

## Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM/BETT Lesson Plan

**Lesson Title:** It's Fraction Time!: Fraction Talks & Who Is Winning Game     **Lesson #** 4     **Date:** Feb. 4, 2023  
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**Rationale:**

The purpose of this lesson is for students to develop their computational efficiency, flexibility, and accuracy when working with fractions. Proficiency with fractions serves as an important foundation for other skills such as financial literacy, telling time, measurements when baking/cooking, and more.

**Core Competencies:**

Communication	Thinking	Personal & Social
<p>Communicating</p> <ul style="list-style-type: none"> <li>● Connecting and engaging with others <ul style="list-style-type: none"> <li>○ Students will listen, contribute, develop understanding and relationships, and learn to consider diverse perspectives.</li> </ul> </li> <li>● Acquiring and presenting information <ul style="list-style-type: none"> <li>○ Students will communicate by receiving and presenting information.</li> </ul> </li> </ul> <p>Collaborating:</p> <ul style="list-style-type: none"> <li>● Supporting group interactions <ul style="list-style-type: none"> <li>○ Students will listen actively, take turns speaking, and acknowledge contributions in class discussions.</li> </ul> </li> </ul>	<p>Critical Thinking and Reflective Thinking:</p> <ul style="list-style-type: none"> <li>● Analyzing and critiquing <ul style="list-style-type: none"> <li>○ Students will reflect to make defensible judgments and draw conclusions.</li> </ul> </li> </ul> <p>Reflecting and assessing</p> <ul style="list-style-type: none"> <li>● Students will apply critical, metacognitive, and reflective thinking to identify ways to improve or adapt their approach to learning.</li> </ul>	<p>Personal Awareness &amp; Responsibility</p> <ul style="list-style-type: none"> <li>● Self-advocating <ul style="list-style-type: none"> <li>○ Students will develop their confidence, value themselves, and value their ideas.</li> </ul> </li> <li>● Self-regulating <ul style="list-style-type: none"> <li>○ Students will be aware that learning involves patience and time, and they will try to persevere when facing difficult questions.</li> </ul> </li> </ul> <p>Social Awareness and Responsibility</p> <ul style="list-style-type: none"> <li>● Valuing diversity <ul style="list-style-type: none"> <li>○ Students will be inclusive in their behavior and recognize that everyone has something to contribute.</li> </ul> </li> </ul>

**Big Ideas (Understand)**

- Numbers describe quantities that can be represented by equivalent fractions. (Grade 5)

## Learning Standards

(DO)

(KNOW)

Learning Standards - Curricular Competencies	Learning Standards - Content
<p><b>Grade 5</b></p> <ul style="list-style-type: none"> <li>● Reasoning and analyzing               <ul style="list-style-type: none"> <li>○ CC1: Use reasoning to explore and make connections</li> <li>○ CC2: Estimate reasonably</li> <li>○ CC3: Develop mental math strategies and abilities to make sense of quantities</li> </ul> </li> <li>● Understanding and solving               <ul style="list-style-type: none"> <li>○ CC6: Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving</li> <li>○ CC7: Visualize to explore mathematical concepts</li> <li>○ CC8: Develop and use multiple strategies to engage in problem solving</li> </ul> </li> <li>● Communicating and representing               <ul style="list-style-type: none"> <li>○ CC10: Communicate mathematical thinking in many ways</li> <li>○ CC11: Use mathematical vocabulary and language to contribute to mathematical discussions</li> <li>○ CC12: Explain and justify mathematical ideas and decisions</li> <li>○ CC13: Represent mathematical ideas in concrete, pictorial, and symbolic forms</li> </ul> </li> <li>● Connecting and reflecting               <ul style="list-style-type: none"> <li>○ CC14: Reflect on mathematical thinking (sharing the mathematical thinking of self and others, including evaluating strategies and solutions, and posing new problems and questions)</li> </ul> </li> </ul>	<p><b>Grade 5</b></p> <ul style="list-style-type: none"> <li>● C2: decimals to thousandths</li> <li>● C3: Equivalent fractions</li> <li>● C4: Whole-number, fraction, and decimal benchmarks               <ul style="list-style-type: none"> <li>○ two equivalent fractions are two ways to represent the same amount (having the same whole).</li> <li>○ comparing and ordering of fractions and decimals</li> <li>○ estimating fractions with benchmarks (e.g., zero, half, whole)</li> <li>○ equal partitioning</li> </ul> </li> </ul>

