

1 2 = 8 5 + 7 9 = 4 0 6 + 5

9

7 - 3

8

4 + 6

0

3

1 = 7

0

5

+ 9

3

7

7 - 6 + 4 9 - 5 = 8 4 + 6 0 3 =

# Key Understandings in the Elementary Mathematics Classroom

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## For the Teacher ...

The inclusive classroom is a reality. Educators are expected to deliver quality programming and specialized support to a wide variety of learners. The recurring question is: How is it possible to teach the key concepts to students with varying levels of ability?

Differentiated instruction is a proactive approach that involves adjusting the content or process to address the varied learning needs of students. The model used in this resource provides teachers with a way of achieving this objective.

**Key Understandings in the Elementary Mathematics Classroom** contains examples of anchor questions that can be used to provide a snapshot of each student's ability based on one of the expectations in each strand of the mathematics curriculum at designated grade levels.

For example,

By completing worksheet N-1, students in Grades, 1, 2, or 3 can demonstrate the level of their understanding of the identified learning expectations for addition. Teachers can then plan instruction to meet the students' learning needs.

For each key concept, the questions can be used to determine the level at which a student is demonstrating understanding.

<b>Strand</b>	<b>Key Concept</b>
Number Sense and Numeration	Addition
Measurement	Estimation and Measurement of Area
Geometry and Spatial Sense	Classification of 2-D Shapes
Patterning and Algebra	Patterns
Data Management and Probability	Probability

## Strand: Number Sense and Numeration

### Key Concept – Addition

Curriculum Expectations	Tasks	Materials	Teacher Notes
<p><u>Grade 1</u> – demonstrate addition (and subtraction) facts to 20 using concrete materials</p> <p><u>Grade 2</u> – add (and subtract) two-digit numbers with and without regrouping, with sums less than 101, using concrete materials</p> <p><u>Grade 3</u> – add (and subtract) 3-digit numbers with and without re-grouping using concrete materials</p>	<p>Students solve problems related to number. (Worksheet N-1)</p>	<ul style="list-style-type: none"> <li>- manipulatives</li> <li>- September and October calendars</li> <li>- graph paper</li> <li>- colouring materials (pencil crayons, markers, crayons)</li> </ul>	<p>In the third question, you may wish to change the grade.</p> <p>Read problems orally, highlighting key words.</p> <p>See Answer Key N-5.</p>
<p><u>Grade 4</u> – add 2 four-digit numbers</p> <p><u>Grade 5</u> – add 3 four-digit numbers</p> <p><u>Grade 6</u> – add 4 three-digit numbers</p>	<p>Students solve problems related to number. (Worksheet N-2)</p>	<ul style="list-style-type: none"> <li>- base 10 materials</li> <li>- graph paper</li> </ul>	<p>In the first question, you may wish to change the grade.</p> <p>Read problems orally, highlighting key words.</p> <p>See Answer Key N-5.</p>
<p><u>Grade 7</u> – add fractions with simple denominators using concrete materials, drawings, and symbols</p> <p><u>Grade 8</u> – add simple fractions</p>	<p>Students solve problems related to number. (Worksheet N-3)</p>	<ul style="list-style-type: none"> <li>- base 10 materials</li> <li>- fraction strips (Worksheet N-4)</li> </ul>	<p>Read problems orally, highlighting key words.</p> <p>See Answer Key N-5.</p>

## N-1 Strand: Number Sense and Numeration Addition

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Jane went to school 5 days this week.

Bill went to school 4 days this week.

Sara went to school 3 days this week.

Altogether, how many days did the students go to school?

Show your work

Using a calendar, colour the days the children go to school in September and in October.

How many school days are there in September?

How many school days are there in October?

Find the sum of school days in September and October.

Show your work

There are 192 days in the school year.

If you go to school every day, how many days would you go to school by the end of Grade 3?

Show your work

## N-2 Strand: Number Sense and Numeration

## Addition

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Your teacher attended school for 3610 days.

Your best friend has attended Day Care for 100 days, Junior Kindergarten for 96 days, Senior Kindergarten for 95 days, and then 192 days each year since Kindergarten.

Calculate the total number of days your best friend has attended school by the end of Grade 3. What is the total number of days your best friend and your teacher have gone to school?

Show your work

Your teacher attended school 3610 days.

Your principal went to school 4021 days.

The Grade 1 teacher went to school 3619 days.

What is the sum of days your teacher, your principal, and the Grade 1 teacher have gone to school?

Show your work

In one year, you attended school every day. Your brother attended 186 days. Your sister attended 177 days. Your older brother has never missed a day.

If there are 192 days in a school year, what is the total number of days that you and your sister and brothers attended school?

Show your work

**N-3 Strand: Number Sense and Numeration****Addition**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Jim is graduating from Grade 8 and as part of a math project he has to calculate the time he has spent at his Senior School.

In Grade 6, he was at school for  $\frac{9}{10}$  of the school year.

In Grade 7, he left on March 1st to go on an extended vacation with his family.

Jim returned to school at the beginning of December of his Grade 8 year.

Jim calculated that he had attended his Senior School for  $2\frac{3}{10}$  school years.

Is he correct?

Explain your thinking.

## N-4 Fraction Strips

$\frac{1}{10}$									
----------------	--	--	--	--	--	--	--	--	--

$\frac{1}{10}$									
----------------	--	--	--	--	--	--	--	--	--

$\frac{1}{10}$									
----------------	--	--	--	--	--	--	--	--	--

$\frac{1}{10}$									
----------------	--	--	--	--	--	--	--	--	--

$\frac{1}{10}$									
----------------	--	--	--	--	--	--	--	--	--

$\frac{1}{10}$									
----------------	--	--	--	--	--	--	--	--	--



## N-5 Number Sense and Numeration Answer Key

### Worksheet N-1

$$5 + 4 + 3 = 12$$

(Answer varies with year.)

e.g.,

$$\begin{array}{r} 19 \text{ days of school in September} \\ + 22 \text{ days of school in October} \\ \hline 41 \text{ days of school in total} \end{array}$$

192 days of school in Grade 1  
384 days of school by the end of Grade 2  
576 days of school by the end of Grade 3

### Worksheet N-2

$$3610 + 100 + 96 + 95 + 192 + 192 + 192 = 4477 \text{ days (Using Grade 3 as the end year)}$$

$$3610 + 4021 + 3619 = 11\,250 \text{ days}$$

$$192 + 186 + 177 + 192 = 747$$

### Worksheet N-3

The answer is incorrect.

$$\text{Sept to Feb. inclusive} = \frac{6}{10}$$

$$\text{Dec. to June inclusive} = \frac{7}{10}$$

$$\frac{9}{10} + \frac{6}{10} + \frac{7}{10} = \frac{22}{10} = 2\frac{2}{10} \text{ or } 2\frac{1}{5} \text{ school years}$$

