Practice Task – Up and Down the Number Line

STANDARDS FOR MATHEMATICAL CONTENT

MCC5.NF.1 Use equivalent fractions as a strategy to add and subtract fractions.
Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = ad + bc/bd)*

STANDARDS FOR MATHEMATICAL PRACTICE

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

ESSENTIAL QUESTIONS

- How can fractions with different denominators be added together?
- What strategies can we use for adding and subtracting fractions with different denominators?
- What models can we use to help us add and subtract fractions with different denominators?
- What do equivalent fractions have to do with adding and subtracting fractions?

MATERIALS

- Game board
- Two counters per person
- Available manipulatives

GROUPING

Partner Task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

This game was developed from a kindergarten counting game and adapted for use with fractions.

In this task students spin a spinner to move their counters up and/or down the number line. The first to move to their side of the number line wins the game. This game will allow students to use their fractional understandings to add and subtract fractions, look for relationships between certain fractions, and as their fractional computation strategies develop, logical thinking and problem solving skills will begin to develop their game playing strategies.

Comments

Multiple fraction models should be made available to the students as support for students who need it. In addition, fractional number lines (other than the ones included with the task) could benefit many students with this task. Students could utilize blank (open) number lines as a strategy as well.

This task could be introduced in a small group or by playing with class as a whole using available technology. In addition, the teacher could role model with a student, or better yet have two students role model how to play for the rest of the class.

Before asking students to work on this task, be sure students are able to:

- Use models to create equivalent fractions (see previous tasks and Teaching Student Centered Mathematics, volume 2, pg 155-156 (Slicing Squares).
- Understand that a whole can be written as a fraction with any number of parts as long as all of those parts are included to make the whole. For example, a whole can be cut into tenths. In order to have a whole, I need all ten tenths (10/10).
- Be able to decompose fraction, for example $^{4}/_{4}$ = ½ + ½ or ¼ + ¾.

Task Directions

Students will follow directions below from the Create Three Game activity.

Play several rounds with each other.
Keep track of computation strategies used (use models in explanations during the closing).
Keep track of game playing strategies you think are helping you.

During and after the students complete the task:

Which students have developed a strategy based on fraction understandings of numerators and denominators?
Which students are becoming fluent in creating equivalent fractions when adding fractions?
Which students still prefer to use manipulatives and rely heavily on models?

FORMATIVE ASSESSMENT QUESTIONS

- What fraction would you like to spin first? Why?
- What strategies do you have for this game?
- If you could change the spinner, what fraction would you like to have on it?
- Do you notice any relationships between any of the fractions?
- Do you think other fractions may have similar relationships? What fractions might have this similar relationship? Explain.

Questions for Teacher Reflection
While planning the task:
What level of support do my struggling students need in order to be successful with this task?
In what way can I deepen the understanding of those students who are competent in this task?
Could this game be played again, or changed in any way?
After the lesson:
How did my students engage in the 8 mathematical practices today?
How effective was I in creating an environment where meaningful learning could take place?
How effective was my questioning today? Did I question too little or say too much?
Were manipulatives made accessible for students to work through the task?
One positive thing about today's lesson and one thing you will change.

Technology
http://www.counton.org/games/map-fractions/racing/ this is an interactive board game where players race bikes on a game board by adding fractions with like denominators.

http://www.counton.org/games/map-fractions/frosty/ this is an interactive three across board game where players add fractions with like and unlike denominators and place a virtual counter on the sum. The first to get three in a row wins the game.

http://www.k-5mathteachingresources.com/ this site offers simple contextual problems to use to extend and support students in their understanding of fraction computation and all problems are correlated to CCSS.