The Race to One
Task #2

(This Task builds from Task 1)

Adapted from North Carolina Department of Public Instruction

Student Objectives: "I can explain, recognize, and generate equivalent fractions."

Standards to Measure	**Mathematical Practices**
4.NF.A.1 Explain why a fraction *a/b* is equivalent to a fraction *(n x a)/(n x b)* by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principal to recognize and generate equivalent fractions. **4.NF.B.3** Understand a fraction a/b with a>1 as a sum of fractions 1/b. **b.** Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.* **c**. Add and subtract mixed numbers with like denominators; e.g., by replacing each mixed number with an equivalent fraction, and /or by using properties of operations and the relationship between addition and subtraction.	3. Construct viable arguments and critique the reasoning of others. 7. Look for and make use of structure**.**

Materials:

Fraction Cards, Race to One Game Board, Race to One Rules, chips or counters per game

Computer version:

http://illuminations.nctm.org/ActivityDetail.aspx?ID=18

G **Engage Students with the Goal**	<u>State and Rate</u> Objective: "I can explain, recognize, and generate equivalent fractions." Students rate themselves to the goal (1, 2, 3, 4).	Setting Objectives and Providing Feedback
A **Access Prior Knowledge**	Ask students, "Which is bigger 1/2 or 3/6?" Give them some time to think about it and draw quick models if needed. Have students pair share and discuss their reasoning. After they discuss with each other, discuss as a class. This conversation should lead into that the two fractions are equivalent when dealing with the same whole.	Nonlinguistic Representation Identifying Similarities and Differences

N **New Information**	**Pass out the "Race to One Game Board."** Ask students to reason about what fractional parts each part of the game board represents. As they do, have them fill in the fractional parts. (Halves, Thirds, Fourths, Fifths, Sixths, Eights, and Tenths). **As students fill in their boards, ask questions such as:** -Do you see any equivalent fractions? -Is (fractional part) bigger, smaller, or equal to (fractional part)? -What does each full bar represent? (1 whole) Also discuss what happens to the numerator and denominator (pieces) as the fractional parts change from one fraction bar to the other. **Introduce the game "Race to One" by playing a practice game with the class.** Using just the fraction cards that are equal to or less than one, shuffle the cards and place them face down. Start by placing one chip on each fraction bar at a location that is less than 3/4. (Students will start at the beginning of the fraction bar during their game.) Select a card from the pile and discuss the possible moves available to the students. The player can move more than one chip, or more than one chip during each play, but they must move the full amount on the chosen card. If a player is not able to move the full amount, they lose their turn. Once a player moves a chip exactly to the number 1 on any fraction bar, they collect the chip. Place a new chip at the beginning of that fraction bar so every play has 7 chips available. Play a few hands so students can get an idea of how to play. Students are given a game board for every pair of students playing.	Similarities and Differences Nonlinguistic Representation Cues, Questions, and Advance Organizers
A **Application**	**Students play the game Race to One in pairs.** Move throughout the room observing how the students are playing the game. **Suggested questions:** What game piece are you moving? Are there other game pieces that you could also move? How do you know? Which move will help you get more pieces closest to one? Bring the class back together after students have played the game for about 20 – 30 minutes. Continue your practice game from the beginning of the class, but have students decide which chips to move and how far. Discuss the possibilities and the reasons why the students choose to make them. Continue to play this game. If students need an extension, tape two "Race to One" boards together, and make the game "Race to Two." *In this version, all the cards can be used.*	Cooperative Learning Providing Feedback Generating and Testing Hypotheses Practice and Homework
G **Revisit the Goal**	State and Rate Objective: "I can explain, recognize, and generate equivalent fractions." Students rate themselves to the goal (1, 2, 3, 4).	Setting Objectives and Providing Feedback

Evaluation of Students

Formative:

As students are playing the game, observe them and pose questions to check for their mathematical understanding. Suggested questions are in the Explore section.

Summative:

If teachers want a summative assessment, pose an additional follow-up task, such as:
You have the card ¾. Name 3 possible moves that you can make on the game board.

- One move involves 1/2
- One move that includes 1/4
- One move that includes 1/6

Plans for Individual Differences

Intervention:

For students who are struggling to find equivalent fractions, provide fraction manipulatives (fraction bars, fraction tiles) to help them.

Extension:

Play "Race to Two" the entire time if students need an extension.