## Strand: Measurement

### Key Concept – Estimation and Measurement of Area

Curriculum Expectations	Tasks	Materials	Teacher Notes
<p><u>Grade 1</u> – estimate and count the number of uniform and non-uniform shapes that will cover a surface</p> <p><u>Grade 2</u> – estimate and measure specified areas using uniform non-standard units, and record the measures</p> <p><u>Grade 3</u> – estimate and measure the area of shapes using uniform non-standard units, and compare and order the shapes by area</p>	<p>Students estimate and count uniform shapes that cover a surface. (Worksheet M-1)</p> <p>Students estimate and measure the area of the shapes using uniform non-standard units and order the areas of shapes from greatest to least. (Worksheet M-2)</p>	<ul style="list-style-type: none"> <li>- scissors</li> <li>- glue</li> <li>- uniform non-standard units (centimetre cubes, paperclips, etc.)</li> </ul>	<p>Allow students to respond orally or to draw the explanation.</p> <p>See Answer Key M-7.</p>
<p><u>Grade 4</u> – estimate the area of regular polygons and measure the area in square centimetres using grid paper</p> <p><u>Grade 5</u> – estimate and calculate the perimeter and area of rectangles and squares</p> <p><u>Grade 6</u> – estimate and calculate the area of a parallelogram and the area of a triangle using a formula</p>	<p>Students estimate and measure the area of shapes (Worksheet M-2) and record their findings. (Worksheet M-3)</p> <p><b>Note</b> Grade 6 completes page 2 of Worksheet M-2, as well.</p>	<ul style="list-style-type: none"> <li>- centimetre squares</li> </ul>	<p>Provide the formula for area of a parallelogram (base × height).</p> <p>Provide the formula for area of a triangle (<math>\frac{1}{2}</math> base × height).</p> <p>See Answer Key M-7.</p>

Curriculum Expectations	Tasks	Materials	Teacher Notes
<p><u>Grade 7</u> – estimate and calculate the perimeter and area of an irregular two-dimensional shape (e.g., trapezoid, hexagon)</p> <p><u>Grade 8</u> – estimate and calculate the radius, diameter, circumference, and area of a circle using a formula in a problem-solving context</p>	<p>Students estimate and calculate the perimeter and area of a trapezoid. (Worksheet M-4)</p> <p>Students estimate and calculate the circumference and area of a circle. (Worksheet M-5)</p>	<p>- rulers</p>	<p>Use questioning and prompts to guide students in identifying the formulas.</p> <p>Provide the formula for area of a parallelogram (length × width).</p> <p>Provide the formula for area of a triangle (<math>\frac{1}{2}</math> length × width).</p> <p>Provide the formula for the circumference of a circle (<math>C = 2 \pi r</math>).</p> <p>Provide the formula for area of a circle (<math>A = \pi r^2</math>).</p> <p>Provide the fact that <math>\pi = 3.14</math>.</p> <p>See Answer Key M-6.</p>

# M-1 Area of Shapes

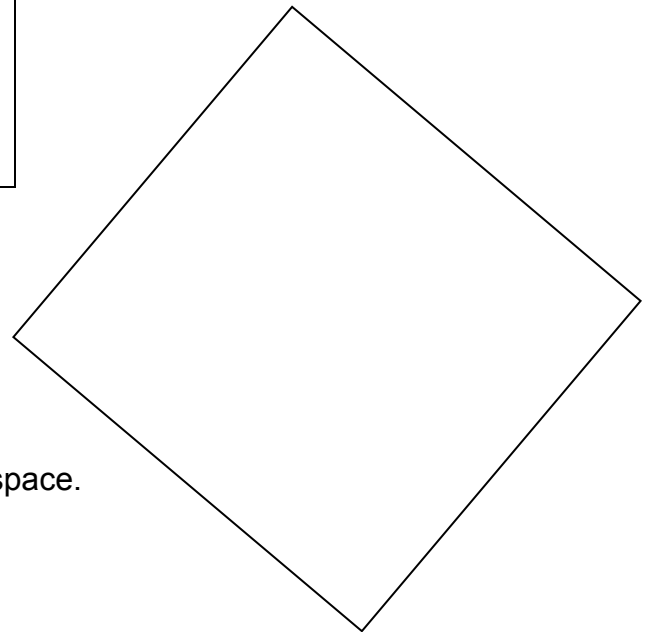
Name: \_\_\_\_\_ Date: \_\_\_\_\_

Estimate how many sandboxes you need to cover each shape.  
Cut out the sandboxes and use them to cover each shape.  
Count how many sandboxes you used to cover each shape.



I think I need \_\_\_\_\_ sandboxes.

I used \_\_\_\_\_ sandboxes.



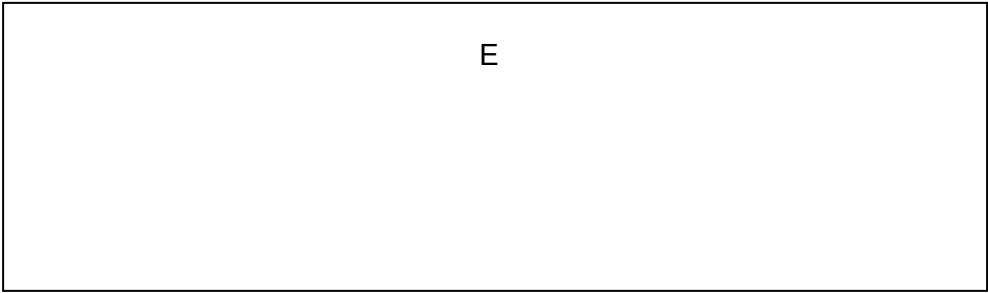
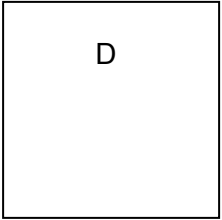
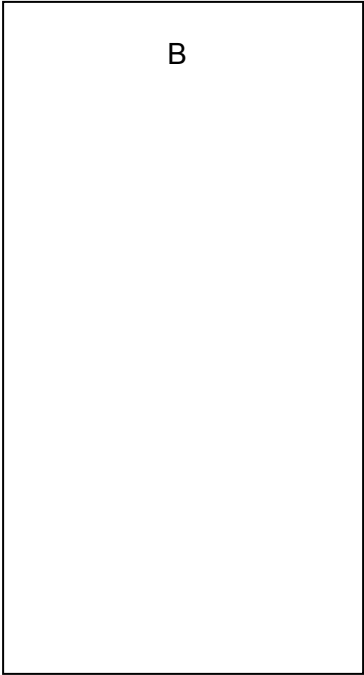
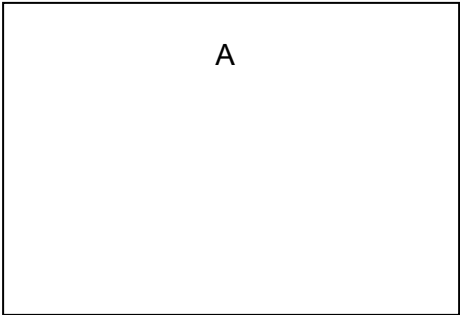
I think I need \_\_\_\_\_ sandboxes.

