Exploring Mathematics Through Problem-Solving and Student Voice

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Grade 5

Number Sense and Numeration

Grade 3 - Number Sense and Numeration (Skip Counting)

Materials: chart paper, markers, number lines, hundreds chart

Curriculum Expectations: Count forward and backwards by 1's, 2's, 5's, 10's, and 100's to 1000 from various starting points, and by 25's to 1000 starting from multiples of 25, using a variety of tools and strategies.

Minds On: 5-10 Minutes

- Can you skip count by 2's, 5's, 10's and 25's?
- Can you count forward?
- Can you count backwards?
- What can we use to count forward on?
- What can we use to count backwards 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 or pairs 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 120. 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 50 and skip count forward and backwards in as many different ways as you can. Show your work.	Start at 50 and skip count forward and backwards in as many different ways as you can. Show your work.
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Grade 5 - Number Sense and Numeration (Representing Numbers)

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

Curriculum Expectations: Represent whole numbers to 100, 000, 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 1,125?**
- Have students choose manipulatives to use to show the given number.
- Record their responses on chart paper (create an anchor chart).

Sample Responses

- 1 cube, 1 flat, 2 rods and 5 units
- 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 12,419.**
- 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 12,419.

Tell everything you know about the number 12,419.

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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 5 - Number Sense and Numeration (Place Value & Comparing Numbers)

Materials: chart paper, markers, number cards, envelopes

Curriculum Expectations: Compare, and order whole numbers to 100,000, using a variety of tools.

Minds On: 5-10 Minutes

- Put 5 numbers in a bag and pull them out.
- How many different 5-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 have students share their work.
- If students do not use a T-Chart, show them how to use a T-Chart to organize their work.
- Point out the patterns in the T-Chart.
- **Generalization**: I can compare numbers by first looking at the 10,000's digit, 1,000's digit, 100's digit, 10's digit, and 1's digit.

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

Working On It

The number of toy cars in each box has 5 digits: 1, 4, 6, 2 and 8. The rectangular box has fewer toy cars than the cylinder box. How many toy cars could there be in each box? How do you know? How many ways can you find? Show your work.

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Extension (Independent Task for Math Journal)

* Put 5 numbers in an envelop for each student.

Using the number cards in your envelope, make all the 5-digit numbers you can. List the numbers from greatest to least. How do you know you have listed your numbers from greatest to least? Explain your thinking.	Using the number cards in your envelope, make all the 5-digit numbers you can. List the numbers from greatest to least. How do you know you have listed your numbers from greatest to least? Explain your thinking.
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Grade 5 - 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 four-digit numbers, using a variety of mental strategies.

Minds On: 5-10 Minutes

- Review 4-digit addition with and without regrouping.
- Review 4-digit subtraction with and 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 various 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 4-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 2, 6, 3, 9, 5, 4, 8, and 7 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? What is the least difference? Show your work.

Use the 2, 6, 3, 9, 5, 4, 8, and 7 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? What is the least difference? Show your work.

Use the 2, 6, 3, 9, 5, 4, 8, and 7 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? What is the least difference? Show your work.

Extension (Independent Task for Math Journal)

Arrange the numbers: 1, 3, 5, 6, 7, 9, 2, and 4 to create 4-digit addition problems. Find the greatest sum. Using the same numbers, create 4-digit subtraction problems. Find the least difference. Show your work and explain your thinking.	Arrange the numbers: 1, 3, 5, 6, 7, 9, 2, and 4 to create 4-digit addition problems. Find the greatest sum. Using the same numbers, create 4-digit subtraction problems. Find the least difference. Show your work and explain your thinking.
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Grade 5 - Number Sense and Numeration (Multiplication)

Materials: chart paper, markers, counters

Curriculum Expectations: Multiply two-digit whole numbers by one-digit whole numbers, using a variety of tools (e.g., base ten materials or drawings of them, arrays, etc.), student-generated algorithms, and standard algorithms.

Minds On: 5-10 Minutes

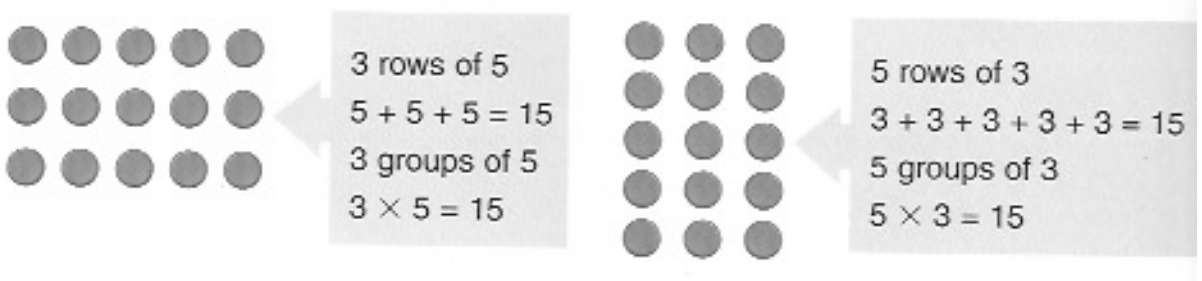
- How can we arrange ourselves into equal rows on the carpet?
- Relate this to an array in multiplication.
- Draw an array on chart paper with the multiplication sentence.
- Relate this to repeated addition, arrays and equal rows.

Working On It: 20-25 Minutes

- Arrange students into small groups or pairs.
- Paste the "Working On It" 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 to discuss while student share their work.
- Create an anchor chart highlighting the 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 use an array to show multiplication.

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

Working On It

How many ways can you arrange 90 counters in equal rows? How do you know you have found all the ways? Arrange 91 counters in equal rows. How many ways can you do this? Show your work and explain your thinking.

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Extension (Independent Task for Math Journal)

There are 42 singers and 72 dancers. Can they form equal rows of 2, 3, 4, 5, and 6? How do you know? What other equal rows can they form? Show your work.	There are 42 singers and 72 dancers. Can they form equal rows of 2, 3, 4, 5, and 6? How do you know? What other equal rows can they form? Show your work.
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Measurement

Grades 4-5 - 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

- How many different units of measure can you think of?
- 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
- How do they relate? (100cm = 1m)

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 students how close their estimate was to their actual measurement.
- What unit of measure helped or would help students to be more accurate in the future? What unit of measurement did you use and why? Is it standard or non-standard?

Generalization: I can make a reasonable estimate based on my knowledge of standard units.

Extension: Have students work on the "Independent Task" in their Math Journal (see below).
Ask students to estimate and measure height, width, length, distance, etc. of _____ (your choice) using different units of measurement.

Working On It

Estimate the width and length of the classroom. Measure and compare your results.

Estimate the width and length of the classroom. Measure and compare your results.

Estimate the width and length of the classroom. Measure and compare your results.

Extension

Estimate and measure height, width, length, distance, etc. of ________________ using different units of measurement.	Estimate and measure height, width, length, distance, etc. of ________________ using different units of measurement.
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Grade 4/5 - Measurement (Perimeter)

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

Curriculum Expectations: Estimate, measure, and record length, height, and distance, using standard units.
Determine, through investigation, the relationship between the side lengths of a rectangle and its perimeter and area.

Minds On: 5-10 Minutes

- What is a polygon?
- Name as many different polygons you can think of. Have students popcorn their ideas. Do not record.
- What is perimeter?
- How can we find the perimeter of polygons?
- Which standard unit is the most appropriate to use? Why?

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

- Ask groups to share their solutions.
- Discuss patterns they found.
- Discuss how they know if they found all of the possible polygons.
- Look for some sort of methodical strategy to show their work.
- Demonstrate understanding that you can have many different shaped polygons with the same perimeter.

