

## Critical Questions for Investigations Grade 2

### Mathematical Thinking

#### Investigation 1: Exploring Materials

1 Exploring Cubes and Arrangements of 10	How would you describe your arrangement? (CU)
2 Exploring Cubes, Patterns, Blocks and Geo-blocks	Is there anything you notice about the pattern blocks? About the Geo-blocks? (CU)
4 Building and Sorting Cube Things	Why did you choose to sort your blocks the way you did? (SP, RL)

#### Investigation 2: Looking at Numbers

1 How Many Days Have We Been in School?	How do you use numbers? (CU, MC)
2,3 Card Games	Can you predict which card you will need to draw to get 10? (RL)
6 Today's Number and Counting Pockets	What did we want to find out? (CU, MC)
8 Ways to Get to 12 Assessment	What is your story for a way to get 12? (CU, MC)

#### Investigation 4: Geometric Counts

1 Geo-Blocks and Pattern Block Puzzles	How many different ways are there to fill a shape? How do you know when you have found them all? (SP, RL)
3 Counting Geo-Blocks and Pattern Blocks	How many different geo-blocks are in a set? How can you prove that? (SP, RL)
5 Sorting Geo-Blocks Assessment	How are your blocks alike or different? (CU)

#### Investigation 4: Counting

1 Enough for the Class?	If everyone takes one cube, how many cubes will be left in the bag? (SP, RL) How did you solve the problem? (CU)
2 Counting Coins, Counting Choices Assessment	What coins might he/she trade his pennies for? (MC, RL)
3,4 Counting Strips and Counting Choices	How did you record your counting? Did you see any patterns to help you? (CU)
5 Enough for the Class? Revisited Assessment	How did you represent the problem? (CU, MC)

## Coins, Coupons and Combinations

### Investigation 1: 10's and Doubles

1 Combinations of 20	How do you know you found all the combinations? (RL)
2,3 Card Games	What would I need to add to ___ to get to 10? (SP)
4,5 Doubles	What happens when you double ___? What does the number sentence look like? (SP)
6 Number Strings Assessment	How would you add ___+___+___? (SP)
7 Exploring Calculators	Does the answer make sense? How do you know?(RL)
8,9 Close to 20 and Beat the Calculator – Play game until most students are at recall level. Can use the 10+10 strategy	How did you solve the number string? (CU)
10 Today's Number and The Magic Pot Assessment	What is another way to make ___? (SP, RL)
11 Counting Pockets	How can we check our answer? (RL)

### Investigation 2: Grouping by 2's, 5's, and 10's

1 Using Groups	What patterns do you see? (SP)
2 Exploring Multiples of 5 Assessment	What do you notice about the sequence of numbers? (SP)
3 Counting By Different Groups Assessment	How did you count up the groups? (CU)
4,5 Counting Choices Assessment	How do you keep track of what you have counted? (RL)
6 Ways to Make 15¢	How do you know we have all the combinations? (RL)
7,8,9 Coins and Coupons	What coupons did you find that totaled 50¢? How do you know? (SP, RL)
10 Collecting Pocket Data	How does the 100 chart help us count? (CU, MC)

### Investigation 3: Introducing Addition and Subtraction Situations

1 Introducing Combining Situations	Will the answer be more or less than ___? (SP)
2 Addition Notation	What is a story for ___+___= ? (SP)
3 Introducing Separating Situations	What strategy did you use for the separating situations? (CU)
4,5 Making Sense of Addition and Subtraction Assessment	What strategy did you use to check your answer? (RL)

### Investigation 4: One Hundred

1 Exploring the 100 Chart	What patterns do you see on the 100 chart? (SP)
2,3,4 Working with 100	How many more do I need to get to 10 (50, 100)? (SP)
5 Penny-a-Pocket Assessment	How did you know which strategy to use? (RL)

## Does It Walk, Crawl, or Swim?

### Investigation 1: Sorting People and Yekttis

1,2 Collecting and Representing Data About Ourselves	What does your representation tell us? (CU)
3 Working with Two Attributes	Was it easy or hard to sort with 2 rules? Why? (CU)
4,5 Looking at Yekttis Assessment	What are the attributes that the Yekttis have in common? (CU, RL)
6 Introducing Venn Diagrams Assessment	How did you know where to place your Yektti? (RL)

### Investigation 2: Collections: What Goes Together?

1,2 Exploring Thing Collections	What does your collection not have? (SP, RL)
3,4 Sink and Float Assessment	Why do you think some things sink and others float? (RL,MC)

### Investigation 3: Animals in the Neighborhood

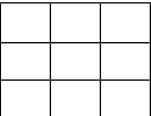
1 How Animals Move	How did you categorize your information? (CU)
2,3 Representing Data In More Than One Way Assessment	What does your representation tell us? (CU)