## Instructional Objectives & Assessment

Instructional Objectives (students will be able to...)	Assessment
<p><u>Fraction Talks Activity</u></p> <ul style="list-style-type: none"> <li>● Students will be able to apply their knowledge of fractions by identifying fractions in the pictures shown.</li> </ul>	<ul style="list-style-type: none"> <li>● How: The teacher will take note of student contributions and understanding using a “teacher/student conversation or observation tracking sheet” to gain an understanding of what the students may need extra help with.               <ul style="list-style-type: none"> <li>○ Is the student applying their knowledge on fractions to class discussions?</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>○ Is the student contributing to class discussion in some way?</li> <li>○ Is the student able to identify fractions?</li> <li>● <b>(conversation &amp; observation, formative)</b></li> </ul>
<p><u>"Who is Winning" Activity</u></p> <ul style="list-style-type: none"> <li>● Students will be able to use reasoning to explain their prediction of who will win.</li> <li>● Students will be able to place fractions on a number line accurately.</li> </ul>	<ul style="list-style-type: none"> <li>● How: The teacher will collect all worksheets and mark the products to check for student understanding. <ul style="list-style-type: none"> <li>○ Was the student able to use reasoning to explain their prediction for who would win?</li> <li>○ Was the student able to place the people on the number line accurately?</li> </ul> </li> <li>● <b>(product, formative)</b></li> </ul>

### Prerequisite Concepts and Skills:

<ul style="list-style-type: none"> <li>● The students can participate effectively and respectfully in group discussion.</li> <li>● The students are familiar with the "Fraction Talks" process.</li> <li>● The students have a basic understanding of fractions (See below) <ul style="list-style-type: none"> <li>○ Fractions are a type of number.</li> <li>○ What a numerator and denominator is.</li> <li>○ Common fractions (ex. 1/2, 1/3, 1/4, etc.).</li> <li>○ Fraction parts are equal shares or equal-sized portions of a whole or unit.</li> </ul> </li> <li>● The students will also have experience (from grade 4 Math, and from previous lessons): <ul style="list-style-type: none"> <li>○ comparing and ordering of fractions with common denominators</li> <li>○ estimating fractions with benchmarks (e.g., zero, half, whole)</li> <li>○ using concrete and visual models</li> <li>○ equal partitioning</li> </ul> </li> </ul>
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### Indigenous Connections/ First Peoples Principles of Learning:

<ul style="list-style-type: none"> <li>● Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors. <ul style="list-style-type: none"> <li>○ In strengthening/developing their computational efficiency, flexibility, and accuracy when working with fractions, students will set themselves up for success in the future when developing other skills such as financial literacy, telling time, measurements when baking/cooking, etc.</li> </ul> </li> <li>● Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). <ul style="list-style-type: none"> <li>○ Students will collaborate with their peers to develop their understanding of fractions.</li> <li>○ Students will reflect on their mathematical thinking and compare it to that of their peers.</li> </ul> </li> <li>● Learning involves patience and time. <ul style="list-style-type: none"> <li>○ Students need to practice patience in order to effectively participate in group discussions.</li> <li>○ Students will also need to be patient with themselves and their peers when developing an understanding of fractions.</li> </ul> </li> </ul>
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### Universal Design for Learning (UDL):

<ol style="list-style-type: none"> <li>1. MULTIPLE MEANS OF REPRESENTATION <ul style="list-style-type: none"> <li>● Options for perception: <ul style="list-style-type: none"> <li>○ For spoken language (ex. speaking to the class, etc.) use text equivalents in the form of captions or automated speech to text.</li> <li>○ Adjust the volume and rate of speech when speaking to the class.</li> <li>○ Using "easy-to-read" fonts on print materials.</li> </ul> </li> <li>● Options for language &amp; symbols:</li> </ul> </li> </ol>
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- Pre-teach any vocabulary that is needed for understanding the lesson (this will have been done in previous lessons leading up to this one)

Options for Comprehension:

- Activate prior knowledge/schemas using hooks at the beginning of each lesson (in this lesson using Fraction Talks)
- Highlight big ideas and relationships in the lesson