Generalization: I can create a variety of regular and irregular polygons with the same perimeter.

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

Working On It

How many different polygons can you make with a perimeter of 36 centimetres? Name them. Are they regular or irregular? How do you know?

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Extension # 1 (Independent Task for Math Journal)

How many different polygons can you draw with a perimeter of 24 cm? How do you know that you have drawn all of the possible polygons? Use the chart paper and manipulatives of your choice to show your work.	How many different polygons can you draw with a perimeter of 24 cm? How do you know that you have drawn all of the possible polygons? Use the chart paper and manipulatives of your choice to show your work.
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Extension # 2 (Independent Task for Math Journal)

Mr. Richmond has 36 large squares of tile to make the floor of a pen for his rabbits. He wants to make a polygon shaped pen with the least amount of fencing. What polygon would be best for Mr. Richmond to use?	Mr. Richmond has 36 large squares of tile to make the floor of a pen for his rabbits. He wants to make a polygon shaped pen with the least amount of fencing. What polygon would be best for Mr. Richmond to use?
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Grade 5 - Measurement (Area)

Materials: grid chart paper, markers, square tiles, centimeter grid paper, geoboards

Curriculum Expectations: Estimate and measure the perimeter and area of regular and irregular polygons, using a variety of tools.

Minds On: 5-10 Minutes

- On grid chart paper draw a polygon.
- How many different irregular polygons can you make having an area of 24 square units with different perimeters?
- 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

- Look for patterns that students have come up with to find all the possibilities.
- How did you make sure that you didn't count squares twice? What strategies did you use? (dots, highlighter, rows, started at top left)
- Highlight the use of 1/2 squares.

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

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 a number of their own.

Working On It

How many different figures can you make having an area of 56 square units, with different perimeters? Use the grid paper and square tiles provided to show your work.

How many different figures can you make having an area of 56 square units, with different perimeters? Use the grid paper and square tiles provided to show your work.

How many different figures can you make having an area of 56 square units, with different perimeters? Use the grid paper and square tiles provided to show your work.

How many different figures can you make having an area of 56 square units, with different perimeters? Use the grid paper and square tiles provided to show your work.

Extension (Independent Task for Math Journal)

How many different figures can you make having an area of 32 square units, with different perimeters? Use the grid paper and square tiles provided to show your work.	How many different figures can you make having an area of 32 square units, with different perimeters? Use the grid paper and square tiles provided to show your work.
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Grade 5 - Measurement (Elapsed Time)

Materials: chart paper, markers, demonstration clocks

Curriculum Expectations: Estimate and determine elapsed time, with and without using a time line, given the durations of events expressed in minutes, hours, days, weeks, months, or years.

Minds On: 5-10 Minutes

- Review telling time using a demonstration clock.
- Demonstrate 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 and 1's
- Addition and subtraction
- Diagrams
- Timelines

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

You are travelling from Toronto to Sudbury. You leave Toronto at 11:00 a.m. and arrive in Sudbury at 4:57 p.m. How long did it take you to travel?

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

Charlie and Frank met at the mall at 5:00 p.m. Charlie took 45 minutes to get to the mall. He also stopped for 16 minutes to get coffee. Frank took 25 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 45 minutes to get to the mall. He also stopped for 16 minutes to get coffee. Frank took 25 minutes. At what time did each boy leave home? How do you know?
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Geometry and Spatial Sense

Grade 4/5 – Geometry and Spatial Sense (2-D Shapes)

Materials: chart paper, markers, Pattern Blocks, Attribute Blocks, Decl-blocks

Curriculum Expectations:
Grade 4: Identify and compare different types of quadrilaterals, and sort and classify them by their geometric properties.
Grade 5: Distinguish among polygons, regular polygons and irregular polygons.

Minds On: 5-10 Minutes

Show students a rhombus. (Grade 4)
Show students a regular and irregular pentagon. (Grade 5)
Tell me everything you know about polygons. How do you know it everything you know? Is it reasonable?

- What information are you going to use to answer the question?
- What strategy will you use?

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

Bansho

- Which answer is correct? How do you know?
- Chart-Share strategies and post for future use
- Highlight KEY vocabulary

Guiding Questions:
1) How do you know you've found all the possibilities?
2) How is this solution similar or different to others?

Generalization: I can compare regular and irregular polygons by using my knowledge about their geometric properties.

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

Working On It

A certain shape makes you think of a rectangle, but it is not a rectangle. What could it be? Why?

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Grade 4-5 – Geometry and Spatial Sense (Angles)

Materials: chart paper, markers

Curriculum Expectations:
Grade 4: Relate names of benchmark angels to their measures in degrees. Identify benchmark angles using a reference tool and compare other angles to these benchmarks.
Grade 5: Identify and classify acute, right, obtuse and straight angles. Measure and construct angels up to 90 degrees using a protractor.

Minds On: 5-10 Minutes

- Display different angles.
- Tell me everything you know about angels.
- How can you form angels? (Two lines meeting at a vertex)
- Write what students know on chart paper.
- Highlight key words (vertex, arm, right angle, acute angle, obtuse angle)
- Introduce the protractor, its purpose and how to use it.

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

- Use students' thinking and create an anchor chart defining the different types of angles and their degrees.

Generalization: I can draw and measure angles of different sizes.

Working On It

Draw 6 different angles. How can you order them? What criteria did you use? Explain how you know.

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Draw 6 different angles. How can you order them? What criteria did you use? Explain how you know.

Grade 4-5 – Geometry and Spatial Sense (3-D Shapes)

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

Curriculum Expectations: Construct skeletons of three-dimensional figures, using a variety of tools (e.g., straws and modelling clay, toothpicks and marshmallows, Polydrons), and sketch the skeletons.

Minds On: 5-10 Minutes

- Have students use toothpicks and plasticine (or materials of your choice) to build a 3-dimensional shape with 6 vertices.

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

Gallery Walk

- Identify and describe the different figures that students have created.

Generalization: I can construct skeletons of 3-dimensional figures.

Working On It

A 3-D shape has exactly 12 edges. What shape could it be? How do you know? Construct the shape. What does the net look like?

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Patterning and Algebra

Grades 4/5 – Patterning and Algebra (Repeating Patterns)

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

Curriculum Expectations: Make predictions related to repeating geometric and numeric patterns.

Minds On: 5-10 Minutes

- Display Pattern Blocks, Attribute Blocks, Power Polygons and Deci-blocks
- Discuss their attributes.
- Ask students: What is a repeating pattern?
- Choose students to share some examples of repeating patterns.
- Ask students: What is the pattern rule?
- Have the class predict what would come next. What is the 10^{th} term?

Working On It: 20-25 Minutes

- Arange 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 and predict future terms.

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 Deci-blocks. Create a repeating pattern. Trade with another group. Have them find the pattern rule and predict the next term.

Choose Pattern Blocks, Attribute Blocks, Power Polygons or Deci-blocks. Create a repeating pattern. Trade with another group. Have them find the pattern rule and predict the next term.

Choose Pattern Blocks, Attribute Blocks, Power Polygons or Deci-blocks. Create a repeating pattern. Trade with another group. Have them find the pattern rule and predict the next term.

