Exploring Mathematics Through Problem-Solving and Student Voice

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Grade 2

Number Sense and Numeration

Grade 2 - Number Sense and Numeration (Skip Counting)

Materials: chart paper, markers, number lines, hundreds chart
Curriculum Expectations: Count forward by 1's, 2's, 5's, 10's, and 25's to 200, using number lines and hundreds charts, starting from multiples of 1, 2, 5, and 10.
Minds On: 5-10 Minutes
• Can you skip count by 2's, 5's, 10's and 25's? • Can you count forward? • What can we use to count forward on?
Working On It: 20-25 Minutes
• Arrange students into small groups or pairs. • Paste the "Working On It" task onto chart paper for each group (see template below). • Have students work together in groups to complete the task.
Consolidation: 10-15 Minutes
• Choose a strategy to have students share their thinking of how they solved the problem. • Highlight key strategies with the class.
Generalization: I can skip count forward and backwards from different starting points.
Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Aileen counted on a number line and stopped at the number 50. What might her number pattern be? Is there more than 1 pattern? Show your work.

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Extension (Independent Task for Math Journal)

Start at 25 and skip count forward in as many different ways as you can. Show your work.	Start at 25 and skip count forward in as many different ways as you can. Show your work.
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Grade 2 - Number Sense and Numeration (Representing Numbers)

Materials: chart paper, markers, a variety of manipulatives for representing numbers

Curriculum Expectations: Represent whole numbers to 100, using a variety of tools.

Minds On: 5-10 Minutes

- Review different types of manipulatives found in the Math Centre.
- Ask students: **How many different ways can you show the number 23?**
- Have students choose manipulatives to use to show the given number.
- Record their responses on chart paper (create an anchor chart).

Sample Responses

- 2 rods and 3 units
- 2 dimes and 3 pennies, 4 nickels and 3 pennies, 23 pennies
- pictures, words, tallies, addition and subtraction sentences
- 10-Frames

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- **Tell everything you know about the number 56.**
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Create an anchor chart with students modeling various ways to represent numbers.

Sample Responses

- Base 10 models
- Base 10 name
- Expanded Form
- Numerals and Words
- Addition or subtraction sentences
- Money

Generalization: I can represent numbers in many different ways.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below). Choose a number you would like students to represent or have them choose their own number (use the number cards and have students randomly select a number if they are choosing their own).

Working On It:

Tell everything you know about the number 56.

Tell everything you know about the number 56.

Tell everything you know about the number 56.

Tell everything you know about the number 56.

Tell everything you know about the number 56.

Extension (Independent Task for Math Journal)

Tell everything you know about the number _____. Show you work.	Tell everything you know about the number _____. Show you work.
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Grade 2 - Number Sense and Numeration (Place Value & Comparing Numbers)

Materials: chart paper, markers, number cards, envelopes

Curriculum Expectations: Compare and order whole numbers to 100, using a variety of tools.

Minds On: 5-10 Minutes

- Put 2 numbers in a bag and pull them out.
- How many different 2-digit numbers can you make?
- What is the greatest number?
- What is the smallest number?

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Look for ways students organized their work.
- Choose a strategy to discuss while students share their work.
- **Generalization**: I can compare numbers by first looking at the 10's digit and then the 1's digit.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

What 2-digit numbers can you make with the numbers 6 and 8? Which number is the greatest? Which number is the least? How do you know? Show your work.

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What 2-digit numbers can you make with the numbers 6 and 8? Which number is the greatest? Which number is the least? How do you know? Show your work.

Extension (Independent Task for Math Journal)
* Put 2 numbers in an envelop for each student.

Using the number cards in your envelope, make as many 2-digit numbers you can. List the numbers from greatest to least. How do you know which one is greatest? Explain your thinking.	Using the number cards in your envelope, make as many 2-digit numbers you can. List the numbers from greatest to least. How do you know which one is greatest? Explain your thinking.
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Grade 2 - Number Sense and Numeration (Addition and Subtraction)

Materials: chart paper, markers, number cards, various manipulatives

Curriculum Expectations: Solve problems involving the addition and subtraction of two-digit numbers, without regrouping, using concrete materials (e.g., base ten materials, counters, etc.), student-generated algorithms, and standard algorithms

Minds On: 5-10 Minutes

- Review 2-digit addition without regrouping.
- Review 2-digit subtraction without regrouping.
- Complete sample questions on chart paper.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Look for ways students organized their work.
- Focus on a strategy students used while they share their work.
- Create an anchor chart highlighting the different strategies for addition and subtraction.

Sample Strategies

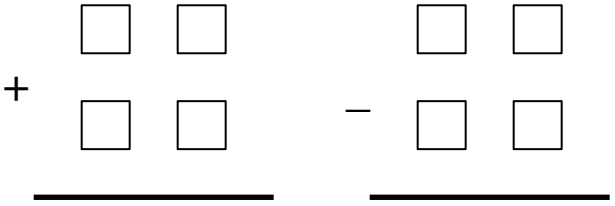
- Base 10 Blocks
- Pictures
- 10-Frames
- 100 Chart
- Number Line
- Add the 10's first and then the 1's
- Standard Form

Generalization: I can create and solve 2-digit addition and subtraction problems using different strategies.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

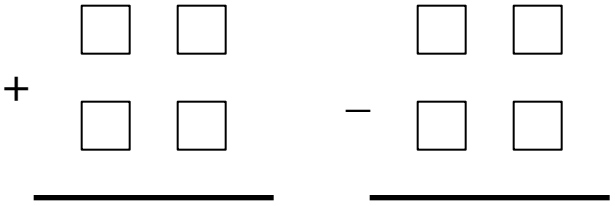
Working On It

Use the 1, 2, 3, and 4 number cards. Arrange the cards to make addition and subtraction problems. Record your problems.



How many sums and differences can you find? What is the greatest sum? The least difference? Show your work.

Use the 1, 2, 3, and 4 number cards. Arrange the cards to make addition and subtraction problems. Record your problems.



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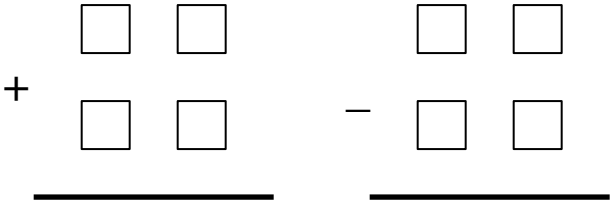

How many sums and differences can you find? What is the greatest sum? The least difference? Show your work.

Extension (Independent Task for Math Journal)

Arrange the numbers: 1, 3, 5, and 6 to create 2-digit addition problems. Find the greatest sum. Using the same numbers, create 2-digit subtraction problems. Find the least difference. Show your work and explain your thinking.	Arrange the numbers: 1, 3, 5, and 6 to create 2-digit addition problems. Find the greatest sum. Using the same numbers, create 2-digit subtraction problems. Find the least difference. Show your work and explain your thinking.
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Grade 2 - Number Sense and Numeration (Multiplication)

Materials: chart paper, markers, counters

Curriculum Expectations: Represent and explain, through investigation using concrete materials and drawings, multiplication as the combining of equal groups (e.g., use counters to show that 3 groups of 2 is equal to 2 + 2 + 2 and to 3 x 2)

Minds On: 5-10 Minutes

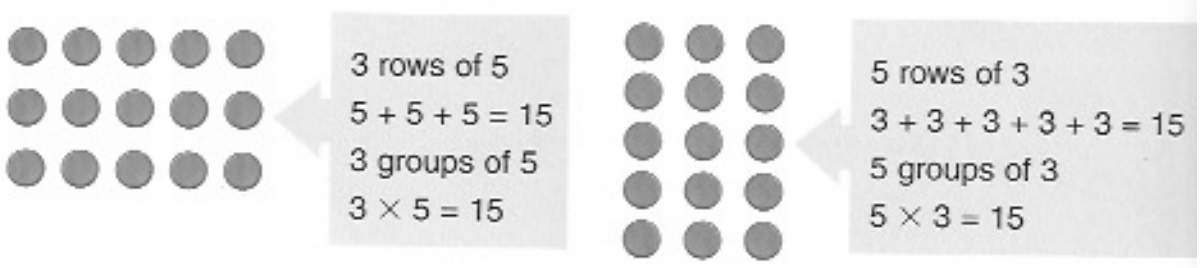
- How can we arrange ourselves into equal rows on the carpet?
- Relate this to an array in multiplication.
- Draw an array on chart paper with the multiplication sentence.
- Discuss the terms rows and columns.
- Relate this to repeated addition, arrays and equal rows.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Look for ways students organized their work.
- Focus on a strategy to discuss while student share their work.
- Create an anchor chart highlighting different strategies for multiplication.



