaining, etc.). (the number on the top of the fraction) eg. **1** / 4

	Greater (larger) than 3 > 1 (read from Left to Right) ***Less (smaller) than*** 1 < 3 ***Represent*** - show an idea in a concrete way (symbols - numbers, pictures, physical objects). ***Compare*** - to examine the differences between numbers, quantities or values to decide if it is greater than, smaller than or equal to another quantity ***Order*** - Putting things into their correct place following a stated rule (eg. smallest to largest, largest to smallest)

6. ASSESSMENT PLAN

Key resources: Instructional Design Map and https://curriculum.gov.bc.ca/classroom-assessment

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?
Day 1 - The lesson will be taught in a consecutive, raveled manner with frequent opportunities for students to practice and show their work on small whiteboards, which will enable the teacher to check for all students' understanding as the lesson progresses. Feedback will be formative. Students will then complete a worksheet individually, practicing the skills from the lesson. Teacher will collect the worksheets at the end of the period, making sure to look over them to check for understanding and give brief written feedback (and notice patterns in the class as a whole) before the next math block. (Formative assessment). **Day 2** - i) Teacher will review concepts from last block, emphasizing and practicing any areas showing weakness or misunderstanding from the worksheet. ii) Retrieval practice using small whiteboards to show their thinking (eg. Do these two fractions have common denominators? 1/4 and 3/4? 1/7 and 1/5? **AND** Put these fractions in order from smallest to largest: 2/6, 4/6, 5/6, etc.). Teacher will give feedback. iii) Move on to work on Google fraction App on Chromebooks with a partner (students will create a page of fraction images to print for their fraction portfolio - Summative assessment). Teacher will gauge how the class is doing and if there is a need to add a third 20-minute minute block for catch-up or for further practice of the concept.

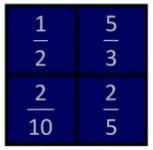
7. DESIGN CONSIDERATIONS

Key resources: Instructional Design Map

Make brief notes to indicate how the lesson will meet needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.
The lessons will be a blend of teacher-led instruction, collaboration and guided practice with a partner (classroom to be set up with students sitting with a partner), individual work on worksheets with manipulatives available to use. I foresee some kids finishing the worksheets quickly and needing further challenge - the teacher will provide extension questions to those who are ready. Teacher will focus support on students who need more practice to pick up new math concepts (eg. certain kids with slower auditory

processing speed or working memory challenges may need the directions repeated to them one-on-one, as well as represented visually on the whiteboard). Students who need more time outside of the math block to complete the worksheets will have the opportunity to work in a small group with the teacher during silent reading time. **Cross-curricular connections:** Art activity (outside with a partner using masking tape and chalk, or as individuals on a white paper). (see Appendix A)
Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*
Document camera; Class set of small whiteboard/ whiteboard pens and erasers; a set of two 15-piece unifix cubes of two different colours for each student; Class set of Chromebooks, if possible (if not, could be two students to one Chromebook); connection to a printer; worksheets photocopied for Day 1; Math Learning Center Chrome App should be downloaded on all Chromebooks and Smartboard.

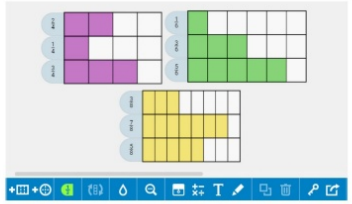
8. LESSON OUTLINE

Instructional Steps	Student Does/Teacher Does *(learning activities to target learning intentions)*	Pacing
OPENING: *e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge*	**DAY 1**: Start with a question/ puzzle: *Which one doesn't belong?* Students can brainstorm ideas about which one doesn't belong and why they think so, giving a reason for their thinking. for example, from : http://www.wodb.ca/numbers.html (or teacher could create one of their own).  	5 mins.

BODY: • *Best order of activities to maximize learning -- each task moves students towards learning intentions* • *Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback* • *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modeling* • *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	Use previous activity to transition to the raveled lesson. Each student should have a small whiteboard, a whiteboard pen and eraser, as well as two sets of 15 unifix cubes of two different colours. The teacher will be up front and writing on either a large whiteboard or Smartboard. ***Critical Discernment #1: Distinguish between Denominator and Numerator*** ***Denominator*** - represents the total number of pieces in the whole (the number on the bottom of the fraction) **eg. 1 / 4** (Show some examples on whiteboard/ Smartboard). ***Represent*** - show an idea in a concrete way (symbols - numbers, pictures, physical objects). Show this distinction in a number of representations: i) Draw a pie on your whiteboard with 4 equal pieces. Those four pieces represent the **denominator**. Now draw a new pie with 5 pieces… 6 pieces… 8 pieces. What would be the denominator in a fraction representing each of these pies? (Students should write their answer on their whiteboard and either hold it up, or teacher will quickly circulate to check responses). Try the same thing with bars divided into different numbers of equal pieces. Do as many examples as necessary to ensure all students understand. Erase whiteboards. Now we introduce the numerator. ***Numerator*** - represents the specific number of pieces in the whole that are indicated (coloured in, eaten, remaining, etc.). (the number on the top of the fraction) **eg. 1 / 4** "Fraction basics" reggae song (stop at 1 min in): https://youtu.be/VxpbMg_WASs Now we will draw two pies each with four parts. On the first pie, colour one section; on the second pie, colour two sections. These coloured-in sections are represented by the **numerator**. This is the number that is written on top of the fraction. For each pie, write a fraction that contains the denominator, 4, representing the whole number of parts and then write the numerator, representing the number of parts that are coloured. (Students will hold up their whiteboards as they are ready and teacher will check everyone's understanding - do as much practice as it takes until everyone shows understanding. Provide extensions to those who need it by giving them fractions with larger denominators to draw). Finally, give students a series of fractions to consider, eg. 3/5, 3/7, 1/3, 2/3. Ask them: Which of these fractions has 3 as its denominator? Which ones have 3 as the numerator? Have them represent each of	25 mins.

	these fractions with the unifix cubes. The number representing the numerator should be a different colour than the rest of the cubes. Model this for the class, eg. 3/7 would have 7 blocks in total and 3 of them would be red, while the rest would be yellow. ***Critical Discernment #2: Which fractions have a common denominator? Can we compare fractions that have a different denominator?*** Provide the students with a new list of fractions, eg. 1/4. 3/6, 5/6, 3/4. Which of these fractions have a **common denominator** (ie. the same denominator)? Write on whiteboards and check for understanding. ***Definition: Compare*** - to examine the differences between numbers, quantities or values to decide if it is greater than, smaller than or equal to another quantity Model on large whiteboard, and have students draw two pies with the same denominator. Then have them colour a different number of pieces in each to represent the numerator, (eg. 1/4 and 3/4). Can we compare these two pies represented by their fractions? How much was eaten of each? Which pie was more eaten? Which pie has the most remaining? (Check answers on whiteboards). Students should make a representation of these fractions with the unifix cubes, eg. 1/4 would have one red cube and three yellow cubes, while 3/4 would have 3 red cubes and 1 yellow cube. Now draw a third pie. This pie should have six sections. Two are coloured. (2/6). Can we easily compare this pie with our other two pies? (When it is represented by an image, we can sometimes 'eyeball it' to compare which pie has more eaten, but when the pies are represented in fraction form, we can only compare the ones with the same denominator). Do some more practice examples on whiteboards. ***Critical Discernment #3: If we want to put fractions in order, they also must have a common denominator.*** ***Order*** - Putting things into their correct place following a stated rule (eg. smallest to largest, largest to smallest) ***Greater (larger) than*** $3 > 1$ (read from Left to Right) ***Less (smaller) than*** $1 < 3$ On whiteboards: Which is greater, 2/3 or 1/3? Which is greater, 2/5 or 4/5? etc. Which is less, 5/6 or 3/6? Which is less, 2/3 or 1/3? Given the following fractions, first work with a partner to represent them with your unifix cubes, then write them on your whiteboard from smallest to largest.	

	3/7, 5/7, 2/7, 1/7, 4/7 - teacher will circulate to check for understanding and decide whether to offer another set of fractions to practice ordering on the whiteboard. Now ask, can we compare these two fractions: 1/2 and 2/3? Represent as pie images on whiteboards, and with unifix cubes. Visually see that we cannot compare the fractions because they have a different denominator (number of total parts). Try it with a couple more examples. Finally, ask students if we can put these fractions in order: 1/2, 3/4, 1/3, 5/6, 3/5? Yes or no on whiteboards. Why not? Give a few more examples of fraction lists with different denominators for practice and formative feedback. Now they will complete a worksheet individually to practice the skills introduced in this lesson (See embedded link, below). They should discuss with a partner if they have a question before asking the teacher. Teacher will collect the worksheets, making sure to check them before the next math block in order to verify understanding and notice any errors or error patterns that are occurring. Worksheet for practice: https://docs.google.com/document/d/14unONDNYpjl83fZHb8GdhQmheEuu0B5SbDPfhVgEab8/edit?usp=sharing ***Extension questions for those who need them:*** Put these fractions in order from **smallest** to **greatest**: 3/19, 6/19, 15/19, 5/19, 17/19, 2/19. Draw a picture to represent these fractions. Put these fractions in order from **greatest** to **smallest**: 15/31, 7/31, 6/31, 25/31, 10/31, 27/31. Draw a picture to represent these fractions. Create a similar challenge for a classmate who is also finished the worksheet. **DAY 2:** ***Opening:*** Youtube video of "Fraction Basics" song from Day 1 for warm-up and review (see above for link). Teacher will review concepts from last block, emphasizing and practicing any areas showing weakness or misunderstanding from the worksheet. The class will engage in retrieval practice using small	20 mins. 45 mins.

	whiteboards to show their thinking (eg. Do these two fractions have common denominators? 1/4 and 3/4? 1/7 and 1/5? **AND** Put these fractions in order from smallest to largest: 2/6, 4/6, 5/6, etc.) Students will have the opportunity to practice the skills introduced in Day 1, building fraction representations on Math Learning Center Chrome App (free to download to Smartboard and Chromebooks). Students will work with a partner on a Chromebook to build specific sets of fractions with common denominators indicated by the teacher. At the end of the lesson, the students will print their screen and hand in the sheet to become part of their Fraction portfolio. Math Learning Center app fractions page: https://apps.mathlearningcenter.org/fractions/ eg. Build the following sets of fractions: i) 2/4, 1/4 and 3/4 ii) 3/5, 1/5 and 5/6 iii) 7/8, 5/8 and ¾. 	
CLOSING: • *Closure tasks or plans to gather, solidify, deepen or reflect on the learning* • *review or summary if applicable* • *anticipate what's next in learning* • *"housekeeping" items (e.g. due dates, next day requirements*	Next Math block we will continue thinking about and exploring ways to represent fractions. In the meantime, as you go about your life at school and at home, try to notice examples of fractions around us (eg. the school bus had 10 windows on one side, and three of them were open - how would we represent that as a fraction?). Bring your example(s) back to share with the class next time.	1-2 min.

9. REFLECTION *(anticipate if possible)*

• *Did any reflection in learning occur, e.g. that shifted the lesson in progress?* • *What went well in the lesson (reflection on learning)?* • *What would you revise if you taught the lesson again?* • *How do the lesson and learners inform you about necessary next steps?* • *Comment on any ways you modeled and acted within the Professional Standards of BC Educators and BCTF Code of Ethics?* • *If this lesson is being observed, do you have a specific observation focus in mind?*
-was this lesson well-raveled, introducing clear critical discernments? -were there areas I needed to either i) lessen the working memory load or ii) provide a clearer juxtaposition of two ideas? -by the end of the lesson, were all learners showing understanding of the new concepts? -did the class have the right background knowledge to be prepared for this lesson? If not, what was missing? -did I have enough extension questions prepared in advance for those learners who were ready?

Appendix A - Art Project (Cross-curricular connection)

References/ Resources

Equatio - Math made digital - Chrome App. Worksheet created using Equatio. Downloadable.

Fraction Basics - Proper Improper Mixed Song - Learn Fractions. By learningupgrade.com. Retrieved from https://youtu.be/VxpbMg_WASs

Lee, Erick. *Which one doesn't belong?* Math Puzzles. Retrieved from http://www.wodb.ca/numbers.html

Math Learning Center Chrome App. https://apps.mathlearningcenter.org/fractions/

Math Minds Online. Unit 1.
https://www.structuringinquiry.com/math-minds-online-course-launch-page/?wppb_cpm_redirect=yes

An Art Idea to Include

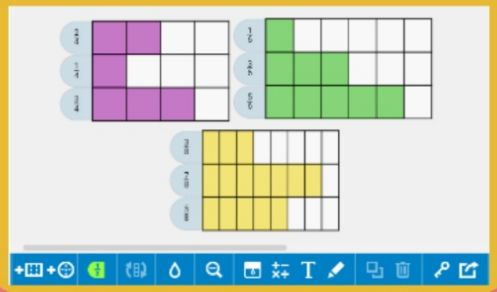
Could be done individually, on a white paper, or outside with a group, using masking tape to make the frame and chalk to colour the sections. Count the total number of sections and then count how many sections of each colour. Represent the fractions numerically and compare.

Some useful resources from the lesson:

- Equatio - Make Math Digital - Google Extension (free for educators). Used to create worksheet: https://docs.google.com/document/d/14unONDNYpjl83fZHb8GdhQmheEuu0B5SbDPfhVgEab8/edit?usp=sharing

- *Fraction Basics - Proper Improper Mixed Song - Learn Fractions*. By learningupgrade.com. Retrieved from https://youtu.be/VxpbMg_WASs

- Math Learning Center Chrome App. (Build fractions visually). https://apps.mathlearningcenter.org/fractions/



Week 3

Overview

Estimating & Comparing Fractions Using Benchmarks

Activities & Resources

Lesson Plans

Lesson Overview

The *goal* of this lesson is to introduce students to, and work toward mastery of, *estimating and comparing fractions using benchmarks* - a known size or amount that helps us understand a different size or amount
e.g. 0, 1/2, & 1

Specifics

Curricular Ties

Lesson Specifics

Allotted Time: 2 x 45-minute blocks with detailed plans
3 x 45-minute blocks for games & unfinished tasks

Focus: Estimating & comparing fractions using the the "Benchmark Strategy"

Why?: Allows students to estimate & compare fractions that have different numerators and denominators without having to find a common denominator and multiply, which is challenging for young learners.

How?: Explicit instruction, discussion, interactive activities, games & guided practice.

Tools: Models and visual aids - area models, fraction strips, fraction circles, and number lines.

WEEK IN A GLANCE

Monday - Block 1 (outline included):

1st, students will be introduced to the strategy, watch an *explanatory video* & discuss the strategy's usefulness. 2nd, students will participate in a *class activity* where they will *create a model of a number line* (i.e. stretch a long piece of string across the front of the classroom and clip on benchmarks 0, ½, and 1). Then, each student will get a different fraction card, which they will clip on the number line according to where they think it goes relative to the benchmarks (i.e. is it closest to 0, ½ or 1?). Once all students' cards have been clipped, we will move along the number line and discuss each card's positioning—adjusting, reasoning, and moving as needed. 3rd, students will pair up with a partner (or two) to do a *Think-Pair-Share activity*. Each pair/ group will get a whiteboard, a dry-erase marker, and an eraser, and will have to work together to answer a set of questions (i.e. *Task Cards*), which will be displayed on the Smartboard. The class will come back together, and groups will share and discuss their answers. Further Task Cards can be displayed on the Smartboard and completed if time permits.

Tuesday (outline not included):

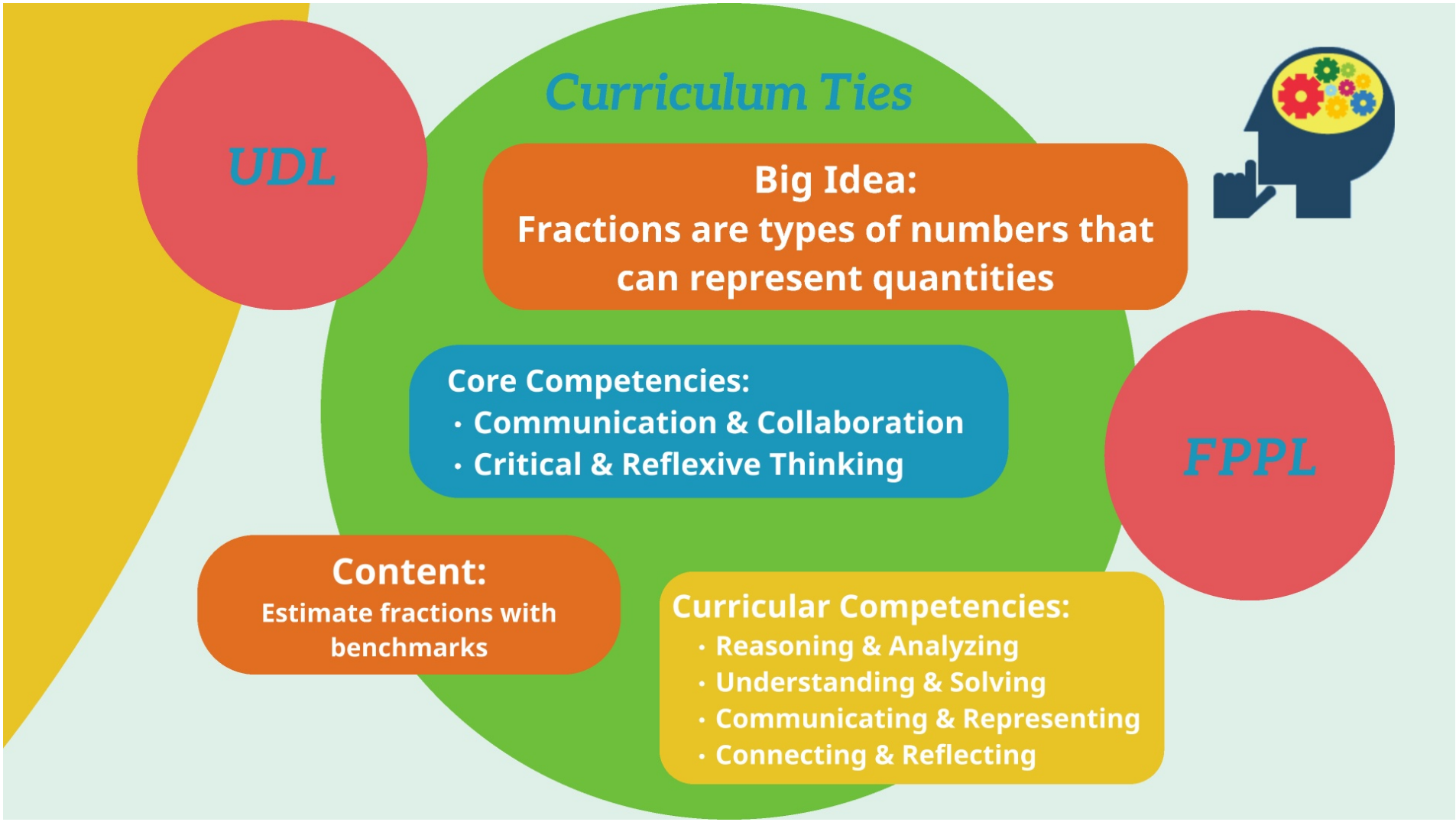
Time allotted for *Task Card completion* and further practice (*see supplemental resources* for "*Benchmark Flash Cards*" and other *games*).

