FIFTH GRADE
Number and Number Sense
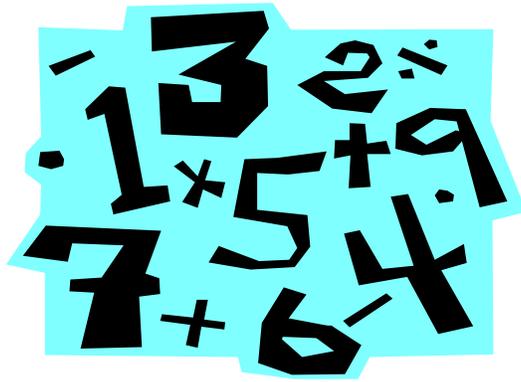
Roll 'em

Reporting Category	Number and Number Sense
Topic	Round decimals
Primary SOL	5.1 The student, given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth.

Materials
- Three number cubes per pair
- Pencil and paper

Vocabulary
round, *decimals, whole number, hundredths*, *tenths*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Player One rolls the three number cubes and puts the three numbers together to form a decimal, then rounds the decimal to the nearest hundredth.
2. Player Two checks the number to make sure it is rounded to the nearest hundredth. If it is correct, Player One gets a point.
3. Player Two rolls the number cubes, makes a decimal, and rounds it to the nearest hundredth. Player One checks the number and, if correct, Player Two scores one point.
4. If a player rounds the number incorrectly, that player must subtract two points from his or her score.
5. Play continues until a score of 10 is reached or you call time.

Note: This is a quick way to determine if a student knows how to round decimals.

Fishing for Decimals/Fractions

Reporting Category Number and Number Sense
Topic Recognize and name fraction and decimal equivalents
Primary SOL 5.2 The student will
    a) recognize and name fractions in their equivalent decimal form and vice versa.
Related SOL 4.3d

Materials
- Fraction and decimal game cards
- Pencil and paper

Vocabulary
 equivalent, *fractions*, *decimals*, *tenth*, *hundredth*, *thousandth*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
The game is played like the "Go Fish" card game.
1. Each player is dealt five cards. The remaining cards are placed in the middle of the playing area to be used as the "fishing" pile.
2. At each turn, the player asks another player for a card he or she needs to make a pair. If the other player has the card, he or she must give it to the player who asked for it. The player then lays down the matched pair. If the other player does not have the desired card, then the first player must "go fish" by drawing another card from the pile.
3. The first player to match all of his or her cards, and thus have no cards remaining in hand, is the winner.

Game Cards

$\dfrac{1}{2}$	**0.50**	$\dfrac{1}{5}$	**0.20**	$\dfrac{1}{4}$
$\dfrac{5}{6}$	**0.83**	$\dfrac{3}{5}$	**0.60**	$\dfrac{3}{4}$
$\dfrac{3}{8}$	**0.375**	$\dfrac{3}{10}$	**0.30**	$\dfrac{4}{5}$

0.80	$\dfrac{1}{8}$	0.125	$\dfrac{2}{5}$	0.40
$\dfrac{5}{8}$	0.25	$\dfrac{7}{8}$	0.875	$\dfrac{7}{10}$
0.70	$\dfrac{9}{10}$	0.90	0.25	0.75

Line-Up

Reporting Category	Number and Number Sense
Topic	Compare and order fractions and decimals
Primary SOL	5.2 The student will
	b) compare and order fractions and decimals in a given set from least to greatest and greatest to least.

Materials
- Paper and pencils
- Number cards containing fractions and decimals
- Sentence strips

Vocabulary
least to greatest, decimal, fractions, denominators, numerators

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Give each group or pair of students a number line marked like the one shown below:
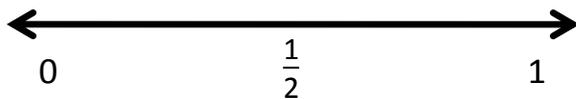
(Use a sentence strip for the number line.)