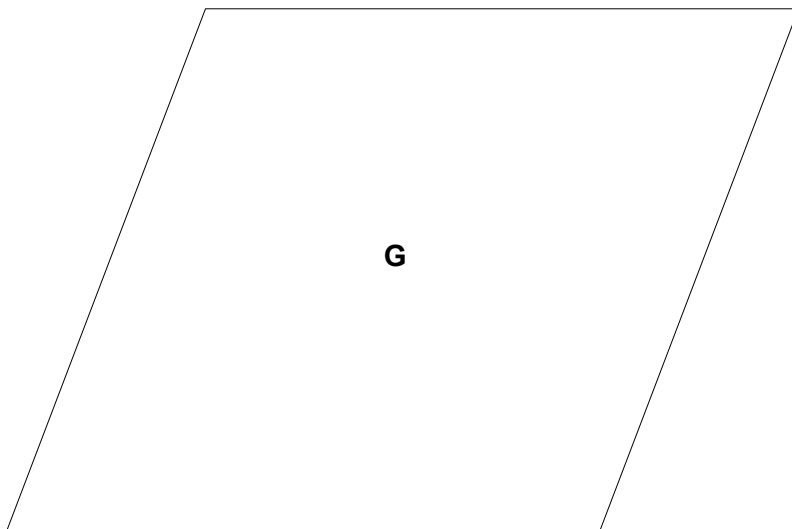
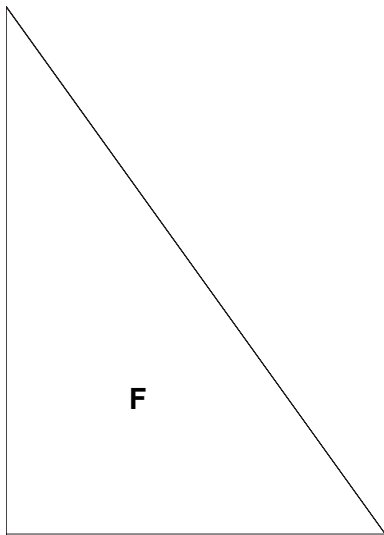
I used \_\_\_\_\_ sandboxes.

Write about which of the above shapes covers more space.  
(Use the back of the page.)



# M-2 Estimating and Measuring Areas of Shapes





### M-3 Areas of Shapes – Record Sheet

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- A) Measure Shape A on Worksheet M-2. Record the area on the chart. Use the area of Shape A to estimate the area of the rest of the shapes. Record your estimates on the chart. Which shape do you think has the largest area
- B) Measure the shapes. Record the area on the chart.

Shape	Estimate	Measurement
A		
B		
C		
D		
E		
F		
G		

Which shape had the largest area?

A B C D E F G

Was your estimate for the largest area correct?

Yes No

Which shape would you choose for a playground

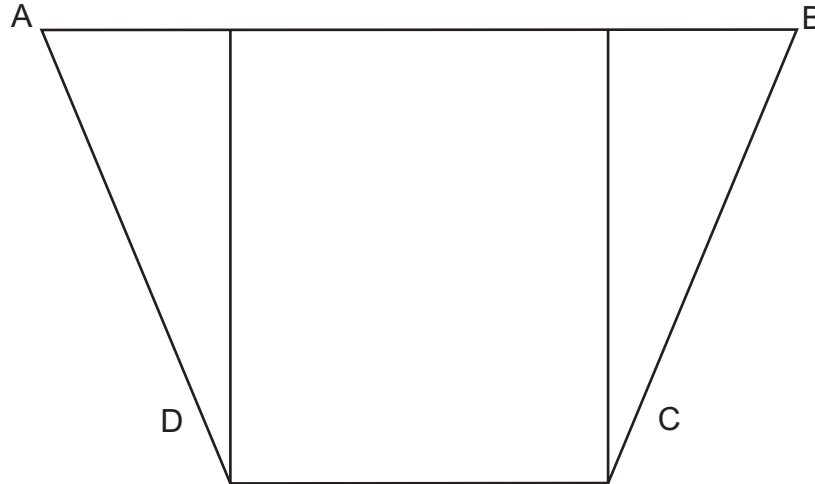
A B C D E F G?

Explain your thinking using words, pictures, and/or numbers. Use the back of this page.

## M-4 Trapezoid Park

Name: \_\_\_\_\_

Date: \_\_\_\_\_



Your community has set aside some land for the development of a skateboard park. Safety regulations require a fence around the perimeter of the park. If 1 cm = 1 metre, estimate how many metres of fencing are needed? Using a centimetre ruler, calculate the actual metres of fencing that are needed.

Estimate of Perimeter: \_\_\_\_\_

Measurement/Calculation of Perimeter: \_\_\_\_\_

The surface area of the park also needs to be paved. Estimate in square metres the amount of surface to be covered. Calculate the actual area of the park.

Estimate of Area: \_\_\_\_\_

Measurement/Calculation of Area: \_\_\_\_\_

Explain your calculations using words, pictures, and/or numbers. Use the back of this page.



## M-5 A Circular Flowerbed

### A Circular Flowerbed

Name: \_\_\_\_\_

Date: \_\_\_\_\_

You are a landscaper working for Mr. Jones. Mr. Jones wants edging around the circumference of his circular flowerbed. He would like a black felt mat to line the surface of the garden area to control weeds. Your job is to calculate the amount of edging and felt required. The diameter of the garden is 6 metres.

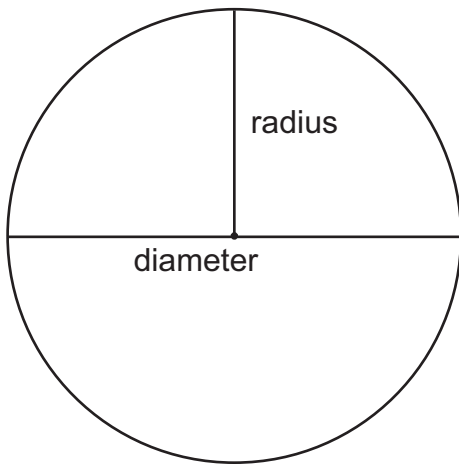
Some formulas to help you with this question:

$$C = 2\pi r \quad (r = 3.14)$$

$$A = \pi r^2$$

$$r = \frac{d}{2}$$

Explain your calculations, using words, pictures, and numbers.



## M-6 Measurement Answer Key

### Worksheet M-1

Rectangle uses 15 sandboxes.

Square uses 9 sandboxes.

### Worksheet M - 2

Shape with the largest area: E

$$A - 6 \text{ cm} \times 4 \text{ cm} = 24 \text{ cm}^2$$

$$B - 9 \text{ cm} \times 5 \text{ cm} = 45 \text{ cm}^2$$

$$C - 10 \text{ cm} \times 1 \text{ cm} = 10 \text{ cm}^2$$

$$D - 3 \text{ cm} \times 3 \text{ cm} = 9 \text{ cm}^2$$

$$E - 13 \text{ cm} \times 4 \text{ cm} = 52 \text{ cm}^2$$

(Grade 6) Shape with the largest area: G

Area of triangle is  $\frac{1}{2}$  of a rectangle:  $A = \frac{b \times h}{2}$

$$\frac{5 \text{ cm} \times 7 \text{ cm}}{2} = 17.5 \text{ cm}^2$$

Area of parallelogram is base  $\times$  height:  $A = b \times h$

$$G - 8 \text{ cm} \times 7 \text{ cm} = 56 \text{ cm}^2$$

### Worksheet M-4

#### Grade 7 - Trapezoid Park

Perimeter:  $6.5 \text{ m} + 5 \text{ m} + 6.5 \text{ m} + 10 \text{ m} = 28 \text{ m}$

Area of a trapezoid is the sum of the 2 parallel sides divided by 2  $\times$  height:

$$A = \frac{AB+DC}{2} \times h \quad (\text{see shape sheet})$$

$$\text{Area: } \frac{(10 \text{ m} + 5 \text{ m})}{2} \times 6 \text{ m} = 45 \text{ m}^2$$