Wednesday - Block 2 (outline included):

1st, students will *review* what was covered in the first block (by way of *1-2 short videos*). 2nd, students will work together to complete a whole class "Benchmark Fractions" *digital sort*, which will be displayed on the Smartboard. 3rd, students will complete a *final pencil-to-paper task* (i.e. a booklet) that will allow them to show their understanding and solidify the curriculum learning intentions (i.e. the "*Do-Know-Understand*").

Thursday & Friday (outlines not included):

Time allotted for *completion of work booklet*. Early finishers can play the "*Comparing Fractions Game*" at the end of the booklet.

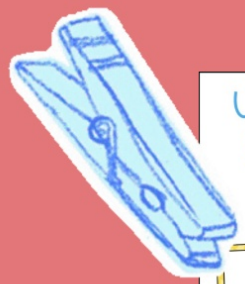

UDL
Curriculum Ties
Big Idea:
Fractions are types of numbers that can represent quantities
Core Competencies:
• Communication & Collaboration
• Critical & Reflexive Thinking
FPPL
Content:
Estimate fractions with benchmarks
Curricular Competencies:
• Reasoning & Analyzing
• Understanding & Solving
• Communicating & Representing
• Connecting & Reflecting

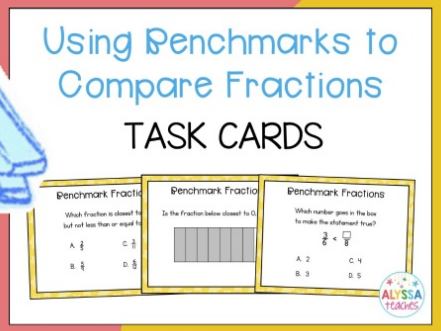
Universal Design for Learning

Lessons will aim for a lively pace, consist of explicit oral and visual instruction, and be interwoven with technology and hands-on activities to engage all learners.

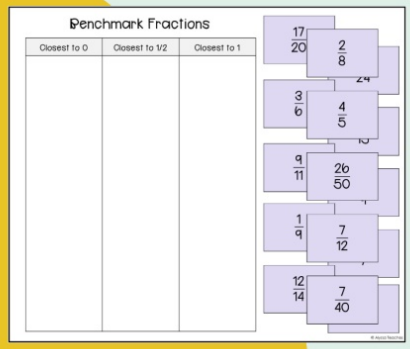
First Peoples Principles of Learning

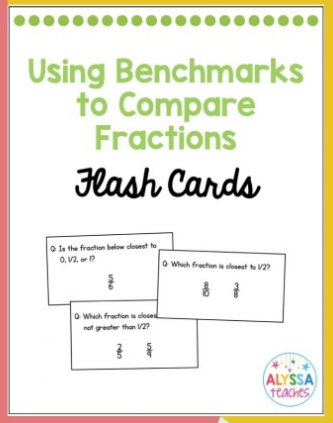
- Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.
- Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
- Learning involves recognizing the consequences of one's actions.
- Learning involves patience and time.

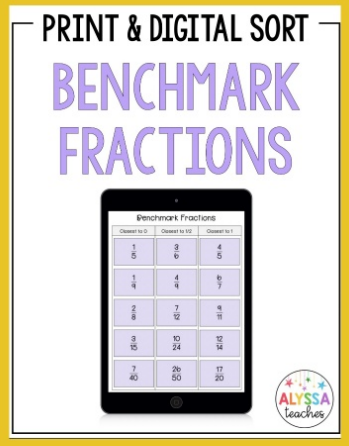


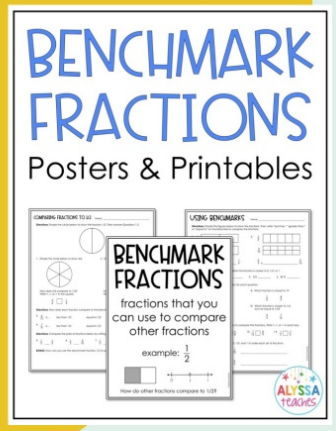


Activities & Resources









FUN

Lesson Plan

SHAPING LITTLE MINDS

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

LESSON PLAN

Candidate's name: Joni Hesselgrave

Grade/Class/Subject:	Grade 4 Mathematics	School:	Any School
Date:	TBD	Allotted Time:	2 x 45 minutes
Topic/Title:	Estimating & Comparing Fractions Using Benchmarks		

1. LESSON ORIENTATION
Key resources: Instructional Design Map

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.

In this lesson, which is spread over **two 45-minute math blocks**, students will be introduced to, and work toward mastery of, estimating and comparing fractions using benchmarks (a known size or amount that helps us understand a different size or amount). I call this the "Benchmark Strategy" and it is extremely useful for estimating and comparing fractions that have different numerators and denominators as it eliminates the need to find a common denominator and multiply (which can be challenging for young learners). Instead, students are encouraged to use models and visual aids (area models, fraction strips, fraction circles, or a number line) to estimate and compare fractions using benchmarks (i.e., zero, half, and a whole).

Monday - Block 1 (outline included):
First, students will be introduced to the strategy, watch an *explanatory video*, and discuss the strategy's usefulness.

Second, students will participate in a *whole class activity* where they will create a model of a number line (i.e. stretch a long piece of string across the front of the classroom and clip on benchmarks 0, ½, and 1). Then, each student will get a different fraction card, which they will clip on the number line according to where they think it goes relative to the benchmarks (i.e. is it closest to 0, ½ or 1?). Once all students' cards have been clipped, we will move along the number line and discuss each card's positioning—adjusting, reasoning, and moving as needed.

Third, students will pair up with a partner (or two) to do a *Think-Pair-Share activity*. Each pair/group will get a whiteboard, a dry-erase marker, and an eraser, and will have to work together to answer a set of questions (i.e. Task Cards), which will be displayed on the Smartboard. The class will come back together and groups will share and discuss their answers. Further Task Cards can be displayed on the Smartboard and completed if time permits.

Tuesday (outline not included):
Time allotted for Task Card completion and further practice (see supplemental resources for "Benchmark Flash Cards" and other games).

Wednesday - Block 2 (outline included):
First, students will *review* what was covered in the first block (by way of 1-2 short videos).

Second, students will work together to complete a whole class "Benchmark Fractions" *digital sort*, which will be displayed on the Smartboard.

Third, students will complete a final *pencil-to-paper* task (i.e. the booklet) that will allow them to show their understanding and solidify the curriculum learning intentions (i.e. the "Do-Know-Understand").

Thursday & Friday (outlines not included):
Time allotted for completion of work booklet. Early finishers can play the "Comparing Fractions Game" at the end of the booklet.

1

Lesson Plan Cont'

2. CORE COMPETENCIES

Key resources: https://curriculum.gov.bc.ca/competencies

Core /Sub-Core Competencies *(check all that apply):*	*Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.*
✓ COMMUNICATION – Communicating ✓ COMMUNICATION – Collaborating ☐ THINKING – Creative Thinking ✓ THINKING – Critical Thinking ✓ THINKING – Reflective Thinking ☐ PERSONAL AND SOCIAL – Personal Awareness and Responsibility ☐ PERSONAL AND SOCIAL – Positive Personal and Cultural Identity ☐ PERSONAL AND SOCIAL – Social Awareness and Responsibility	C Communicating encompasses the set of abilities that people use to impart and exchange information, experiences, and ideas; to explore the world around them; and to understand and effectively use communication forms, strategies, and technologies. • Students will be active listeners, make connections, and ask clarifying and extending questions when appropriate. • Students will share their ideas and try to connect them to others' ideas. • Students will represent mathematical ideas and concepts in concrete, pictorial, and symbolic forms. C Collaborating involves the skills, strategies, and dispositions that people use to work together to pursue common purposes and accomplish common goals. People who collaborate effectively recognize how combining others' perspectives, strategies, and efforts with their own enhances collective understanding, use, and impact. They value the contributions of group members, interact supportively and effectively using inclusive practices, and strive for shared commitment and mutual benefit. • Students will contribute during group activities, cooperate with others, and listen respectfully to their ideas. • Students will collaborate with a partner to practice and understand estimating and comparing fractions using benchmarks (i.e. during the Think-Pair-Share Activity). T Critical and Reflective Thinking encompasses a set of abilities that students use to examine their own thinking and that of others. This involves making judgments based on reasoning, where students consider options, analyze options using specific criteria, and draw conclusions. People who think critically and reflectively are analytical and investigative, willing to question and challenge their own thoughts, ideas, and assumptions and challenge those of others. They reflect on the information they receive through observation, experience, and other forms of communication to solve problems, design products, understand events, and address issues. A critical

	thinker uses their ideas, experiences, and reflections to set goals, make judgments, and refine their thinking. • Students will engage in mathematical inquiry, identifying and investigating fractions and benchmarks. • Students will explore with a purpose and use the Benchmark Strategy to estimate & compare fractions. • Students will explore the possibilities that open up when they use benchmarks and reflect on the process. • Students will apply critical, metacognitive, and reflective thinking in applying the Benchmark Strategy, and will relate this thinking to other experiences, using this process to identify ways to improve or adapt their approach to learning. • Students will reflect on and assess their experiences, thinking, learning process, work, and progress in using benchmarks to estimate & compare fractions. • Students will give, receive, and act on feedback.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES

Key resources: First Peoples Principles of Learning (FPPL); Aboriginal Worldviews and Perspectives in the Classroom

FPPL to be included in this lesson *(check all that apply):*	*How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?*
✓ Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. ✓ Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). ✓ Learning involves recognizing the consequences of one's actions. ☐ Learning involves generational roles and responsibilities. ☐ Learning recognizes the role of Indigenous knowledge. ☐ Learning is embedded in memory, history, and story. ✓ Learning involves patience and time. ☐ Learning requires exploration of one's identity. ☐ Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.	In our Mathematics lessons, students are encouraged to be patient and kind to themselves and each other as they learn new concepts. Lessons will be delivered via open, non-judgmental group discussions, built upon positive teacher/student and student/student relationships and connections. Ideas and concepts will be learned experientially, through a mixture of explicit instruction, modeling, scaffolded support, practice, and student-doing.

4. BIG IDEAS

Key resources: https://curriculum.gov.bc.ca/
(choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?
Big Idea: Fractions are types of numbers that can represent quantities.
Essential Question: How can we use benchmarks to estimate and compare fractions?

5. LEARNING STANDARDS/INTENTIONS

Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum)

Curricular Competencies: *What are students expected to do?*	**Content:** *What are students expected to learn?*
During this lesson, students will participate in large and small group discussions and activities, as well perform independent work. In this lesson, students are expected to **DO** the following: **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. **3. Communicating and representing** • Communicate mathematical thinking. • 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.	Prior to this lesson, students will know that fractions are numerical quantities that represent parts of a whole, each with a denominator indicating the number of equal parts that make up the whole, and a numerator indicating the number of equal parts used or taken from the whole. They will also know how to compare fractions with common numerators and common denominators. In this lesson, students are expected to **KNOW** the following: • How to estimate and compare fractions with uncommon numerators and denominators using benchmarks. 

6. ASSESSMENT PLAN

Key resources: Instructional Design Map and https://curriculum.gov.bc.ca/classroom-assessment

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?
Students will demonstrate their learning and understanding of estimating and comparing fractions using benchmarks (i.e. the Benchmark Strategy) several ways: 1. By *engaging* in the classroom discussions, and with the explanatory videos. 2. By *participating* in the whole class number line model/activity. 3. By *working collaboratively to solve* the Task Cards in the Think-Pair-Share activity. 4. By *contributing* to the whole class "Benchmark Fractions" digital sort. 5. By *self-assessing* their understanding in thumbs up/down polls. 6. By *completing* the final, **summative,** pencil-to-paper task (i.e. the booklet). Students will receive **formative feedback** at each stage of learning. Student booklets will be handed in at the end of the block so that the teacher can review and provide feedback to students on where they are in their learning (vs. where they need to be) before the next block. Instruction can then be adjusted, with the teacher reviewing and/or re-teaching when necessary, to whomever necessary. Students will complete corrections in their booklets before handing them in at the end of the week for **summative feedback.** Throughout the week, students will have ample opportunity to practice, gain teacher feedback, and receive extra support as they work toward mastery of the concept.

7. DESIGN CONSIDERATIONS

Key resources: Instructional Design Map

Make brief notes to indicate how the lesson will meet needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.
It is essential that all students be included in the lessons and work blocks. Effective UDL strategies (tailored to the classroom and students) will be utilized to ensure that lessons and tasks are accessible to all learners. Lessons will aim for a lively pace, consist of explicit oral and visual instruction, and be interwoven with technology and hands-on activities to engage all learners. Composite tasks will be broken down into steps and parts, and the robust whole class discussions and Think-Pair-Share activity will be geared toward an intensified understanding that will prepare students for independent work. When necessary, additional support and further accommodations will be made for individual students.
Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*
Purchase and download the following supplemental resources, which are used in this lesson: *Alyssa teaches. Benchmark Fractions Bundle.* TpT. https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Bundle-4395187

For Block 1:

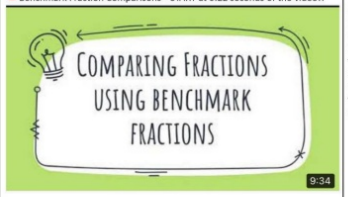
- Open the following video and have it ready to display on the Smartboard (starting at 0:22):
  - Benchmark Fraction Comparisons
- Buy or collect a long piece of string and enough clothespins/clips to complete the number line model.
- Print & cut enough fraction cards from "Using Benchmarks to Compare Fractions: Flash Cards." (Alyssa teaches' *Benchmark Fractions Bundle.* TpT). Might need to make more depending on the size of the class.
- Open "Using Benchmarks to Compare Fractions: TASK CARDS." (Alyssa teaches' *Benchmark Fractions Bundle.* TpT) and have ready/oriented to display on the Smartboard (for Think-Pair-Share activity).
- Ensure that there are enough whiteboards, dry erase markers, and erasers for the Think-Pair-Share activity.

For Block 2:

- Open the following videos and have them ready to display on the Smartboard:
  - Compare fractions using the benchmark fraction 1/2
  - Compare fractions using the benchmark of one whole
- Open "Print & Digital Sort: Benchmark Fractions" (Alyssa teaches' *Benchmark Fractions Bundle.* TpT) and then click the link to open the Google Slide containing the digital sort. Have ready for the class activity.
- Have visuals of "Benchmark Fractions", "Fraction Strips" & "Fraction Circles" on the computer, ready to display (attached at the end of this lesson).
- Photocopy "Benchmark Fractions", "Fraction Circles", and "Fraction Strips" - one per student.
- Open "Benchmark Fractions: Poster & Printables" (Alyssa teaches' *Benchmark Fractions Bundle.* TpT) and have it ready to show on the Smartboard.
- Print/Photocopy booklets (double sided) - pages 3-8 of "Benchmark Fractions: Poster & Printables."
- Print the booklet's answer key for marking - pages 9-12 of "Benchmark Fractions: Poster & Printables."

8. LESSON OUTLINE - BLOCK 1 - 45 minutes

Instructional Steps	**Student Does/Teacher Does** *(learning activities to target learning intentions)*	**Pacing**
OPENING: *e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge*	Cue ALL students that it is time for Math, referring them to the visual schedule. When students are seated, organized, quiet, and "eyes on," say: "Today, you will be introduced to a new strategy that will help you compare fractions with uncommon numerators and denominators. This strategy is called the 'Benchmark Strategy' because it uses benchmarks—a known size or amount that helps us understand a different size or amount. It is a visual strategy and can be performed using area models, fraction strips, fraction circles, or a number line. After some practice, you will be able to do much of this estimating and comparing mentally, by simply picturing the fractions in your brain and comparing it to the benchmarks of 0, ½, and 1."	Quick transition to lesson; interactive and lively pace. (2.5 min)

BODY: • *Best order of activities to maximize learning -- each task moves students towards learning intentions* • *Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback* • *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modeling* • *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	I DO: Show the introductory video, pausing as needed to engage students in discussion and allow them time to digest and understand the information. STUDENTS DO: Quietly watch and listen to the video. Engage in class discussion when the video is paused. Benchmark Fraction Comparisons - START at 0:22 seconds of the video!!  I DO: Say, "as you can see, this strategy is particularly useful for comparing fractions with uncommon numerators and denominators as it eliminates the need to find a common denominator and perform multiplication." I DO: Ask students if they have any questions or concerns. STUDENTS DO: Raise questions and/or concerns. I DO: Answer student questions and concerns. I DO: Then say, "Ok, now it's time for us to take what we have learned about the Benchmark Strategy and put it into action! Are you ready?!?" STUDENTS DO: Show enthusiasm and get ready to participate. I DO: Explain the whole class number line modeling activity by saying, "Ok, we are going to make a model of a number line by stretching a long piece of string across the front of the classroom. Then, I am going to have three volunteers clip the benchmarks 0, ½, and 1 onto the correct spot on the number line. Then, each student is going to get a different fraction card, which they will have to clip onto the number line according to where they think it goes relative to the benchmarks (i.e. is it closest to 0, ½ or 1?). I will call students up one at a time; once all students' cards have been clipped, we will go along the number line and discuss each card's positioning—adjusting, reasoning, and moving as needed. Does anyone have any questions about what we are going to do?"	Interactive, Responsive and lively pace. Redirect students who go off-task as needed. (10 min instruction, followed by 30 min to complete the activities)

STUDENTS DO: Raise questions and/or concerns. Most likely ask if they can be the ones to put up the benchmark fractions.

I DO: Answer student questions and concerns. Then, choose three students to take on the role of placing the benchmarks, and two students to hold the ends of the string (best done randomly if you have names on popsicle sticks). Then, unroll the string, cut to length, and have the two "holders" take their positions at the front of the class (one on each side).

I DO: Ask the three students with benchmarks to place them on the number line using the clips provided. Guide if necessary.