Extension (Independent Task for Math Journal)

Create as many different repeating patterns as you can. Write the pattern rules. Predict the 10^{th} term for each.	Create as many different repeating patterns as you can. Write the pattern rules. Predict the 10^{th} term for each.
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Grades 4/5 – Patterning and Algebra (Growing Patterns and Shrinking Patterns)

Materials: chart paper, markers, Pattern Blocks, Attribute Blocks, Deci-blocks, Power Polygons
Curriculum Expectations: **Grade 4:** Extend, describe, and create repeating, growing, and shrinking number patterns. **Grade 5:** Make a table of values for a pattern that is generated by adding or subtracting a number to get the next term, or by multiplying or dividing by a constant to get the next term, given either the sequence or the pattern rule in words.
Minds On: 5-10 Minutes
• Brainstorm "What is a growing pattern?" and " What is a shrinking pattern?" as a class. • Select students to list examples and their pattern rule on chart paper (geometric, numbers, skip counting, addition, subtraction, multiplication) • 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 they used to solve the problem (T-Charts, pictures, pattern rules, diagrams)
Generalization: I can create growing patterns using different strategies. I can make predictions related to growing and shrinking geometric and numeric patterns.
Extension: Have students work on the "Independent Task" in their Math Journal (see template below).

Working On It

Create as many growing and/or shrinking patterns as you can. Write the pattern rules. Make predictions related to your pattern (e.g., What would be your 30^{th} term?)

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Extension (Independent Task for Math Journal)

Look at the Figures below. What would figure 4, 5, and 6 look like? Draw and describe the pattern rule. What would figure 10 look like? Explain whether this is a growing or shrinking pattern and state how you know.

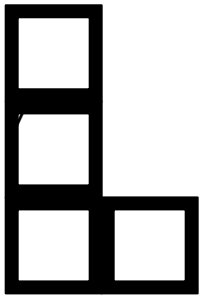


Figure 1

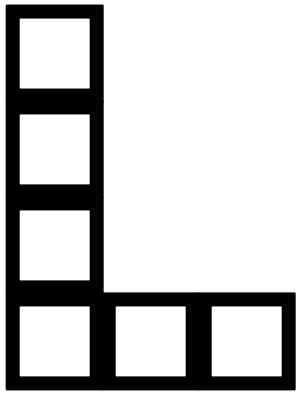


Figure 2

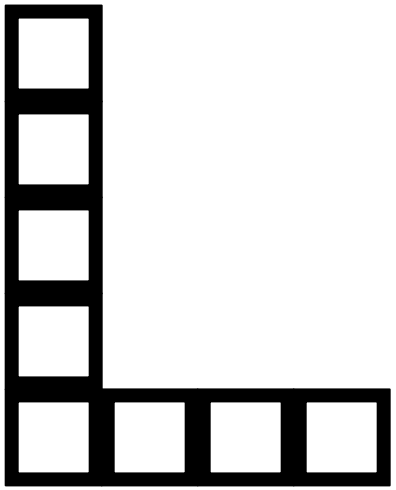


Figure 3

Look at the Figures below. What would figure 4, 5, and 6 look like? Draw and describe the pattern rule. What would figure 10 look like? Explain whether this is a growing or shrinking pattern and state how you know.

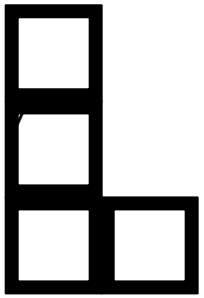


Figure 1

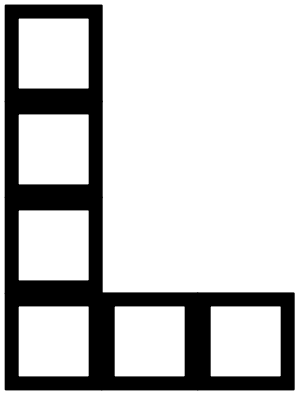


Figure 2

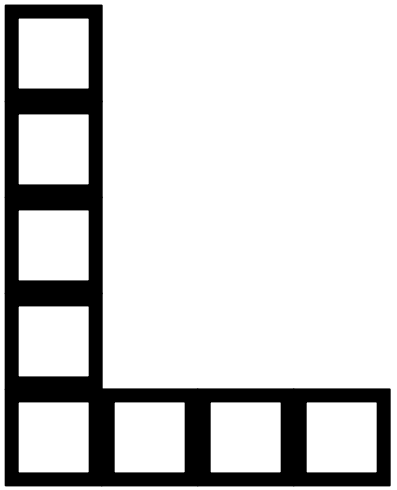


Figure 3

Data Management and Probability

Grade 5 – 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 by comparing similarities and differences between two related sets of data.

Minds On: 5-10 Minutes

- Present the class with 2 sets of data (one on a tally chart and the other on a bar graph). You can create the data or use a tally chart and bar graph of your choice.
- How can we compare both sets of data?
- 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.
- Look for measures of central tendency (mean, median, and mode)

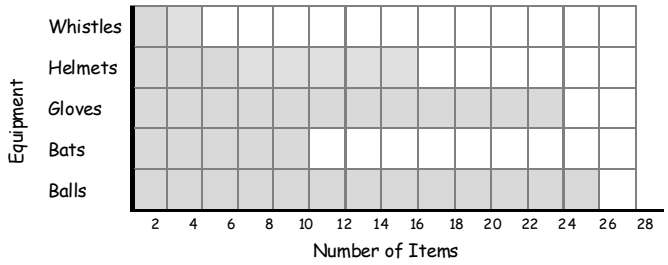
Generalization: I can compare different sets of data by identifying thier similarities and differences.

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

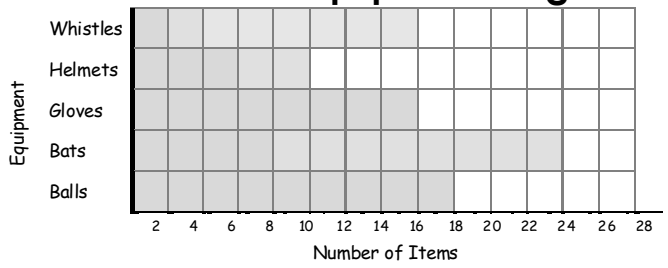
Working On It

Room 26 and Room 27 each have a bag of equipment. The graphs show the number of each kind of equipment in each bag.

Room 26's Equipment Bag



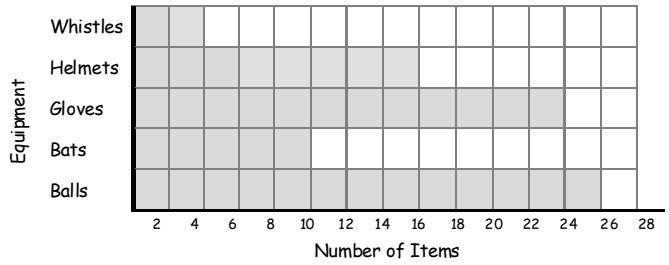
Room 27's Equipment Bag



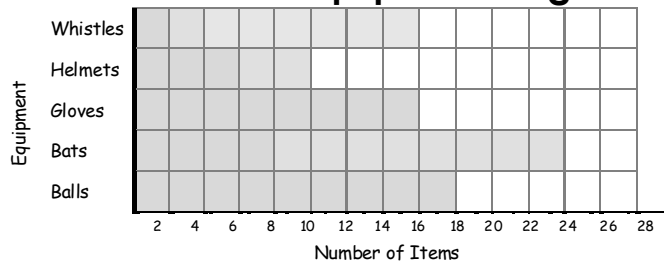
Compare the data represented in each of the graphs.

Room 26 and Room 27 each have a bag of equipment. The graphs show the number of each kind of equipment in each bag.