### Worksheet M-5

#### Grade 8 – A Circular Flowerbed

$$\begin{aligned} r &= \frac{d}{2} \\ &= \frac{6}{2} \\ &= 3 \text{ m} \end{aligned}$$

$$\begin{aligned} C &= 2\pi r \\ &= 2 \times 3.14 \times 3 \\ &= 18.84 \text{ m} \end{aligned}$$

$$\begin{aligned} A &= \pi r^2 \\ &= 3.14 \times 3^2 \\ &= 3.14 \times 9 \\ &= 28.26 \text{ m}^2 \end{aligned}$$

## Strand: Geometry and Spatial Sense

### Key Concept – Classification of 2-D Shapes

Curriculum Expectations	Tasks	Materials	Teacher Notes
<p><u>Grade 1</u> – compare and sort two-dimensional shapes according to attributes they choose</p> <p><u>Grade 2</u> – compare and sort two-dimensional shapes according to number of sides and vertices</p> <p><u>Grade 3</u> – compare and sort two-dimensional shapes according to two or more attributes</p>	<p>Students compare and sort two-dimensional shapes into two groups. (Worksheets G-1 and G-3)</p> <p>Students compare and sort 2-D shapes into three groups. (Worksheets G-2 and G-3)</p>	- scissors and glue	<p>Begin the exploration with manipulatives, e.g., power polygons, pattern blocks.</p> <p>Read through instructions orally.</p> <p>See Answer Key G-6.</p>
<p><u>Grade 4</u> – sort and classify two-dimensional figures according to shape</p> <p><u>Grade 5</u> – classify two-dimensional shapes according to angle and side properties (e.g., obtuse, scalene)</p> <p><u>Grade 6</u> – classify two-dimensional shapes according to angle and side properties (e.g., acute, isosceles)</p>	<p>Students sort and classify shapes according to shape, angle, and side properties. (Worksheets G-2 and G-3)</p>	- scissors and glue	<p>Read through instructions orally.</p> <p>See Answer Key G-6.</p>
<p><u>Grade 7</u> – identify, describe, compare, and classify geometric figures</p> <p><u>Grade 8</u> identify, describe, compare, and classify geometric figures</p>	<p>Students show the relationships between shapes. (Worksheets G-4 and G-5)</p>	- scissors and glue	<p>Read through instructions orally.</p> <p>See Answer Key G-6.</p>

# G-1 Sorting Record 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Cut out the shapes on G-3.

Sort and classify the shapes.

Write the title of each category on the line at the top of each column.

\_\_\_\_\_

\_\_\_\_\_

--	--

Explain your thinking using numbers, pictures, and/or words. Use the back of this page.

## G-2 Sorting Record 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Cut out the shapes on G-3.

Sort and classify the shapes.

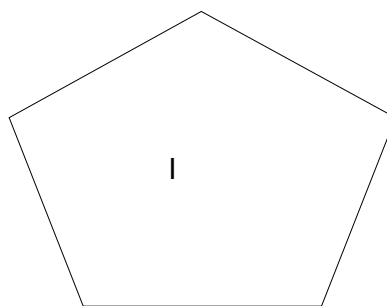
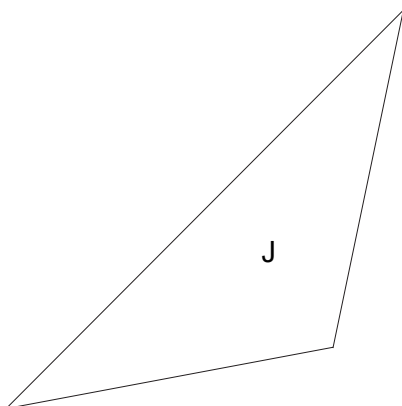
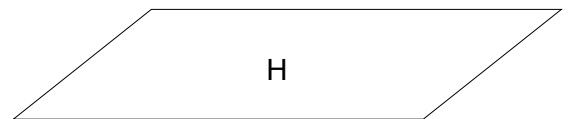
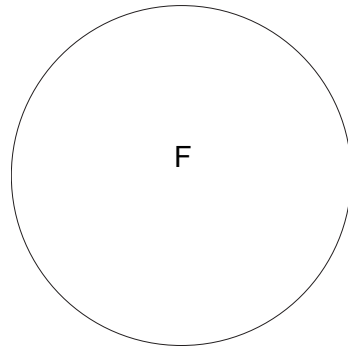
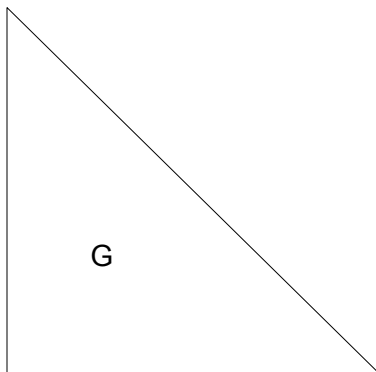
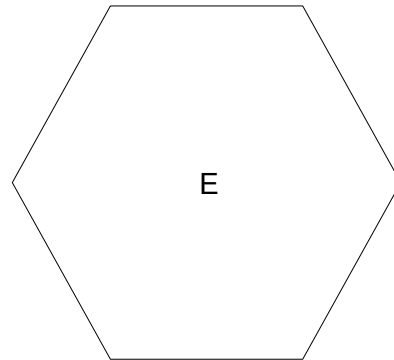
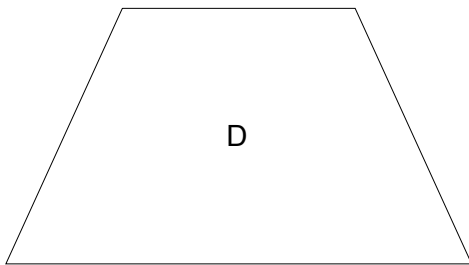
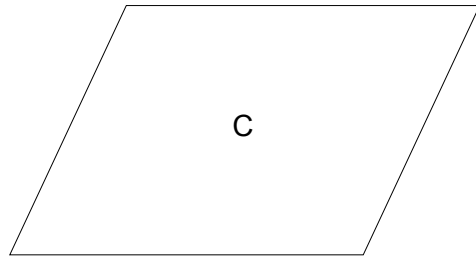
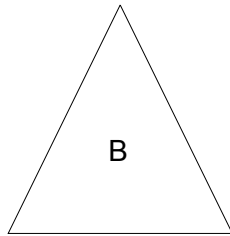
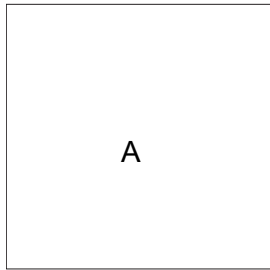
Write the title of each category on the line at the top of each column.