Generalization: I know that multiplication is repeated addition.

- I know that not all numbers can be put into equal groups.
- I can create arrays to show multiplication facts.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

How many ways can you arrange 12 counters in equal rows? How do you know you have found all the ways? Arrange 13 counters in equal rows. How many ways can you do this? Show and explain your thinking.

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How many ways can you arrange 12 counters in equal rows? How do you know you have found all the ways? Arrange 13 counters in equal rows. How many ways can you do this? Show and explain your thinking.

Extension (Independent Task for Math Journal)

There are 6 singers and 8 dancers. Can they form equal rows of 2? How do you know? Can they form equal rows of 3? How do you know? What other equal rows can they form? Show your work.	There are 6 singers and 8 dancers. Can they form equal rows of 2? How do you know? Can they form equal rows of 3? How do you know? What other equal rows can they form? Show your work.
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Measurement

Grades 1-3 - Measurement (Calendar)

Materials: chart paper, markers, a calendar, calendar template, Student Planner

Curriculum Expectations: Solve problems involving the relationships between minutes and hours, hours and days, days and weeks, and weeks and years, using a variety of tools.

Minds On: 5-10 Minutes

- Review the calendar (purpose, parts, how to read it)
- Ask students: Looking at our classroom calendar, what information does a calendar give you?
- Have students popcorn their answers. Do not record them.

Sample questions:
- How many days in a week?
- How many months in a year?
- How many weeks in a year?
- How many weeks in a month?
- How often does a leap year happen?

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Choose 3 student samples to model and pull key information to create an anchor chart.

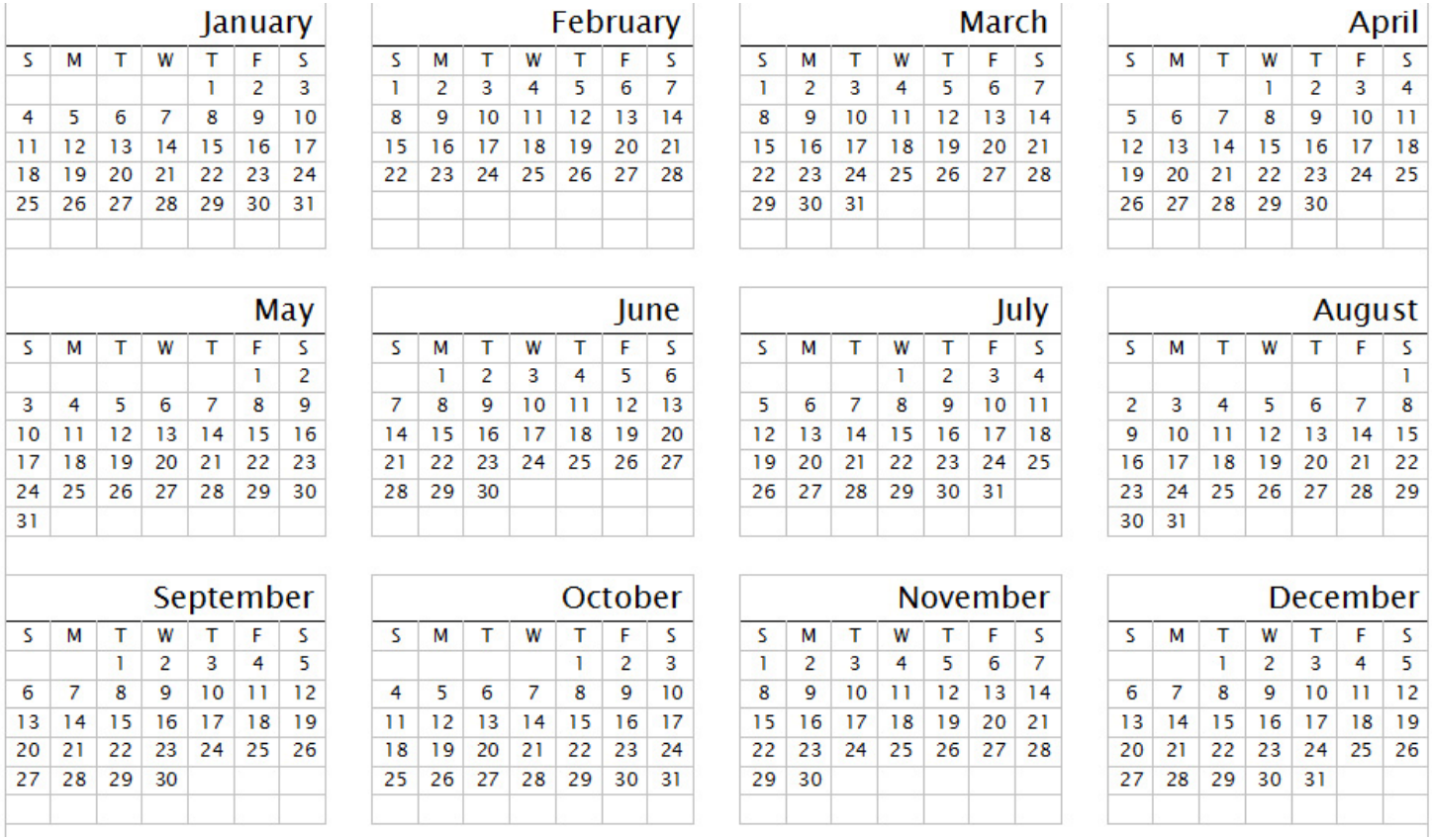
Sample Information:
- The year starts in January, not September
- How many hours in a day.
- How many days in a month, year, etc.
- How many weeks in a month, year, etc.
- Every calendar year changes.
- Leap years.

Generalization: I can use a calendar to record important events in my life.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below). Select days, weeks, or months on the calendar you would like the students to identify or be aware of.

Working On It

Write everything you know about a calendar.



January

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

March

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

July

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

August

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

October

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

December

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

Grade 2/3 Extension # 1 (Independent Task for Math Journal)

Use your Student Planner to find: - 8 days after January 8th. - 11 days before Halloween. - 7 days after the first day of school. - 3 weeks after Remembrance Day. - 5 weeks before June 18th. - 4 months before May 25th.	Use your Student Planner to find: - 8 days after January 8th. - 11 days before Halloween. - 7 days after the first day of school. - 3 weeks after Remembrance Day. - 5 weeks before June 18th. - 4 months before May 25th.
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Grade 2/3 Extension # 2 (Independent Task for Math Journal)

Riddle: Use the clues to find the date.

1. The date falls on a month with 31 days.
2. It is in the 8th month.
3. It is on an even date.
4. It is on the third Sunday.

What date is it?

Riddle: Use the clues to find the date.

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What date is it?

Grades 1-3 - Measurement (Linear Measurement)

Materials: chart paper, markers, a variety of manipulatives for measuring, rulers

Curriculum Expectations: Estimate, measure, and record length, height, and distance, using standard units.

Minds On: 5-10 Minutes

- What tools can we use to measure with?
- Brainstorm ideas on chart paper.
- Show students the objects or tools that they suggested as visuals for the rest of the class.
- Record the units they mentioned (standard and non-standard) using a T-Chart.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Ask groups what part of the desk they measured, and what they used to measure with and how.
- From their responses, introduce and define linear measurement terms (length, width, height)
- Some students may have measured perimeter and area. Introduce and define these terms.
- Determine whether the tools used were non-standard or standard.

Generalization: I can use a variety of tools to measure things.

Extension: Have students work on the "Independent Task" in their Math Journal (see below).

Working On It

How many different ways can you measure the width of your desk?

How many different ways can you measure the width of your desk?

How many different ways can you measure the width of your desk?

How many different ways can you measure the width of your desk?

Extension

Choose a measurement tool and measure the length, width, height, distance, etc. of ______________________________.	Choose a measurement tool and measure the length, width, height, distance, etc. of ______________________________.
Choose a measurement tool and measure the length, width, height, distance, etc. of ______________________________.	Choose a measurement tool and measure the length, width, height, distance, etc. of ______________________________.
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Grade 2 - Measurement (Perimeter)

Materials: chart paper, markers, a variety of non-standard units for measuring.