Room 26's Equipment Bag



Room 27's Equipment Bag

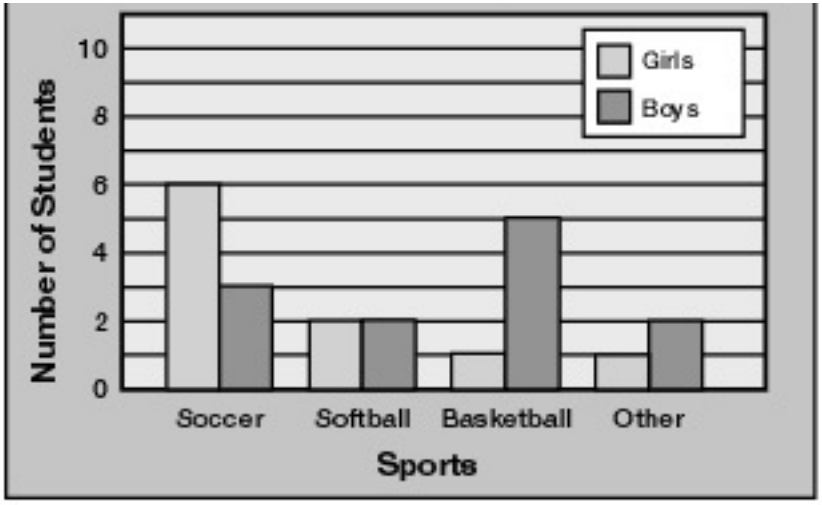


Compare the data represented in each of the graphs.

Extension (Independent Task for Math Journal)

The double bar graphs show favourite sports of boys and girls in Grade 5.

Our Favourite Sports



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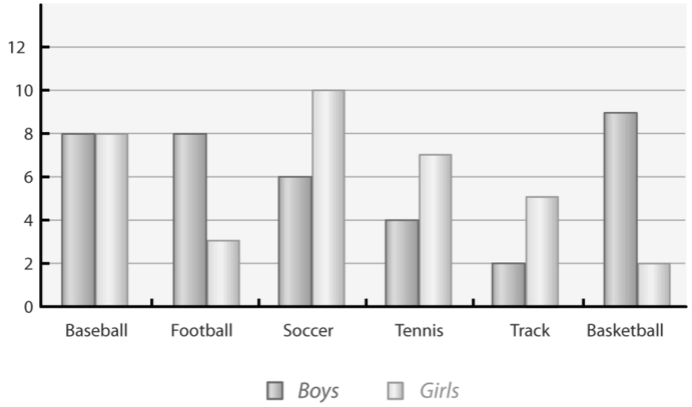

Compare the sets data represented in each of the graphs.

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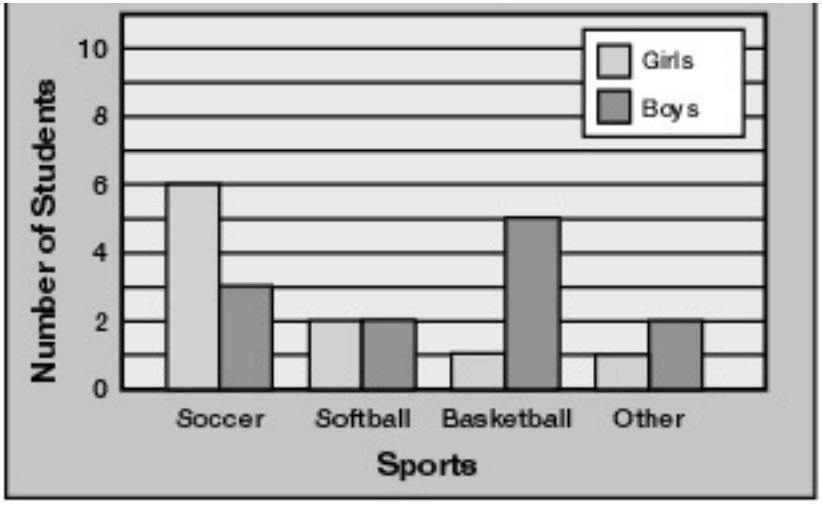
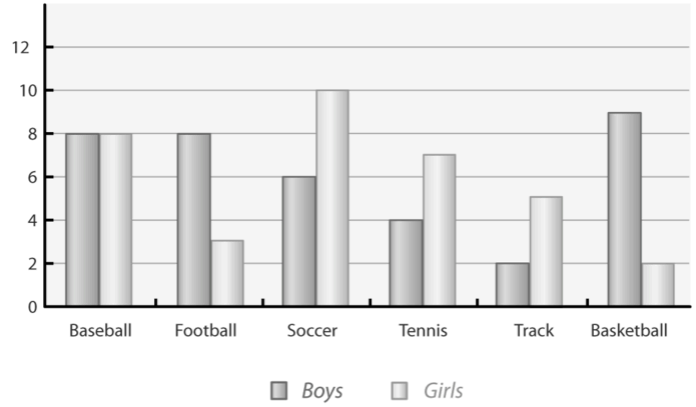


Favourite Sports



Compare the sets data represented in each of the graphs.

Grade 5 – Data Management (Creating Graphs)

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

Curriculum Expectations: Collect and organize categorical or discrete primary and secondary data and display the data in charts, tables, and graphs, with appropriate titles and labels, and with labels ordered appropriately along horizontal and vertical axis.

Minds On: 5-10 Minutes

- Present the class with the following question: How many hours do you spend doing extra-curricular activities?
- Create a T-Chart or Frequency Chart to organize student responses.
- Define the word survey and its purpose.
- How can we display our results? (pictograph, bar graph, line plot, 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 various graphs.
- Discuss the significance of the parts of each graph you expect students to know.
- 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. Kearns baked cookies and distributed them to her family. The results are shown on the tally chart. How many different ways can you graph the results?

Number of Cookies distributed	
Name	Number of Cookies received
Gloria	𝍸
Nancy	||||
Ashley	𝍸 |
Rebecca	𝍸 ||
Rachel	|||

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Number of Cookies distributed	
Name	Number of Cookies received
Gloria	𝍸
Nancy	||||
Ashley	𝍸 |
Rebecca	𝍸 ||
Rachel	|||

Extension (Independent Task for Math Journal)

Conduct a survey. Graph the results in at least 3 ways. What did you learn after conducting your survey?	Conduct a survey. Graph the results in at least 3 ways. What did you learn after conducting your survey?
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Grade 5 – Data Management (Interpreting Graphs)

Materials: grid chart paper, markers, sample graphs

Curriculum Expectations: Read, interpret and draw conclusions from primary and secondary data presented in charts, tables, and graphs.

Minds On: 5-10 Minutes

- Display a variety of graphs on chart paper (pictograph, bar graph, line plot, circle graph, broken-line graph).
- Name the different types of graphs and their purpose.
- Discuss the purpose of graphs. (to display 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.
- Review SALTZ (when creating bar graphs)

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

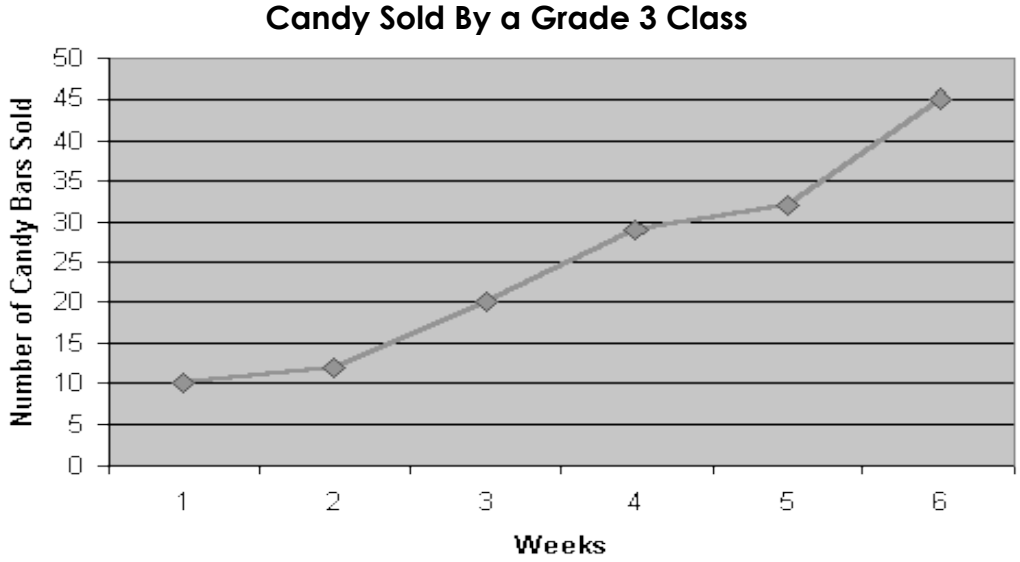
- Look for students' interpretation of the graph.
- Look for comparative language (most, least, how many more, total number)
- Look for strategies for interpreting data.
- Ask: How does the title help you figure out what question was asked?