2. Suggested numbers for the number card sets:

$\frac{1}{2}$, 0.91, 0.04, 0.89, 0.51, $\frac{2}{8}$

$\frac{3}{10}$, 0.37, 0.08, 0.65, 0.71, $\frac{3}{5}$

$\frac{1}{5}$, 0.81, 0.07, 0.43, 0.21, $\frac{1}{4}$

$\frac{2}{5}$, $\frac{7}{10}$, 0.50, 0.03, 0.71, 0.42

$$0.73, 0.06, 0.25, 0.76, \frac{1}{2}, \frac{3}{4}$$

3. Give the group or pair a set of number cards that contain both fractions and decimals. Working together, the students must decide where each number fits on the given number line. The students will place the cards on the number line from least to greatest. Once all students have completed their number lines, students may move around the room checking each other's number lines.
4. Bring the students back into the pairs/groups and discuss why the numbers were placed on the number line at each point.

Assessment
- **Questions**
    - Why were the numbers placed on the number line at each point?
    - How did you know which was least and which was greater?

Fractions and Decimals…Out to Dry

Reporting Category	Number and Number Sense
Topic	Compare and order fractions and decimals
Primary SOL	5.2 The student will

> b) compare and order fractions and decimals in a given set from least to greatest and greatest to least.

Materials

- Yarn
- Clothesline
- Clothes pins
- Number cards
- Recording sheets
- Pencils
- Calculator (optional)

Vocabulary

least, *greatest*, *order*, *fractions*, *decimals*, *mixed numbers*

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Create five groups (decks) of number cards, each including fractions, decimals, and mixed numbers.
2. Place each deck of cards at a learning station in the classroom.
3. Have students work in small groups to order the number cards from least to greatest and place them on the clothesline. Students should record their results on the handout provided.
4. Check for accuracy and replace the decks. Then have the students rotate to the next station, until all groups have completed all five decks.
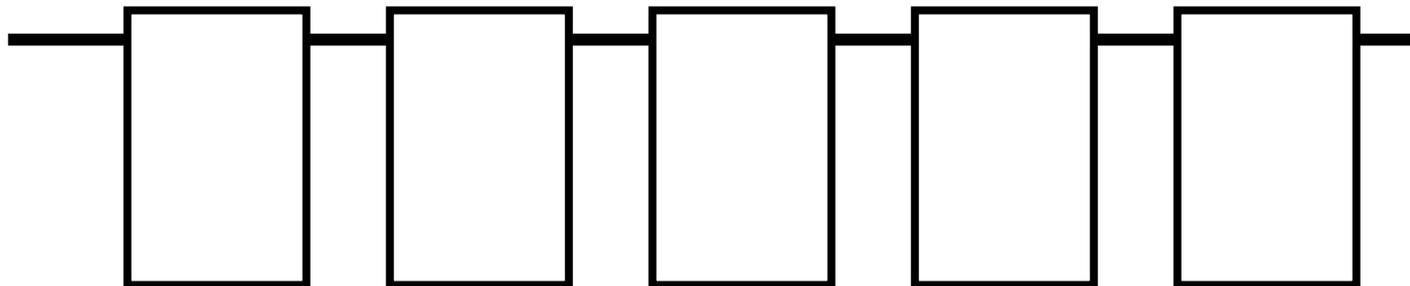
   Sample "deck" combination:

