

Critical Questions for Investigations Grade 5

Picturing Polygons

Investigation 1: Identifying Polygons

1 Is It a Polygon?	What attributes make a figure a polygon? (SP)
2 Making Polygons	Name and describe one polygon with more than 4 sides. (CU, SP)
3 Polygon Pictures With Coordinate Geometry Assessment	List the ordered pairs of a 4-point shape drawn on a coordinate grid. (CU)
4 Coordinate Geometry With Geo-Logo	Draw a polygon using 5 points on a coordinate grid and list the ordered pairs. (CU, SP)

Investigation 2: Triangles and Quadrilaterals

1,2,3 Sorting Polygons Assessment	Complete this statement: "All triangles..." (CU, MC)
4,5 Making Shapes That Follow Rules*	Is it impossible for a triangle to have two right angles? Explain why or why not? (CU, RL)
6,7 Using Move and Turn Commands Assessment	Explain the difference between turns and angles. (CU)
8 Finding Angle Sizes Assessment	Draw a shape with a 90 degree angle and a shape with a 45 degree angle. (SP, CU)
9 Angles and Turns Together	What do you know about 45 degree angles and 60 degree angles? (CU)

Investigation 3: Perimeter and Area

Changing Gardens	What is area? What is perimeter?
Perimeter	How are area and perimeter related?
Spaghetti and Meatballs for All	What did you notice about the areas and perimeters of the shapes you made?

Name That Portion

Investigation 1: Exploring Percents and Fractions

1 Connecting Fractions, Decimals, and Percents	How are fractions, decimals, and percents related? (CU, RL)
2 Percent Grid Patterns	Explain what percent is. Use pictures, words, and/or numbers (CU)
3,4 Fraction and Percent Grids	What strategy would you use to find the equivalent percent for $\frac{2}{5}$? (SP, RL)
5,6 Percent Equivalent Strips Assessment	Order from smallest to largest the following fractions: $\frac{7}{10}$, $\frac{1}{3}$, $\frac{1}{2}$. How do you know? (SP, RL)
7 Fraction and Percent Problems Assessment	Explain what was the most difficult problem for you on SS 9 and why. (CU)

Investigation 2: Models for Fractions

1,2 Fractions on Clocks	How are clock fractions helpful for learning about fractions? (CU, MC)
3 Fraction Strips Assessment	Change the following equation into a subtraction problem. $\frac{1}{2} + \frac{1}{6} = \frac{2}{3}$ You may use the fraction strips. (SP)
4,5 Fraction Tracks	Would you put a halfway point on the 5's line? Why or why not? (RL, CU)
6 The Fraction Track Game	If you draw an $\frac{8}{10}$ card what two moves could you make? (SP, RL)
7,8 Fraction Games	What is the most difficult game? Why? (CU, RL)
9 Problems with Fractions	What strategy did you use most on SS #17? (SP)

Investigation 2: Exploring Decimals

1 Interpreting Decimals	Complete the following: I learned...or I feel... (CU)
2 Decimals on Grids Assessment	0.2, 0.02, 0.20 Which is worth the least and why? (CU)
3,4 Decimal Games Assessment	Which game did you find the easiest and why? (CU)
5,6 Fractions to Decimals	0.255 and 0.1555555 Which is greater? How do you know? (CU, RL)
7 Fraction, Percent, and Decimal Problems Assessment	Explain what was the most difficult problem on SS 23 and why. (CU, RL)
8 Comparing Fractional Amounts Assessment	Which portions did you find the easiest to understand and use – fractions, decimals, or percents? Why? (RL, MC, CU)

Building on Numbers You Know

Investigation 1: Exploring Distance Between Numbers

1 Reasoning About Multiples	How can you tell how many times you have skip counted a number? (SP)
2 Counting Puzzles <i>Note: Include estimation in all possible activities.</i>	How do you determine which numbers we can count by between two numbers? (SP, RL)
3,4 Exploring Patterns of Multiples	How can you find multiples of a number? (SP)
5 Multiple Towers Assessment	How can multiple towers help us with multiplication and division? (RL)
6,7 The Digits Game	How can you use the digits of a number to raise and lower a value? (RL)
8 Subtraction Strategies Assessment	What are 2 strategies you use to subtract? (SP)

Investigation 2: Multiplication and Division Situations

1,2 Multiplication and Division Strategies Assessment	What strategies do you have for solving 2-digit multiplication problems? (SP)
3 Division Strategies	What strategies do you use to divide large numbers in to equal groups? (SP)
4 What Should We Do with the Extras? Assessment	What is a situation where you would need to divide? What would you do with the extras? (SP, RL)
5,6 Relating Multiplication to Division	How are multiplication and division related? (CU)