STUDENTS DO: Clip the three benchmarks (0, ½, and 1) on the number line.

I DO: Hand all the other students a clothespin/clip and a fraction card. Then, one at a time, call students up to place their cards where they think they should go–using what they have learned about the Benchmark Strategy.

STUDENTS DO: Go up, when called, and place a fraction card where they think it should be relative to the benchmarks (i.e. Is it closest to 0, ½ or 1? How close?)

I DO: Once all the fraction cards have been placed, say "ok, let's see how we did!" Move along the number line and discuss each card's positioning—adjusting, reasoning, and moving as needed. Talk aloud and probe students with questions and queries that will get them engaged and solidify understanding. Once everyone is satisfied with all of the fraction card placements, congratulate the class, and praise them on their ability to work together and use the Benchmark Strategy.

I DO: Ask students to retrieve the cards and clips off the string (doesn't have to be the one they originally had) and put them in the bin provided. Thank the "holders" and have them put the string in the bin as well.

STUDENTS DO: Retrieve the fraction cards and clips and place them in the bin, along with the string.

I DO: Say, "Ok, let's continue practicing this strategy. When I say, you will need to find a partner (or two) who you are able to work well with. Together, you will solve a series of tasks using the Benchmark Strategy. You will have 3-5 minutes to solve 4 questions, which will be displayed on the Smartboard. You will write your answers on a whiteboard and must be prepared to share your solutions with the class when the time is up. Once you are in your group, one member of each group will need to come and get a whiteboard, a dry-erase marker, and an eraser. Then, find a place to sit where you can see the Smartboard clearly. Does anyone have any questions before we begin?"

STUDENTS DO: Raise questions and/or concerns.

I DO: Answer student questions and concerns. Then say, "ok, it's time to get into your pairs or small groups and collect your supplies!"

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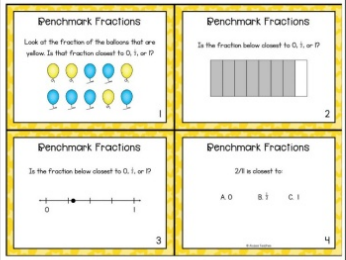
(Alternatively, groups could be decided by the teacher).

STUDENTS DO: Form pairs/groups, collect supplies, and find a spot to sit.

I DO: Once everyone is ready and eyes on, display the first set of task cards:



STUDENTS DO: Work in pairs/groups to solve the four questions and then write down their answers on the whiteboards (i.e. 1A, 2A, 3A, and 4A).

I DO: Circulate the room to observe, listen, probe student thinking, and offer feedback/guidance.

I DO: Once groups are showing they are getting close to being done, tell them that they have 20 seconds to finish up. Countdown from 5 seconds, hand raised, and wait for students' attention.

STUDENTS DO: Finish up and sit quietly when the teacher has gotten to 1.

I DO: Ask groups to share their answers.

WE DO: Have a class discussion. Pairs/groups share while the teacher guides, offers feedback, and probes further thinking.

If time, additional sets of questions can be displayed on the Smartboard and completed in the same fashion (time permitting).

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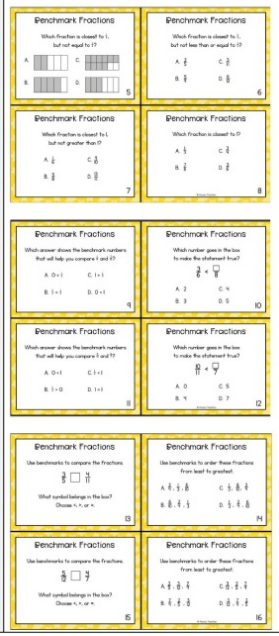
Additional task cards:



10

CLOSING: • *Closure tasks or plans to gather, solidify, deepen or reflect on the learning* • *review or summary if applicable* • *anticipate what's next in learning* • *"housekeeping" items (e.g. due dates, next day requirements*	Cue students that it is nearing the end of Math and that they need to wrap up what they are working on. Let them know that they will have more time tomorrow to work on completing further task cards. Ask students to relate their level of understanding by a show of "thumbs up" (I get it), "thumbs in the middle" (I get some of it), or "thumbs down" (I am confused/do not get it). Cue ALL students to move on to the next activity/scheduled task	Wrapping it up! (2.5 min)

9. REFLECTION - Block 1

• *Did any reflection in learning occur, e.g. that shifted the lesson in progress?* • *What went well in the lesson (reflection on learning)?* • *What would you revise if you taught the lesson again?* • *How do the lesson and learners inform you about necessary next steps?* • *Comment on ways you modeled & acted within the Professional Standards of BC Educators & BCTF Code of Ethics?* • *If this lesson is being observed, do you have a specific observation focus in mind?*
*To be completed at the end of the lesson/block.

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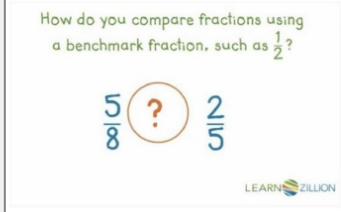
LESSON OUTLINE - BLOCK 2 - 45 Minutes

Instructional Steps	Student Does/Teacher Does *(learning activities to target learning intentions)*	Pacing
OPENING: *e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge*	Cue ALL students that it is time for Math, referring them to the visual schedule. When students are seated, organized, quiet, and "eyes on," say: "Today, we will start by watching a few videos to review and refresh what we previously learned about estimating and comparing fractions using benchmarks–that is, our Benchmark Strategy. Then, we will work as a class to complete a 'Benchmark Fractions' *digital sort*. Finally, you will work independently to complete a work booklet that will allow you to show your understanding and solidify your learning!"	Quick transition to lesson; interactive and lively pace. (2.5 min)
BODY: • *Best order of activities to maximize learning -- each task moves students towards learning intentions* • *Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback* • *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modeling* • *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	I DO: Show the following videos to help review and solidify the information that was covered in Block 1. Pause as needed to engage students in discussion, and allow them time to digest and understand the information. If students seem to be catching on, only show the first video; if it appears they need more clarification, watch the second video as well. STUDENTS DO: Quietly watch and listen to the videos. Engage in class discussion when the videos are paused. Compare fractions using the benchmark fraction 1/2  Compare fractions using the benchmark of one whole	Interactive, Responsive and lively pace. Redirect students who go off-task as needed. (10 min instruction, followed by 30 min to complete the activities)

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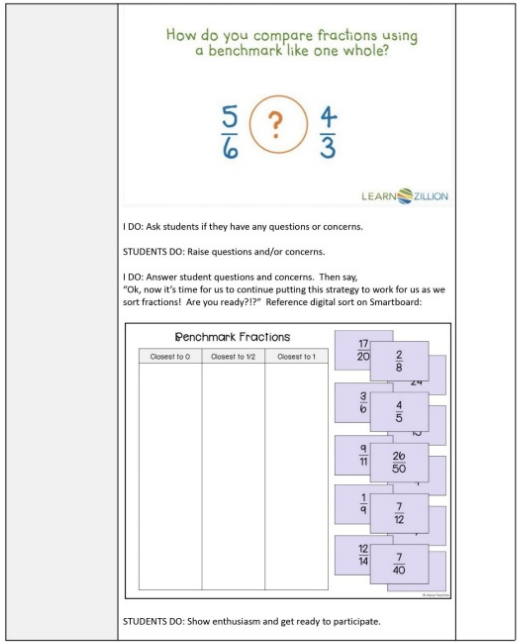

I DO: Ask students if they have any questions or concerns.

STUDENTS DO: Raise questions and/or concerns.

I DO: Answer student questions and concerns. Then say,
"Ok, now it's time for us to continue putting this strategy to work for us as we sort fractions! Are you ready?!?" Reference digital sort on Smartboard:

STUDENTS DO: Show enthusiasm and get ready to participate.

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	I DO: Explain that, like in the last block with the number line, we will be using the benchmark strategy to sort fractions; this time into columns instead of along the number line. Here, all they have to do is decide whether each fraction is "Closest to 0", "Closest to ½", or "Closest to 1". I DO: Ask students if they have any questions or concerns. STUDENTS DO: Raise questions and/or concerns. I DO: Answer student questions and concerns. Then, one by one, ask students to come up and place digital fraction cards into correct columns. STUDENTS DO: Come up, when called, and move a digital fraction card into the column where they think it belongs (i.e. "Closest to 0", "Closest to ½", or "Closest to 1"). I DO: Once all of the digital fraction cards have been sorted, say "ok, let's see how we did!" Go through each column and discuss each card's positioning—adjusting, reasoning, and moving as needed. Talking aloud and probing students with questions and queries that will get them engaged and solidify understanding. Once everyone is satisfied with the digital fraction card placements, congratulate the class on a job well done! STUDENTS DO: Be proud of themselves! I DO: Say, ok, "now it's time for each of you to show what you know by completing an independent *pencil-to-paper* task–a booklet that will bring together what you know about fractions in general to what you now know about estimating and comparing fractions using benchmarks! This task will help solidify your understanding and prepare you for future fraction work." I DO: On the Smartboard, bring up and review the following visual aids: "Benchmark Fractions", "Fraction Strips" & "Fraction Circles." Let students know that these tools will be available at the front for their reference when they are working on the booklet. Then, bring up pages 3-8 of "Benchmark Fractions: Poster & Printables" and review with students so that they understand the types of questions in the booklet. STUDENTS DO: Listen attentively. Raise hands if they have questions or concerns. I DO: Once all of the pages have been reviewed and students know what to expect, ask if there are any further questions or concerns. STUDENTS DO: Raise questions and/or concerns. I DO: Answer student questions and concerns. Then, let students know that they have the rest of the math block–and additional time tomorrow and the next day–to complete the booklet. If they get stuck, they are encouraged to ask for support. Guidance and feedback will be provided to all!	

	I DO: Have the hand-out helpers distribute the photocopied booklets and remind students that this must be done in pencil and that they are welcome to grab any of the visual aids from the front table (reference the stacks of photocopied "Benchmark Fractions", "Fraction Strips" & "Fraction Circles"). STUDENTS DO: Get out their pencils, grab any visual tools they want, and start working on the booklet. I DO: Circulate the classroom to offer support, guidance, and feedback.	
CLOSING: ● *Closure tasks or plans to gather, solidify, deepen or reflect on the learning* ● *review or summary if applicable* ● *anticipate what's next in learning* ● *"housekeeping" items (e.g. due dates, next day requirements*	Cue students that it is nearing the end of Math and that (1) they should wrap up the question they are working on, and (2) hand in what they have completed (with their name clearly indicated). Ask students to relate their level of understanding by a show of "thumbs up" (I get it), "thumbs in the middle" (I get some of it), or "thumbs down" (I am confused/do not get it). Let students know that I will return their practice questions tomorrow, with feedback, and that there will be time for them to do corrections, ask clarifying questions, and gain more practice. Cue ALL students to move on to the next activity/scheduled task	Wrapping it up! (2.5 min)

REFLECTION - Block 2

● *Did any reflection in learning occur, e.g. that shifted the lesson in progress?* ● *What went well in the lesson (reflection on learning)?* ● *What would you revise if you taught the lesson again?* ● *How do the lesson and learners inform you about necessary next steps?* ● *Comment on ways you modeled & acted within the Professional Standards of BC Educators & BCTF Code of Ethics?* ● *If this lesson is being observed, do you have a specific observation focus in mind?*
*To be completed at the end of the lesson/each block.

Supplemental Resources:

Alyssa teaches (2014). "Using Benchmarks to Compare Fractions: TASK CARDS." In, *Benchmark Fractions Bundle*. TpT. Purchased and downloaded June 7, 2022 from https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Bundle-4395187

Alyssa teaches (2015). "Using Benchmarks to Compare Fractions: Flash Cards." In, *Benchmark Fractions Bundle*. TpT. Purchased and downloaded June 7, 2022 from https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Bundle-4395187

Alyssa teaches (2016). "Print & Digital Sort: Benchmark Fractions." In, *Benchmark Fractions Bundle*. TpT. Purchased and downloaded June 7, 2022 from https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Bundle-4395187

Alyssa teaches (2019). "Benchmark Fractions: Posters & Printables."In, *Benchmark Fractions Bundle*. TpT. Purchased and downloaded June 7, 2022 from https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Bundle-4395187

Fraction Cards for Number Line Model Activity

Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{5}{6}$	Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{1}{8}$
Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{2}{9}$	Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{10}{12}$
Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{9}{11}$	Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{3}{6}$
Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{5}{12}$	Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{0}{4}$
Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{4}{7}$	Q: Is the fraction below closest to 0, 1/2, or 1? $\frac{6}{11}$

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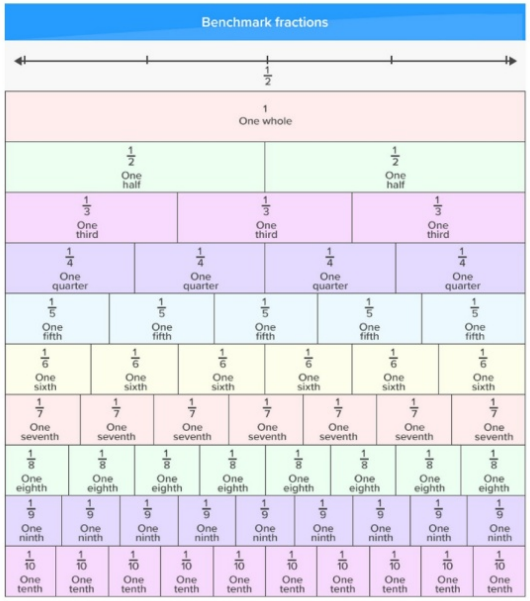
Additional Resources - Copy for students to use as tools when completing the booklet



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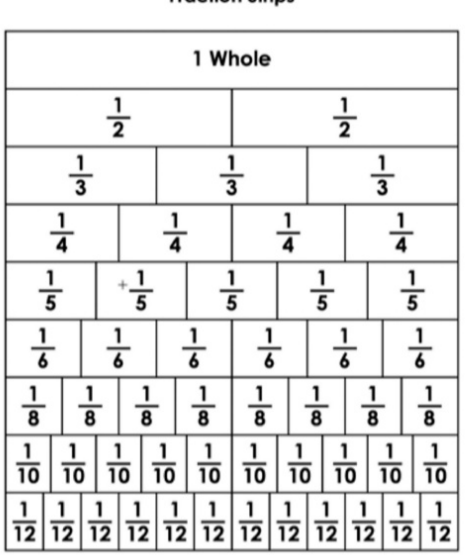
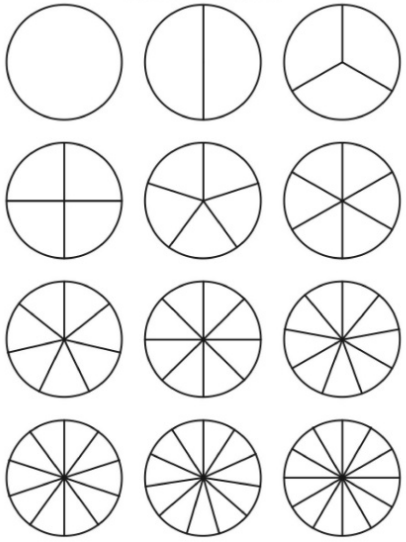


19

Black Line Fraction Circles



Free Math Worksheets at http://www.math-drills.com

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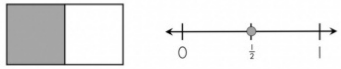
Pg 3- 8 of the "Booklet" - from Alyssa Teaches: "Benchmark Fractions: Posters & Printables." TpT.
https://www.teacherspayteachers.com/Product/Benchmark-Fractions-Poster-and-Worksheets-4395177

BENCHMARK FRACTIONS

fractions that you can use to compare other fractions

example: $\frac{1}{2}$



How do other fractions compare to 1/2?

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FRACTIONS EQUAL TO 1/2

Name: _____

Directions: Shade exactly one-half of each figure below. Write the numerator to complete each fraction.

1.  $\frac{\_}{2}$
2.  $\frac{\_}{4}$
3.  $\frac{\_}{6}$
4.  $\frac{\_}{8}$
5.  $\frac{\_}{10}$
6.  $\frac{\_}{12}$

7. Each fraction above is equivalent to 1/2. What is true about each fraction?
   - The numerator is _____ *(half of or double)* the denominator.
   - You can divide the denominator by _____ to get the numerator.
8. What are some other fractions that are equal to 1/2? Write some examples below.
9. Lara wants to split a pizza with her brother. The pizza has been cut into 20 slices. How many slices will Lara get if they share the pizza fairly? Write your answer as a fraction.
10. Hector is at basketball practice. He made exactly half of the 14 shots he took from the 3-point line. How many 3-pointers did he make? Write your answer as a fraction.

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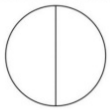
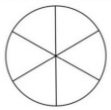
COMPARING FRACTIONS TO 1/2

Name: _____

Directions: Shade the circle below to show the fraction 1/2. Then answer Questions 1-2.



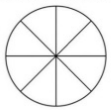
1. Shade the circle below to show 4/6.



How does 4/6 compare to 1/2?
Write <, >, or = in the square.

$\frac{4}{6}$ ☐ $\frac{1}{2}$

2. Shade the circle below to show 3/8.



How does 3/8 compare to 1/2?
Write <, >, or = in the square.

$\frac{3}{8}$ ☐ $\frac{1}{2}$

Directions: How does each fraction compare to the benchmark 1/2? Circle the correct answer.

3. $\frac{4}{12}$ is... less than 1/2 equal to 1/2 more than 1/2

4. $\frac{7}{8}$ is... less than 1/2 equal to 1/2 more than 1/2

Directions: Compare the pairs of fractions below by writing <, >, or = on each line.

5. $\frac{1}{3}$ ___ $\frac{1}{2}$ 6. $\frac{1}{2}$ ___ $\frac{5}{10}$ 7. $\frac{1}{2}$ ___ $\frac{5}{6}$ 8. $\frac{5}{4}$ ___ $\frac{1}{2}$

BONUS: How can you use the benchmark fraction 1/2 to quickly compare 4/8 and 9/10?

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FRACTIONS ON THE NUMBER LINE

Name: _____

Directions: Show where each fraction is on the number line. (You may want to label the number line first.) Is it closest to the benchmark of 0, 1/2, or 1? Check the correct column in the chart.

FRACTION	NUMBER LINE	0	1/2	1
$\frac{2}{4}$	0 — 1			
$\frac{1}{6}$	0 — 1			
$\frac{5}{8}$	0 — 1			
$\frac{4}{10}$	0 — 1			

FRACTIONS ON THE NUMBER LINE

Name: _____

Directions: Show where each fraction is on the number line. (You may want to label the number line first.) Is it closest to the benchmark of 0, 1/2, or 1? Check the correct column in the chart.