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_

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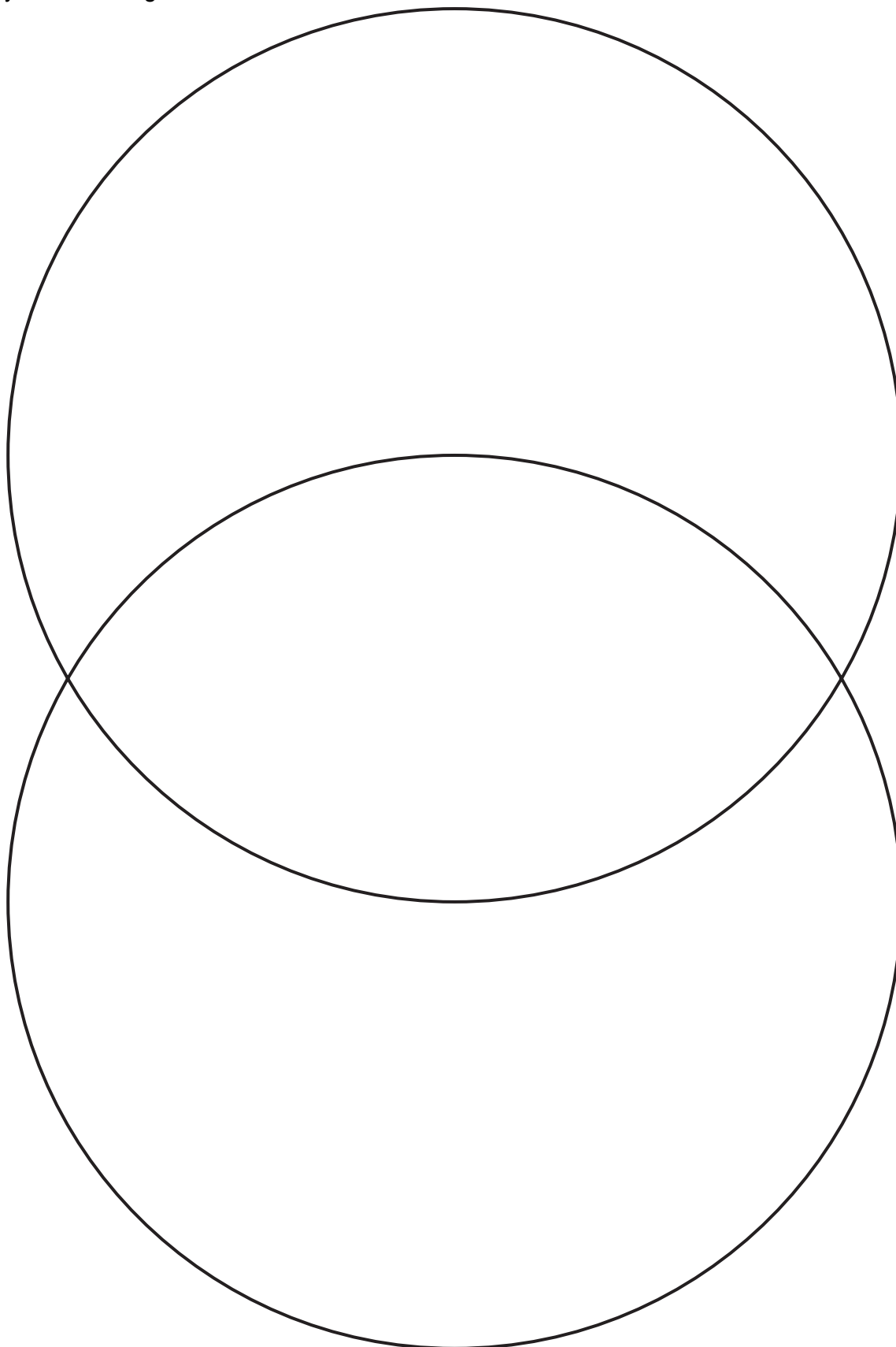
Explain your thinking using numbers, pictures, and/or words. Use the back of this page.

### G-3 Shapes for Sorting

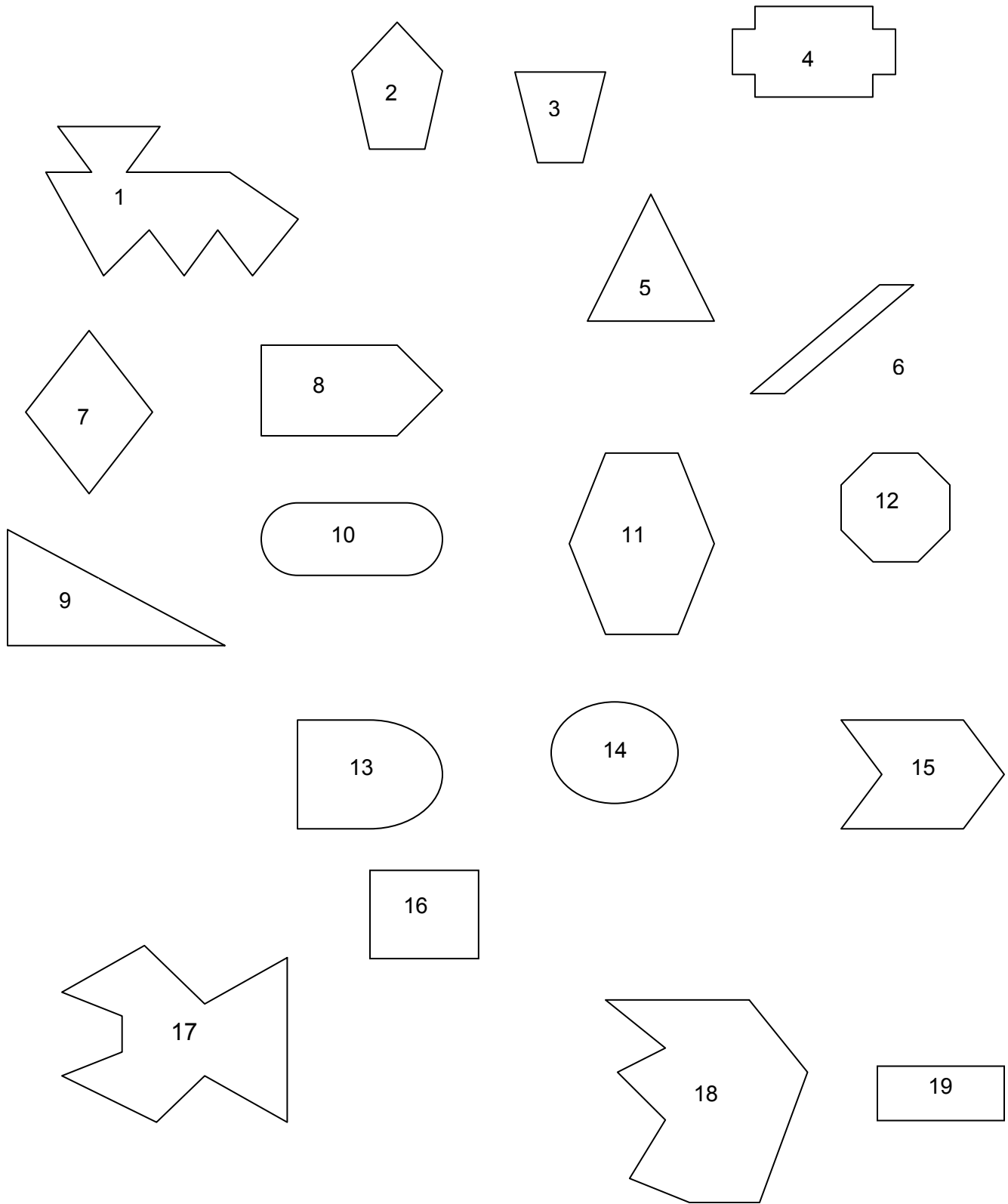


## G-4 Venn Diagram – Sorting Shapes

Cut out the shapes on G-5. Use the Venn diagram to show relationships among these shapes. Explain your reasoning.



# G-5 Shapes





**Worksheets G-1, G-2, and G-3**

Answers will vary.

Examples may include:

- number of sides;
- triangles and other shapes;
- number of vertices.