The Race to One

Game Rules

1. Shuffle the fraction cards that are equal to or less than 1. Place them face down.

2. Place seven counters on the game board, one at the beginning of each fraction bar.

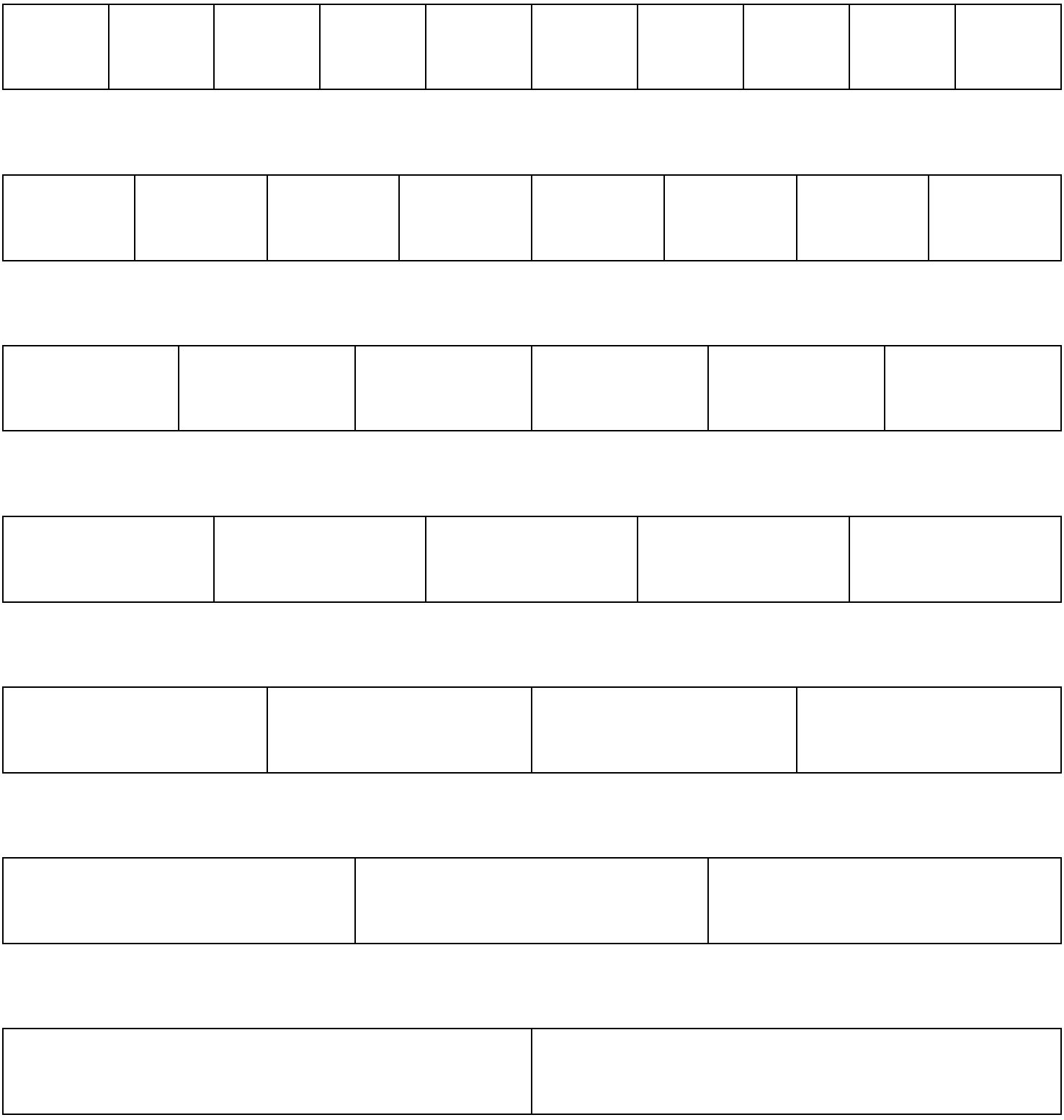
3. Player 1 draws the first card off the top of the deck of fraction cards. Move a chip (or chips) the total amount shown on the card. You can move one or more than one chip on every turn. You must move the full value of the fraction on the fraction card. Example: Player 1 chooses 3/5; they can move one chip 3/5 on the fifths line or 6/10 on the tenths line. They can also move more than one chip the following ways: 1/2 and 1/10, 1/5 and 4/10, or 1/3, 1/6, and 1/10.

4. Player 2 draws the next card off the top of the deck of fraction cards and moves their chip or chips the total found on their card. Players take turns flipping cards and moving chips.

5. When a chip lands exactly on one, the player has won the chip. Once a player has won a chip, another chip is placed at the beginning of the fraction bar so that there are always 7 chips being played at one time.

6. If you are unable to move the amount found on the fraction card, your turn is over.

The Race to One Game Board



$\frac{1}{2}$	$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{4}$
$\frac{3}{4}$	$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$
$\frac{4}{5}$	$\frac{1}{6}$	$\frac{5}{6}$	$\frac{1}{8}$
$\frac{3}{8}$	$\frac{5}{8}$	$\frac{7}{8}$	$\frac{1}{10}$
$\frac{7}{10}$	$\frac{3}{10}$	$\frac{9}{10}$	$\frac{4}{3}$

$\frac{2}{2}$	$\frac{3}{2}$	$\frac{3}{3}$	$\frac{2}{4}$
$\frac{4}{4}$	$\frac{5}{4}$	$\frac{6}{4}$	$\frac{5}{5}$
$\frac{6}{5}$	$\frac{7}{5}$	$\frac{2}{6}$	$\frac{3}{6}$
$\frac{8}{6}$	$\frac{4}{6}$	$\frac{6}{6}$	$\frac{7}{6}$
$\frac{9}{6}$	$\frac{2}{8}$	$\frac{4}{8}$	$\frac{6}{8}$

$\frac{8}{8}$	$\frac{9}{8}$	$\frac{10}{8}$	$\frac{11}{8}$
$\frac{12}{8}$	$\frac{2}{10}$	$\frac{4}{10}$	$\frac{5}{10}$
$\frac{6}{10}$	$\frac{8}{10}$	$\frac{10}{10}$	$\frac{11}{10}$
$\frac{12}{10}$	$\frac{13}{10}$	$\frac{14}{10}$	$\frac{15}{10}$
$\frac{1}{1}$			