Curriculum Expectations: Estimate, measure, and record the distance around objects, using non-standard units.

Minds On: 5-10 Minutes

- Review terms.
- What are the characteristics of a rectangle?
- How many linking cubes does it take to measure the distance around a book? Have a student measure.
- How many popsicle sticks does it take to measure the distance around the same book? Have a student measure.
- Discuss the different results and why they are different.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Ask groups to share their solutions.
- Discuss patterns they found.
- Discuss how they found the perimeter of their object.
- Discuss which unit needed more or less to measure around with.
- Look for some sort of methodical strategy to show their work.

Generalization: I can use non-standard units to find the perimeter of rectangles and squares in the classroom.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Select 3 different units to measure the perimeter of your desk. Which unit is the fastest/easiest to measure with? Why?

Unit	Estimate	Perimeter

Extension # 1 (Independent Task for Math Journal)

Choose 3 objects to measure. Choose units to measure with. Measure and record your measurements.

Object	Unit	Length of Sides	Perimeter
picture	cubes	3 + 2 + 3 + 2	10 cubes

Choose 3 objects to measure. Choose units to measure with. Measure and record your measurements.

Object	Unit	Length of Sides	Perimeter
picture	cubes	3 + 2 + 3 + 2	10 cubes

Grade 2 - Measurement (Area)

Materials: grid chart paper, markers, square tiles, triangle grid paper

Curriculum Expectations: Estimate, measure, and record area, through investigation using a variety of non-standard units.

Minds On: 5-10 Minutes

- How many different figures can you make with 4 square tiles?
- Have students work in pairs to find the different possibilities.
- Discuss and show all the different possibilities.
- Discuss how different figures can have the same area.
- Define area.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Have students share their results.
- Look for patterns that students have come up with to find all the possibilities.
- Discuss all of their possibilities.

Generalization: I can create a variety of figures with the same area.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below). Choose a number you would like the students to represent or have them choose a number of their own.

Working On It

Using 6 green triangles, how many figures can you make? Use the triangle grid paper to show your figures.

Using 6 green triangles, how many figures can you make? Use the triangle grid paper to show your figures.

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Using 6 green triangles, how many figures can you make? Use the triangle grid paper to show your figures.

Extension (Independent Task for Math Journal)

How many different figures can you make with an area of 12 square units? Use the grid paper and square tiles provided to show your work.	How many different figures can you make with an area of 12 square units? Use the grid paper and square tiles provided to show your work.
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Grade 2 - Measurement (Elapsed Time)

Materials: chart paper, markers, demonstration clocks

Curriculum Expectations: Tell and write time to the quarter-hour, using demonstration digital and analogue clocks.

Minds On: 5-10 Minutes

- Model counting forward and backwards by 5's on a demonstration clock.
- Review key words in time problems (arrive at, leave at)

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Review and document on an anchor chart the students' strategies

Strategy Examples:

- Counting by 5's
- Addition and subtraction
- Diagrams
- Timeline

Generalization: I can use a variety of strategies to solve word problems involving time.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

If Ms. Scalzo left her house at 7:30 a.m. and it took her 15 minutes to get to school, at what time did she arrive there? Show how you solved the problem.

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If Ms. Scalzo left her house at 7:30 a.m. and it took her 15 minutes to get to school, at what time did she arrive there? Show how you solved the problem.

Extension (Independent Task for Math Journal)

Charlie and Frank met at the mall at 5:00 p.m. Charlie took 30 minutes to get to the mall. Frank took 15 minutes. At what time did each boy leave home? How do you know?	Charlie and Frank met at the mall at 5:00 p.m. Charlie took 30 minutes to get to the mall. Frank took 15 minutes. At what time did each boy leave home? How do you know?
Charlie and Frank met at the mall at 5:00 p.m. Charlie took 30 minutes to get to the mall. Frank took 15 minutes. At what time did each boy leave home? How do you know?	Charlie and Frank met at the mall at 5:00 p.m. Charlie took 30 minutes to get to the mall. Frank took 15 minutes. At what time did each boy leave home? How do you know?
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Geometry and Spatial Sense

Grade 2 – Geometry and Spatial Sense (2-D Shapes)

Materials: grid chart paper, markers, Pattern Blocks, Attribute Blocks, Deci-blocks

Curriculum Expectations: Identify and describe various polygons, and sort and classify them by their geometric properties, using concrete materials and pictorial representations.

Minds On: 5-10 Minutes

Show students a rectangle.

- Tell me everything you know about this rectangle
- Highlight key words (vertices, sides, angles)
- Correct any misused terms as needed (e.g., corners, lines, points, etc.)

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Have students share their results.
- Highlight the 4-sided shapes they made and their names.

Generalization: I can create different polygons by using my knowledge about their geometric properties.

Working On It

How many different 4-sided shapes can you make? Can you name them?

How many different 4-sided shapes can you make? Can you name them?

How many different 4-sided shapes can you make? Can you name them?

How many different 4-sided shapes can you make? Can you name them?

How many different 2D shapes can you make? Can you name them?

Grade 2 – Geometry and Spatial Sense (3-D Shapes)

Materials: chart paper, markers, geometric solids, toothpicks, plasticine

Curriculum Expectations: Create models and skeletons of prisms and pyramids, using concrete materials, and describe their geometric properties.

Minds On: 5-10 Minutes

- Have students use toothpicks and plasticine to build a 3-dimensional shape.
- Ask students to name and describe their solid.
- Highlight key words (vertices, faces, edges).
- Create an anchor chart highlighting the characteristics of various 3-dimensional solids (name of solid, number of faces, number of vertices, number of edges, does the solid roll or can it be stacked?).

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Have students share and describe their solids.
- Identify the different shapes that students have created by their names.
- Identify the 2-dimensional faces they see.

Generalization: Using my knowledge of 2-dimensional shapes, I can build 3-dimensional shapes and describe them.

Working On It

Construct a 3-D shape with 12 edges. What shape is it? How do you know?

Construct a 3-D shape with 12 edges. What shape is it? How do you know?

Construct a 3-D shape with 12 edges. What shape is it? How do you know?

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Construct a 3-D shape with 12 edges. What shape is it? How do you know?

Patterning and Algebra

Grade 2 – Patterning and Algebra (Repeating Patterns)

Materials: chart paper, markers, Pattern Blocks, Attribute Blocks, Deci-blocks, Power Polygons
Curriculum Expectations: Create a repeating pattern by combining two attributes.
Minds On: 5-10 Minutes
• Display Pattern Blocks, Attribute Blocks, Power Polygons and Deci-blocks • Discuss their attributes. • Review and record what attributes are and what patterns are. • Look for patterns around the classroom. • How do you know it's a pattern? (It repeats).
Working On It: 20-25 Minutes
• Arrange students into small groups or pairs. • Paste the "Working On It" task onto chart paper for each group (see template below). • Have students work together in groups or pairs to complete the task.
Consolidation: 10-15 Minutes
• Have students share their patterns. • Point out the changing attributes in the patterns (colour, shape, position, size – deci-blocks, etc.) • Create an anchor chart highlighting key words (core, pattern rule, growing, shrinking, naming, number, etc.)
Generalization: I can create different repeating patterns using Pattern Blocks, Attribute Blocks or Deci-blocks.
Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Choose Pattern Blocks, Attribute Blocks, Power Polygons or Decablocks to make as many repeating patterns as you can. Use at least 2 attributes. Tell what attributes are changing.

Choose Pattern Blocks, Attribute Blocks, Power Polygons or Decablocks to make as many repeating patterns as you can. Use at least 2 attributes. Tell what attributes are changing.

Choose Pattern Blocks, Attribute Blocks, Power Polygons or Decablocks to make as many repeating patterns as you can. Use at least 2 attributes. Tell what attributes are changing.

Extension (Independent Task for Math Journal)

Create repeating patterns with 2 changing attributes and describe your patterns.	Create repeating patterns with 2 changing attributes and describe your patterns.
Create repeating patterns with 2 changing attributes and describe your patterns.	Create repeating patterns with 2 changing attributes and describe your patterns.
Create repeating patterns with 2 changing attributes and describe your patterns.	Create repeating patterns with 2 changing attributes and describe your patterns.
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Grade 2 – Patterning and Algebra (Growing Patterns)

Materials: chart paper, markers, Pattern Blocks, Attribute Blocks, Deci-blocks, square tiles, chain links, coins, Power Polygons

Curriculum Expectations: Create growing or shrinking patterns.