## 2. MULTIPLE MEANS OF ACTION AND EXPRESSION

- Options for physical action:
  - Provide alternatives in the requirements for range of motor action necessary to interact with instructional materials (Ex. provide devices that support the use of pencils for students with low fine motor function, allow student to use speech-to-text assistive technology)
- Options for expressive skills and fluency:
  - Compose in multiple media (ex. drawing/illustrating, writing, speaking, etc.). Ex. during the Fraction Talks activity, students have the option to write or draw their thinking on their whiteboards, as well as verbally explain their thinking to the class during this activity.
- Options for executive functions:
  - The teacher will model thinking using “think alouds”

## 3. MULTIPLE MEANS OF ENGAGEMENT

- Options for recruiting interest:
  - Provide learners with as much autonomy as possible. Ex. by providing different types of tools that can be used for solving, etc.
  - Use activities that can be personalized & contextualized for students' lives.
  - Provide tasks that allow for active participation
- Options for sustaining efforts & persistence:
  - Provide opportunities for collaboration
  - Vary the degree of freedom for acceptable performance
  - Emphasize process, effort and improvement
- Options for self-regulation:
  - Provide students with feedback and scaffolds (charts, templates, or displays) that support them in understanding their progress.

### Differentiate Instruction (DI):

- This game can be differentiated by changing the value of the fractions in the game.
- For English Language Learners, the red light, green light game might not be familiar. So, modelling/working through the game with the entire class may help with understanding.
- The teacher can provide students with low vision their own paper copies of the Fraction Talk pictures to look at, instead of asking them to look at the picture on the smartboard.
- For students struggling with seeing certain colors, the teacher may need to choose a Fraction Talk picture with colors that the student will be able to recognize easily.
- The teacher can provide “fraction reference sheets” for students who need more support with recognizing fractions. Here is a link to a useful one:  
<https://www.teacherspayteachers.com/Product/Fractions-Reference-Sheet-3900089?st=8b0a326e72604b58aa04baee3070c83a>
- If a student struggles with anxiety when verbally sharing with the class, the teacher can give them the opportunity to share their answer/thinking by showing it on their whiteboard and holding it up for the class to see.

## Materials and Resources

- Class set of small white boards, white board pens, and white board erasers.
- Smartboard
- Fraction Talk pictures to be shown on the Smartboard. Found here: <https://mathforlove.com/lesson/fraction-talks/>
- Cuisenaire rods
- Class set of "Who Is Winning?" worksheets – obtained from *Elementary and Middle School Mathematics: Teaching Developmentally (2022)* by Van de Walle, J. A. and Folk, S.

## Lesson Activities:

Teacher Activities	Student Activities	Time
<p>Introduction (anticipatory set – "HOOK"):</p> <p><u>Hook: Fraction Talks Activity</u></p> <ul style="list-style-type: none"> <li>• The teacher will display a picture on the Smartboard that represents fractional relationships. The teacher will then pose the question "What fraction of space is occupied by each color?" and ask students to think of evidence that supports their answer.</li> <li>• The teacher will then give the students time to solve the problem mentally.</li> <li>• The teacher will ask students to share their answers to the question asked. During this step the teacher will also record students answers, even the incorrect ones, on the board.</li> <li>• The teacher will facilitate discussion by asking questions about how students thought about the problems, if they have different strategies, and by focusing on students' attention on the possible ways to solve the problems. During this step the teacher will also try to record the students' thinking on the board.               <ul style="list-style-type: none"> <li>○ Example questions:</li> <li>○ "Is there a strategy that works well this activity?" Ex. splitting</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Students will actively listen to instructions and the question being asked.</li> <li>• Students will consider the question asked and the picture on the board for a minute or two. Students can choose to use their whiteboards to show their thinking. When students have an answer, they will quietly hold one thumb up to show that they have their solution.</li> <li>• Students will put their hand up, and when asked by the teacher, share their answer with the rest of the class.</li> <li>• Students will provide evidence to support their answer and show that it is correct.</li> <li>• Students will put their hands up to answer the questions posed by the teacher.</li> </ul>	<p>2 mins.</p> <p>3 mins.</p> <p>2 mins.</p> <p>8 mins.</p>