FRACTION	NUMBER LINE	0	1/2	1
$\frac{2}{4}$	0 — 1			
$\frac{1}{6}$	0 — 1			
$\frac{5}{8}$	0 — 1			
$\frac{4}{10}$	0 — 1			

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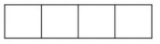
USING BENCHMARKS

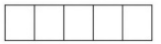
Name: _____

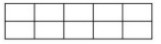
Directions: Shade the figures below to show the fractions. Then write "less than," "greater than," or "equal to" on the blank line to compare the fractions.

1. $\frac{1}{2}$ 

$\frac{1}{4}$ 

$\frac{1}{2}$ is _____ $\frac{1}{4}$

2. $\frac{2}{5}$ 

$\frac{6}{10}$ 

$\frac{2}{5}$ is _____ $\frac{6}{10}$

Directions: On each line, write whether the fraction is closest to 0, 1/2, or 1.

3. 6/7 _____ 4. 2/12 _____ 5. 3/5 _____ 6. 8/10 _____

Directions: Circle the correct fraction for each question.

7. Which fraction is closest to 0?

$\frac{4}{6}$ $\frac{1}{3}$

8. Which fraction is closest to 1?

$\frac{7}{8}$ $\frac{4}{9}$

9. Which fraction is closest to 1/2, but not greater than 1/2?

$\frac{8}{12}$ $\frac{2}{5}$

10. Which fraction is closest to 1/2, but not equal to 1/2?

$\frac{2}{4}$ $\frac{7}{16}$

Directions: Use benchmark fractions to compare the fractions. Write <, >, or = in each box.

11. $\frac{9}{10}$ ☐ $\frac{1}{2}$ 12. $\frac{3}{6}$ ☐ $\frac{4}{8}$ 13. $\frac{7}{12}$ ☐ $\frac{8}{9}$ 14. $\frac{1}{5}$ ☐ $\frac{7}{6}$

Directions: Use the benchmarks of 0, 1/2, and 1 to order each set of fractions.

15. least to greatest $\frac{3}{6}$ $\frac{6}{8}$ $\frac{2}{10}$ _____

16. greatest to least $\frac{1}{4}$ $\frac{9}{9}$ $\frac{5}{6}$ _____

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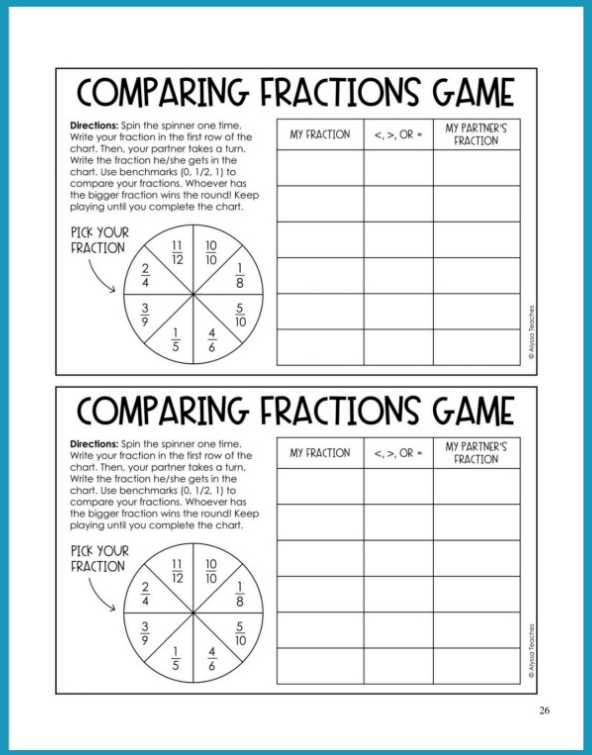

COMPARING FRACTIONS GAME

Directions: Spin the spinner one time. Write your fraction in the first row of the chart. Then, your partner takes a turn. Write the fraction he/she gets in the chart. Use benchmarks (0, 1/2, 1) to compare your fractions. Whoever has the bigger fraction wins the round! Keep playing until you complete the chart.

PICK YOUR FRACTION

MY FRACTION	<, >, OR =	MY PARTNER'S FRACTION

COMPARING FRACTIONS GAME

Directions: Spin the spinner one time. Write your fraction in the first row of the chart. Then, your partner takes a turn. Write the fraction he/she gets in the chart. Use benchmarks (0, 1/2, 1) to compare your fractions. Whoever has the bigger fraction wins the round! Keep playing until you complete the chart.

PICK YOUR FRACTION

MY FRACTION	<, >, OR =	MY PARTNER'S FRACTION

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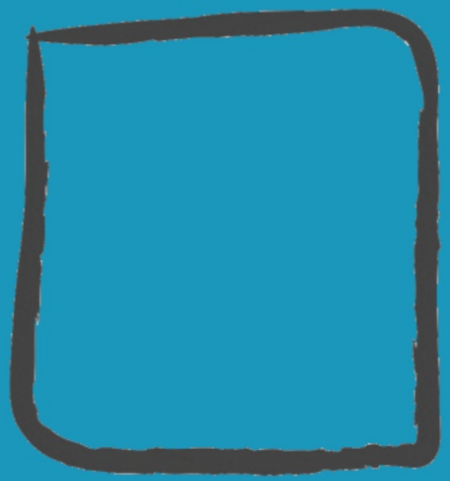
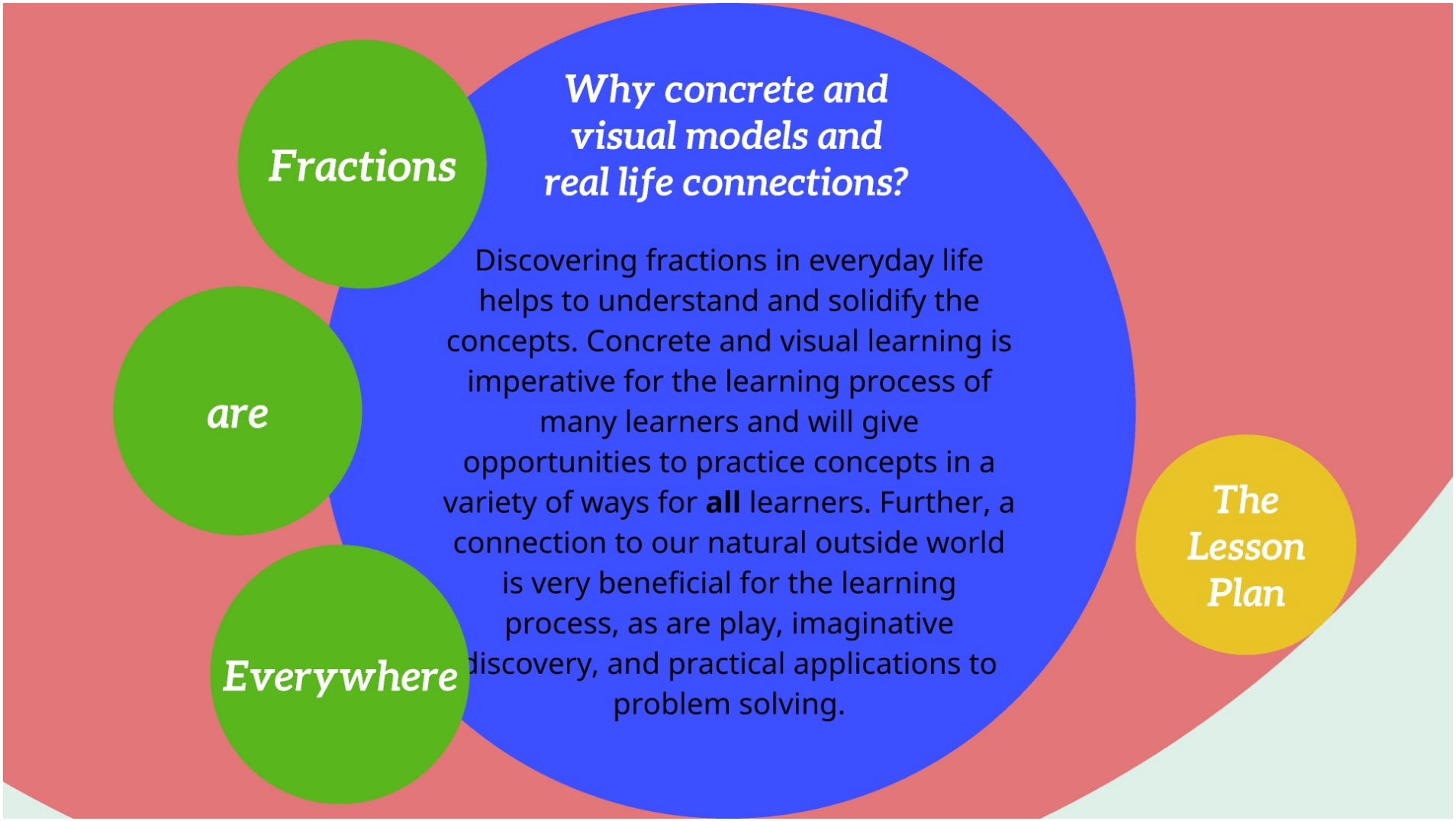
And....that's a wrap for Lesson 3!!



Week 4

Fractions:
Concrete and Visual Models

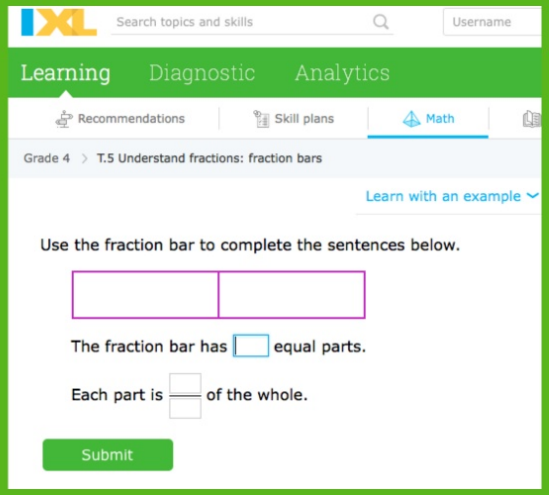
Let's have a look


Fractions
are
Everywhere
Why concrete and visual models and real life connections?
Discovering fractions in everyday life helps to understand and solidify the concepts. Concrete and visual learning is imperative for the learning process of many learners and will give opportunities to practice concepts in a variety of ways for **all** learners. Further, a connection to our natural outside world is very beneficial for the learning process, as are play, imaginative discovery, and practical applications to problem solving.
The Lesson Plan

Fractions are Everywhere

A video to inspire the idea that fractions are all around us.

Fractions are Everywhere



IXL Math

An Interactive Smart-Board Activity

Fractions are Everywhere

Exploring Math in Nature

https://mobile.twitter.com/LeafyTrailsFS/status/1257600769685172224/photo/1

Math Fractions Grade 4 Lesson Plan: Concrete and Visual Models

Page 1

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

Candidate's name:

Grade/Class/Subject:	Grade 4 - Math	School:	Anyschool
Date:	June 2, 2022	Allotted Time:	2 x 45 min blocks
Topic/Title:	Fractions: concrete and visual models		

1. LESSON ORIENTATION
Key resources: Instructional Design Map

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.
Discovering fractions in everyday life helps to understand and solidify the concepts. Concrete and visual learning is imperative for the learning process of many learners and will give opportunities to practice concepts in a variety of ways for all learners. Further, a connection to our natural outside world is very beneficial for the learning process, as are play, imaginative discovery, and practical applications to problem solving.

2. CORE COMPETENCIES
Key resources: https://curriculum.gov.bc.ca/competencies

Core /Sub-Core Competencies *(check all that apply)*:	*Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.*
x COMMUNICATION – Communicating x COMMUNICATION – Collaborating x THINKING – Creative Thinking x THINKING – Critical Thinking x THINKING – Reflective Thinking x PERSONAL AND SOCIAL – Personal Awareness and Responsibility □ PERSONAL AND SOCIAL – Positive Personal and Cultural Identity x PERSONAL AND SOCIAL – Social Awareness and Responsibility	- Students will share in ideas and work in groups to share ideas and concepts. - Students will brainstorm and collaboratively discuss ideas and concepts. - Students will be searching for fraction representatives in nature and in the classroom. They will be exploring different ways that fractions can be represented and coming up with their own ideas and discoveries. - Students will analyze different aspects of making fractions and distinguish some different types of fractions. - Students will understand that respectful behavior and acceptable standards are expected. - Students will understand that they are responsible for their own actions. - Students will share ideas and work respectfully with each other in many of experiences while understanding that everyone has equally essential input.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES
Key resources: First Peoples Principles of Learning (FPPL); Aboriginal Worldviews and Perspectives in the Classroom

FPPL to be included in this lesson *(check all that apply)*:	*How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?*
x Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. x Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). x Learning involves recognizing the consequences of one's actions. □ Learning involves generational roles and responsibilities. □ Learning recognizes the role of Indigenous knowledge. □ Learning is embedded in memory, history, and story. x Learning involves patience and time. □ Learning requires exploration of one's identity. □ Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.	- Respectful collaboration will be expected. Students will be expected to show respect to the land and the environment when in the outdoor classroom. - Students will share their experiences and reflect on how they think about math in the real world. They will understand that through connectedness with the land and others they gain knowledge and insight. - Students will understand that each person has a role to play and that we are all responsible for our actions and how we affect our environment and others. - Students will learn that it takes time to understand certain concepts and that everyone learns at a different pace and in a different way.

4. BIG IDEAS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?
Fractions are types of numbers that can represent quantities.

5. LEARNING STANDARDS/INTENTIONS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum)

Curricular Competencies: *What are students expected to do?*	**Content:** *What are students expected to learn?*
- I can use reasoning to explore and make connections - I can model mathematics in contextualized experiences - I can develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving - I can visualize to explore mathematical concepts - I can develop and use multiple strategies to engage in problem solving - I can represent mathematical ideas in concrete, pictorial, and symbolic forms - I can communicate mathematical thinking in many ways - I can connect mathematical concepts to each other and to other areas and personal interests	- Ordering and comparing fractions

6. ASSESSMENT PLAN
Key resources: Instructional Design Map and https://curriculum.gov.bc.ca/classroom-assessment

Page 2

Page 3

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?
- Formative assessment with feedback and support, through observation and interactions, will be provided. - Students will be expected to share one concrete fraction example by the end of day two to provide a summative assessment of their understanding of the meaning of fractions. This will be an example of their own choice and understanding in the setting of their choice. They may provide the example through a drawing, a physical manipulative, a verbal description or any other method by which they are able to show their understanding of a fraction. Summative Single Point Assessment Rubric:

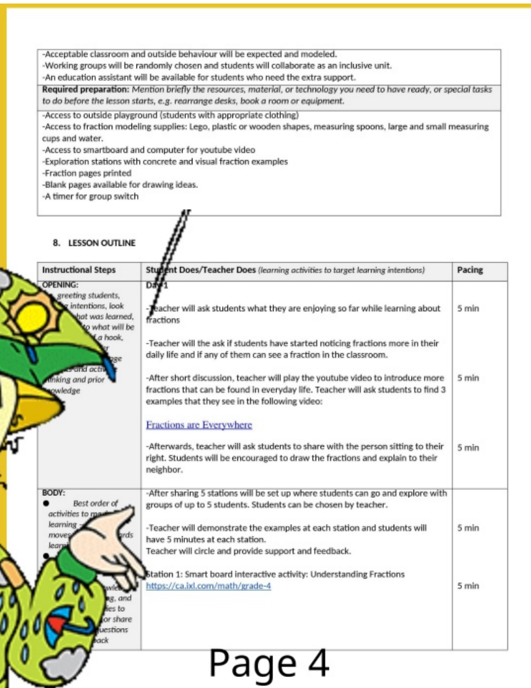
Big Idea	Emerging	Developing	Proficient	Extending
Fractions are types of numbers that can represent quantities	Understands basic fractions (halves, quarters, wholes)	Identifies different ways to represent pieces of a whole, when and where they are used	Describes the uses of differing mathematical ways to represent pieces of a whole;- Applies them to problem based learning depicting real life scenarios connected to place, story, cultural practices and perspectives relevant to Indigenous peoples, the local community, and other cultures	Compares and contrasts differing mathematical ways to represent pieces of a whole as tools for representing pieces of a whole in daily life situations

Adapted from Katz (2019). Accessed at https://www.sd44.ca/sites/inclusiveed/EducationalPlanning/Programming/bccurriculumrubrics/_layouts/15/WopiFrame.aspx?sourcedoc=%7B6B8643CD-B0E2-4803-83CF-E67E9CB11161%7D&file=Math%20Rubrics.docx&action=default&CT=1652375272434&OR=DocLibClassicUI

7. DESIGN CONSIDERATIONS
Key resources: Instructional Design Map

Make brief notes to indicate how the lesson will meet needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.
-Students will be asked to support each other throughout the learning process. -Opportunities for verbal, visual, hands on learning with support will be offered. -Students will be asked to make personal connections with the material being presented/learned.

Interactive Exploration



-Acceptable classroom and outside behaviour will be expected and modeled.
-Working groups will be randomly chosen and students will collaborate as an inclusive unit.
-An education assistant will be available for students who need the extra support.

Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*

-Access to outside playground (students with appropriate clothing)
-Access to fraction modeling supplies: Lego, plastic or wooden shapes, measuring spoons, large and small measuring cups and water.
-Access to smartboard and computer for youtube video
-Exploration stations with concrete and visual fraction examples
-Fraction pages printed
-Blank pages available for drawing ideas.
-A timer for group switch

8. LESSON OUTLINE

Instructional Steps	Student Does/Teacher Does *(learning activities to target learning intentions)*	Pacing
OPENING: *greeting students, … intentions, look … hat was learned, … o what will be … f a hook, … ge … and acti… inking and prior … owledge*	Day 1 -Teacher will ask students what they are enjoying so far while learning about fractions -Teacher will the ask if students have started noticing fractions more in their daily life and if any of them can see a fraction in the classroom. -After short discussion, teacher will play the youtube video to introduce more fractions that can be found in everyday life. Teacher will ask students to find 3 examples that they see in the following video: Fractions are Everywhere -Afterwards, teacher will ask students to share with the person sitting to their right. Students will be encouraged to draw the fractions and explain to their neighbor.	5 min 5 min 5 min
BODY: ● *Best order of activities to … learning … moves … rds lear…* ● *… wle… g, and … ies to … or share … uestions … ack*	-After sharing 5 stations will be set up where students can go and explore with groups of up to 5 students. Students can be chosen by teacher. -Teacher will demonstrate the examples at each station and students will have 5 minutes at each station. Teacher will circle and provide support and feedback. Station 1: Smart board interactive activity: Understanding Fractions https://ca.ixl.com/math/grade-4	 5 min 5 min

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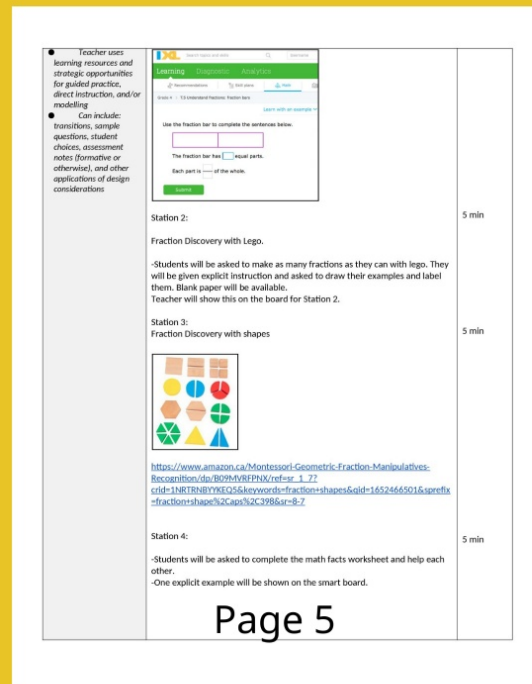
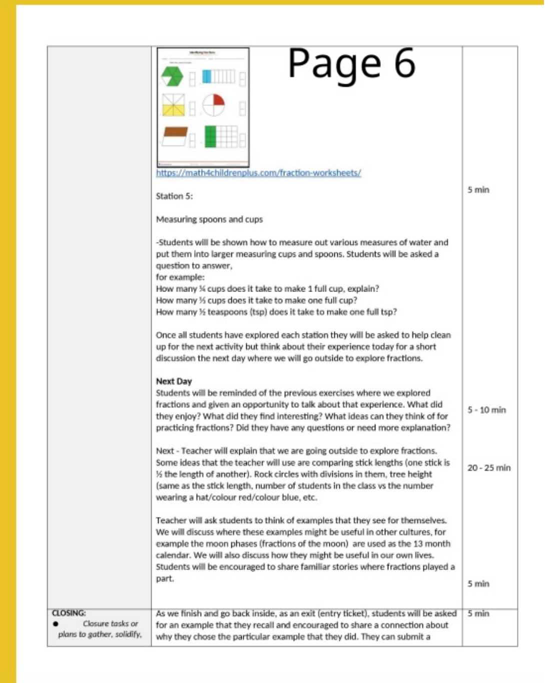


● *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modelling* ● *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	Learning Diagnostic Analytics Use the fraction bar to complete the sentences below. The fraction bar has ☐ equal parts. Each part is — of the whole. Submit Station 2: Fraction Discovery with Lego. -Students will be asked to make as many fractions as they can with lego. They will be given explicit instruction and asked to draw their examples and label them. Blank paper will be available. Teacher will show this on the board for Station 2. Station 3: Fraction Discovery with shapes https://www.amazon.ca/Montessori-Geometric-Fraction-Manipulatives-Recognition/dp/B09MVRFPNX/ref=sr_1_7?crid=1NRTRNBYYKEQ5&keywords=fraction+shapes&qid=1652466501&sprefix=fraction+shape%2Caps%2C398&sr=8-7 Station 4: -Students will be asked to complete the math facts worksheet and help each other. -One explicit example will be shown on the smart board.	5 min 5 min 5 min

Page 5



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	https://math4childrenplus.com/fraction-worksheets/ Station 5: Measuring spoons and cups -Students will be shown how to measure out various measures of water and put them into larger measuring cups and spoons. Students will be asked a question to answer, for example: How many ¼ cups does it take to make 1 full cup, explain? How many ⅓ cups does it take to make one full cup? How many ½ teaspoons (tsp) does it take to make one full tsp? Once all students have explored each station they will be asked to help clean up for the next activity but think about their experience today for a short discussion the next day where we will go outside to explore fractions. **Next Day** Students will be reminded of the previous exercises where we explored fractions and given an opportunity to talk about that experience. What did they enjoy? What did they find interesting? What ideas can they think of for practicing fractions? Did they have any questions or need more explanation? Next - Teacher will explain that we are going outside to explore fractions. Some ideas that the teacher will use are comparing stick lengths (one stick is ½ the length of another). Rock circles with divisions in them, tree height (same as the stick length, number of students in the class vs the number wearing a hat/colour red/colour blue, etc. Teacher will ask students to think of examples that they see for themselves. We will discuss where these examples might be useful in other cultures, for example the moon phases (fractions of the moon) are used as the 13 month calendar. We will also discuss how they might be useful in our own lives. Students will be encouraged to share familiar stories where fractions played a part.	5 min 5 - 10 min 20 - 25 min 5 min
CLOSING: ● *Closure tasks or plans to gather, solidify,*	As we finish and go back inside, as an exit (entry ticket), students will be asked for an example that they recall and encouraged to share a connection about why they chose the particular example that they did. They can submit a	5 min

deepen or reflect on the learning ● *review or summary if applicable* ● *anticipate what's next in learning* ● *"housekeeping" items (e.g. due dates, next day requirements*	drawing or other visual representation as well and will be given time later to finish this. Students will be supported with ideas and will be allowed to ask other students for help. We will then go inside and start our next lesson.	

9. REFLECTION *(anticipate if possible)*

● *Did any reflection in learning occur, e.g. that shifted the lesson in progress?* ● *What went well in the lesson (reflection on learning)?* ● *What would you revise if you taught the lesson again?* ● *How do the lesson and learners inform you about necessary next steps?* ● *Comment on any ways you modelled and acted within the Professional Standards of BC Educators and BCTF Code of Ethics?* ● *If this lesson is being observed, do you have a specific observation focus in mind?*
-Did the students enjoy the lesson? -Were intentional connections made? -Can Students have a take home message that they feel good about? -Was the time allotted effective? -Was the material inclusive? -Do the students have connections to past and future learning experiences? -Did the students understand the material or do they need more time or a different method of teaching? -Was teacher explicit and give opportunity for UDL opportunities? -Was teacher inclusive and was the expected out come achieved? -What would have made the lesson better?

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Have Fun Finding Fractions Everywhere!

Week 5

Equal Partitioning in Minecraft

This lesson allows 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 of Equal Partitioning.

The Details

Incorporating Indigenous Worldviews

Lesson Details

This lesson can be taught in either a 2 x 45-minute block or a 1 x 1.5-hour block format.

It requires a smart-board in a computer lab and for all students to be registered with Minecraft Education Edition prior to the lesson.

Embedding First Peoples Principles of Learning

Students will be provided opportunities to make mistakes in their mathematical learning, and then will be guided to help them learn from those mistakes.

Students will practice patience, knowing that building skills in mathematics is a lifelong process that requires time.

Inclusive Pedagogical Approach

Lesson Inclusivity Plan

Read aloud rubric “I can” statements to support low literacy students.

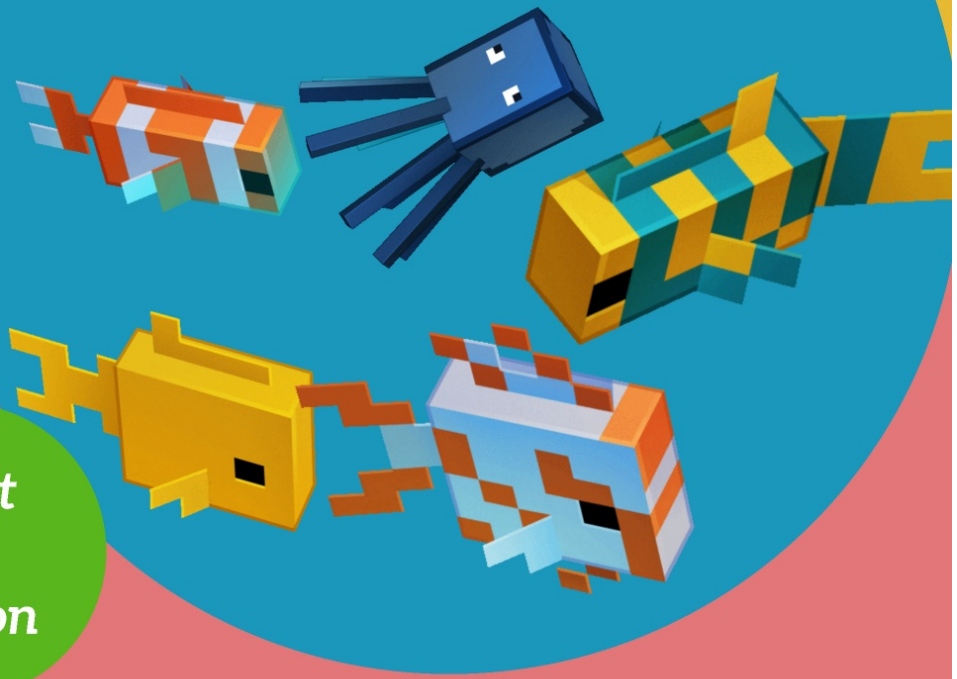
Designed for students with low experience with technology with advanced variations for high experienced students added on at the project level after the explicit lesson.

Allowance for students to have regular movement and eye breaks while working with technology.

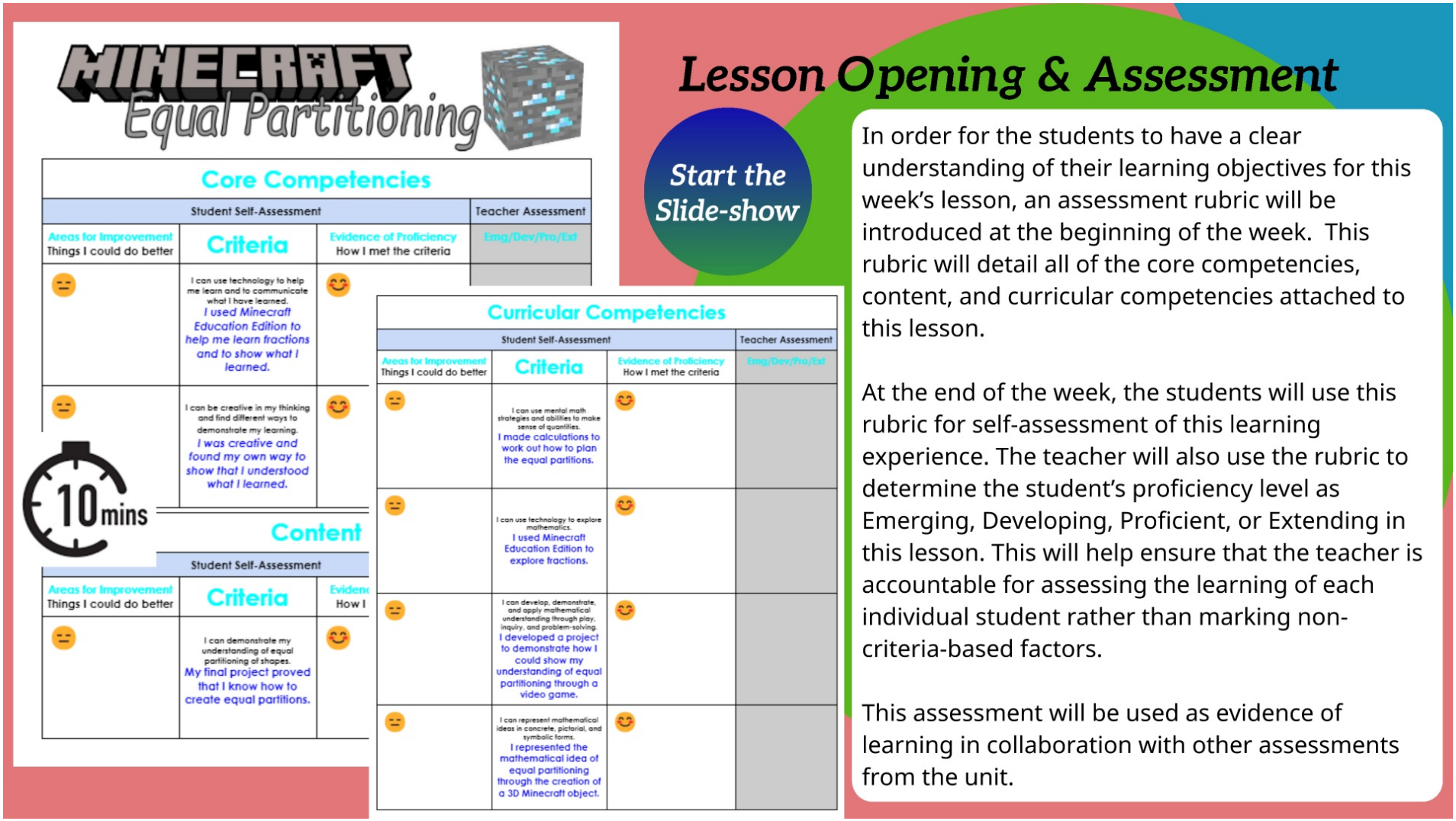
EAs/YCWs, if needed for students who may need extra assistance with technology.

Ensure seating arrangement in Computer Lab is beneficial for math learning (consult your neighbour for help first strategy).

Cross-curricular: Vocabulary - Morphology “Equal Partitioning” “Pixel”



Start the Lesson



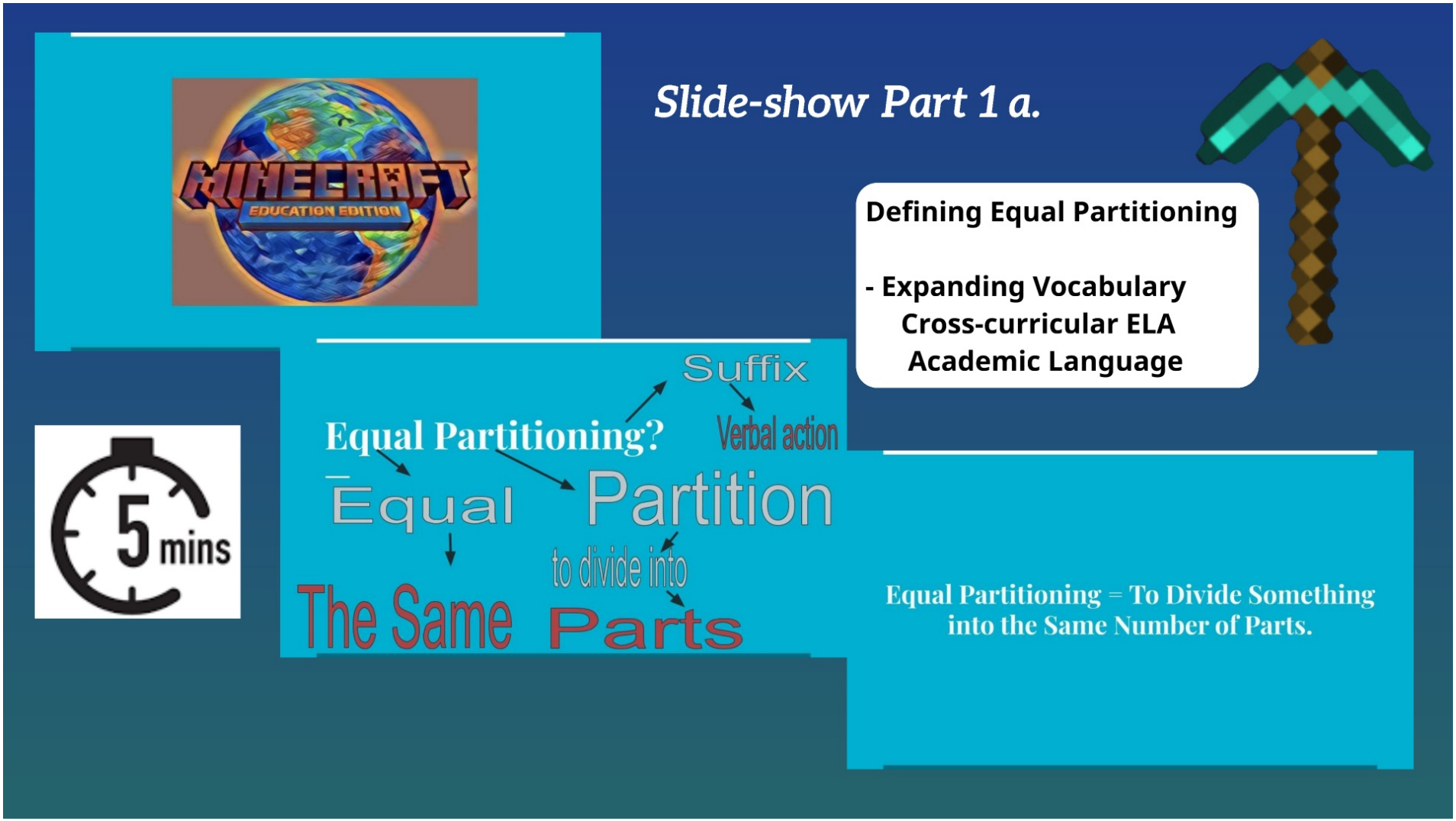
Lesson Opening & Assessment

Start the Slide-show

In order for the students to have a clear understanding of their learning objectives for this week's lesson, an assessment rubric will be introduced at the beginning of the week. This rubric will detail all of the core competencies, content, and curricular competencies attached to this lesson.

At the end of the week, the students will use this rubric for self-assessment of this learning experience. The teacher will also use the rubric to determine the student's proficiency level as Emerging, Developing, Proficient, or Extending in this lesson. This will help ensure that the teacher is accountable for assessing the learning of each individual student rather than marking non-criteria-based factors.

This assessment will be used as evidence of learning in collaboration with other assessments from the unit.


Slide-show Part 1 a.
Defining Equal Partitioning
- Expanding Vocabulary
Cross-curricular ELA
Academic Language
5 mins
Equal Partitioning?
Suffix
Verbal action
Equal
Partition
to divide into
The Same
Parts
Equal Partitioning = To Divide Something into the Same Number of Parts.

Slide-show Part 1 b.

Introduction to Equal Partitioning with familiar objects in a known context.

Before Minecraft, let's warm our brains up with a mental snack.

Is the Orange Juice equally partitioned?