   $0.625, \frac{3}{4}, 1\frac{1}{5}, 0.15, \frac{1}{2}$
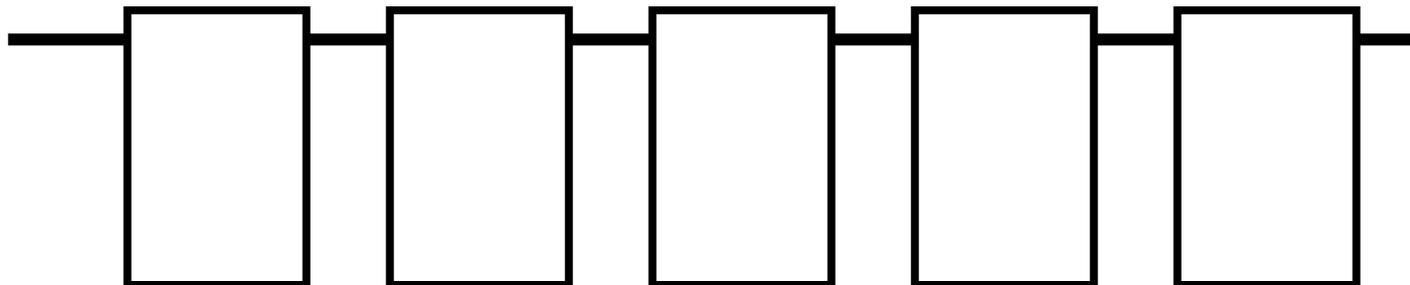
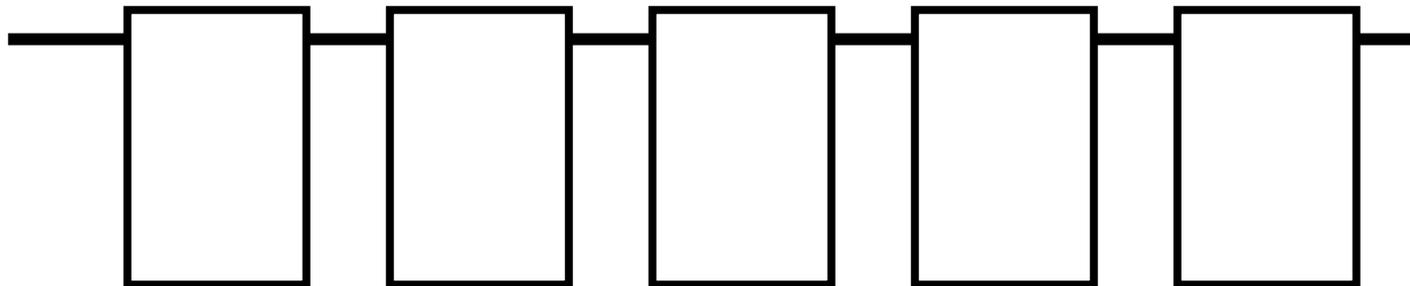# Fractions and Decimals...Out to Dry