Minds On: 5-10 Minutes

- Brainstorm "What is a growing pattern?" as a class.
- Select students to show some growing patterns on chart paper (geometric, numbers, skip counting, etc.)
- Correct only if they have not shown a growing pattern.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Have students share their solutions.
- Highlight the different strategies students used to solve the problem (T-Charts, pictures, pattern rules, diagrams)

Generalization: I can create growing patterns using different strategies.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Make as many different growing patterns as you can, using manipulatives of your choice. Explain your pattern rule.

Make as many different growing patterns as you can, using manipulatives of your choice. Explain your pattern rule.

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Make as many different growing patterns as you can, using manipulatives of your choice. Explain your pattern rule.

Extension (Independent Task for Math Journal)

Your teacher bought stickers for the class. On Monday, she gives 2 stickers to her students. On Tuesday, the students get 4 stickers. On Wednesday, she gives 6 stickers to her students. On Thursday, the students get 8 stickers. How many stickers do the students get on Friday by their teacher? What is the pattern rule? Show and explain your thinking.

Complete the T-chart below.

Days	Number of Stickers
Monday	2
Tuesday	4

Your teacher bought stickers for the class. On Monday, she gives 2 stickers to her students. On Tuesday, the students get 4 stickers. On Wednesday, she gives 6 stickers to her students. On Thursday, the students get 8 stickers. How many stickers do the students get on Friday by their teacher? What is the pattern rule? Show and explain your thinking.

Complete the T-chart below.

Days	Number of Stickers
Monday	2
Tuesday	4

Data Management and Probability

Grade 2 – Data Management (Comparing Graphs)

Materials: grid chart paper, markers, sample graphs

Curriculum Expectations: Read primary data presented in charts, tables, and graphs, then describe the data using comparative language, and numbers that represent the frequency of the information presented.

Minds On: 5-10 Minutes

- Have 2 students stand at the front of the classroom.
- How can we compare these 2 students?
- Define the word compare (What's the same? What's different?)
- How can we show our comparisons? (T-Chart, Venn Diagram, 3-Column Chart)

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Share the different ways students have compared their information.
- Discuss a simple way to show their comparisons.
- Model using a 3-Column Chart or Venn Diagram.
- Look for comparative language and the differences.

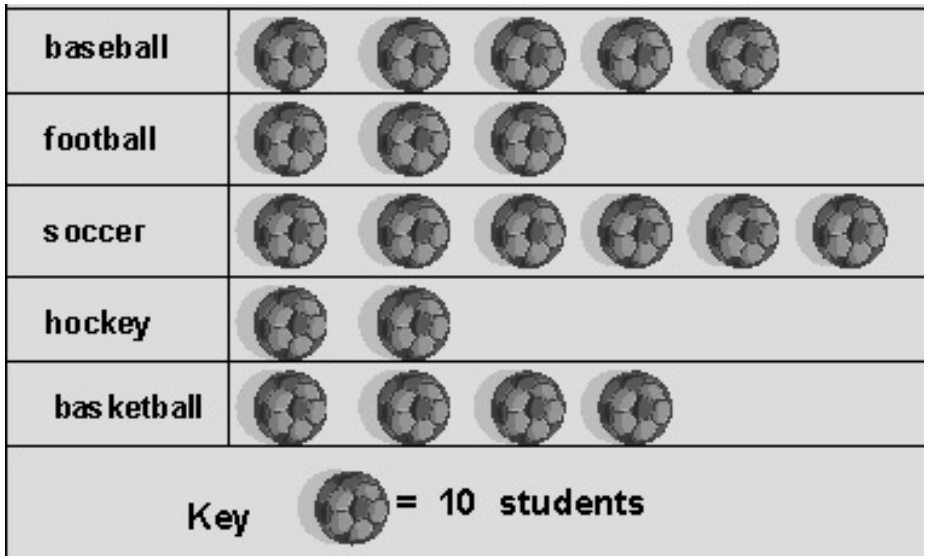
Generalization: I can compare data displayed on different graphs.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

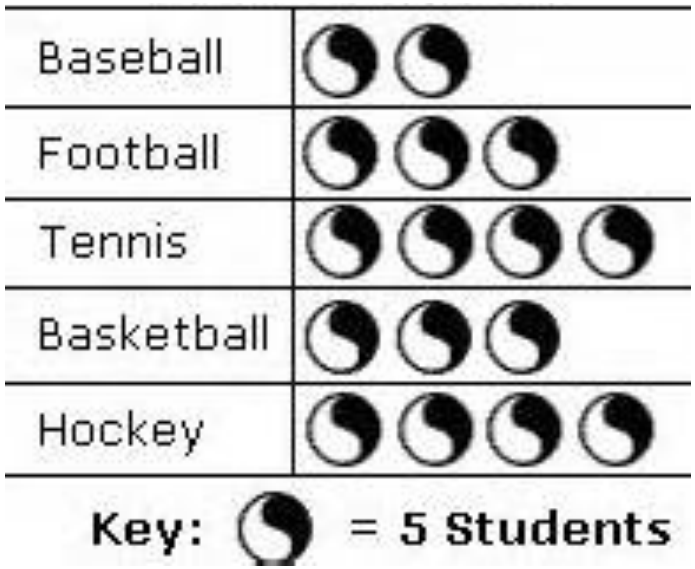
Working On It

The pictographs show the favourite sports played by Grade 2 students.

Sports Played by Grade 2 Students



Favourite Sports



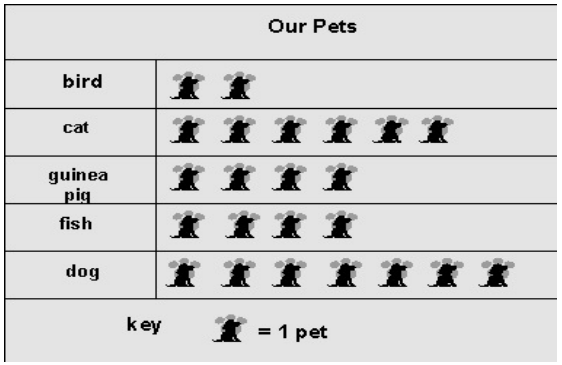
What information do the pictographs tell us? Compare the pictographs.

Extension (Independent Task for Math Journal)

The pictographs show the favourite pets for two Grade 2 classes.

Favorite Pets	
Cat	🐾 🐾 🐾 🐾 🐾
Dog	🐾 🐾
Hamster	🐾 🐾 🐾

Each 🐾 stands for 2 votes.

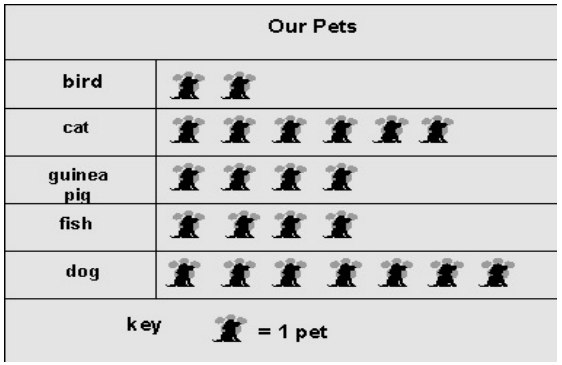


What information do the pictographs tell us? Compare the pictographs.

The pictographs show the favourite pets for two Grade 2 classes.

Favorite Pets	
Cat	🐾 🐾 🐾 🐾 🐾
Dog	🐾 🐾
Hamster	🐾 🐾 🐾

Each 🐾 stands for 2 votes.



What information do the pictographs tell us? Compare the pictographs.

Grade 2 – Data Management (Creating Graphs)

Materials: grid chart paper, markers, ruler, grid paper

Curriculum Expectations: Collect and organize categorical or discrete primary data and display the data in charts, tables, and graphs, with appropriate titles and labels, and with labels ordered appropriately along horizontal axis, as needed, using many-to-one correspondence.