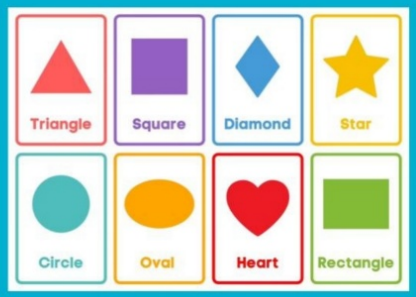
Equal Partitioning True or False?

T F T T F

Is this diamond cupcake sword equally partitioned?

Slide-show Part 2

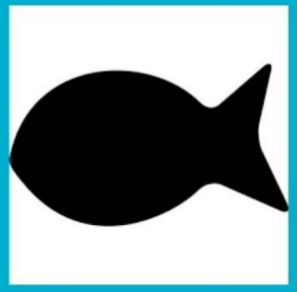
Let's try to equally partition some basic shapes.



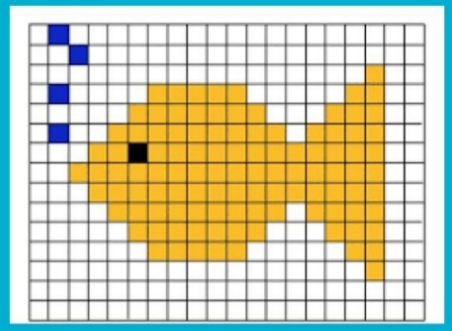
Making Connections

- Student participation to create equal partition on basic shapes.
- Critical Thinking??? How do you create equal partitions with irregular shapes?
- Pixels are small blocks that create a picture
- Minecraft is based on blocks!

How could we equally partition this fish shape?



We could start with PIXELS




MINECRAFT
Let's Go!
Time to sign in
Slide-show Part 3
The first step is a simple "Copy me build" activity where the students build the same as the demonstrated shapes in the slide-show and then post a sign beside their build to show if the shape is built with equal partitioning or not.
Formative Assessment
15 mins
Copy me build
Make a sign to show your answer
Copy me build
Copy me build
Is this an equally partitioned rectangle?
Make a sign to show your answer
Copy me
Copy me build
Is this an equally partitioned triangle?
Make a sign to show your answer

Students are challenged to use their mental math skills in an increasingly more difficult series of challenges to build equally partitioned shapes in preparation for their project.

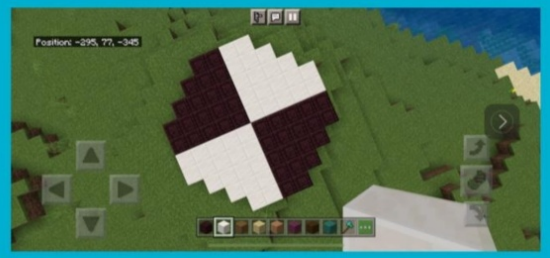
Slide-show Part 4

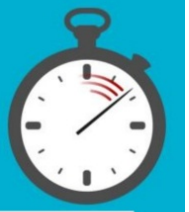
One Minute Challenge

Build a 6 x 6 Square with Equal Partitioning with 6 different Blocks

Three Minute Challenge

Build a 4 block Octagon with Equal Partitioning with 2 different blocks (76 blocks total)



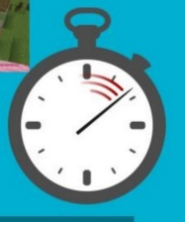


Two Minute Challenge

Build a 72 block rectangle using 8 different blocks, not in rows.

Five Minute Challenge

Build a 3D Shape where each layer is a different type of block using 5 types of blocks. Minimum 300 blocks.



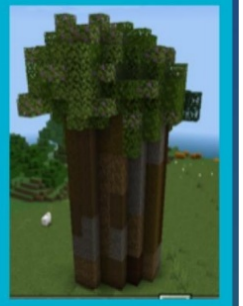
Slide-show Part 5

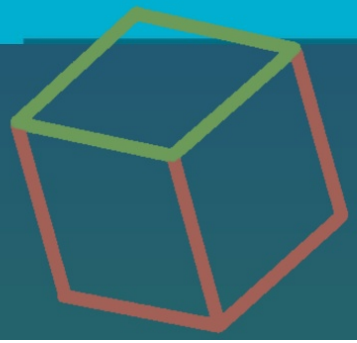
Now it is time for the students to create some evidence of their learning.

Project Time!

Time limit: Between now and five minutes before the end of class, so we can do self-assessments 😊

Objective: To build an object of your choosing that creatively demonstrates your learning about equal partitioning.





Excerpt from Lesson Plan: "If students are stuck on finding a creative idea, remind them that it is only one component of the rubric. If they are not feeling creative, they could always build at least a simple shape that meets the same requirements and let them weigh the value of doing something rather than nothing. Alternatively, ask them a few close-ended questions to narrow down choices of something to build. i.e., a simple house.

FFPL Opportunity: This may be a good time to softly remind students that they have a responsibility in their learning. As the teacher, you are there to support and guide them through the process, but this is now the time to show what they have learned.

Give students a five-minute warning to allow them to wrap up their work. Remind them to do their best work in the last five minutes. Are there any extra features they could add to make it super special if they are done early?

At the end of the five minutes, have the students close Minecraft and begin to fill out the Rubric. If there are students that would like more time to improve their project in the future that can be arranged in “Ketchup” time, but for right now, they can fill out the rubric as it is. Another rubric can be printed, if they do more work on it again later. Improvements are always welcome! "

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

DRAFT LESSON PLAN (REVISED 2021)

Candidate's name: Sara McManus

Grade/Class/Subject:	Grade 4 Mathematics	School:	Intermediate Elementary
Date:	Spring 2022	Allotted Time:	1.5 hours Total
Topic/Title:	Equal Partitioning in Minecraft		

1. LESSON ORIENTATION

Key resources: Instructional Design Map

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.

This lesson is one in a 6 week unit of lessons on Comparing and Ordering Fractions in Mathematics 4. The lessons are 1.5 hours per week and this is the fifth week's lesson. This lesson can be taught in either a 2 x 45-minute block or a 1 x 1.5-hour block format. It requires a smartboard in a computer lab and for all students to be registered with Minecraft Education Edition prior to the lesson.

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 of Equal Partitioning.

2. CORE COMPETENCIES

Key resources: https://curriculum.gov.bc.ca/competencies

Core /Sub-Core Competencies *(check all that apply):*	*Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.*
☑ COMMUNICATION – Communicating ☐ COMMUNICATION – Collaborating ☑ THINKING – Creative Thinking ☐ THINKING – Critical Thinking ☐ THINKING – Reflective Thinking ☐ PERSONAL AND SOCIAL – Personal Awareness and Responsibility ☐ PERSONAL AND SOCIAL – Positive Personal and Cultural Identity ☐ PERSONAL AND SOCIAL – Social Awareness and Responsibility	This lesson will directly address the core competencies through the following "I can" goal statements for each student: - I can use technology to help me learn and to communicate what I have learned. - I can be creative in my thinking and find different ways to demonstrate my learning.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES

Key resources: First Peoples Principles of Learning (FPPL); Aboriginal Worldviews and Perspectives in the Classroom

FPPL to be included in this lesson *(check all that apply):*	*How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?*
☐ Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. ☐ Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). ☑ Learning involves recognizing the consequences of one's actions. ☐ Learning involves generational roles and responsibilities. ☐ Learning recognizes the role of Indigenous knowledge. ☐ Learning is embedded in memory, history, and story. ☑ Learning involves patience and time. ☐ Learning requires exploration of one's identity. ☐ Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations.	Students will be provided opportunities to make mistakes in their mathematical learning, and then will be guided to help them learn from those mistakes. Students will practice patience, knowing that building skills in mathematics is a lifelong process that requires time.

4. BIG IDEAS

Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?

Big Idea
Fractions are types of numbers that can represent quantities. **BC Curriculum Mathematics 4**

Essential Question
What is equal partitioning?

5. LEARNING STANDARDS/INTENTIONS

Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum)

Curricular Competencies: *What are students expected to do?*	**Content:** *What are students expected to learn?*
- "Develop mental math strategies and abilities to make sense of quantities - Use technology to explore mathematics - Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem-solving - Represent mathematical ideas in concrete, pictorial, and symbolic forms" **BC Curriculum Mathematics 4**	Ordering and Comparing Fractions • equal partitioning **BC Curriculum Mathematics 4**

6. ASSESSMENT PLAN

Key resources: Instructional Design Map and https://curriculum.gov.bc.ca/classroom-assessment

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?
In order for the students to have a clear understanding of their learning objectives for this week's lesson, an assessment rubric will be introduced at the beginning of the week. This rubric will detail all of the core competencies, content, and curricular competencies attached to this lesson. At the end of the week, the students will use this rubric for self-assessment of this learning experience. The teacher will also use the rubric to determine the student's proficiency level as Emerging, Developing, Proficient, or Extending in this lesson. This will help ensure that the teacher is accountable for assessing the learning of each individual student rather than marking non-criteria-based factors. This assessment will be used as evidence of learning in collaboration with other assessments from the unit.

7. DESIGN CONSIDERATIONS

Key resources: Instructional Design Map

Make brief notes to indicate how the lesson will meet the needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.
The teacher will read aloud rubric "I can" statements to support low literacy students. UDL - Lesson designed for students with low experience levels using technology with advanced variations for students to be added on at the project level after the explicit lesson. Allow for students to have regular movement and eye breaks while working with technology. Arrange for Education Assistants/Youth Care Workers to be available, if needed for students who may need extra assistance with technology. Ensure seating arrangement in Computer Lab is beneficial for math learning (consult your neighbour for help first strategy). Cross-curricular: Vocabulary - Morphology "Equal Partitioning" "Pixel"

Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*
Book Computer Lab for Math Block(s) [Option A 2 x 45 minutes or Option B 1 x 1.5 hour] Prepare Slide Presentation for Lesson, Pre-load on Big Screen Photocopy Rubric for Student Distribution Timer

8. LESSON OUTLINE

Instructional Steps	**Student Does/Teacher Does** *(learning activities to target learning intentions)*	**Pacing**
OPENING: *e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge*	Settle students into the computer lab. Welcome the students and ask the students to leave their computers off and position themselves to view the projector screen for a math lesson. (If the students have not used Minecraft Education Edition in class before you will need to add extra time to set up each student.) Distribute Minecraft - Equal Partitioning Assessment Rubric to each student. *Over the past four weeks, we have been learning about comparing and ordering fractions in a bunch of different ways. For this week's lesson, we are focusing on an idea called Equal Partitioning. You can see it is written there as the title under Minecraft.*  *This week, we are going to use technology to play with Equal Partitioning and you are going to be able to build something of your choice using this mathematical concept.* *First, I am going to review this rubric with you, so that you know what you need to focus on this week in Math. Then we will spend some time discovering what equal partitioning is, and then you will all be able to spend the rest of the week building in Minecraft Education Edition your own Equal Partitioning Project. At the end of the week, you will use this same rubric to give yourself a self-assessment of your proficiency. Does this sound like a good plan for Math this week?* *Thumbs up if you like the plan -* 👍 Formative Feedback	Opening 10 minutes to review Rubric

Okay, let's look at our Core Competencies. We only have two that we are focusing on this week.

Core Competencies

Student Self-Assessment			Teacher Assessment
Areas for Improvement Things I could do better	Criteria	Evidence of Proficiency How I met the criteria	Emg/Dev/Pro/Ext
😐	I can use technology to help me learn and to communicate what I have learned. I used Minecraft Education Edition to help me learn fractions and to show what I learned.	😊	
😐	I can be creative in my thinking and find different ways to demonstrate my learning. I was creative and found my own way to show that I understood what I learned.	😊	

The Criteria says, I can use technology to help me learn and communicate what I have learned, and then in blue it says: I used Minecraft Education Edition to help me learn fractions and to show what I learned.

Who can tell me, are these the same or different? Why might they be different colours?.... Yes, the blue one is bigger, it is in the past tence and it is specific to your Math project. The black one is smaller, yes, that is our objective or our goal for the blue one. Great!!!

So what about the second one, it says: I can be creative in my thinking and find different ways to demonstrate my learning. And then it says: I was creative and found my own way to show that I understood what I learned.

Who recognizes what categories of core competencies these are from? Yes, that's right. The first one is a Communication competency where we are learning how to be good communicators. This week we are using our technology to help us communicate through MINECRAFT!!! And, the second one is Creative Thinking. Isn't it cool that we can be creative in Math? Math is used in lots of creative art and design. I can't wait to see what creative ways you find to demonstrate equal partitioning.

So let's talk about that...

Content

Student Self-Assessment			Teacher Assessment
Areas for Improvement Things I could do better	Criteria	Evidence of Proficiency How I met the criteria	Emg/Dev/Pro/Ext
😐	I can demonstrate my understanding of equal partitioning of shapes. My final project proved that I know how to create equal partitions.	😊	

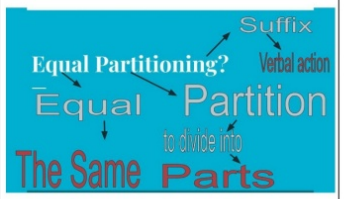
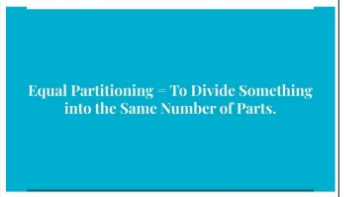
In content, the criterion is I can demonstrate my understanding of equal partitioning of shapes, and the blue part tence of that says, my project proved that I know how to create equal partitions. - Oh, I can't wait to show you... We better hurry up.

The next four are all about the curricular competencies. Now, remember, curricular competencies are the skills that help you do any kind of math, so we are looking at how we are practicing these skills this week.

Curricular Competencies

Student Self-Assessment			Teacher Assessment
Areas for Improvement Things I could do better	Criteria	Evidence of Proficiency How I met the criteria	Emg/Dev/Pro/Ext
😐	I can use mental math strategies and abilities to make sense of quantities. I made calculations to work out how to plan the equal partitions in my final project.	😊	
😐	I can use technology to explore mathematics. I used Minecraft Education Edition to explore fractions.	😊	
😐	I can develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving. I developed a project to demonstrate how I could show my understanding of equal partitioning through a video game.	😊	
😐	I can represent mathematical ideas in concrete, pictorial, and symbolic forms. I represented the mathematical idea of equal partitioning through the creation of a 3D Minecraft object.	😊	

BODY: ● *Best order of activities to maximize learning -- each task moves students towards learning intentions* ● *Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback*	*The first one says that I can use mental math strategies and abilities to make sence of quantities. And then, I made calculations to work out how to plan the equal partitions. So this one is really just a fancy way of saying did you use your brain to really think about the math needed to build your shapes.* *The second one says that I can use technology to explore mathematics. I used Minecraft Education Edition to explore fractions. I hope by the end of this week everyone can put a big smiley face on this one! But - if you are struggling this week using the technology, what are three things you can do? Sure - that's great. You could ask your computer neighbour if they have any advice. What else? Yes, you can always come and ask me, but what if you look over and I'm busy. Do you think I would want you sitting and not working until I'm available? No, that's right, you can start an "I need help list" and then you can put your name on the list and try and move on to something else and you know I'll be there soon.* *The third competency is that I can develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem-solving. Then I developed a project to demonstrate how I could show my understanding of equal partitioning through a video game. That one is almost the same thing as the content!* *And the last one is that I can represent mathematical ideas in concrete, pictorial, and symbolic forms. With the past tence of I represented the mathematical idea of equal partitioning through the creation of a 3D Minecraft object. Sometimes these almost all sound a little the same don't they. We are just looking at our learning from a slightly different perspective.* *Let's get on with the learning... Everybody - Stand up and take a big stretch while I bring up the Slide Show with our Equal Partitioning Lesson.* *Slideshow PART 1*  	Part 1 Definition and Mental Snack Intro 10 minutes

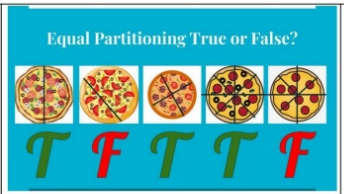
● *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modelling* ● *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	*Are we ready? Thumbs up* 👍  *Let's start with the definition of Equal Partitioning by breaking apart the words into what we know. Who can tell me what "Equal" means? There are great ideas. Could we say these mean "The Same"? Awesome. And what does it mean when we add "ing" to the end of a word? Yes, it is called a 'suffix' when we add it to the end of a word and "ing" means that we are saying the word is becoming an action of doing something, we'll call that a "verbal action." How about word Partition? Yes, when I think of a Partition, I think of maybe a dividing wall. Who else can give examples of partitions? Yeah, so partitions divide things, don't they? So what is the smallest root word here? Right... It's 'Part', so could we say we are dividing into parts? Awesome.*  *When we put it together, does this sound like a good definition?* *Thumbs up if you agree with the definition -* 👍 *Thumbs down if you think we need to modify it -* 👎	

Before Minecraft, let's warm our brains up with a mental snack.

Get your brains ready! Here we go...

So what do you think? Is the orange juice equally partitioned between the glasses? No... Why not? Oh.... The glasses are different sizes. That's a great observation. That means the amount of liquid inside the glasses is different right? And according to our definition, these are all the same aren't they, but they aren't equally divided parts.

Who wants some Pizza?

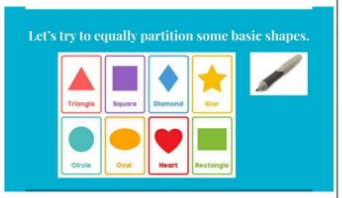


Let's look at these one at a time. If you think it's TRUE and it is equally partitioned, then I want you to stand up. If you think it is FALSE and it is not equally partitioned, then I want you to squat. Ready. Let's do the first one. Yes, if you stood up, you are right, it was TRUE. That is divided right down the middle, so there are two halves of the pizza and two halves are equal aren't they. Continue for each pizza, explaining why the pizza is or is not equally partitioned.

Should we have some cupcakes next?

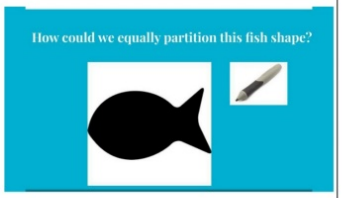
Okay, this time sit in your chair if the answer is yes, and stand in front of your chair if the answer is no. Okay, how did you all know that it's not equally partitioned? Who can tell me? Good - that's right, we can prove that they are not equal right away because there are not as many light blue cupcakes as dark blue cupcakes, so we know it's not equal.

Slideshow Part 2

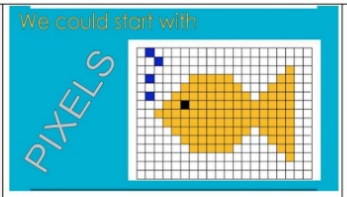


Part 2
Student partitioning shapes & intro to pixels
10 minutes

Ask volunteer students to come up to the smart board to draw equal partitions on the shapes. Talk about different ways that the shapes could be divided into equal parts.