## Shapes, Halves and Symmetry

### Investigation 1: Investigation 1: Composing and Decomposing Shapes

1 Shapes Around Us	Where do we find rectangles in our classroom? (SP)
2,3 Seeing Shapes within Shapes	How many green triangles does it take to cover a yellow hexagon? (SP)
4,5 Shape Puzzles	How can you fill a yellow hexagon using three different shapes of pattern blocks? (SP)
Assessment	
6,7,8 Building Buildings	Complete the number pattern: 2, 4, __, 6, 8, __ (SP)

### Investigation 2: What Is a Rectangle?

1 Investigating Quadrilaterals	What shapes have only four sides? (SP)
2 Which Rectangle Is the Biggest?	Which is the biggest – shape A or shape C? Why? (RL)
3 Building Rectangles	Describe this rectangle:  (CU)
4, 5 Describing Rectangles	Draw a picture of a rectangle that has 12 tiles and 4 columns. (CU)
6 Picturing Rectangles Assessment	How would you describe a rectangle? (CU, MC)

### Investigation 3: Fractions of Geometric Shapes

1,2 Halves of Rectangles and Solids Assessment	What is a half? (SP)
3,4,5 Cutting Congruent Halves	How do you know that your shape can be cut in congruent halves? (SP, RL)
6 Fraction Flags	How are the flags designed so they are half one color and half another? (SP, MC)
7,8 Fourths and Thirds of Rectangles (excursion)	What does <i>thirds</i> mean? (SP, CU)

### Investigation 4: Symmetry

1,2 Symmetrical Designs	Name something in the classroom that is symmetrical. Why is it? (SP, CU)
3,4 Reflecting Blocks and Tiles	What would happen to the symmetry of your design if you moved the mirror? (SP)
5,6 Paper Folding and Cutting	How could you prove this shape is symmetrical? (RL)
7 Symmetrical Pictures Assessment	How is your picture symmetrical? (SP, CU)

## Putting Together and Taking Apart

### Investigation 1: Combining and Separating

1 Introducing Combining Situations	What does combining mean? (CU)
2 Introducing Separating Situations	What does separating mean? (CU)
3,4 Making Sense of Addition and Subtraction	Is this problem a combining or separating problem? How do you know? (RL)
5,6 Writing Stories for Numerical Problems Assessment	Write a story problem for $12 + 6 =$ (SP)

### Investigation 2: Working with 100

1 Exploring the 100 Chart	What are some multiples of 5? (SP)
2 Games on the 100 Chart	How many more cubes do I need to make 50 if I am on 39? (SP)
3,4 Working with 100	How far are you from ___ cubes? How can you find out? (SP, RL)
5,6 Collect \$1	What is the least number of coins you could have to equal \$1? (SP, RL)
7 How Many Paper Clips? Assessment	What strategies did you use to count the paper clips? (RL)

### Investigation 3: Finding the Missing Part

1 Parts and Wholes	How can you find the missing part? (SP, RL)
2 Problems with a Missing Part	What story could we write for $26 - \underline{\quad} = 19$ ? (SP)
3,4,5 Separating and Combining Choices Assessment	Can we solve this problem with addition and subtraction? (SP, CU)

### Investigation 4: Adding Up to 100

1 Emma's Animals	How do you keep track of the amounts to be added? (CU)
2 Ways to Make 100	Write a number string with 4 numbers equal to 100. (SP, CU)
3,4 Stories About 100	What is a story for $54 + 23 =$ ? (SP)

### Investigation 5: Addition and Subtraction Strategies

1 Introducing Comparing Situations	What is a strategy you use to compare two amounts? (RL, CU)
2, 3 Capture 5	How far did you move? How do you know? (RL)
4,5 Strategies for Combining	What is a strategy you use for combining amounts? (CU)
6 Capture 5 Strategies	What cards would you use to get to 45 from 14? (MC, SP)
7 Strategies for Separating	Can you explain ___'s strategy? (RL, CU)
8 How Far?	What was easy or difficult about today's lesson? Why? (CU)

Assessment	
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## How Long? How Far?

### Investigation 1: Comparing Lengths

1 Scavenger Hunt	How did you measure the long lengths? Why? (SP, RL)
2,3,4 A Scavenger Hunt Choice Time Assessment	What did you notice as you used the blue and yellow strips? (CU, MC)
5,6,7 Choices About Measurement	How did you count the cubes used to measure the distance? (SP, CU)
8 Measuring Our Classroom Assessment	What tool did you choose to measure the classroom? Did you get an accurate measurement? Why or Why not? (SP, RL)

### Investigation 2: Paths and *Geo-Logo*

1 Walking, Visualizing, and Representing Paths	Describe your path. (CU)
2,3 Investigating Turns	Did you reach the baby turtle without running out of energy? Why or why not? (SP, RL)
4,5 Measuring Paths Assessment	Do turn amounts stay the same even though the step-size changes? Why or why not? (SP,RL)
6,7,8 Moving on a Grid Assessment	What strategy did you use to plan Tina the Turtle's trip? Why? (RL, CU)
Ongoing Excursion: <i>Geo-Logo</i> : Shapes and Pictures	