Minds On: 5-10 Minutes

- Present the class with the following question: *What is your favourite subject?* (Math, Reading, Writing, Art, Gym, Science, Other).
- Create a T-Chart to organize student responses.
- Define the word survey and its purpose.
- How can we display our results? (pictograph, bar graph, etc.).

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Highlight the proper ways to create a pictograph and a bar graph.
- Discuss the significance of the "key" when creating pictographs, and introduce how to create a proper bar graph by discussing the significance of the Scale, Axis, Labels, Title, Zero (SALTZ)
- Correct any attempts if needed.

Generalization: I can collect, organize and graph data in a variety of ways.

Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Ms. Donatelli wanted to know how many of her students had birthdays in January, April, August and December. She conducted a survey and tallied her results. How many different ways can you graph the results?

Birthdays in different months	
Month	Number of students
January	𝍸 ||
April	𝍸
August	𝍸 𝍸
December	𝍸 |

Ms. Donatelli wanted to know how many of her students had birthdays in January, April, August and December. She conducted a survey and tallied her results. How many different ways can you graph the results?

Birthdays in different months	
Month	Number of students
January	𝍸 ||
April	𝍸
August	𝍸 𝍸
December	𝍸 |

Extension (Independent Task for Math Journal)

Conduct a survey. Organize your data and graph the results. What did you learn after conducting your survey?	Conduct a survey. Organize your data and graph the results. What did you learn after conducting your survey?
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Grade 2 – Data Management (Interpreting Graphs)

Materials: grid chart paper, markers

Curriculum Expectations: Interpret and draw conclusions from data presented in charts, tables, and graphs.

Minds On: 5-10 Minutes

- Display a variety of graphs (pictograph, bar graph) and charts (tally chart) on chart paper.
- Name the different types of graphs and their purpose.
- Discuss the purpose of graphs and charts. (to display and organize data)
- How do we read each of the graphs?

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" task onto chart paper for each group (see template below).
- Have students work together in groups or pairs to complete the task.

Consolidation: 10-15 Minutes

- Have groups share their work.
- Highlight important information by creating an anchor chart.
- Introduce SALTZ (when creating bar graphs)

S – scale (What is it counting by?)
A – Axis
L – Labels
T – Title
Z - Zero

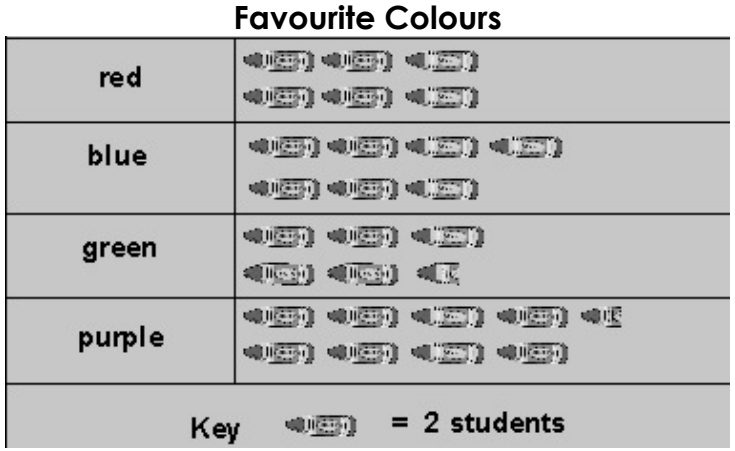
- Look for students' interpretation of the graph.
- Look for comparative language (most, least, how many more, total number)
- Look for strategies for interpreting data.
- Ask: How does the title help you figure out what question was asked?

Generalization: I can interpret data on a graph.

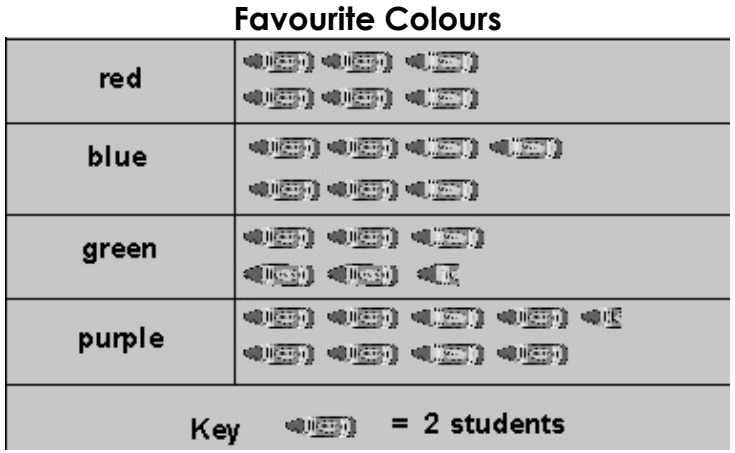
Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Tell everything you know about this graph.

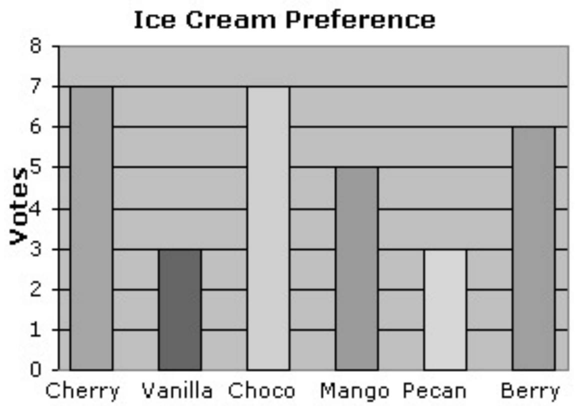


Tell everything you know about this graph.

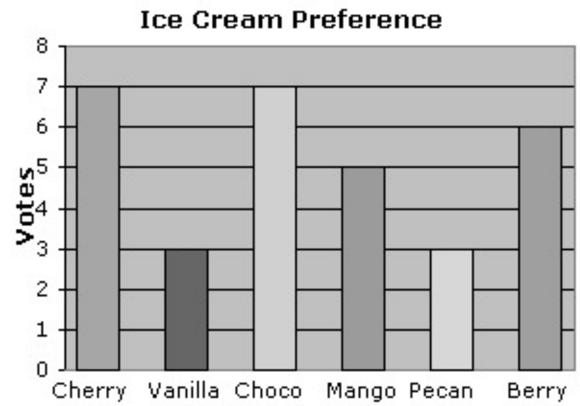


Extension (Independent Task for Math Journal)

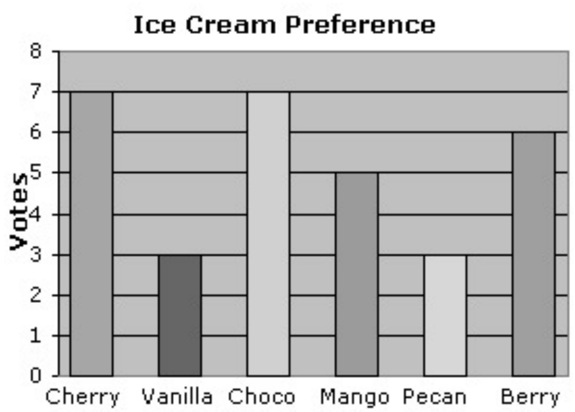
Interpret this graph.



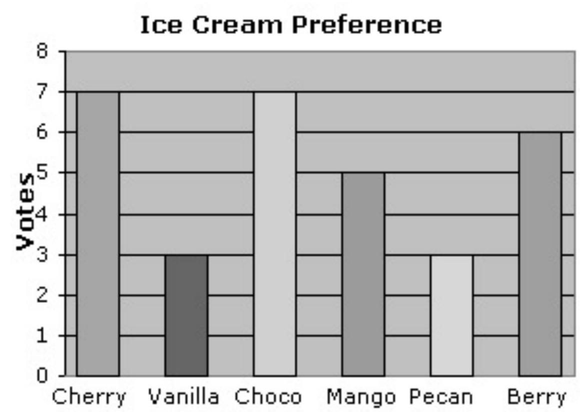
Interpret this graph.



Interpret this graph.



Interpret this graph.



