COMMON CORE COLLABORATIVE NUMBER SYSTEM CARDS

Grades 6–8

MEANINGFUL TASKS

by Kit Norris

TEACHER'S PAGE

GRADE LEVEL	6
TASK	Does It Make Sense?
COMMON CORE STATE STANDARDS ADDRESSED	6.NS.1
STANDARDS FOR MATHEMATICAL PRACTICE	1. Make sense of problems and persevere in solving them. 3. Construct viable arguments and critique the thinking of others.

LAUNCH

Once students have used the cards to form their groups, present them with the following problem:

Without calculating, which expression will result in a larger quantity?
½ of ½ *or* ½ ÷ ½

Have the groups discuss and be ready to share their reasoning with the class. Look for students to reason that any number divided by itself equals one whole, while taking one-half of one half leads to a smaller result, ¼.

If necessary, have the teams draw models to verify their conclusions or represent both expressions using fraction strips or another manipulative.

TASK

Give each group of four a division example to solve. Group members contribute to the solution according to their designated roles:

Recorder: Writes a story that can be solved using the division example given to the team.
Facilitator: Solves the division example.
Team Captain: Draws a picture of the example or represents it using manipulatives.
Resource Manager: Writes the corresponding multiplication sentence.

Have the teams record their work on large paper so they can share their work with the class.

CLOSURE

Teams present their work to the class. Ask the class what they notice about the problems and solutions. What patterns do they see? Why do they think this is occurring? Ask the teams to create two problems exhibiting this same pattern.

DOES IT MAKE SENSE?

NAME _____

Solve these pairs of problems. Look for patterns.

1. $\frac{3}{8} \div \frac{3}{4}$

$\frac{3}{4} \div \frac{3}{8}$

2. $\frac{5}{12} \div \frac{5}{6}$

$\frac{5}{6} \div \frac{5}{12}$

3. $\frac{5}{6} \div \frac{2}{3}$

$\frac{2}{3} \div \frac{5}{6}$

4. $\frac{2}{5} \div \frac{1}{10}$

$\frac{1}{10} \div \frac{2}{5}$

TEACHER'S PAGE

GRADE LEVEL	7
TASK	Location, Location!
COMMON CORE STATE STANDARDS ADDRESSED	7.NS.1
STANDARDS FOR MATHEMATICAL PRACTICE	2. Reason abstractly and quantitatively.

LAUNCH

For this whole-class activity, place a long string across the room at the level of the average student's shoulder height. Give each student a card displaying a fraction or decimal, such as those included in the following list:

1/2, 0.05, 2/3, 0.1, 3/4, 5/3, 0.12, 9/5, 1.2, 0.4, 3/8, –1/2, –0.02, 1/5, –1/5, 3/10, –0.3, –7/8, –3/8, 0.9, 0.09, –0.089, 1/4, 0.25, –1/4
0, 1, 2 (Reserve to use as indicated below.)

Ask students to consider where the value on their card might be located on the number line. (Note: Intentionally delay indicating where 0, 1, and 2 might be located. Let the students raise this issue.)

Ask students who have an idea of where their value is located on the number line to stand at the location they think represents their value.

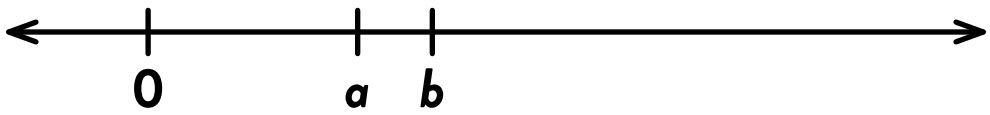
Ask: *What do we need in order to place these values on the number line?*

Have the students agree among themselves about where 0, 1, and 2 are located on the number line. Then have them locate the other values on the number line.

Ask students to discuss with their teams whether or not the values are placed correctly on the number line. If a team thinks a specific value should be moved, the students on that team must offer a compelling argument for why they think the value is misplaced. Continue rearranging the values until everyone is satisfied that the values are correctly positioned.

TASK

Now that students have worked with placing values on a number line, they will determine the location of the same values on the number line shown below:



These values will be expressed as a relationship between *a* and *b*. (See student page.)

CLOSURE

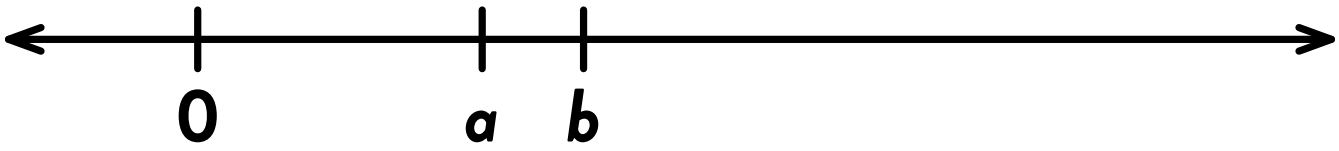
Because students are working with variables, the exact placement of each value indicated will be approximate. Students should agree about the general placement of the values.

Finding the location of these values is challenging. Students should see that they cannot determine the location because they do not have an indication of the whole. Before they can determine the ratio of *a* to *b*, they need to know where 1 is located.

LOCATION, LOCATION!

NAME _____

Locate the following expressions on the number line. Use the capital letter associated with each expression to indicate its location on the number line.



A. $a + b$

B. $a - b$

C. $b - a$

D. $\frac{a}{b}$

TEACHER'S PAGE

GRADE LEVEL	8
TASK	Show What You Know
COMMON CORE STATE STANDARDS ADDRESSED	8.F.2
STANDARDS FOR MATHEMATICAL PRACTICE	4. Model with mathematics. 7. Look for and make use of structure.

LAUNCH

Review linear equations such as $y = 2x + 1$. What do students know about this equation?

Look for them to determine the slope and y-intercept, make a table of values, and be able to sketch a graph of this equation.

TASK

1. Students work in their groups. Each group is given a linear equation and each student in the group contributes information about the linear equation according to their role in the group.

   Recorder: Determines the slope and y-intercept.
   Facilitator: Creates the table of values.
   Resource Manager: Graphs the equation.
   Team Captain: Creates a word problem that uses the equation to answer the question in the story.

2. Remind the students that if they finish their job ahead of others, they should help other members of their team as needed. All members of the team must agree to all parts of the task.
3. After the teams have completed their work, the teams should exchange the word problems. Are the teams able to come up with the equation called for in the word problem they have just received?
4. Have the different teams talk among themselves to compare their equations. What do the equations have in common? What is different? What similarities and differences do they see in the graphs of the different equations?
5. Have the teams work with the equations on the student page. For each new equation, the team members rotate roles to complete a new task.

CLOSURE

Ask the students to reflect on which role/task they found the easiest to accomplish. What strategies did they use to determine the equation called for in the word problem? Did they see similarities among the different equations?

SHOW WHAT YOU KNOW

NAME _____

Contribute information about the following linear equations according to your role in the group:

Recorder:	Determine the slope and y-intercept.
Facilitator:	Create the table of values.
Resource Manager:	Graph the equation.
Team Captain:	Create a word problem that uses the equation to answer the question in the story.

1. $y = -2x + 3$

2. $y = 2x - 3$

3. $y = \frac{1}{2}x + 1$

4. $y = 2x + 1$

5. $y - 2 = 3x$

6. $y = 3x + 2$

7. $4 = \frac{1}{2}x + y$

8. $8 = x + 2y$