Practice Task: Trash Can Basketball

STANDARDS FOR MATHEMATICAL CONTENT

MCC4.NF.7 Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of the comparisons with the symbols >, =, or <, and justify the conclusions, e.g. by using a visual model.

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 sure of structure.
8 Look for and express regularity in repeated reasoning.

BACKGROUND KNOWLEDGE

Before the activity, the class should have had several lessons to demonstrate and practice understanding and representing tenths.

One tenth of a final score is determined by one throw if your final score (the whole) is determined by ten throws.

ESSENTIAL QUESTIONS

- How are decimals and fractions related?
- Why is the number 10 important in our number system?
- How can I write a decimal to represent a part of a group?
- When we compare two decimals, how do we know which has a greater value?

MATERIALS

- "Trash Can Basketball" student recording sheet
- Each group will need 10 pieces of "trash" (paper balls).
- Box, tub, or trash can for a container
- Crayons or markers and construction paper for making a poster

GROUPING

Partner/Small Group Activity

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

Students collect data from playing "Trash Can Basketball." They use the data to write decimal fractions and decimal numbers.

Comments

The copy room is a good source of trash paper. Be sure the paper balls are tight. Loosely packed ones make it really difficult to throw accurately.

All solutions reached in this task should be specific to the data collected. All student work should show both their data and their partner's data. Tallies should match decimal numbers assigned. Explanations should be clearly stated and specific.

Before beginning the throwing contest, as a class, decide on any rules regarding practice throws.

Task Directions

PART 1

Students will follow directions below from the "Trash Can Basketball: Part 1" student recording sheet.

This is your chance to demonstrate your basketball skills! You have been chosen to participate in a paper-ball throwing contest.

Directions:

1. Use the scrap paper to make 10 paper balls per group. (Wad the paper balls up tightly so they are easier to aim.)
2. Place a trash can (or other large container) 5 feet away.
3. Predict how many paper balls you will be able to get into the basket. Write your prediction in the chart below.
4. Take turns with your partner(s) throwing the ten paper balls into the trash can. Your partner will collect data using tally marks on the chart below to show how many of the 10 paper balls went into the trash can.

Trash Can Basketball Contest					
Player #1	Number of Tosses	Prediction for Number of "Baskets"	Number of "Baskets" (Use tallies)	Score as a fraction	Score as a decimal
_____	10				
Player #2	Number of Tosses	Prediction for Number of "Baskets"	Number of "Baskets" (Use tallies)	Score as a fraction	Score as a decimal
_____	10				

5. Create a poster to display your group's results. Your poster should include the following.
   a. Represent the number of good throws for each partner as a decimal fraction and express a comparison of decimal fraction scores using a >, <, or = symbol.

b. Represent the number of good throws for each partner as decimal numbers and express a comparison of decimal scores using a >, <, or = symbol.

Example:

Player #1	—	0.6 of the baskets
Player # 2	—	0.7 of the baskets

— — 0.6 < 0.7

c. Write to explain the results of the contest. Be prepared to share your poster and results with the class.

PART 2

Students will follow directions below from the "Trash Can Basketball: Part 2" student recording sheet.

This is your chance to demonstrate your basketball skills! You have been chosen to participate in a paper-ball throwing contest.

Directions:

1. Use the scrap paper to make 10 paper balls per group. (Wad the paper balls up tightly so they are easier to aim.)
2. Place a trash can (or other large container) 5 feet away.
3. Predict how many paper balls you will be able to get into the basket. Write your prediction in the chart below.
4. Take turns with your partner(s) throwing the ten paper balls into the trash can. Your partner will collect data using tally marks on the chart below to show how many of the 10 paper balls went into the trash can.
5. Combine your data with the data of 9 other people and record it below, for a total of 100 throws.
6. Create a poster to display your group's results. Your poster should include the following.
   a. Represent the number of good throws for each partner as a decimal fraction and decimal out of 100 throws for the entire group.
   b. Represent the total number of good throws for the entire group as a decimal fraction and decimal out of 100 throws for the entire group.

Example:

Player #1	5/100	0.05 of the baskets
Player # 2	7/100	0.07 of the baskets
TOTAL	67/100	0.67 of the baskets

   c. Write to explain the results of the contest. Be prepared to share your poster and results with the class.
   d. Compare your group data with the data of other people in your class.

FORMATIVE ASSESSMENT QUESTIONS

- How did you determine your score? How many times did you throw the paper ball? How many times did you "make a basket"?
- How is your score written as a decimal fraction?
- How is your score written as a decimal?
- How do we compare two decimal fractions?
- How do we compare two decimals?
- How did you collect your data for Part 2?
- Why did the denominator of the fractions change for part 2?
- How are the decimals from Part 1 like the decimals from Part 2? How are they different?
- Can students accurately explain how they determined their decimal and decimal fraction scores?
- Do students recognize how decimal fractions and decimals are related?
- Can students correctly compare the two scores in both decimal fraction and decimal forms?
- Could students explain why the denominators changed from Part 1 to Part 2?

DIFFERENTIATION

Extension

- Have students compare their group data of several people and compare the decimals for those groups.
- Have students plot the results of Part 1 or Part 2 on a number line.

Intervention

- Have the chart pre-made on the poster for student use and/or allow student to write his/her results on a computer, print, and attach to the poster.

Name _____ Date _____

Trash Can Basketball: Part 1

This is your chance to demonstrate your basketball skills! You have been chosen to participate in a paper-ball throwing contest.

Directions:

1. Use the scrap paper to make 10 paper balls per group. (Wad the paper balls up tightly so they are easier to aim.)
2. Place a trash can (or other large container) 5 feet away.
3. Predict how many paper balls you will be able to get into the basket. Write your prediction in the chart below.
4. Take turns with your partner(s) throwing the ten paper balls into the trash can. Your partner will collect data using tally marks on the chart below to show how many of the 10 paper balls went into the trash can.

Trash Can Basketball Contest					
Player #1	Number of Tosses	Prediction for Number of "Baskets"	Number of "Baskets" (Use tallies)	Score as a fraction	Score as a decimal
_____	10				
Player #2	Number of Tosses	Prediction for Number of "Baskets"	Number of "Baskets" (Use tallies)	Score as a fraction	Score as a decimal
_____	10				

5. Create a poster to display your group's results. Your poster should include the following.
   a. Represent the number of good throws for each partner as a decimal fraction and express a comparison of decimal fraction scores using a >, <, or = symbol.
   b. Represent the number of good throws for each partner as decimal numbers and express a comparison of decimal scores using a >, <, or = symbol.

      Example:

      Player #1 — 0.6 of the baskets

      Player # 2 — 0.7 of the baskets

      — — 0.6 < 0.7

   c. Write to explain the results of the contest. Be prepared to share your poster and results with the class.

Name _____ Date _____

Trash Can Basketball: Part 2

Now that you've compared your and your partner's data, let's see how we can represent the results of more people!

Directions:

1. Combine your data with the data of 9 other people and record it below, for a total of 100 throws.

Player	Number of "Baskets"	Score as a fraction (out of 100)	Score as a decimal (out of 100)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
TOTAL			

2. Create a poster to display your results. Your poster should include the following.
   a. Represent the number of good throws for each partner as a decimal fraction and decimal out of 100 throws for the entire group.
   b. Represent the total number of good throws for the entire group as a decimal fraction and decimal out of 100 throws for the entire group.
   c. Write to explain the results of the contest. Be prepared to share your poster and results with the class.
   d. Compare your group data with the data of other people in your class.