Fractions Between Fractions Lesson Plan

I. About the Task

Cognitive Demand Level of the Task

Cognitive Demand Level (check one)		**Justification:**
Low	**High**	
☐ Memorization	☐ Procedure with connection	The purpose of the lesson is to understand something about mathematics rather than practice procedures. Students will develop their own procedures to accomplish the task.
☐ Procedure without connection	X Doing math	

Purpose: What do you want students to know and understand about mathematics as a result of working on this task?
Students should understand that there is always another fraction that can be created in between two fractions. They will also develop a strategy for finding a fraction between any two given fractions.

Solution Strategies: What are all the ways this task can be solved? (Solve the task yourself!)

- How will students solve it?
- What misconceptions might students have?
- What errors might students make?

1. Students may attempt to use their fraction strips to determine in-between fractions.
2. Students may find common denominators and then an equivalent fraction for each end point, searching for a numerator between them.
3. Students may draw on a number line.
4. Students may use benchmarks fractions (0, ½, 1) in order to determine relative fraction size and then use the same reasoning to find a fraction larger than the smaller fraction but smaller than the larger one.

Prior Knowledge: What concepts/skills/academic language is useful and necessary for students *to be engaged with this task*?

USEFUL	NECESSARY
Fraction Strips Common Denominators Number Line Concepts Knowledge of Benchmark Fractions	Equivalent Fractions

II. Setting Up the Task

1. How will you introduce students to the activity so as not to reduce the demand of the task?

We will talk about what they know (fractions have different equivalent forms, fractions have relative sizes) and then ask if they can always find another fraction in between two fractions or not.

2. What will you hear that lets you know students understand the task?

Students will be talking about fractions that are bigger and smaller than fractions that are given or that they create as they solve the problem.

3. How will students work on and complete this task?

- What resources and tools will students have to use?
  Students should have fraction strips, paper, pencils, and scissors.

- How will students work to explore this task? (circle all that apply):

  (individually) (pairs) small groups

  How long will they work individually/in pairs/in small groups? Will students be partnered in a specific way? If so, in what way?
  Students will work until several groups appear to be ready to discuss their answers.
  Students are paired by the cooperating teacher in the same way each class.

- How will students record and report their work?

Students will record their work in their math journals, where they record their work and any notes they take each day.

III. Supporting Students' Exploration of the Task

<u>Teacher Questioning</u>

What questions will you ask to uncover and assess, focus, and advance student understanding of key mathematical ideas?

Questions		
<u>Uncover/Assess</u>	<u>Focus</u>	<u>Advance</u>
What are you thinking? Can you place these fractions on a number line or on your fraction strips?	Can the fractions be represented in different ways? (If using a visual tool) What	Can you think of an example that doesn't work?

	would it look like if I used a powerful magnifying glass?	

Student Engagement

- What will you do if a student does not know how to begin to solve the task?

I will ask them to put two fractions on a number line and then ask if they can find a place in between those two points. After they, I will ask if they can always do that or if they think there is a limit and why.

- What will you do if a student finishes early?

I will ask early finishers to think of as many ways as possible to find a number between two fractions, since there are several ways.

- What will you do if student focus on non-mathematical aspects of the activity?

I will work with students in order to help them focus. This lesson will be presented to a small group so I will be able to keep an ear out for each pair of students.

Student Understanding

- What will you see or hear that lets you know students are thinking about key mathematical ideas?

They will be talking about making equivalent fractions (or "renaming" fractions to make them look the same). They will likely be drawing on number line or cutting paper into smaller and smaller bits to see how far they can go.

- What academic language will you listen for students to use?

Numerator, denominator, equal/equivalent

IV. Orchestrating A Class Discussion around Mathematical Goals

1. What mathematical ideas do you want shared and discussed?

I want them to talk about whether it is always possible to find another fraction between two fractions. If there is time, we may talk about whether than is true for whole numbers or only for fractions

2. What <u>academic language</u> do you want student using?

Equal/equivalent, numerator, denominator

3. How will you determine which solutions get shared and in what order?

Because the group is small (12 students) and they are used to being allowed to share all their thoughts, I will likely let them all have a chance to speak. If that seems to confusing, I will be looking for groups that made progress and choose them to speak before the groups that feel they have a solution.

4. What questions will you ask to assess and/or advance student understanding of important mathematical ideas?

Question	Desired Student Response
1. Is it always possible to find a number in between two fractions? 2. Is this true for whole numbers? 3. How can you find a number between two fractions?	1. Yes, because fractions can be found that are smaller and smaller. 2. No, because whole numbers can only be divided so far. 3. There are several answers, including finding common denominators and making equivalent fractions, and dividing a fraction strip or number line into smaller and smaller pices.

Lesson-at-a-Glance

Beginning	What students will do: Students will be asked to think about whether they can find a number between any two fractions or not. They will discuss it in pairs and then share with the group.	*How will I introduce the students to the activity without telling them how to approach the problem, thereby lowering the cognitive demand level of the task?*
Middle	What students will do: Students will work in pairs to attempt to show why they thought they could (or could not) find a number in between any two fractions. They will also attempt to find strategies for finding that number. Questions: Can a number line be divided into smaller and smaller pieces? How are you figuring out how many numbers are between two fractions?	*What questions will I ask to focus, assess, and advance students' mathematical understanding?* *How will I ensure that students remain engaged in the lesson?* *How will students share out and discuss their thinking?*
End	What students will do: Students will share their solutions and reasoning. They will discuss ways to find the number between two fractions. They will demonstrate that they can always find a number between two fractions using their developed strategies. *Note: If the lesson does not take the entire class period we will play the Fraction Tracks game, for which I will come with all the necessary game pieces.	*What mathematical understanding do I want students to take away from this lesson?* *How will I know if they "got it?"*