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.



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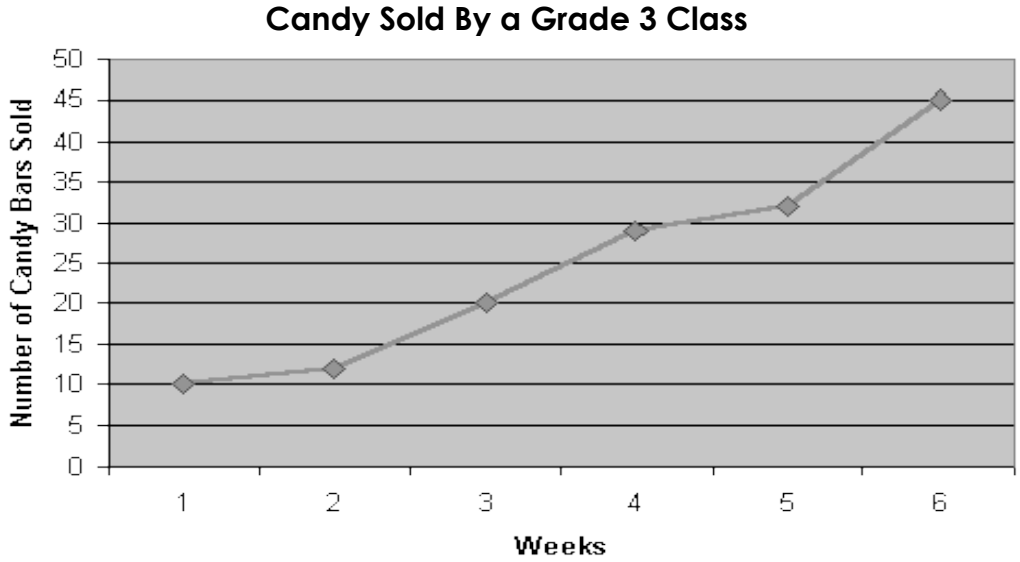
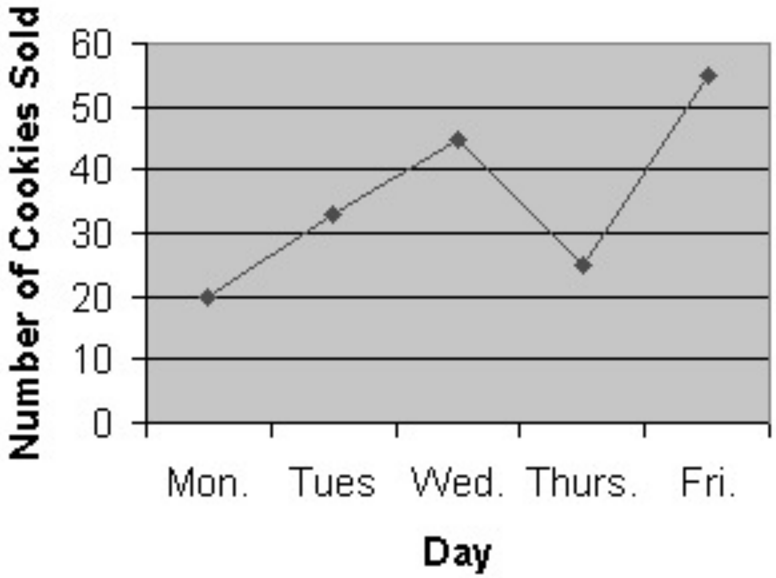


<u>Extension</u> (Independent Task for Math Journal)

Interpret this graph.

<u>Girl Scout Cookie Sales</u>



Interpret this graph.

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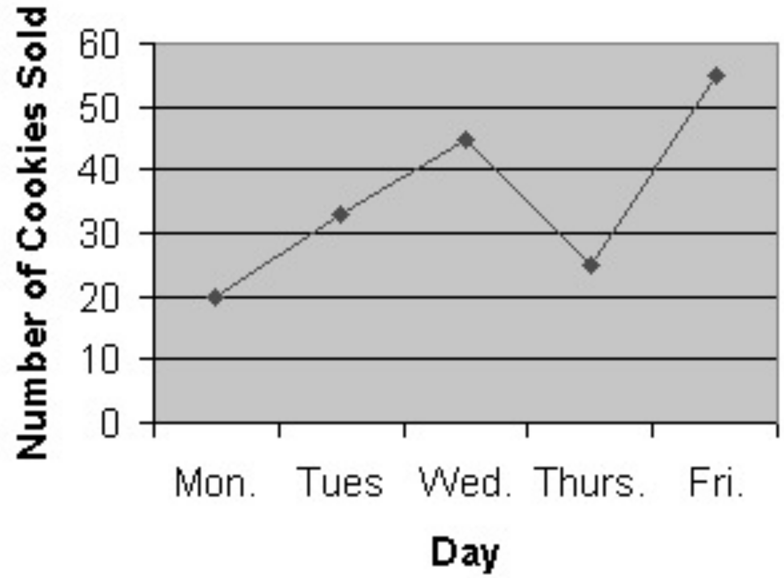
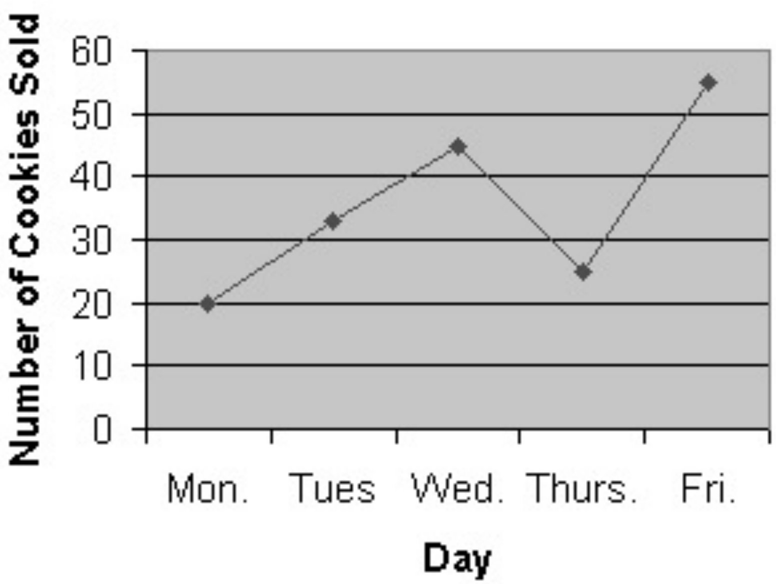