Investigation 3: Ways to Multiply and Divide

1,2,3 Multiplication Clusters	How can you use simple multiplication problems to help you solve more challenging ones? (MC, SP)
4,5,6 Division Clusters Assessment	How can multiplication help you solve division problems? (MC, SP)
7,8,9 How Did I Solve It?	What are two or more ways to solve multiplication and division problems? (SP)
10 Ways to Multiply and Divide Assessment	I learned... (CU)

Prime Time

Investigation 1: The Factor Game

1.1 Playing the Factor Game	What did your analysis of the factor game tell you about prime numbers?
1.2 Playing to Win the Factor Game	

Investigation 2: The Product Game

2.1 Playing the Product Game	Using the words <i>factor</i> , <i>multiple</i> and <i>divisible by</i> , write as many statements as you can about this mathematical sentence: $4 \times 7 = 28$
2.2 Make Your Own Product Game	
2.3 Classifying Numbers	

Investigation 3: Factor Pairs

3.1 Arranging Space	How can you tell if a number is divisible by 2? By 5? By 10? <i>Divisibility Games in Nimble with Numbers 4-5 pg. 98 – 101.</i>
3.2 Finding Patterns	
3.3 Reasoning with Odd and even Numbers	

Investigation 4: Common Factors and Multiples

4.1 Riding Ferris Wheels	Describe how you can find the common multiples for two numbers.
4.2 Looking at Locust Cycle	
4.3 Planning a Picnic	

Investigation 4: Factorizations

5.1 Searching for Factor Strings	How can you use the prime factorization of two numbers to find their common multiples?
5.2 Finding the Longest Factor String	
5.3 Using Prime Factorizations	

Data About Us

Investigation 1: The Factor Game

1.1 Organizing Your Data	What does the median tell you about a set of data?
1.2 Interpreting Graphs	
1.3 Identifying the Mode & Range	
1.4 Identifying the Mean	
1.5 Experimenting with the Median	

Investigation 2: Types of Data

2.1 Category and Number Questions	How would you explain what categorical and numerical data are to a classmate who missed this investigation?
2.2 Counting Pets	

Investigation 3: Using Graphs to Group Data

3.1 Traveling to School	Numerical data can be displayed using more than one kind of graph. How do you decide when to use a line plot, bar graphs or stem and leaf plots? Explain your reasoning.
3.2 Jumping Rope	

Investigation 4: Coordinate Graphs

4.1 Relating Height to Arm Span	When you make a coordinate graph of data pairs, what do you consider when deciding what scale to use on each axis?
4.2 Relating Travel Time to Distance	

Investigation 4: What Do We Mean By *Mean*?

5.1 Evening Things Out	You have used three measures of center: the mean, the median, and the mode. Why do you suppose these are called “measures of center”? What does each tell you about a set of data? Why might people prefer to use the median instead of the mean?
5.2 Finding the Mean	
5.3 Data with the Same Mean	
5.4 Using Your Class's Data	
5.5 Watching Movies	

Bits and Pieces I

Investigation 1: Fundraising Fractions

1.1 Fund Raising Fractions	What do the numerator and denominator of a fraction tell you?
1.2 Using Fraction Strips <i>Folding the fractions in 1.2 takes most of the period.</i>	
1.3 Comparing Classes	
1.4 Exceeding the Goal	
1.5 Using Symbolic Form <i>Save fraction strips from Lab sheet 1.5 for future lessons.</i>	

Investigation 2: Comparing Fractions

2.1 Comparing Notes	How can you decide whether a given fraction is closed to 0, $\frac{1}{2}$, or 1?
Finding Equivalent Fractions	
Making a Number Line	
2.4 Comparing Fractions to Benchmarks	

Investigation 3: Cooking with Fractions

3.1 Cooking with Fractions	How can square models help you decide which of two fractions is larger?
3.2 Baking Brownies	

Investigation 4: From Fractions to Decimals

4.1 Designing a Garden	When comparing two decimals, how can you decide which decimal represents a larger number?
4.2 Making Smaller Parts	
4.3 Using Decimal Benchmarks	
4.4 Playing Distinguishing Digits	

Investigation 4: Measuring Parallelograms

5.1 Choosing the Best	Describe how to find a decimal equivalent to a given fraction. How can you check your strategy to see that it works?
5.2 Writing Fractions as Decimal	
5.3 Moving From Fractions to Decimals	

Investigation 2: One Out of One Hundred

6.1 It's Raining Cats	Describe how you can change a percent to a decimal and to a fraction. Describe how you can change a fraction to a percent. Describe how you can change a decimal to a percent.
6.2 Dealing with Discounts	
6.3 Changing Forms	
6.4 It's Raining Cats & Dogs	