**Worksheets G-2 and G-3**

Answers will vary.

Examples may include:

- four-sided figures;
- triangles;
- all acute angles;
- all right angles;
- all obtuse angles;
- parallel sides;
- regular/irregular shapes.

**Worksheets G-4 and G-5**

Certain sorting criteria may include:

- sorting shapes according to the interior angles;
- shapes with angles less than 45 degrees;
- shapes with obtuse angles;
- shapes with parallel sides.

## Strand: Patterning and Algebra

### Key Concept – Patterns

Curriculum Expectations	Tasks	Materials	Teacher Notes
<p><u>Grade 1</u> – identify counting patterns in hundreds charts</p> <p><u>Grade 2</u> – explore multiples in a hundreds chart</p> <p><u>Grade 3</u> – use addition and subtraction to generate simple patterns in a hundreds chart</p>	<p>Students identify patterns in a hundreds chart. (Worksheet P-1)</p>	<p>- 100s chart (P-4)</p> <p>- three different coloured, transparent chips</p>	<p>See Answer Key P-7.</p>
<p><u>Grade 4</u> – recognize mathematical relationships in patterns</p> <p><u>Grade 5</u> – recognize the relationship between the position of a number and its value</p> <p><u>Grade 6</u> – recognize the relationships and use them to summarize and generalize patterns</p>	<p>Students identify patterns in a hundreds chart and explain the relationship. (Worksheet P-2)</p>	<p>- 100s grid (P-5)</p>	<p>Use the following cues for finding patterns:</p> <ul style="list-style-type: none"> <li>- position of even/odd numbers;</li> <li>- position of perfect squares;</li> <li>- differences between numbers in rows or columns;</li> <li>- multiples of 3, 4, 5, etc.</li> </ul> <p>See Answer Keys P-7 and P-8.</p>
<p><u>Grade 7</u> – extend a pattern, complete a table, and write words to explain pattern</p> <p><u>Grade 8</u> – find patterns and describe them using words and algebraic expressions</p>	<p>Students identify and extend patterns and record their explanation. (Worksheet P-3)</p>	<p>- 100s grid (P-6)</p>	<p>Use the following cues for finding patterns:</p> <ul style="list-style-type: none"> <li>- position of even/odd numbers</li> <li>- position of perfect squares</li> <li>- differences between numbers in rows or columns</li> <li>- multiples of 3, 4, 5, etc.</li> </ul> <p>See Answer Keys P-7, P-8, and P-9.</p>





## P-3 Explaining Patterns

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- Find patterns in grids P-5 and P-6.
- Extend the patterns and explain, using the pattern rule(s).

## P-4 Patterns on a Hundreds 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

## P-5 Extending Patterns

1	3	6	10						
2	5	9							
4	8								
7	12								
11									

## P-6 Explaining Patterns

			10	9	8	7			
			11	2	1	6			
			12	3	4	5			
			13	14					



## P-7 Patterning and Algebra

## Answer Key

### Worksheet P-1

2, 4, 6, 8, 10.....

Count by 2s

5, 10, 15, 20...

Count by 5s

10, 20, 30...

Count by 10s

Grade 3: 1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78, 91, 105 (From 21 backwards minus 6, minus 5, minus 4, .... And from 45 onwards plus 10, plus 11, plus 12, plus 13, ....)

### Worksheet P-2

See Answer Key P-8

- Row 1: The pattern is add 2 to the first term, add 3 to the second term, add 4 to the third term, ....  
The extension would be 66, 78, 91, 105, 120
- Row 2: the pattern is add 3 to the first term, add 4 to the second term, add 5 to the third term, ....  
The pattern is growing by one in each row but the starting point is different.
- Answers will vary.

### Worksheet P-3

See Answer Key P-8.

Diagonally down 1, 5, 13 column: add 4, 8, 12, 16, 19, 16, 12, 8, 4

Horizontal 1, 3, 6 row:  $1 + 2 = 3 + 3 = 6 + 4 = 10 \dots$

Vertical down 55, 64, 72: add 9, 8, 7, 6, 5, 4, 3, 2, 1

Any diagonal up left to right add 1: e.g., 46, 47, 48, 49

Any diagonal down right to left subtract 1: e.g., 21, 20, 19, 18

See Answer Key P-9.

Diagonally down 81, 49, 25, 9 and 1 – divided respectively by 9, 7, 5, 3 and 1 which is decreasing by 2

Diagonals – even and odd rows

Diagonals - differences in numbers occur by 4's and/or 8's

Numbers in columns are even, odd, even, odd (column 1); odd, even, odd, even (column 2), and so on.

## P-8 Patterns on a Hundreds Chart - Answer Key

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

## P-9 Extending Patterns - Answer Key

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

## Strand: Data Management and Probability

### Key Concept – Probability

Curriculum Expectations	Tasks	Materials	Teacher Notes
<p><u>Grade 1</u> – use events from meaningful experiences to discuss probability</p> <p><u>Grade 2</u> – investigate simple probability situations (flipping a coin, tossing dice)</p> <p><u>Grade 3</u> – conduct simple probability experiments (e.g., rolling a number cube, spinning a spinner) and predicting the results</p>	<p>Students design a game using a 4-quadrant spinner and record their results on a graph. (Worksheets D-1, D-2, and D-3)</p>	<ul style="list-style-type: none"> <li>- scissors</li> <li>- paper fastener</li> </ul>	<p>Explain the task on Worksheet D-1.</p> <p>See Answer Key D-8.</p>
<p><u>Grade 4</u> – compare experimental results with predicted results</p> <p><u>Grade 5</u> – predict probability in simple experiments and use fractions to describe probability</p> <p><u>Grade 6</u> – examine experimental probability results in the light of theoretical results</p>	<p>Students design a game using an 8-quadrant spinner and record their results on a graph. (Worksheets D-4 and D-5)</p>	<ul style="list-style-type: none"> <li>- scissors</li> <li>- paper fastener</li> <li>- graph paper</li> </ul>	<p>Explain the task on Worksheet D-4.</p> <p>See Answer Key D-8.</p>
<p><u>Grade 7</u> – identify the favourable outcomes among the total number of possible outcomes and state the associated probability</p> <p><u>Grade 8</u> – identify the favourable outcomes among the total number of possible outcomes and state the associated probability</p>	<p>Students design a game using a spinner and record their results on a graph. (Worksheets D-6 and D-7)</p>	<ul style="list-style-type: none"> <li>- scissors</li> <li>- paper fastener</li> <li>- graph paper</li> <li>- graphing program</li> </ul>	<p>Explain the task on Worksheet D-6.</p> <p>See Answer key D-8.</p>

## D-1 Spinner Game 1

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- Cut out and assemble the spinner.
- Choose a category for your spinner game, e.g., toys, animals, flowers, sports, etc.
- Choose 3 different items and use pictures and/or words to fill in your spinner, e.g., toys: ball, doll, truck, ball.

Make predictions:

I think \_\_\_\_\_ will be spun the **most** because \_\_\_\_\_

\_\_\_\_\_

I think \_\_\_\_\_ will be spun the **least** because \_\_\_\_\_

\_\_\_\_\_

Spin your spinner 20 times. Use the chart to keep a tally of your results.  
Put the names of the items at the top of the columns.



On a graph show the results of your spins. (D-3)  
Add a title to your graph.  
Label the parts of the graph.