Name _____   **Date_____**
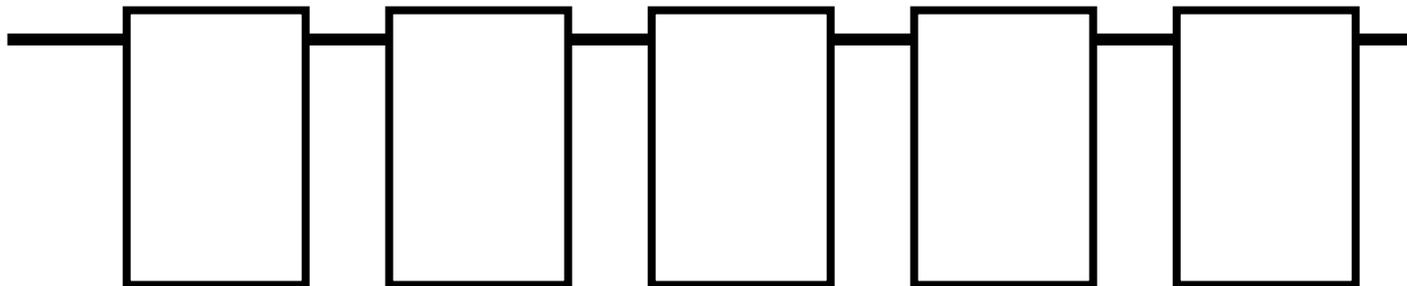
DECK A

DECK B

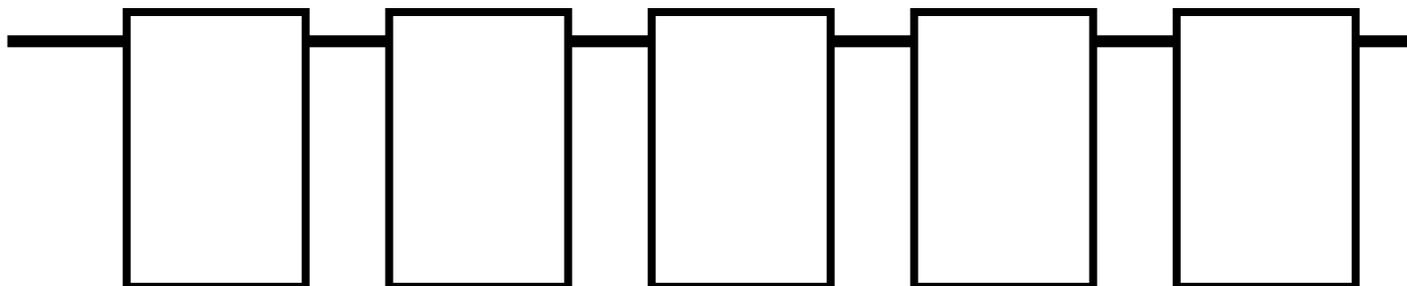**DECK C**

DECK D

DECK E

Prime and Composite Numbers

Reporting Category Number and Number Sense
Topic   Prime and composite numbers
Primary SOL 5.3 The student will
  a) identify and describe the characteristics of prime and
   composite numbers.
Related SOL 4.5a

Materials
- Colored tiles
- Grid paper
- Pencils
- Scissors
- Glue
- Chart paper

Vocabulary
prime, composite, factor, multiples, common factors

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Review with students their understanding of factoring. Ask students to define the mathematical term *factor* and provide examples of factors to help them generate the definition for themselves. Display or hand out copies of a multiplication table, if needed.
2. Ask students to give you all the factors for 8, and prompt them to give the factor pairs, not just one number. For example, if a student says that 4 is a factor of 8, ask how he/she knows that. The response should be, "Because 2 × 4 = 8." Ask for factors of other numbers, and list them on the board. Have students look for similarities and differences among the factors. For example, all numbers have 1 and the number itself as factors. Some numbers have more than 1 and itself as factors. These numbers are different from those with only 1 and itself as factors. This concept lays the foundation for understanding prime and composite numbers.
3. The students will now use their knowledge of factoring to assist them with investigating characteristics of prime and composite numbers. Have pairs of students use colored tiles to find as many different arrays as they can for making the facts of a given product, using the colored tiles given. Each time they find an array, they can then represent it on grid paper. They must use all of the tiles each time.

## Examples:

Factor Arrays for 6:

1 x 6
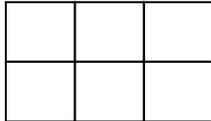
2 x 3

Factor Arrays for 1:

1 x 1

4. The students color one square on the grid paper for every one colored tile in their array. This will form an array on their grid paper.
5. They will cut it out and glue it to their chart paper and label it with the corresponding factors. They continue this process until they believe that they have found all of the factors.
6. Students are to record the factor pairs for the number 12. Listing the factors from least to greatest is a good way to help students stay organized.
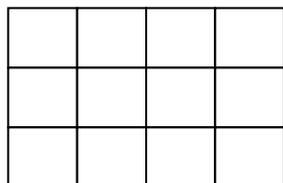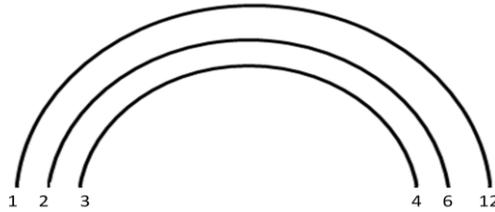
Factor Arrays for 12:

1 x 12

2 x 6

3 x 4
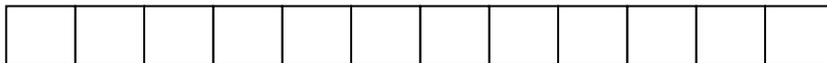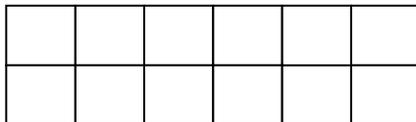
7. Students determine that the factor pairs are 1 and 12, 2 and 6, 3 and 4 and list them on the Factor Arc in ascending order that link the factor pairs (1 links to 12, 2 links to 6, and 3 links to 4).