Grade 2 – Data Management (Probability)

Materials: grid chart paper, markers
Curriculum Expectations: Describe probability as a measure of the likelihood that an event will occur, using mathematical language (i.e., *impossible*, *unlikely*, *less likely*, *equally likely*, *more likely*, *certain*)
Minds On: 5-10 Minutes
• Discuss probability terms *impossible*, *unlikely*, *less likely*, *equally likely*, *more likely*, *certain* • Have students share some everyday examples for each.
Working On It: 20-25 Minutes
• Arrange students into small groups or pairs. • Paste the "Working On It" task onto chart paper for each group (see template below). • Have students work together in groups or pairs to complete the task.
Consolidation: 10-15 Minutes
• Have students share their examples. • Note their explanations for how they know.
Generalization: I understand and can give examples of different likelihoods.
Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Come up with as many examples for each of the following likelihoods: *impossible*, *unlikely*, *less likely*, *equally likely*, *more likely*, *certain*. Explain how you know your example matches the likelihood.

Come up with as many examples for each of the following likelihoods: *impossible*, *unlikely*, *less likely*, *equally likely*, *more likely*, *certain*. Explain how you know your example matches the likelihood.

Come up with as many examples for each of the following likelihoods: *impossible*, *unlikely*, *less likely*, *equally likely*, *more likely*, *certain*. Explain how you know your example matches the likelihood.

<u>Extension</u> (Independent Task for Math Journal)

Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.	Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.
Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.	Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.
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Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your sentence.	Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.
Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.	Write an example of each of the likelihoods (*impossible*, *unlikely*, *less likely*, *more likely*, *certain*). Illustrate your examples.

Appendices

Group Members: _____

K What you **KNOW**	W What you **WANT TO KNOW**	C **CONDITIONS**
What information does the problem tell you?	What questions need to be answered?	What conditions need to be met? What information is important to remember?

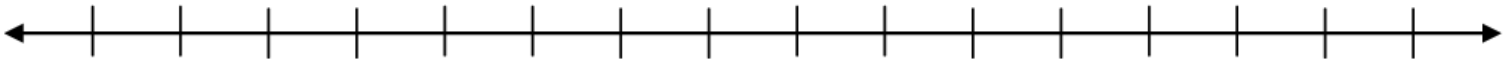
Number Cards

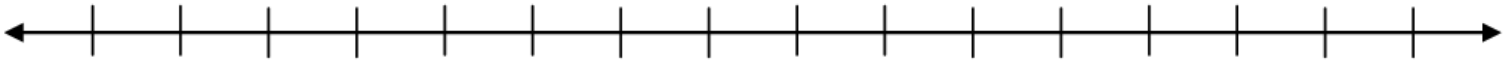
0	1	2	3	4
5	6	7	8	9
0	1	2	3	4
5	6	7	8	9

100 – Chart

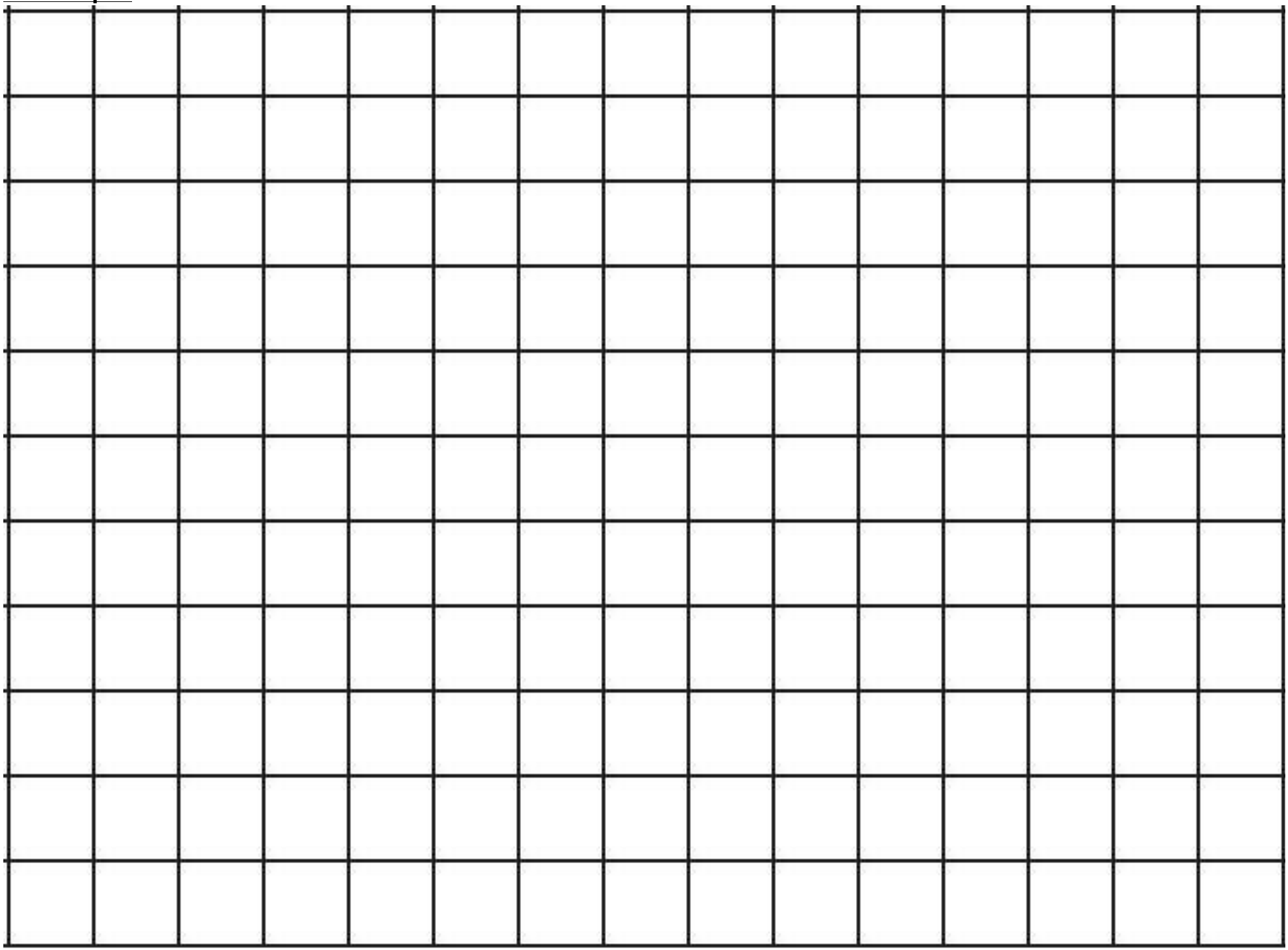
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Number Line