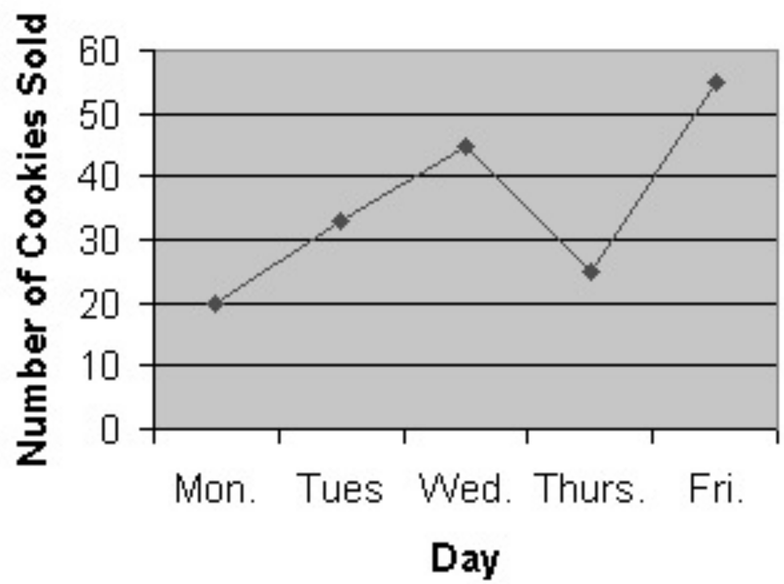
Interpret this graph.

<u>Girl Scout Cookie Sales</u>



Interpret this graph.

<u>Girl Scout Cookie Sales</u>



Grade 5 – Data Management (Probability)

Materials: grid chart paper, markers, number cubes

Curriculum Expectations: Determine and represent all the possible outcomes in a simple probability experiment.

Minds On: 5-10 Minutes

- What are all the sums we can get when rolling 2 number cubes?
- List sums on chart paper.
- Ask: Are these sums equally likely? How do you know?
- Have students share their ideas.

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.
- Note if students find a pattern.
- Note if they can find the sums (e.g., different ways to make 6)
- Recognize which number is the most frequent (number 7). Discuss "Lucky 7".
- Review and discuss probability language (likely, unlikely, certain, impossible, most likely, possible)

Generalization: I understand that some sums are more likely to be rolled on the number cubes than others.

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

Working On It

Show all the possible outcomes when rolling 2 number cubes. How do you know you have found all of the ways? Explain your thinking.

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

How does knowing all possible outcomes when rolling 2 number cubes help you when playing a game? Justify your answer.	How does knowing all possible outcomes when rolling 2 number cubes help you when playing a game? Justify your answer.
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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?

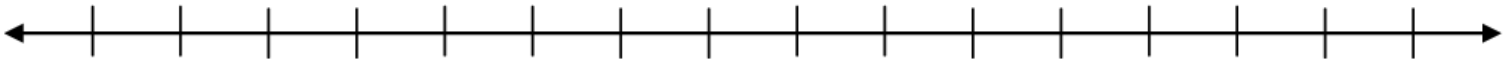
Number Cards

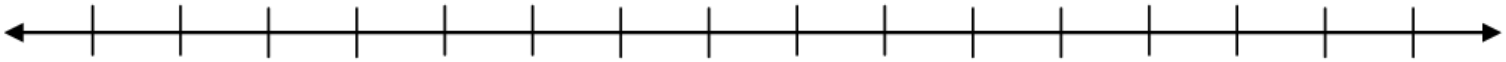
0	1	2	3	4
5	6	7	8	9
0	1	2	3	4
5	6	7	8	9

100 – Chart

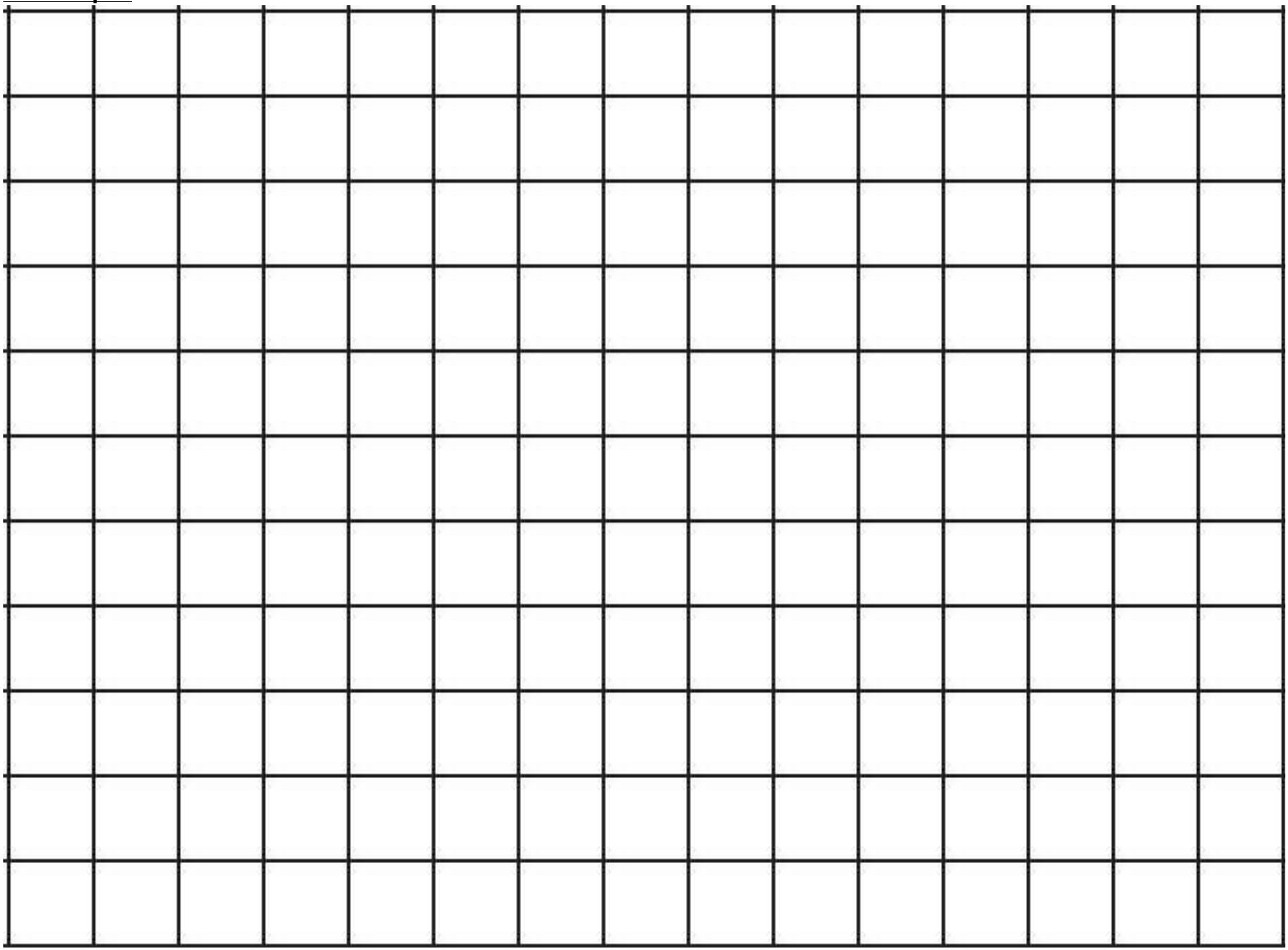
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Number Line