Let a student or two try to equally partition this fish shape. It is expected that they will have difficulty finding a way to divide the fish equally other than to divide the fish only in half horizontally.



Everything that we see digitally is actually many tiny little squares, so what do you think about the idea of dividing the fish into many little squares?

We could define the word "pixel" as a picture element. They are the smallest unit of information that makes up a picture. What does this remind you of? Oh - Minecraft is made up of squares too!

Slideshow Part 3

Part 3
Copy Me Minecraft Building
Equal Partitioning
15 minutes

Have the students build each of the following "Copy me builds" and post a "Yes" or "No" sign beside their build to indicate if the shape has been equally partitioned. Have students indicate they are done by putting their hands on their heads or alternate fun signal. Rotate through the room checking signs between posting each slide and revealing the answer animation. The colour/type of blocks used is not important so long as they are different.


Copy me build
Is this an equally partitioned rectangle?
Make a sign to show your answer
Copy me build
Is this an equally partitioned rectangle?
Make a sign to show your answer
Copy me build
(Two gold blocks)
Is this an equally partitioned rectangle?
Make a sign to show your answer


Copy me build
Is this an equally partitioned rectangle?
Make a sign to show your answer
Copy me build
Is this an equally partitioned triangle?
Make a sign to show your answer
Slideshow Part 4
Challenge the students to beat the timer with the following slides.
***This is where mental math strategies really come into play for curricular competencies.
One Minute Challenge
Build a 6 x 6 Square with Equal Partitioning with 6 different Blocks
Option A
End 1st 45-min lesson here
Start 2nd 45 min lesson here
Part 4 Build Challenges 15 minutes

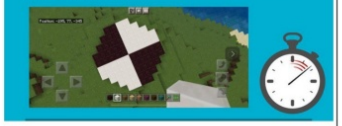
Two Minute Challenge

Build a 72 block rectangle using 8 different blocks, not in rows.

(This one is very easy if they start in the centre and work in an outwards circular pattern repeating the 8 blocks.)

Three Minute Challenge

Build a 4 block Octagon with Equal Partitioning with 2 different blocks (76 blocks total)



Five Minute Challenge

Build a 3D Shape where each layer is a different type of block using 5 types of blocks. Minimum 300 blocks.

Part 5

Part 5
Students work on project 25 minutes

Project Time!

Time limit: Between now and five minutes before the end of class, so we can do self-assessments 🙂

Objective: To build an object of your choosing that creatively demonstrates your learning about equal partitioning.

Rotate throughout the classroom to ensure students are on the right track. If students are stuck on finding a creative idea, remind them that it is only one component of the rubric. If they are not feeling creative, they could always build at least a simple shape that meets the same requirements and let them weigh the value of doing something rather than nothing. Alternatively, ask them a few close-ended questions to narrow down choices of something to build. i.e., a simple house.

FFPL Opportunity: This may be a good time to softly remind students that they have a responsibility in their learning. As the teacher, you are there to support and guide them through the process, but this is now the time to show what they have learned.

Give students a five-minute warning to allow them to wrap up their work. Remind them to do their best work in the last five minutes. Are there any extra features they could add to make it super special if they are done early?

CLOSING:

- *Closure tasks or plans to gather, solidify, deepen or reflect on the learning*
- *review or summary if applicable*
- *anticipate what's next in learning*
- *"housekeeping" items (e.g. due dates, next day requirements*

At the end of the five minutes, have the students close Minecraft and begin to fill out the Rubric. If there are students that would like more time to improve their project in the future that can be arranged in "Ketchup" time, but for right now, they can fill out the rubric as it is. Another rubric can be printed, if they do more work on it again later. Improvements are always welcome!

Collect the student rubrics at the end of the block and let the students know that next week: *We will have a special treat that includes fractions and a campfire!*

Closing
5 minutes

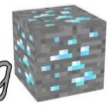
9. REFLECTION *(anticipate if possible)*

- *Did any reflection in learning occur, e.g. that shifted the lesson in progress?*
- *What went well in the lesson (reflection on learning)?*
- *What would you revise if you taught the lesson again?*
- *How do the lesson and learners inform you about the necessary next steps?*
- *Comment on any ways you modelled and acted within the Professional Standards of BC Educators and BCTF Code of Ethics?*
- *If this lesson is being observed, do you have a specific observation focus in mind?*

After this week's lessons, the teacher should reflect on the following:

- Were there any other design considerations that I should have considered for this particular classroom?
  - Did I end up requiring extra adult support in the computer lab?
- Was the self-assessment/teacher assessment rubric the best assessment method for this lesson?
  - Would I have changed any of the "I can" statements to match the lesson & project better?
  - Did I give myself enough time to review the rubric with the students and for the students to complete the rubric at the end of the week's lesson?
- Did the students follow the "ask a computer neighbour" before me, and if I am busy, start a list request if they needed help? Could I have done this differently?
- Did the students like the mental snack idea as an introduction to equal partitioning? Is this something that I could use again in the future?
- Were there any students that were not able to keep pace with the quick turnover of Copy me builds?
  - Was their pace slowed due to technology barriers, or another reason, if so, what?
- Did any of the students have noticeable difficulties in the mental math skills required for the timed challenges or were these the same students as above?
- Were any students not able to complete at least a simple project within the time given?
  - If not, did they genuinely accept the offer for them to complete their project at another time in the future, or am I still building trust with the student?

MINECRAFT Equal Partitioning



Core Competencies

Student Self-Assessment			Teacher Assessment
Areas for Improvement Things I could do better	Criteria	Evidence of Proficiency How I met the criteria	Emg/Dev/Pro/Ext
😑	I can use technology to help me learn and to communicate what I have learned. *I used Minecraft Education Edition to help me learn fractions and to show what I learned.*	😊	
😑	I can be creative in my thinking and find different ways to demonstrate my learning. *I was creative and found my own way to show that I understood what I learned.*	😊	

Content

Student Self-Assessment			Teacher Assessment
Areas for Improvement Things I could do better	Criteria	Evidence of Proficiency How I met the criteria	Emg/Dev/Pro/Ext
😑	I can demonstrate my understanding of equal partitioning of shapes. **My final project proved that I know how to create equal partitions.**	😊	

Curricular Competencies

Student Self-Assessment			Teacher Assessment
Areas for Improvement Things I could do better	Criteria	Evidence of Proficiency How I met the criteria	Emg/Dev/Pro/Ext
😑	I can use mental math strategies and abilities to make sense of quantities. **I made calculations to work out how to plan the equal partitions.**	😊	
😑	I can use technology to explore mathematics. **I used Minecraft Education Edition to explore fractions.**	😊	
😑	I can develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem-solving. **I developed a project to demonstrate how I could show my understanding of equal partitioning through a video game.**	😊	
😑	I can represent mathematical ideas in concrete, pictorial, and symbolic forms. **I represented the mathematical idea of equal partitioning through the creation of a 3D Minecraft object.**	😊	

Thank you

References/Credits

For more information on using Minecraft in your classroom visit https://education.minecraft.net/en-us

This is an original lesson plan created by Sara McManus

Minecraft Digital GIF images purchased through Prezi Membership

Minecraft Build Screenshots - Sara McManus

Week 6

The Details

Bannock by Fractions

The lesson will allow students to use strategies they have learned over the last 5 weeks to compare fractions in a hands-on experiential outdoor learning environment. This lesson will serve as a means to solidify student learning through real-life activities and experiences which they will enjoy outside the classroom around a fire!

The Recipe

Traditional Bannock Making

Traditional bannock making with Phyllis Stevenson

https://www.youtube.com/watch?v=4UGWXEThz68

The Lesson Plan


PHYLLIS STEVENSON
TRADITIONAL BANNOCK
QUESNEL AND DISTRICT COMMUNITY ARTS COUNCIL

BANNOCK "ON A STICK" RECIPE

	CUP FLOUR	4 CUP FLOUR
	TBSP BAKING POWDER	4 TBSP BAKING POWDER
	TBSP SUGAR	1 TBSP SUGAR
	TSP SALT	½ TSP SALT
	TBSP BUTTER	4 TBSP BUTTER
*1	EGG	1 EGG
	CUP MILK	1 CUP MILK
	CUP WATER	1 CUP WATER

*The recipe will still use 1 whole egg

BANNOCK "ON A STICK" RECIPE

	CUP FLOUR	4 CUP FLOUR
	TBSP BAKING POWDER	4 TBSP BAKING POWDER
	TBSP SUGAR	1 TBSP SUGAR
	TSP SALT	½ TSP SALT
	TBSP BUTTER	4 TBSP BUTTER
*1	EGG	1 EGG
	CUP MILK	1 CUP MILK
	CUP WATER	1 CUP WATER

UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

DRAFT LESSON PLAN (REVISED 2021)

Candidate's name: Amanda Sumption

Grade/Class/Subject:	Grade 4 Math	School:	School in Quesnel
Date:	May 20, 2022	Allotted Time:	An afternoon outdoors (approximately 2 hours)
Topic/Title:	Bannock by Fractions (Plus Outdoor Fraction Games & Activities if time permits)		

1. LESSON ORIENTATION
Key resources: Instructional Design Map

Briefly, describe purpose of lesson, and anything else to note about the context of lesson, students, or class, e.g. emergent learning needs being met at this time, elements of focus or emphasis, special occasions or school events.
The purpose of this lesson is to have students use strategies they have learned over the last 5 weeks to compare fractions in a hands-on experiential outdoor learning environment. Students have received explicit instruction in manipulating and comparing fractions in previous lessons so this lesson will serve as a means to solidify student learning through real-life activities and experiences. Students will focus on standard measurement of fractions and their application to cooking. Students will be given explicit instruction in the use of measuring tools, modeling the use of measuring spoons and measuring cups, and their relation to fractions. Students will be given the opportunity to work in pairs or small groups to measure, mix and then bake their bannock over an open fire, during an outside learning day.

2. CORE COMPETENCIES
Key resources: https://curriculum.gov.bc.ca/competencies

Core /Sub-Core Competencies *(check all that apply):*	*Describe briefly how you intend to embed Core Competencies in your lesson, or the role that they have in your lesson.*
☐ COMMUNICATION – Communicating ☒ COMMUNICATION – Collaborating ☒ THINKING – Creative Thinking ☐ THINKING – Critical Thinking ☐ THINKING – Reflective Thinking ☒ PERSONAL AND SOCIAL – Personal Awareness and Responsibility ☐ PERSONAL AND SOCIAL – Positive Personal and Cultural Identity ☒ PERSONAL AND SOCIAL – Social Awareness and Responsibility 	Communicating: Students will work in small groups collaboratively to complete their math fractions activity. Thinking: In this lesson students will explore with a purpose in mind and use what they have learned in the unit to complete the required tasks.. Personal & Social: Students will respectfully and thoughtfully interact with others and the environment around them. Throughout the activities students will focus on working cooperatively with their partner and staying on task.

3. INDIGENOUS WORLDVIEWS AND PERSPECTIVES
Key resources: First Peoples Principles of Learning (FPPL); Aboriginal Worldviews and Perspectives in the Classroom

FPPL to be included in this lesson *(check all that apply):*	*How will you embed Indigenous worldviews, perspectives, or FPPL in the lesson?*
☒ Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. ☒ Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). ☐ Learning involves recognizing the consequences of one's actions. ☐ Learning involves generational roles and responsibilities. ☒ Learning recognizes the role of Indigenous knowledge. ☐ Learning is embedded in memory, history, and story. ☒ Learning involves patience and time. ☐ Learning requires exploration of one's identity. ☐ Learning involves recognizing that some knowledge is sacred and only shared with permission and/or in certain situations. 	Students will learn through holistic hands-on experiential activities, both inside and outside of the school walls, respectfully interacting and connecting with the people and land around them. Students will be encouraged to be purposeful as they use their new fraction skills in a hands-on experiential manner, remembering that learning takes time and patience. *Note: students will have learned about the history and importance of bannock in First Nations Culture in a previous Social Studies lesson (video link in references) **If possible a local Elder will be invited to share their cultural knowledge with the students on their learning journey.

4. BIG IDEAS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum, match lesson to one or more Big Ideas)

What are students expected to understand? How is this lesson connected to Big Idea/s or an essential question?
Big Ideas: Fractions are types of numbers that can represent quantities. In this lesson students will be introduced to the idea of fractions being used in daily life outside of a classroom. Students will take their fraction knowledge and apply it to making bannock, solidifying their fraction knowledge through real-life experiences.

5. LEARNING STANDARDS/INTENTIONS
Key resources: https://curriculum.gov.bc.ca/ (choose course under Curriculum)

Curricular Competencies: *What are students expected to do?*	**Content:** *What are students expected to learn?*
Students will participate in hands-on, real-world fraction use through measuring, mixing and cooking bannock. Students will work together cooperatively to explore this activity and successfully demonstrate their understanding of the given task. **Reasoning and analyzing** ● Use reasoning to explore and make connections **Understanding and solving** ● Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem-solving	Students will know how to use concrete and visual models to represent quantities in real-life situations. Students will understand that fractions in recipes are numbers that represent an amount or quantity and are used in cooking. Students will apply their knowledge of fractions using addition, subtraction, multiplication and division in real-life contexts and problem-based situations. Students will know how to take a set of numbers and fractions and break them down into smaller quantities using these skills.

• 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 **Connecting and reflecting** • 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	Students will have opportunities for authentic practice, building on previous grade-level addition and subtraction facts. Students will use mental math strategies such as halving to explore fractions. Students will be expected to *Know:* -ordering and comparing fractions -addition and subtraction facts to 20 (developing computational fluency) -multiplication and division facts to 100 (introductory computational strategies) -addition and subtraction of decimals to hundredths

6. ASSESSMENT PLAN
Key resources: Instructional Design Map and https://curriculum.gov.bc.ca/classroom-assessment

How will students demonstrate their learning or achieve the learning intentions? How will the evidence be documented and shared? Mention any opportunities for feedback, self-assessment, peer assessment and teacher assessment. What tools, structures, or rubrics will you use to assess student learning (e.g. Performance Standard Quick Scale)? Will the assessments be formative, summative, or both?
Formative Feedback: Students will have various opportunities to show their learning throughout the lesson and outdoor activity. Students will be monitored and given feedback throughout the lesson to ensure understanding at each step. Teacher will assess students' understanding by various means including: during class discussion (student responses), conversations during pair work and recipe fraction conversion (teacher will monitor, guide, and give support as needed), students ability to measure correctly using measuring tools, and during outdoor bannock making and cooking time. Student Self-Assessment: Students will be given the opportunity to complete a self-assessment at the end of the bannock fraction lesson. Students will be asked to reflect on their bannock measuring, mixing, and cooking activity, giving each student a self-assessment sheet to complete before moving on. Students will be asked to rate their bannock as well as writing down one strength they've gained during the fraction unit and one fraction learning they would like to improve upon.

7. DESIGN CONSIDERATIONS
Key resources: Instructional Design Map

Make brief notes to indicate how the lesson will meet needs of your students for: differentiation, especially for known exceptionalities, learning differences or barriers, and language abilities; inclusion of diverse needs, interests, cultural safety and relevance; higher order thinking; motivations and specific adaptations or modifications for identified students or behavioural challenges. Mention any other design notes of importance, e.g. cross-curricular connections, organization or management strategies you plan to use, extensions for students that need or want a challenge.
-This lesson will be about reviewing and practicing student learning, which they have acquired over the past 5 weeks, to complete a hands-on, real-life activity. Students will have practiced and solidified the necessary skills needed to successfully complete this activity. Students will be given the opportunity to work in pairs to complete the measuring component of bannock making, allowing for students to support each other and ensure inclusion of all students. -There will be an adult present at all times monitoring the firepit and ensuring the safety of every student.