Factor Arc for 12

8. Record all the data on the chart paper and have students discuss what they notice about the different numbers. They should notice that only one rectangle could be created with some of the numbers. Have students locate these numbers on the chart and discuss the characteristics of the factors of these numbers. Note that the factors of these numbers (dimensions of these rectangles) are only the number and 1. Ask students if they know the name of these types of numbers (prime). *Prime numbers* are defined as having exactly two unique factors. Explain that the other numbers, those that have more than two factors, are called *composite.*

9. The students then check their factors by creating a factor arc at the bottom of their chart paper.

10. The students must also include a title on their chart paper. Their chart paper should look similar to the following:

Sample Chart Paper Setup
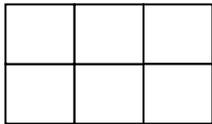
Prime and Composite Numbers

Name _____

Number: 6

Arrays:

1 x 6

2 x 3

Factors: 1 and 6
2 and 3

Number of Arrays: 2

Prime or Composite: Composite

Factor Arc

1 2   3 6

Even and Odd Numbers

Reporting Category   Number and Number Sense
Topic   Even and odd numbers
Primary SOL   5.3   The student will
                                   b)   identify and describe the characteristics of even and
                                         odd numbers.

Materials
- Colored tiles in bags
- Chart paper for operations with even and odd numbers
- Markers
- Overhead projector
- 12 pieces of bubble gum for modeling

Vocabulary
even, odd, fair, equal

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
Even numbers:
1. Ask students what they know about even and odd numbers. Have them discuss if the number 7 is even or odd and their rationale for their decision.
2. Give students a bag of different numbers of colored tiles to divide. Have them empty out their bags and ask for strategies about how to divide their colored tiles fairly. Discuss if the number is even or odd by determining if there is anything left over after dividing the items into two equal piles.
3. Ask the students if they can determine if the number 42 is even or odd. Have students justify why this number is even or odd. Ask students to think about place value and which place value position is the most important for determining whether a number is even or odd. Students may decide that the 2 in the ones place determines whether the student's number is even or odd. Please note that the number 2 is even.
4. Students also need to think about even and odd numbers in terms of divisibility (dividing fairly). Have a student come to the overhead projector and model dividing 12 pieces of bubble gum by 2 (fair share division) since we now know that the number 2 is even. Students determine that 12 divided by 2 equals 6 with no remainder. Have students think about a division fact that results in no remainder. If there is no remainder, then we can say that the division is fair or equal with no leftovers. Dividing an even number by 2 results in no remainder, so we can determine that a number is even when we can divide it by 2 and have no remainder.
5. Through more exploration, students may notice that a number is divisible by 2 if its last digit (the digit in the ones place) is 0, 2, 4, 6, or 8.

Odd numbers:
6. Ask students what we call a number that cannot be evenly or fairly divided by 2. For example, 25 cannot be divided by 2 fairly or evenly since it has a remainder of 1. These numbers are called odd. Therefore, any number whose last digit is not 0, 2, 4, 6, or 8 is an odd number.
7. Give students more time to explore even and odd numbers with operations. Students will make conjectures such as: even + even = even, even + odd = odd, etc.

Sample Chart
Operations and Odd and Even Numbers

Addition	Subtraction	Multiplication
even + even = even	even − even = even	even x even = even
odd + odd = even	odd − odd = even	odd x odd = odd
even + odd = odd	even − odd = odd	even x odd = even
odd +even = odd	odd − even = odd	odd x even = even