<p>up the shapes into equal parts using lines.</p> <ul style="list-style-type: none"> <li>○ "Is it possible to have the same fraction shown in two different ways?" Ex. 1/2 and 4/8.</li> </ul> <p>The teacher will introduce the activities for the lesson (ie. Who Is Winning? Activity).</p>		1 min.
<p>Body:</p> <p><u>Who Is Winning Activity:</u></p> <p>First, the teacher will explain to students that the students on the worksheet are play red-light, green light, and that the fractions indicate how far each person has moved from the start. The teacher will then ask the class to use reasoning to answer the question "Who is winning?" in a class discussion. (Q .1 &amp; 2)</p> <p>The teacher will then ask students to place each person's position on a number line. (Q. 3)</p> <ul style="list-style-type: none"> <li>● Depending on student ability, the teacher can have students do this individually, in pairs, or the teacher can work through it with the entire class through discussion and writing on the board.</li> </ul> <p>*If there is time, or for early finishers* The teacher will then have students use the number line they just created (in Q. 3) to assign a fractional distance to the other students on the worksheet (Q. 4).</p>	<p>Students will use reasoning strategies to compare and decide, sharing their thoughts in a class discussion.</p> <p>Students will place each person on the number line.</p> <ul style="list-style-type: none"> <li>● Students will use Cuisenaire rods, whiteboards and pens, number lines, etc. to help them solve.</li> </ul> <p>*If there is time, or for early finishers* Students will assign a fractional distance to the other students on the worksheet.</p>	8 mins.  15 mins.  5 mins.
<p>Closure:</p> <p>Snowstorm exit activity: the teacher will first ask students to answer one of the following questions on a piece of paper, then ask them to crumple their paper into a ball.</p> <ul style="list-style-type: none"> <li>● How did you overcome any challenges?</li> <li>● What was one thing you learned from today's lesson?</li> <li>● What did you find most interesting?</li> </ul> <p>Finally, when everyone is ready, the teacher will ask students to throw their ball across the room.</p>	<p>Students will reflect on the lesson/their learning, and write down something they learned, a challenge they experienced and how they overcame it, or something they found interesting.</p> <p>Students will crumple their paper, and throw it across the room when instructed to do so.</p>	4 mins.  2 mins.

<p>The teacher will have a few students volunteer to read what is written on their snowball.</p> <p>(Teacher will dismiss students, collecting snowballs to read through later on, gaining information on student strengths/stretches)</p>	<p>Students will volunteer to read out loud what is on their snowball.</p>	
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### Organizational Strategies:

During Fraction Talks Activity:

- To ensure that students who are still working will not be interrupted by those who have finished and stop thinking about solving the problem, the teacher will wait until all students quietly hold one thumb up to show that they have their solution.

For Fraction Talks, and Who Is Winning Activity:

- Whiteboards, worksheets, and other instructional tools will not be distributed until after instructions are given so that students are not distracted by them.
- After giving instructions, the student whose “classroom job” it is to hand things out will be asked by the teacher to hand out the whiteboards, worksheets, instructional tools, etc.

### Proactive, Positive Classroom Learning Environment Strategies:

- When getting the attention of the students, the teacher will do the sequence clapping or “shh-ing” exercise.
- Teacher will verbally acknowledge and thank students who are on task, and will privately address students who are distracting others.
- Teacher will make sure expectations for the activity are clear before students start on them.
- The teacher will move around the classroom to help keep students on track, observe the tools that students are using to solve the problems and observe their ability to solve the problems.
- The teacher will not favor “right” answers over “wrong” ones. Rather, the teacher will highlight the importance of growth in knowledge, importance of explanations, and importance of reasoning to promote a positive mathematical mindset.

### Extensions:

- Extending questions for early finishers:
  - Can you think of a different way to show your thinking?
  - Can you make an equivalent fraction with a different denominator? Why or why not?
  - Individually or with a partner, come up with different fractions, then place those fractions on another number line.
- In a future math or PE lesson, the students could play their own game of red light, green light, and then discuss what fraction they would be on a number line in relation to where they are standing.
- In future math lessons, students can use their knowledge on fractions to explore fractions found on a clock face, and fractions related to money.

### Reflections (if necessary, continue on separate sheet):

\*This section of the lesson plan will be filled in after completing the lesson with students.\*

References:

Math For Love. (2017, December 11). *Fraction talks*. Retrieved January 26, 2023, from <https://mathforlove.com/lesson/fraction-talks/>

Van de Walle, J. A. and Folk, S. (2022). *Elementary and Middle School Mathematics: Teaching Developmentally*. Sixth Canadian Edition, Toronto, ON; Pearson Education Publishing.