

Grade 6 Lesson Observation: Fractions

Background information	
Grade/Level	6
Subject(s)	Math
Topic or Unit of Study	Fractions
Focus	Benchmark and Ordering
Pre-Requisite Knowledge/Skills	<p>Students should:</p> <ul style="list-style-type: none"> • Have an understanding of fractions: basic fractions, improper fractions, and mixed fractions. • Understand mathematic vocabulary inclusive to: numerator and denominator. • Have an understanding of percentages.
Objective(s)	<p>Students will identify and order a variety of different fractions on a fraction number line. This will be done through an activity called “clothesline” fractions.</p> <p>Students will solve multiple mathematical problems consisting of converting percentages into fractions, and ordering and benchmarking such fractions.</p>
Standards Directly from The Ontario Curriculum	
<p>Math – Quantity Relationships</p> <ul style="list-style-type: none"> ○ represent, compare, and order fractional amounts with unlike denominators, including proper and improper fractions and mixed numbers, using a variety of tools (e.g., fraction circles, Cuisenaire rods, drawings, number lines, calculators) and using standard fractional notation. ○ estimate quantities using benchmarks of 10%, 25%, 50%, 75%, and 100% (e.g., the container is about 75% full; approximately 50% of our students walk to school). 	
Summary	<p>This lesson will focus on fractions; benchmarking and ordering, as well as understanding the relationship of converting percentages to fractions. The lesson will start with activating student’s prior knowledge on both fractions (proper, improper and mixed)</p>

	<p>and percentages. The teacher will create a clothesline at the front of the class by taping each end of a long piece of string to the wall, leaving enough room on the string for students to “hang” their fraction T-shirts on the line. The teacher will then hand each student a T-Shirt with a fraction on it. One by one, students will come up to the front of the classroom and pin their fraction T-shirt onto the clothesline. The students will consider benchmark fractions such as $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ as they place their T-Shirt fraction on the clothesline, and explain to the class why they chose to put it there. As students create the T-shirt fraction clothesline, they will record the fraction number line. They will do this by using a dry erase marker on their individual desk tops. Dry erase markers will allow students to wipe desk tops clean after the math lesson. Once students have completed this activity, they will utilize their devices (smart phones, iPad, iPods, tablets) to complete a number of mathematical problems including benchmarking fractions, and converting percentages to fractions in order to put them on a fraction number line.</p>
<p>Materials</p>	<ul style="list-style-type: none"> • Dry Erase Marker • Wipe-able desk top surface • Clothesline (piece of string) • Tape • Clothes pins • Multiple T-Shirt cut outs with a fraction written on each one
<p>Implementation</p>	
<p>Anticipatory Set</p>	<ol style="list-style-type: none"> 1. TTW post the Learning Goal(s) (objectives) on the Smart Board, and read them aloud to the class. 2. TTW host a brief Dynamic Discussion to activate student’s prior knowledge on fractions; proper, improper and mixed – ordering and benchmarking,

	<p>and the relationship between percentages and fractions.</p> <ol style="list-style-type: none"> 3. TTW ask students how fractions are related to real life scenarios – where do we see fractions in our day-to-day lives?
<p>Procedures</p>	<ol style="list-style-type: none"> 1. Anticipatory Set (see above) 2. TTW create a clothesline at the front of the classroom using a long piece of string and taping either end to the wall. 3. TTW hand each students a T-shirt cut out with a fraction on it. Each students fraction will be different. 4. TTW explain to students that they are to place their T-shirt fraction on the clothes line in consideration of benchmark fractions. 5. TTW ask students to explain to the class why they placed their fraction where they did on the clothesline (fraction number line). 6. TTW discuss the results of where students placed their fractions on the clothesline once every student has “hung” their T-shirt on the line. 7. TTW have a brief discussion on the relationship between percentages and fractions and how they can be converted. 8. TSW then be asked to complete a number of mathematical problems representing benchmarking fractions, converting percentages to fractions, and ordering such fractions appropriately on a number line. 9. TTW explain to students that mathematical problems will be completed through activating the “Fractions” worksheet on Google Classroom through use of their

	devices (iPad, iPod, tablet, smartphone, etc.) 10. TTW welcome students to utilize dry erase markers to draw on their desktops in order to manipulate fraction number lines to aid in their learning.
Instructional Materials, Resources, and Planned Supports	
Technology	- Students will be required to utilize their devices to access Google Classroom and complete their "Fractions" worksheet.

Conceptual Development

It is so essential that as educators we enforce conceptual understanding when teaching mathematics. Operational understanding alone is simply not enough. Student are more apt to engage in deeper learning when they are doing, rather than being given a formula or told to follow instructions in a textbook. In this lesson, students engaged in ordering and benchmarking fractions, relating percentage to fractions, and converting percentages in order to benchmark a fraction on a number line. Through activating student’s prior knowledge student’s prior knowledge and allowing students to utilize manipulatives, conceptual development was a factor of this lesson.

Students prior knowledge of fractions was activated in opening discussion, and students were asked to draw connections between fractions and real life occurrences. Having students relate mathematical concepts to real life allows students to grasp a deeper understanding of the concept, and understand where having knowledge of such concepts can be applicable to them in their day-to-day lives. It also allows students to create a mental visual which can aid them in their learning. For example, if a student says that they are reminded of fractions when they think of eating a pizza cut into 8 slices, then they can visualize a pizza with 4 slices gone and 4 slices remaining and know that it is representative of $\frac{1}{2}$ of a pizza.