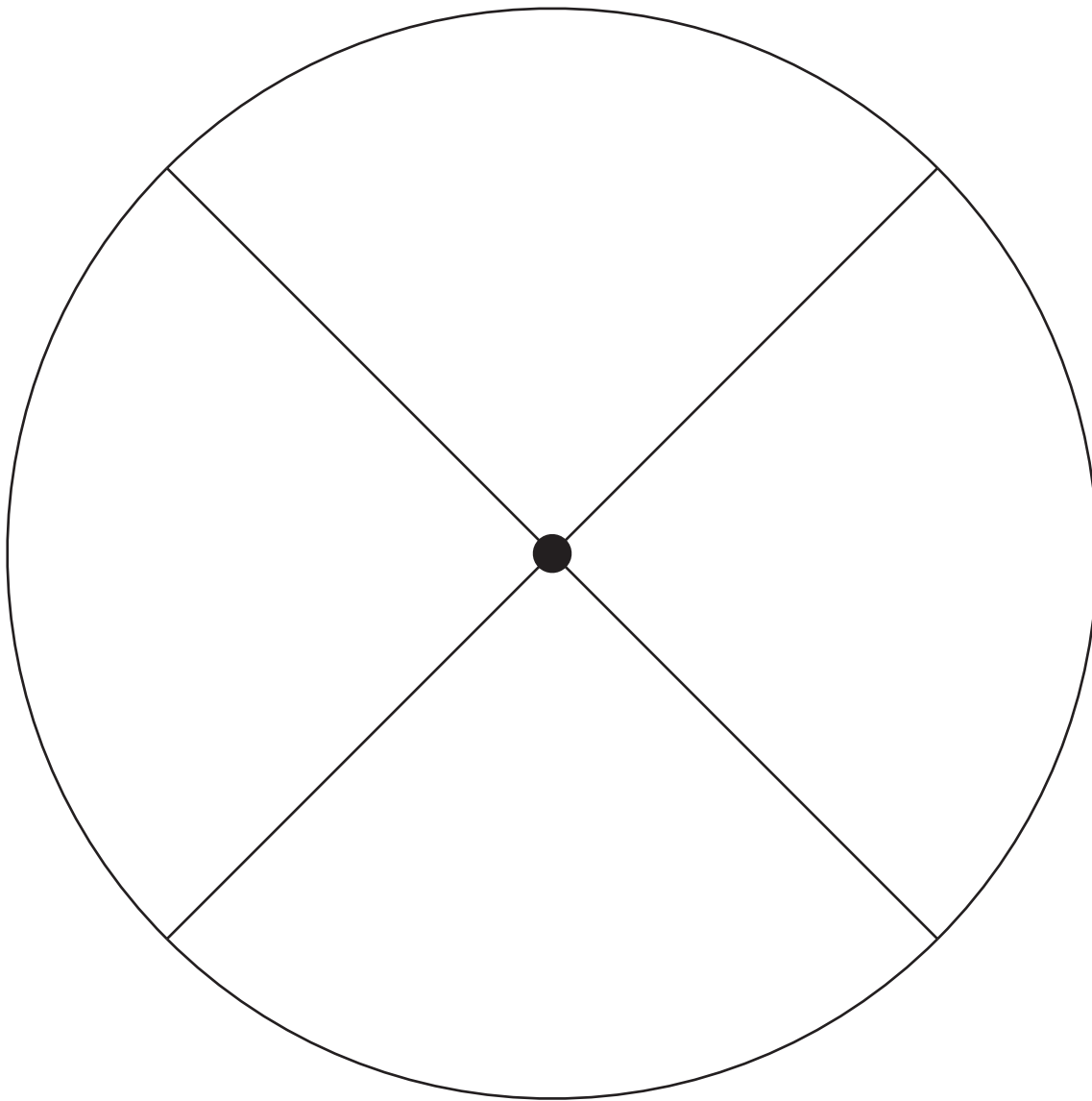
## D-2 Spinner Pattern 1

Cut out the spinner.

Lay a paper clip over the dot.

Put the point of a pencil inside the paper clip on the dot.

Spin the paper clip and see where it stops.



# D-3 Graph

My spinner game is about \_\_\_\_\_.

20			
19			
18			
17			
16			
15			
14			
13			
12			
11			
10			
9			
8			
7			
6			
5			
4			
3			
2			
1			

\_\_\_\_\_

## D-4 Spinner Game 2

Name: \_\_\_\_\_

Date: \_\_\_\_\_

- Make a spinner, using the pattern. (D-5)
- Choose a category for your spinner game, e.g., toys, animals, flowers, sports.
- Choose 3 different items to fill your spinner.
- Fill in the 8-part spinner, showing different choices within your category, e.g., animals: dog, dog, dog, cat, fish, fish, fish, fish

Predict the outcome:

I think \_\_\_\_\_ will be spun the **most**. Explain your predictions.

---

---

I think \_\_\_\_\_ will be spun the **least**. Explain your predictions.

---

---

Spin your spinner 20 times. Use the chart to keep a tally of your results.  
Label the columns with the items.


Was your spinner fair? Yes \_\_\_ No \_\_\_

If no, explain how you could change your spinner to make it fair.

Make a graph to show the results of your spins. You may use the computer or graph paper.

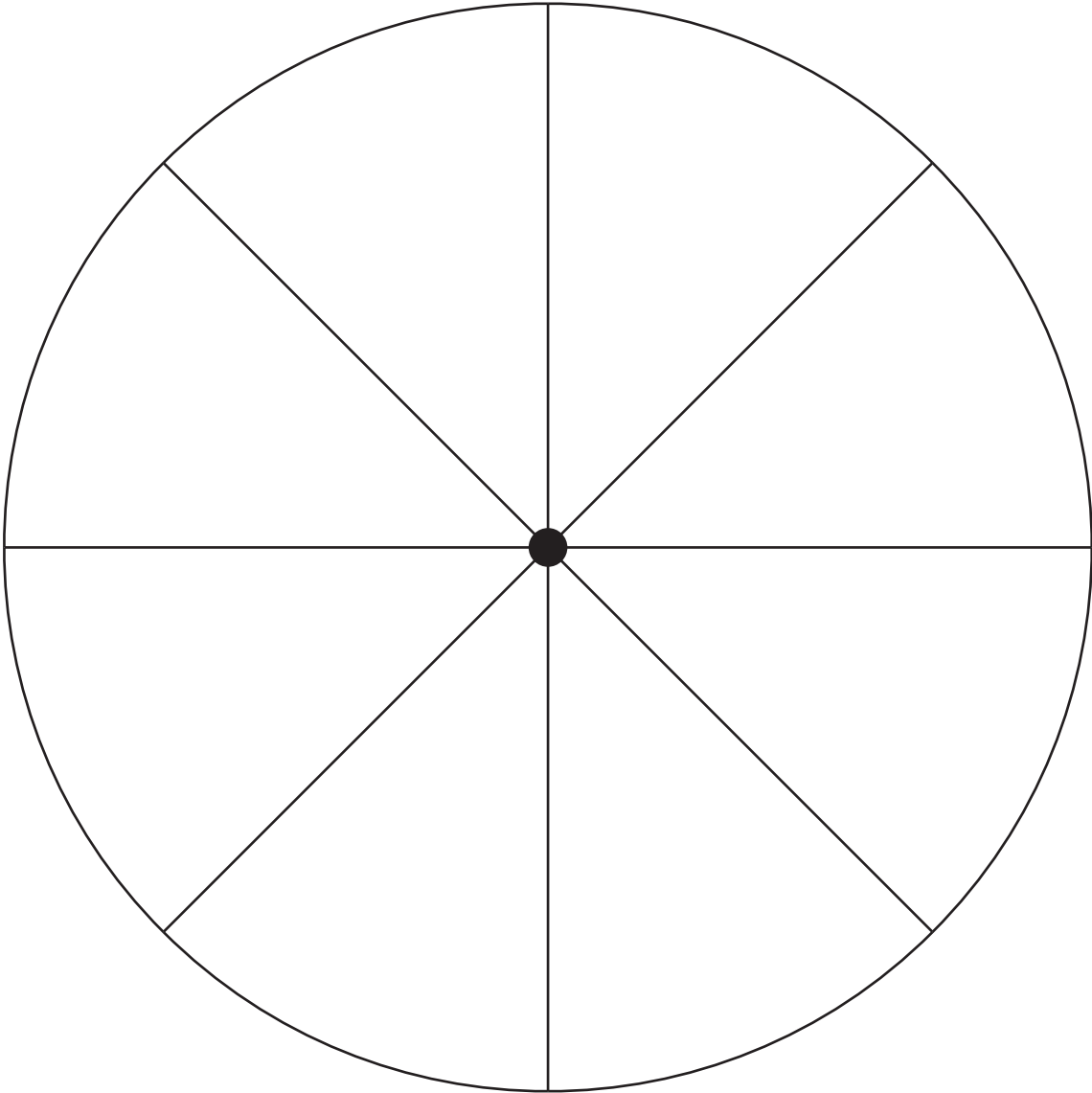
Give your graph a title.