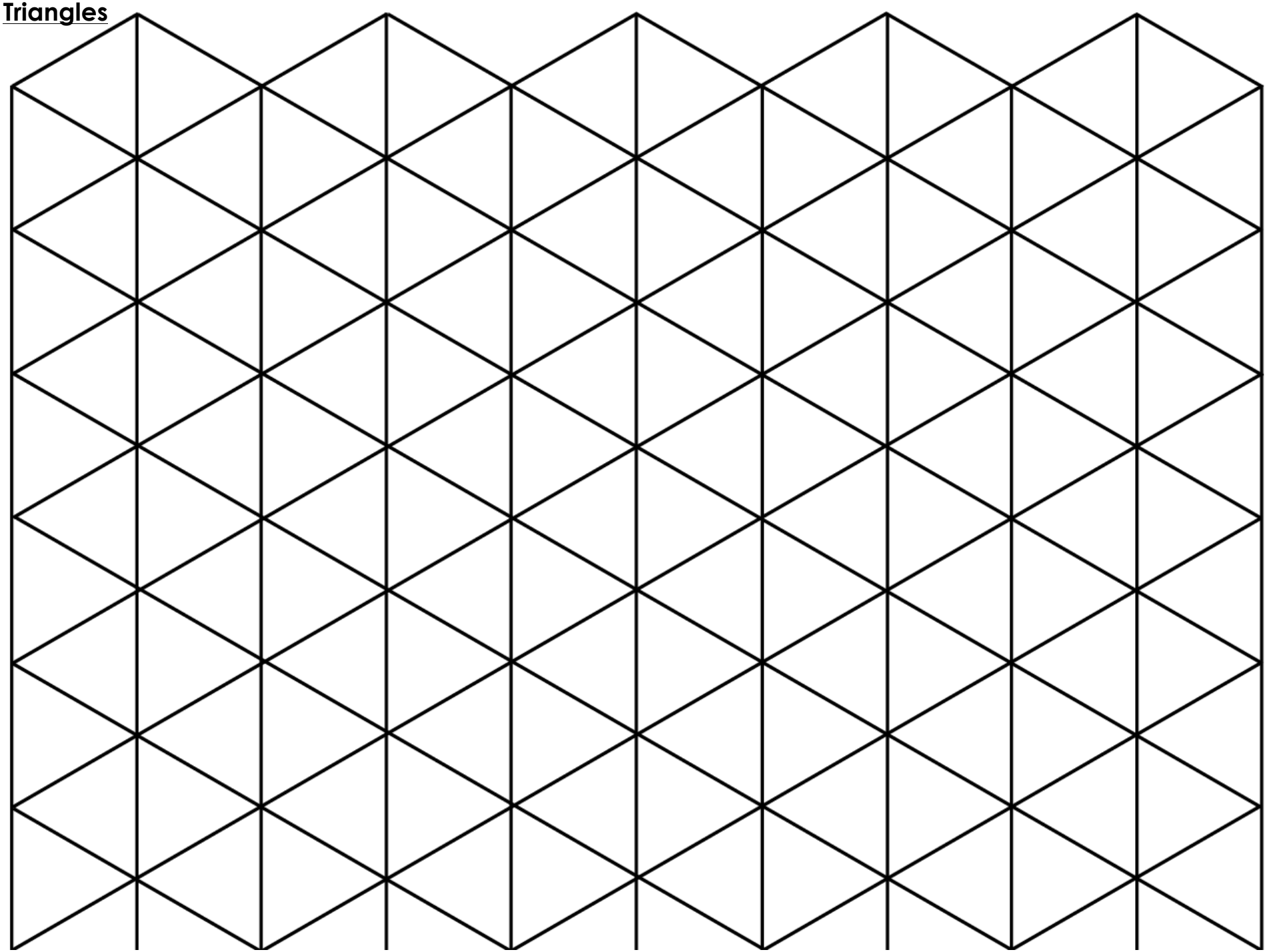




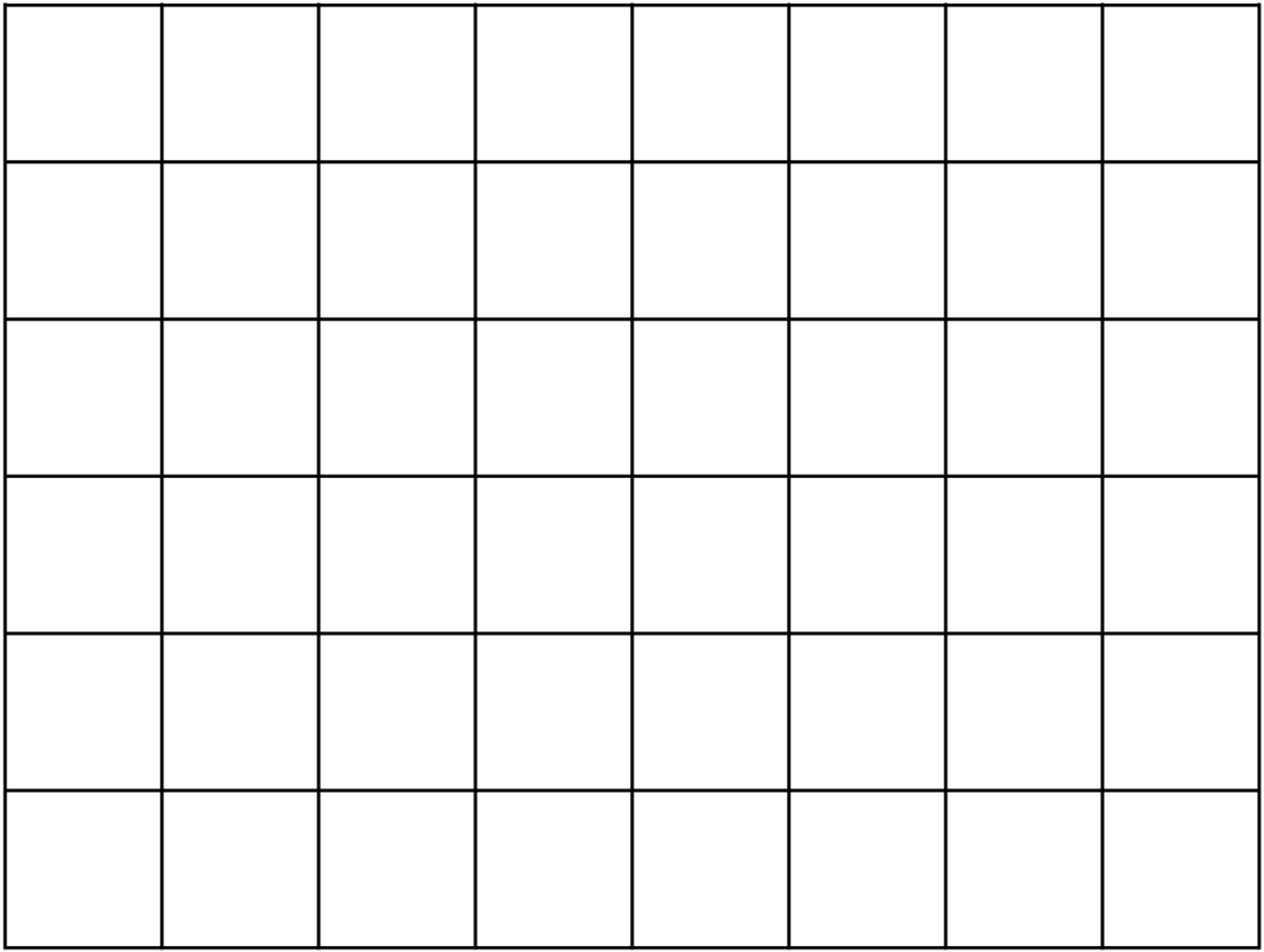
Grid Paper



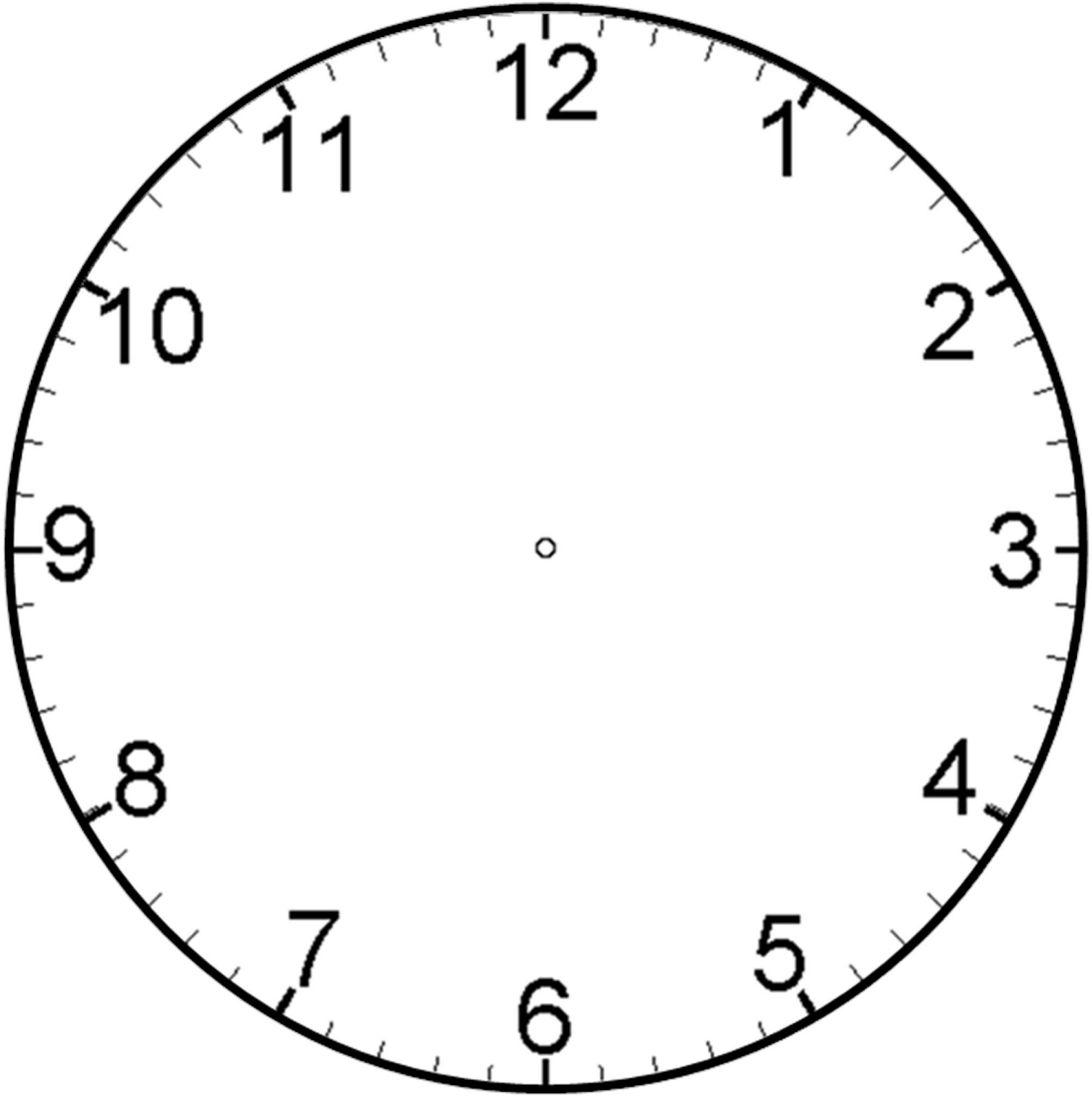
Triangles



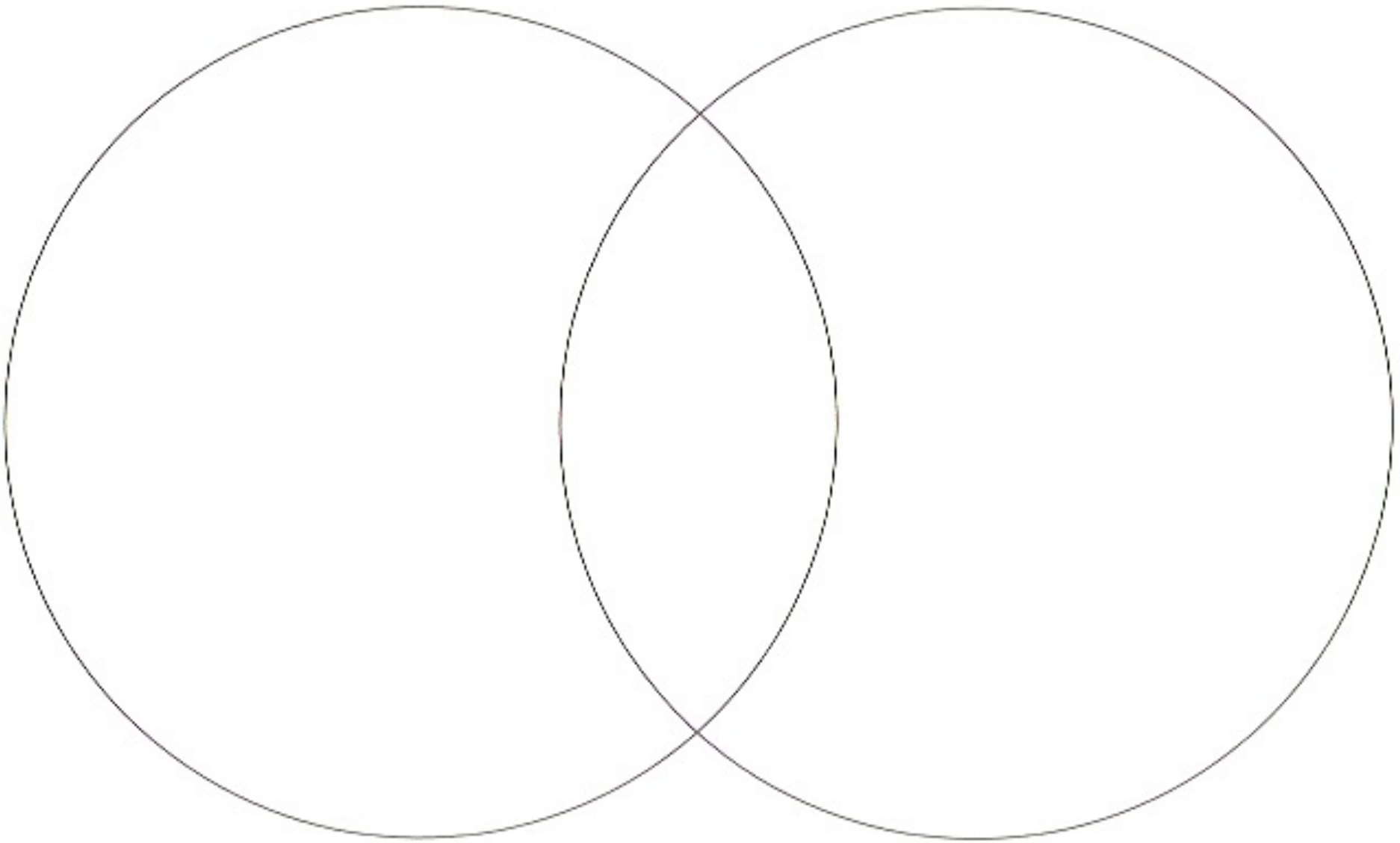
Squares



Clock



Venn Diagram



Pictograph

_____

Key:

_____ **= 1 person**

Glossary of Terms

Glossary For Three-Part Lessons

Minds On (also known as Getting Started) – the teacher activates students' prior knowledge by asking a thought-provoking question to get students engaged in problem solving. Students participate in discussions and they attempt various strategies to solve the problem. As students attempt to answer the question, the teacher sets the expectations and focus for the lesson.

Working On It (also known as Action) – students work in pairs or groups to solve a specific task given to them by the teacher. The groups or pairs develop appropriate strategies to help them solve the problem. They represent their thinking in a variety of ways and reflect upon alternative solutions. Group members discuss their understanding to each other and the teacher. The teacher walks around, observes and assesses the students' work. He/she facilitates learning by answering students questions to clarify confusion; encouraging groups to show and explain their thinking; encouraging students to test their solution to the problem by checking their work; and by providing hints and suggestions without giving solutions away.

Consolidation and Debrief (also known as Reflect and Connect) – the teacher gathers students together and facilitates a whole group discussion about the "Working On It" task. He/she encourages students to share their solutions to the problem, explain strategies used to get to the solution, and to justify their answer. At this time, the teacher addresses any misunderstandings and confusions with the task. There are three ways to conduct the consolidation: gallery walk, math congress and bansho.