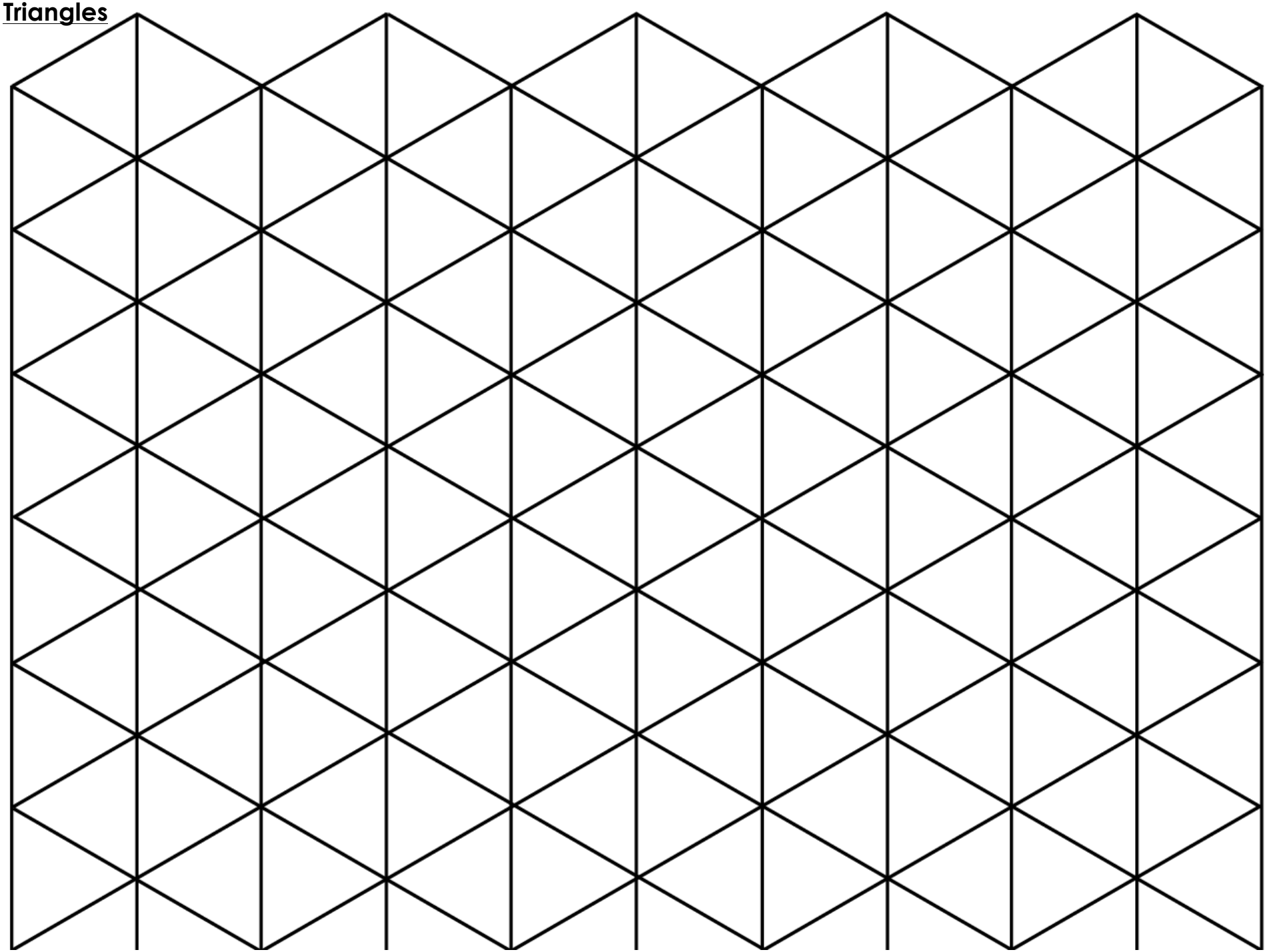




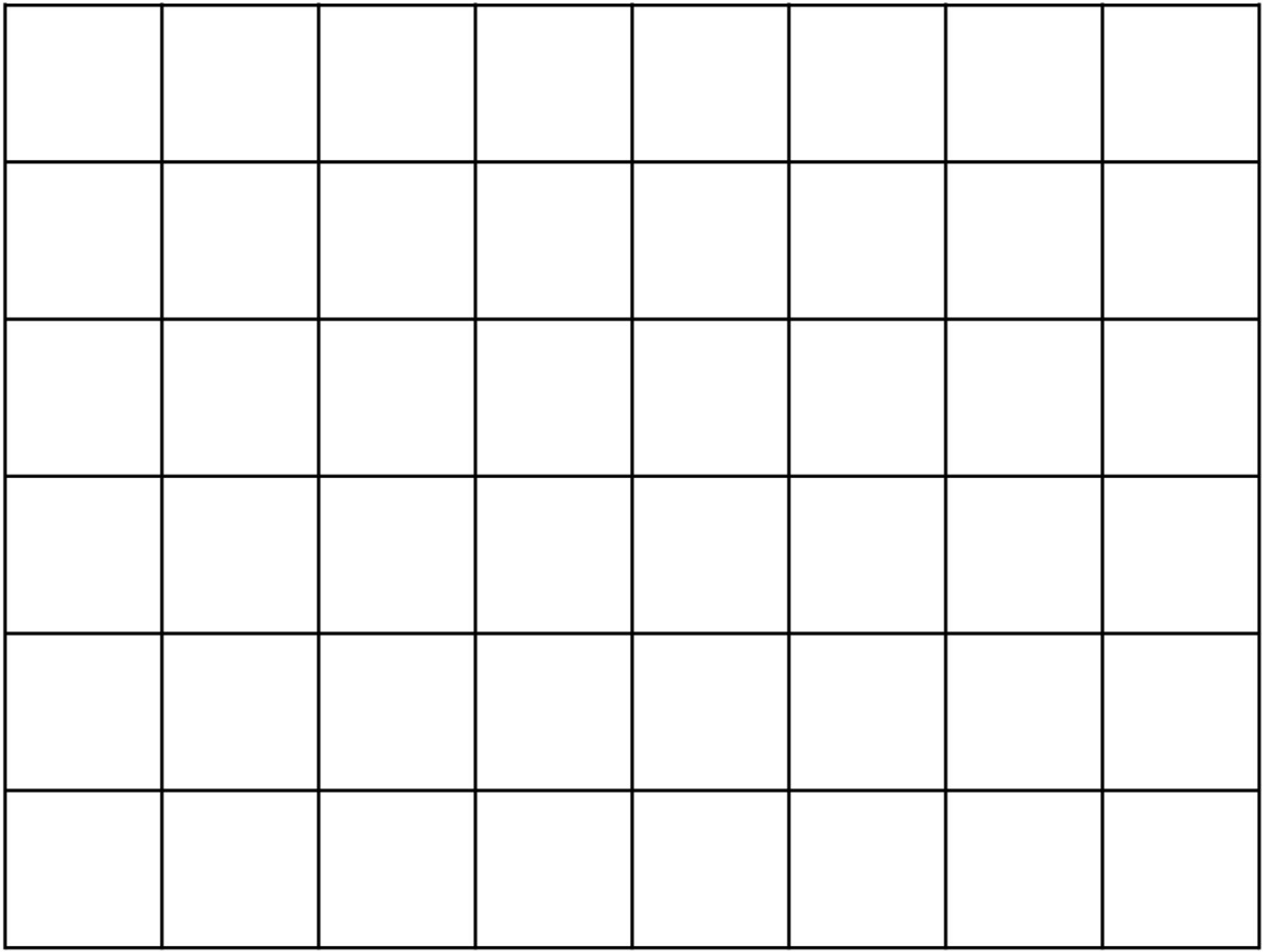
Grid Paper



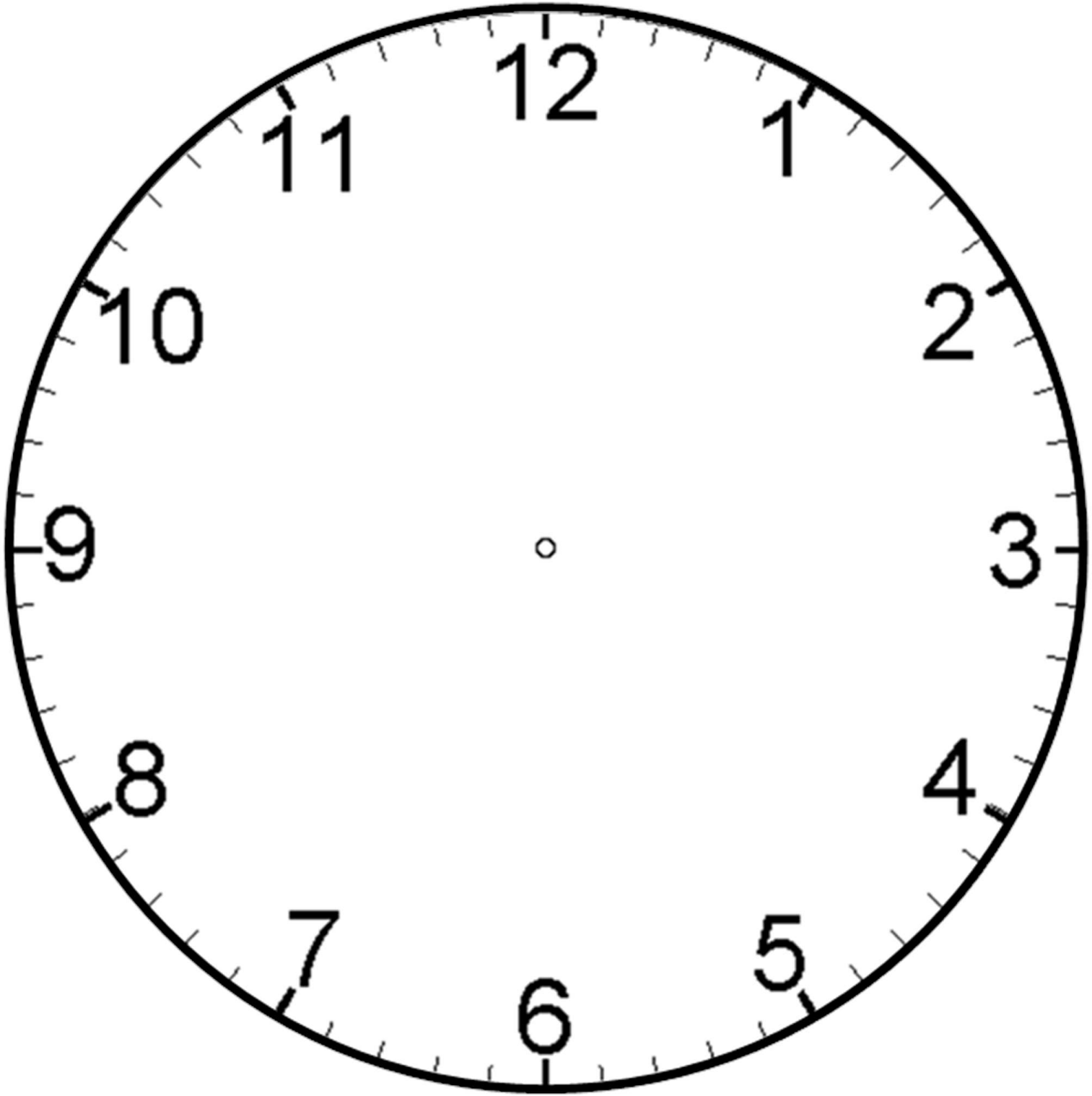
Triangles