Furthermore, students were afforded the opportunity to work with physical manipulatives in this lesson. Students were able to manipulate their T-shirt fraction cut outs by going to the front of the classroom and physically clothes pinning it to where they felt appropriate on the clothesline (fraction number line). Students were also allowed to manipulate a dry erase marker on the top of their desk to draw a number line and distinguish where their fraction, and other classmate’s fractions, would appropriately fit on the number line. Permitting students to tangibly generate a solution allows students to better grasp the concept in which they are learning. If they are unsuccessful at generating a solution, a tangible manipulative allows students to problem solve and gain an even better understanding of the underlying

mathematical concept. Additionally, allowing students to write on their desktops provides them with a visual reference to aid in deeper understanding.

Moreover, when having students come up to the front of the classroom to order their fraction on the number line, fractions were called up not orderly, but in a manner in which called forth the simpler fractions first and eventually calling up the more complex fractions. Having students start off with simpler fractions allows them to develop a solid understanding before continuing on to more complex fractions. The action of moving from simpler concepts to more complex concepts, along with relating concepts to real life scenarios and allowing students to utilize manipulatives are all forms of action that aid in conceptual development in mathematics.

Reflective Inquiry

Incorporating reflective inquiry into mathematical lessons is fundamental in having students be accountable for their learning. It is essential to have students take ownership of their learning as it makes for a positive classroom environment, while improving performance and academic achievement. In this lesson hand gestures, reflective questions and dynamic discussion through think-pair-share method made reflective inquiry a component of this fractions lesson.

Hand gestures were incorporated into this math lesson by: students would hold a thumbs up in front of their chest if they agreed with where their classmates put their T-shirt fractions on the clothesline. If students disagreed, they would put a thumbs down in front of their chest. If students have something to add to what a classmate or teacher said, they would hold one finger up in front of their chest. When asked a question, students would likewise put their thumb up if they have an answer, or put a closed fist in front of their chest to signal that they were thinking about the answer. Utilizing these hand gestures allows student to not only be accountable and elaborate on their learning, but also creates an environment in which every student feels comfortable to participate in.

Furthermore, reflective questions were asked throughout the duration of the entire lesson. Asking students for broader understanding on the concept of proper fractions, improper fractions and mixed fractions, the relationship between percentages and fractions, and how such concepts can be related to real life. Asking these reflective questions allowed students to engage in discussion that showed that they have a broader understanding of how the mathematical concept works, not only in the classroom, but in the real world as well.

Additionally, at the end of the lesson when students were to complete the “Fractions” worksheet on Google Classroom via their devices, they were granted the opportunity to think-pair-share with a partner if they were struggling with a question. This allowed students to engage in discussion where different thoughts and opinions were offered, and students were able to rationalize why or why not they believe their solution to be accurate. Think-pair-share with a partner, along with hand gestures and reflective questioning are all forms of reflective

inquiry, aiding in students grasping a concrete understanding of the mathematical concept in relation to fractions.

Making Connections

In this lesson, students are continuously making connections between fractions and percentages. It is important that students are able to link math concepts to each other, but it is also important that students are able to relate and apply concepts to their everyday lives. In this lesson students relate fractions to percentages through dynamic discussion, relation to real life, and finally through execution of mathematical problems through the “Fractions” work sheet via Google Classroom that students can access on their device.

Visual representations of fractions as pizza slices were put up on the Smart Board during the anticipatory set of this lesson in order to give students an idea, and visual reference, as to how fractions can be used in real life. Many students related with the idea of pizza slices being a good representation of how they view fractions in day to day life. When students were asked how they think fractions can be represented in our day to day lives, the most common examples were: pizza and pie slices, and measurements for baking. Further ties to fractions were appropriate measurements for science experiments, and cutting an apple, watermelon, or orange into equal slices. In regards to percentages, many students related this to sales items at stores and scores on school tests/assignments. Students were generally successful at making connections between fractions and the real world.

Furthermore, the connection between percentages and fractions was a large part of this lesson. Students were able to make the connection that a percentage is just another way of representing a fraction, or vice versa. For example, one student said if they think of a pizza that is cut into 10 slices, and they eat 5 of those slices, then they understand that they will have ate $\frac{1}{2}$ of the pizza slices. Additionally, this student added that they understand that when being represented as percentages, the whole pizza would have been represented as 100% until half of it was ate. The student then voiced that they understood that by eating half of the pizza, they knew that they had to divide 100% in half, which equalled 50%. To tie things together, the student was asked where they believed the percentage 50% or the fraction $\frac{1}{2}$ would go on a number line, and they responded appropriately by saying exactly at the half way mark as they know that the benchmark of $\frac{1}{2}$ is always in the middle of a fraction number line. This discussion with this student ensured the fact that connections have in fact been made, and intended learning has occurred.

Technology

Technology is such a prominent factor of today's day and age that it is beneficial to incorporate the use of technology into mathematic lessons when appropriate. In this lesson, technology was utilized through the use of the Smart Board to provide visual examples, as well as through students utilizing their devices to complete the electronic worksheet. The students could access the “Fractions” worksheet through utilization of their technological devices, by

logging on to Google Classroom. Google Classroom allows students to access all documents that the teacher has submitted to their classroom file. Not only does it allow students to access documents and worksheets, but it also allows students to submit their work electronically. The interactive “Fractions” worksheet was an excellent way to tie in the use of technology to this lesson. On the “Fractions” worksheet, students are able to manipulate fractions and percentages through their touch screen devices, and place them where appropriate on the number fraction line.

Conclusion:

In conclusion, I believe that this lesson on ordering and benchmarking fractions was executed successfully. This was due in large part to implementing the concepts of: conceptual development, reflective inquiry, making connections, and the use of technology. Additionally, this lesson was successful at developing a deeper understanding in students of percentages, and their relationship with fractions. Students were actively engaged throughout the entire duration of this lesson, participated with enthusiasm, contributed to class discussion and overall students met the main objective of this Fractions math lesson.