Required preparation: *Mention briefly the resources, material, or technology you need to have ready, or special tasks to do before the lesson starts, e.g. rearrange desks, book a room or equipment.*
-Have bannock video loaded and smartboard turned on -Prepare bannock making ingredients (flour, water, baking powder, sugar, salt, egg, milk, butter - optional) -Organize bannock ingredient measuring space for students -Arrange measuring implements and baggies for students -Prepare outdoor space including a safe fire pit area (as well as a fire suppresent) -Organize sticks for bannock making over the firepit (previously collected on a walk with students)

8. LESSON OUTLINE

Instructional Steps	**Student Does/Teacher Does** *(learning activities to target learning intentions)*	**Pacing**
OPENING: *e.g. greeting students, sharing intentions, look back at what was learned, look ahead to what will be learning, use of a hook, motivator, or other introduction to engage students and activate thinking and prior knowledge*	Opening: Teacher will greet students and ask students to transition to their desks for Math, and direct them to get out a pencil for our lesson. Teacher will let students know that they will be having an outdoor learning day and will be using their math fraction learning to make bannock on a stick! Teacher will ask students if they have ever made or eaten bannock and if they would like to share their knowledge of bannock. Students will take turns sharing their experience with bannock and any additional information they would like to offer. Students will watch local video of traditional bannock making. Students will observe how to measure and mix the bannock recipe. Students will be directed to watch for ingredients, methods of mixing and making bannock, and other key takeaways from the videos. ***Traditional Bannock Making*** with Phyllis Stevenson in Quesnel, BC https://www.youtube.com/watch?v=4UGWXEThz68 (with butter) https://www.youtube.com/watch?v=54h7wE7I_IM (without butter)  Students will be given 2 minutes to work with a partner and discuss takeaways from the video and think about how they might make their own bannock. Teacher will circulate and monitor student understanding.	3 min (quick transition directly into lesson to allow time for all learning activities) 2-4 min (teacher will give enough time for each student to share) 6 min (teacher will pause video periodically) 2 min (pair and share)

BODY: ● *Best order of activities to maximize learning -- each task moves students towards learning intentions* ● *Students are interacting with new ideas, actively constructing knowledge and understanding, and given opportunities to practice, apply, or share learning, ask questions and get feedback* ● *Teacher uses learning resources and strategic opportunities for guided practice, direct instruction, and/or modelling* ● *Can include: transitions, sample questions, student choices, assessment notes (formative or otherwise), and other applications of design considerations*	<u>Comparing Fractions Smaller Recipe:</u> Teacher will tell students the recipe in the video is too big so we will be breaking it down into a 1/2 batch using our fraction learning. Teacher will ask students to think about math fractions and how they could convert the recipe. Students will be given 1 minute to turn to their partner and discuss the bannock recipe including fractions they will be using and how fractions are used when cooking and be prepared to share their ideas with the class. The teacher will circulate through the classroom, listening to student discussions and offering guidance as needed. As a class, students will discuss how to break down the recipe into smaller bits using examples the teacher has given them (eg. what would 1/2 of 4 cups be?, then what would 1/2 of 1 cup be? and what would 1/2 of 1/2 cup be?)  The Teacher will draw examples on board if needed to help students to visualize how to break down (eg. pie shape cut in 1/2 or in 1/4). The teacher will ask students if they have any other methods or strategies that they used and would like to share with the class. Students will raise their hands to volunteer strategies they might use, what they calculated for an answer, and how they worked out their answer. The teacher will have class helper handout worksheets to use while breaking down the recipe and will put the recipe on the board (video paused at the recipe) for students to reference. Students will work in pairs to break the recipe down into a 1/2 batch from what is used in the video recipe. Students will then work together as a class to share and check their answers are correct. <u>Measuring Bannock:</u> The teacher will let the students know that they will be moving onto the fraction measuring part of the lesson. The teacher will make sure students are quiet and ready with all eyes on the teacher as she prepares to model using measuring tools to measure ingredients in a recipe. 	10 min (students will work in pairs or small groups with teacher monitoring for student understanding and ensuring students are staying on task) 5-7 min (teacher will ensure student understanding before moving on to measuring)

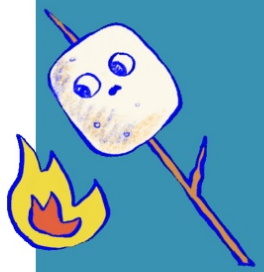
	The first step will be for the teacher to introduce measuring tools including 1/4 teaspoon, 1/2 tablespoon, 1 whole tablespoon, 1/4 cup, 1/2 cup, and 1 whole cup. Students will be given the opportunity to pass tools around the class as the teacher points out how to read the measuring quantity on each tool.  Students will ask questions for clarification on measuring tools if more clarification is needed. The teacher will use the converted 1/2 recipe and model measuring a batch of ingredients into a ziplock baggie, starting with the dry ingredients and then adding the wet ingredients. The teacher will remind the students that they need to measure and pour ingredients carefully into the bag.  As the teacher is measuring the ingredients she will pause to ask the students what will happen if they measure the ingredients incorrectly or part of an ingredient gets spilled so there's not enough in the mixture. Students will raise their hands and volunteer answers. The teacher will ensure students understand that the recipe may not turn out if the ingredients are not measured properly, so it is very important to take their time as they are measuring and pouring their ingredients into their bags. The teacher will pull popsicle sticks and put students in pairs or small groups ensuring every students' needs are being met within each group, adjusting as needed to enhance learning experience. Students will take turns moving through the measuring station of ingredients that has been setup, working cooperatively in pairs to measure bannock ingredients. Students will be encouraged to take turns measuring the ingredients ensuring that each student has been given the opportunity to use the fraction measuring tools.  The teacher will then direct students to bring their bannock baggies and line up getting ready to go outside for the next step.  Students will line up making sure to bring their bannock baggies and transition outside to the meeting point.	3 min (teacher will model measuring for students) 15 min (students will work in pairs or small groups to measure ingredients) 5 min (transitioning outside)

	Mixing/Rolling Bannock: The teacher will model mixing the bannock in a bag, explaining to students that they need to gently need and work the ingredients until they are thoroughly incorporated. Teacher will demonstrate removing the air from the bag and ensure the students remove the air from their bags before they begin. Students will remove all the air from their bags and take turns carefully mixing their bannock ingredients in their pre-measured bags making sure to incorporate all of the ingredients together. Next, the teacher will model rolling bannock explaining that the dough needs to be rolled into a long skinny piece (like a snake). First the teacher will flour her hands and encourage the students to do the same so the dough doesn't stick to their hands.  As the teacher is rolling out the dough she will explain that if the dough is put on the stick in large uneven pieces it will not stay on the stick, it will fall off into the fire. Once the teacher has a long trip she will demonstrate wrapping it around the end of a stick. Teacher will let students know there is enough dough in their bags to make 3 pieces and that they should divide their dough into 3rds (⅓, ⅓, ⅓). Teacher will remind students to flour their hands before they begin working with their dough.  Students will work to divide the batter into 3 pieces. Teacher will monitor to ensure student understanding. Students will each be given a stick and work together in pairs to roll and stretch out their bannock dough, then wrap onto their sticks (students will have gathered sticks on a previous days walk).  Building a Fire/Storytelling Circle: Teacher will have students work together to stack wood into the fire and get ready to start the fire (teacher and students will have discussed fire safety in a previous lesson). Students will work together to stack wood and build a small fire in a fire pit. Time will be given for the fire to heat up so students are able to roast their bannock over the coals rather than over the flames. 	5 min (mixing carefully in bags, taking turns with partner) 10 min (students will divide, roll, and wrap bannock) 45 min (students will take turns telling stories and roasting bannock over the fire pit)

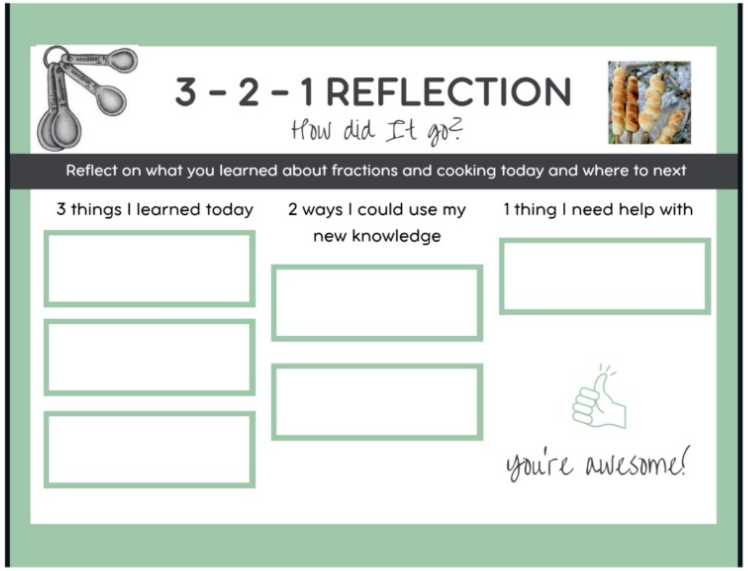
	While the fire is warming up in preparation for roasting bannock, students will have time to share stories around the campfire. *If possible a local elder will be able to attend and share around the fire with the students.  Students will take turns telling stories and sharing around the fire. Once the fire is ready students will begin roasting their bannock in small groups while the others are sharing. Roasting Bannock: First the teacher will model roasting bannock over fire instructing students to carefully hold their sticks above the fire but not too close or it will burn. The teacher will demonstrate good places to hold the bannock and poor places to hold the bannock.  Students will share their experiences roasting over a fire and suggestions they may have. Students will slowly and carefully roast their bannock over the fire following the safety guidelines set out prior to this lesson.	
CLOSING: ● *Closure tasks or plans to gather, solidify, deepen or reflect on the learning* ● *review or summary if applicable* ● *anticipate what's next in learning* ● *"housekeeping" items (e.g. due dates, next day requirements*	 Reflection/Closing: Students will be asked to reflect on their bannock measuring, mixing, and cooking activity. Each student will be given a self-assessment to complete before moving on to the next activity. The assessment will give students the opportunity to reflect on their learning, how fractions can be used in real-life contexts, and areas they might need more work. *If time is left at the end of the day students will be given the opportunity to continue their outdoor fraction learning through various other activities including "fraction representations", "fraction walls", and "fraction hopscotch" (directions attached).	5 min (closing and students complete self-assessment)

9. REFLECTION *(anticipate if possible)*

● *Did any reflection in learning occur, e.g. that shifted the lesson in progress?* ● *What went well in the lesson (reflection on learning)?* ● *What would you revise if you taught the lesson again?* ● *How do the lesson and learners inform you about necessary next steps?* ● *Comment on any ways you modelled and acted within the Professional Standards of BC Educators and BCTF Code of Ethics?* ● *If this lesson is being observed, do you have a specific observation focus in mind?*
*To be completed after the lesson is taught. Teacher will reflect on questions above as well as considering: ● How were the learners able to effectively adapt their previous learning to a real-life context? ● Are there other considerations that should be made if this lesson is delivered again? ● Were there any additional skills that may have been helpful for students to have been taught prior to this lesson?



Student Self-Assessment



Resources

10. RESOURCES:

https://curriculum.gov.bc.ca/curriculum/mathematics/4/core

https://www.youtube.com/watch?v=4UGWXEThz68

https://www.youtube.com/watch?v=54h7wE7l_IM

https://creativestarlearning.co.uk/maths-outdoors/outdoor-maths-using-sticks-to-understand-fractions/

https://www.hants.gov.uk/educationandlearning/oe-pe-dofe/outdoor-education/trailblazer/coordinators/trailblazer-ideas

https://www.dreamstime.com/photos-images/campfire-stories.html

Additional Outdoor Fraction Activities

TRAILBLAZER

Finding your feet outside the classroom!

Representing Fractions

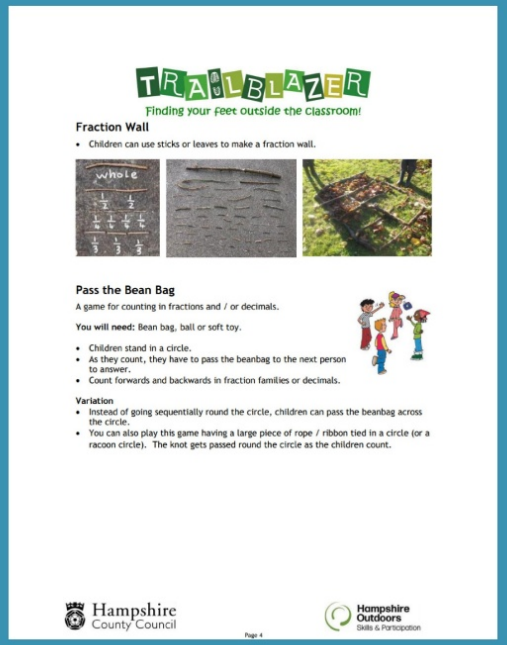
You will need: A list of fractions for children to represent; natural materials eg sticks, stones, flowers etc, hoops and skipping ropes; chalks, whiteboards etc.

- Children can work in pairs or small groups.
- Provide them with a fraction (or equivalent fraction) to represent using natural materials.
- Or represent fractions by chalking on the playground / using the hoops and skipping ropes etc.

- Find equivalent fractions with denominators of 10 and 100 use natural resources to make diagrams to represent them.
- You could then look at their decimal equivalents.

Variation:

- Make a frame on the ground using sticks and ask the children to create a pattern using natural materials with specific instructions eg half of the pattern must be red materials, or 25% must be leaves etc.



TRAILBLAZER

Finding your feet outside the classroom!

Fraction Wall

- Children can use sticks or leaves to make a fraction wall.

Pass the Bean Bag

A game for counting in fractions and / or decimals.

You will need: Bean bag, ball or soft toy.

- Children stand in a circle.
- As they count, they have to pass the beanbag to the next person to answer.
- Count forwards and backwards in fraction families or decimals.

Variation

- Instead of going sequentially round the circle, children can pass the beanbag across the circle.
- You can also play this game having a large piece of rope / ribbon tied in a circle (or a racoon circle). The knot gets passed round the circle as the children count.

Hampshire County Council

Hampshire Outdoors Skills & Participation

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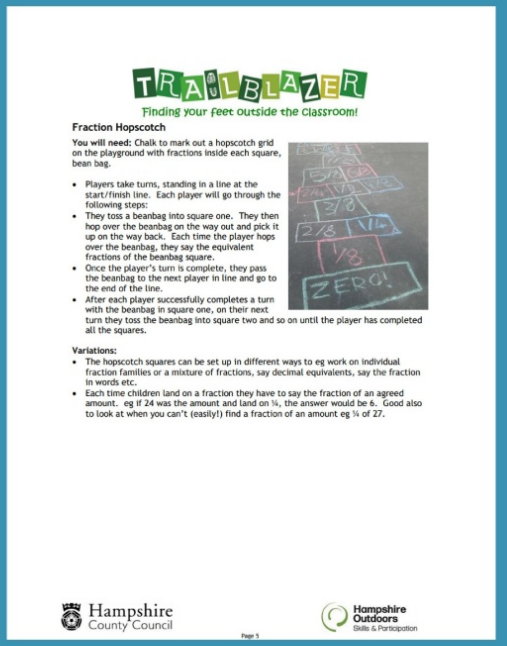

TRAILBLAZER

Finding your feet outside the classroom!

Fraction Hopscotch

You will need: Chalk to mark out a hopscotch grid on the playground with fractions inside each square, bean bag.

- Players take turns, standing in a line at the start/finish line. Each player will go through the following steps:
- They toss a beanbag into square one. They then hop over the beanbag on the way out and pick it up on the way back. Each time the player hops over the beanbag, they say the equivalent fractions of the beanbag square.
- Once the player's turn is complete, they pass the beanbag to the next player in line and go to the end of the line.
- After each player successfully completes a turn with the beanbag in square one, on their next turn they toss the beanbag into square two and so on until the player has completed all the squares.

Variations:

- The hopscotch squares can be set up in different ways to eg work on individual fraction families or a mixture of fractions, say decimal equivalents, say the fraction in words etc.
- Each time children land on a fraction they have to say the fraction of an agreed amount. eg if 24 was the amount and land on ¼, the answer would be 6. Good also to look at when you can't (easily!) find a fraction of an amount eg ¾ of 27.

Hampshire County Council

Hampshire Outdoors Skills & Participation

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In conclusion, this unit provided students the opportunity to develop proficiency in all Core Competencies areas through positive "I can" statements.

Communication

Communicating
- 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.

Collaborating
- I can collaborate with a partner to practice a new math concept.

Thinking

Creative Thinking
- I can be creative in my thinking and find different ways to demonstrate my learning

Critical Thinking
- I can explore with a purpose in mind and use what I learn.

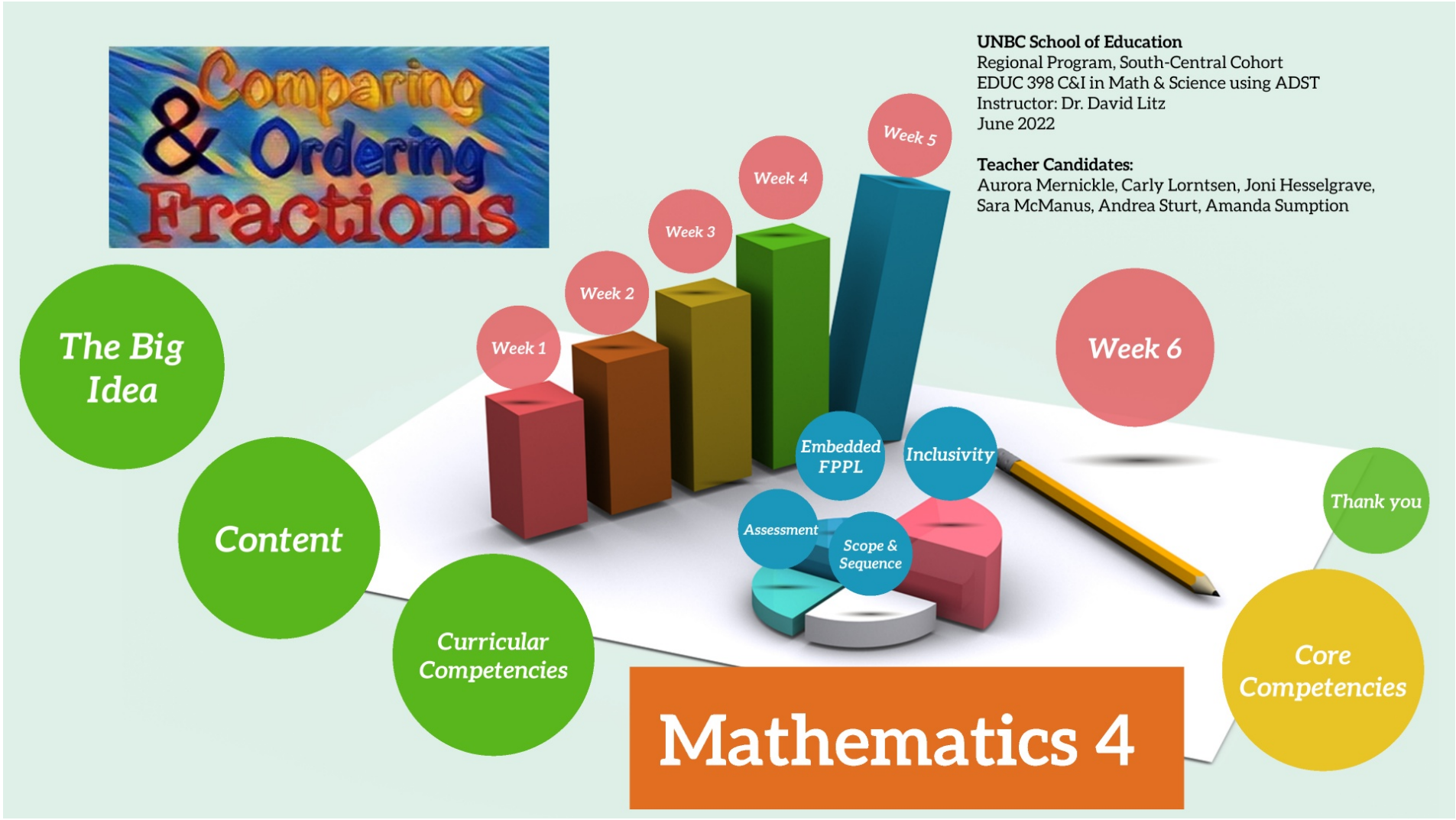
Personal & Social

Personal Awareness and Responsibility - I can interact with others and the environment respectfully and thoughtfully.

Social Awareness & Responsibility - I can work well with my partner and stay on task.

Positive Personal & Social Identity
- 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


THANKYOU
We hope you enjoyed our unit plan!


Comparing & Ordering Fractions
UNBC School of Education
Regional Program, South-Central Cohort
EDUC 398 C&I in Math & Science using ADST
Instructor: Dr. David Litz
June 2022
Teacher Candidates:
Aurora Mernickle, Carly Lorntsen, Joni Hesselgrave, Sara McManus, Andrea Sturt, Amanda Sumption
The Big Idea
Content
Curricular Competencies
Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Embedded FPPL
Inclusivity
Assessment
Scope & Sequence
Thank you
Core Competencies
Mathematics 4