Gallery Walk – the teacher and students walk around and observe student solutions to the group task "Working On It". Students read what the groups did and they give oral and written feedback. The teacher observes how students solved the problem. His/her focus is on Mathematical thinking (strategies that were used to get to the solution such as, addition, subtraction, diagram, 10-frame, multiplication, division, count forward, count backwards, etc.). The teacher uses the mathematical thinking of students and discusses strategies during the consolidation period and for next steps.

Math Congress – the teacher selects 2 or 3 students' solutions and has a class discussion about the mathematical thinking used. Students have an opportunity to talk about their solutions and thinking. The teacher uses questioning to prompt student responses and to bring about specific ideas and strategies. He/she uses students' solutions to discuss mathematical concepts/big ideas.

Bansho – students complete the "Working On It" task and the teacher uses a flat surface (chalkboard, whiteboard, etc.) to display students' solutions. Groups present and discuss their solutions and strategies, while the teacher makes comparisons to students' work by asking questions to address specific math ideas. Group work is sorted and displayed based on the mathematical strategies used and its complexity. Students then compare their solutions with other groups.

Highlight (also known as Summary) – after the consolidation, the teacher facilitates a class discussion and reflection of the "Working On It" task, and relates it to the learning goal for the lesson. He/she prompts students to discuss key mathematical concepts resulting from the activity. The teacher then records key mathematical concepts, vocabulary, algorithms, strategies, etc. using a list, chart, anchor chart, etc. so students can make reference to and make connections to key concepts when completing group and/or independent tasks.

Independent Task (also known as Practice) – the teacher provides an opportunity for students to practice their understanding of key mathematical concepts and strategies by giving them a similar task to complete independently in their Math Journal. Students will apply what they learned during the "Working On It" task, consolidation and highlight discussion, and refer to any anchor charts, lists, charts, etc. developed to assist them in completing the independent task.

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