Label your graph.

Make up 3 questions that you could ask someone about your graph. Write them on the back of your graph.



**D- 5 Spinner 2**



### D-6 Spinner Game 3

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Make a spinner, using the pattern (D-7).

Select a category for your spinner game, e.g., toys, animals, flowers, sports, etc.

Choose 3 different items to fill your spinner.

Design your spinner showing different choices within your category, e.g., sports: hockey, lacrosse, soccer, hockey, soccer, hockey, hockey)

Predict AND explain what you think the outcome will be:

Spin your spinner 20 times. Use the chart to keep a tally of your results.

Label the columns.

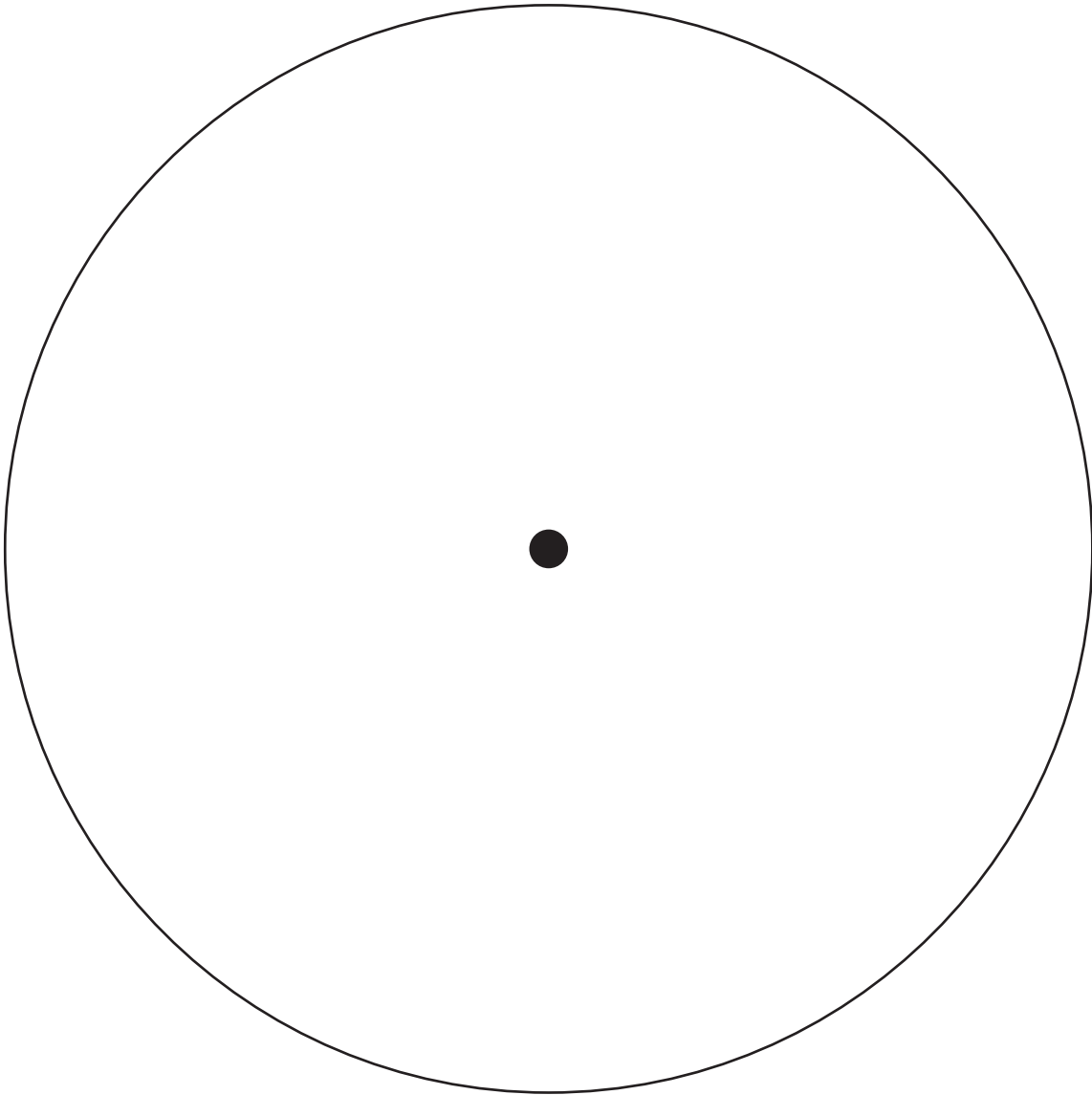


Were all of the outcomes equally likely? Yes \_\_\_\_ No \_\_\_\_

If no, explain how you could change your spinner so that all of the outcomes are equally likely.

Graph your results using a graph of your choice.

**D-7 Spinner 3**



**Worksheets D-1, D-2, D-3**

Key items to look for:

- Spinner should have only three different items (1 item is repeated).
- Total spins/tallies should equal 20.
- Tally chart should be labelled.
- Graph is labelled.
- Tally and graph should match (same numbers in correct columns).
- Responses to questions indicate accurate interpretation of data.

**Worksheets D-4 and D-5**

Key items to look for:

- Spinner should have only three different items (1 item is used repeatedly).
- Spinner sections should radiate from centre point.
- Total spins/tallies should equal 20.
- Tally chart is labelled.
- Graph is labelled.
- Tally and graph should match (same numbers in correct columns).
- Questions asked are related to the data on the graph.

**Worksheets D-6 and D-7**

Key items to look for:

- Spinner should have only three different items (1 or more items are repeated).
- Spinner sections should radiate from centre point.
- Total spins/tallies equal 20.
- Tally chart is labelled.
- Graph is labelled.
- Tally and graph should match (same numbers in correct columns).
- Explanation is reasonable.