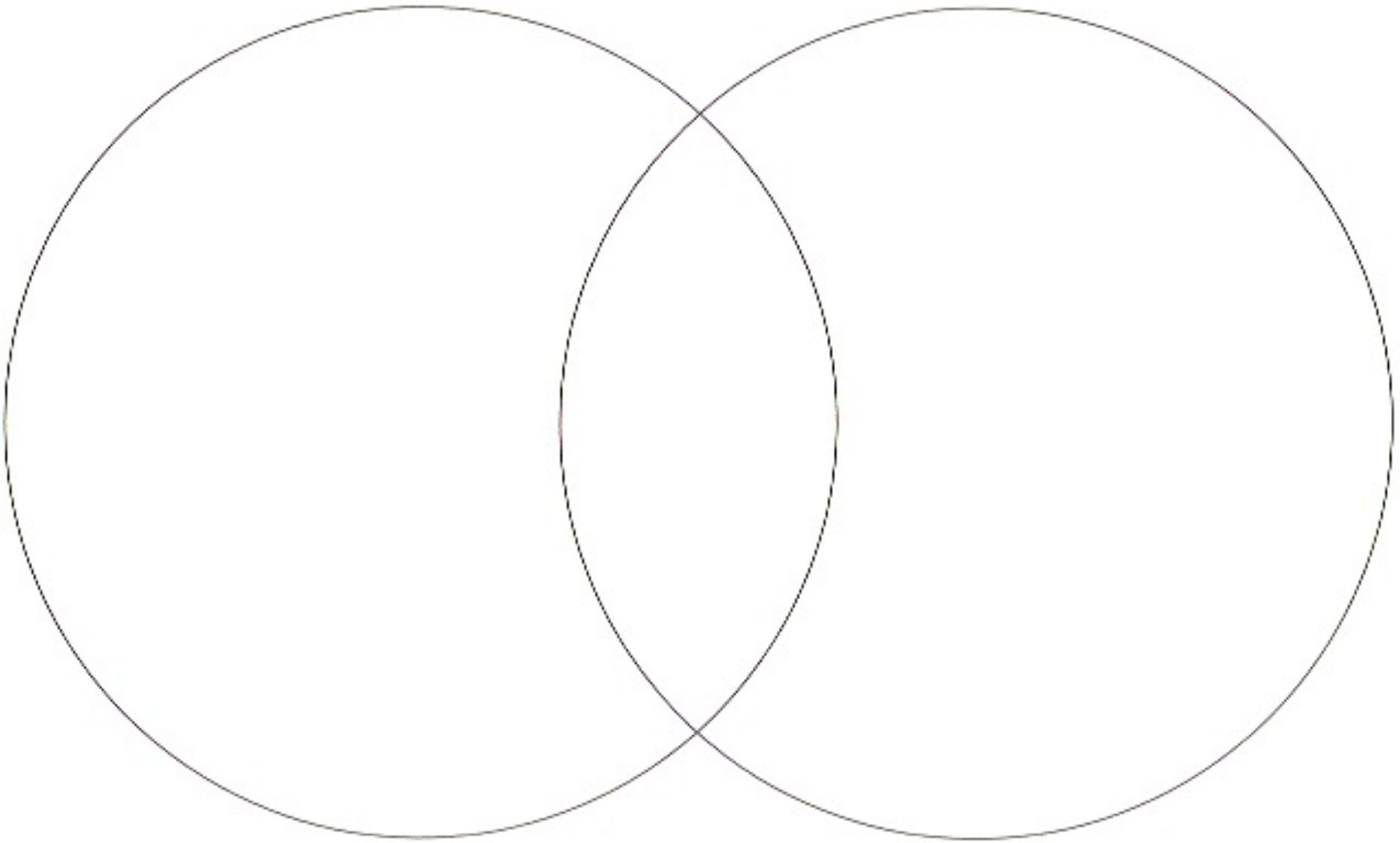
Squares



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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