

ADDISON WESLEY

# Math Makes Sense

1



## Teacher Guide

Unit 1: Sorting and Patterning

**Unit 2: Number Relationships**

Unit 3: Time, Temperature, and Money

Unit 4: Addition and Subtraction to 12

Unit 5: Data Management and Probability

Unit 6: 3-D and 2-D Geometry

Unit 7: Number Patterns

Unit 8: Linear Measurement and Area

Unit 9: Relating 2-D Figures and 3-D Objects

Unit 10: Place Value and Number Applications

Unit 11: Mass and Capacity



Sample  
Unit

## Program Advisers

Pearson Education thanks its Program Advisers, who helped shape the vision for *Addison Wesley Mathematics Makes Sense* through discussions and reviews of prototype materials and manuscript.



Anthony Azzopardi  
Sandra Ball  
Bob Belcher  
Judy Blake  
Steve Cairns  
Daryl Chichak  
Lynda Colgan  
Marg Craig  
Ruth Dawson  
Jennifer Gardner

Florence Glanfield  
Linden Gray  
Pamela Hagen  
Dennis Hamaguchi  
Angie Harding  
Peggy Hill  
Auriana Kowalchuk  
Gordon Li  
Werner Liedtke  
Jodi Mackie

Kristi Manuel  
Lois Marchand  
Cathy Molinski  
Bill Nimigon  
Eileen Phillips  
Evelyn Sawicki  
Shannon Sharp  
Martha Stewart  
Lynn Strangway  
Mignonne Wood

### **Publishing Team**

Claire Burnett  
Stephanie Cox  
Ellen Davidson  
Kathleen ffolliott  
Susan Ginsberg  
Lynne Gulliver  
Enid Haley  
Lesley Haynes  
Elynor Kagan  
Jessica Pegis  
Lynn Pereira  
Rosalyn Steiner  
Denise Wake  
Judy Wilson

### **Publisher**

Susan Green

### **Product Manager**

Anne-Marie Scullion

### **Photo Research**

Karen Hunter

### **Design**

Word & Image  
Design Studio Inc.

## Program Reviewers

### Field Testers

Pearson Education would like to thank the teachers and students who field-tested *Addison Wesley Math Makes Sense 1* prior to publication. Their feedback and constructive recommendations have been most valuable in helping us to develop a quality mathematics program.

### Aboriginal Content Reviewers

Early Childhood and School Services Division,  
Department of Education, Culture, and Employment  
Government of Northwest Territories

**Steven Daniel**, Coordinator, Mathematics, Science, and Secondary Education

**Liz Fowler**, Coordinator, Culture-Based Education

**Margaret Erasmus**, Coordinator, Aboriginal Languages



### Grade 1 Reviewers

**Shari Anderson**

School District 53 (Okanagan), BC

**Jan Bahry**

Edmonton Catholic District School Board, AB

**Sandra Ball**

School District 36 (Surrey), BC

**Keri Biss**

Kawartha Pine Ridge District School Board, ON

**Samantha Boardman**

Toronto District School Board, ON

**Wendy Braithwaite**

School District 63 (Saanich), BC

**Marion Bullen**

Ottawa-Carleton Catholic School Board, ON

**Evelyn Burton**

Kawartha Pine Ridge District School Board, ON

**Penny Champ**

York Region District School Board, ON

**Maggie Martin Connell**

Think-Links Press  
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**Pat Dickinson**

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Durham Catholic District School Board, ON

**Toni Grossi**

Calgary R.C.S.S.D 1, AB

**Lynn Koroluk**

Yorkton R.C.S.S.D. 86, SK

**Thom Koroluk**

Yorkton Public and Yorkdale School Divisions, SK

**Carrie Lorenz**

Saskatoon Catholic District School Board, SK

**Kristi Manuel**

Peel District School Board, ON

**Krista McCracken**

York Catholic District School Board, ON

**Donna Miluch**

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**Jessica Naves**

Toronto District School Board, ON

**Gillian Parsons**

Brant Haldimand-Norfolk Catholic District School Board, ON

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Durham Catholic District School Board, ON

**Leta Potter**

formerly of Toronto District School Board, ON

**Kris Richards**

Greater Essex County District School Board, ON

**Reet Sehr**

Peel District School Board, ON

**Janice Spry**

Burnaby School District, BC

**David Trafford**

Simcoe County District School Board, ON

**Cathy Vachon**

Ottawa-Carleton Catholic School Board, ON



UNIT

2

# Number Relationships

“Number is a complex and multifaceted concept. A rich understanding of number, a relational understanding, involves many different ideas, relationships, and skills. Experience suggests that these relationships do not develop automatically, and it is our job to provide children with a wide assortment of activities that will help them construct these many ideas of number.”

—John A. Van de Walle,  
Elementary and Middle School  
Mathematics, page 87

## FOCUS STRAND

Number Sense and  
Numeration

## SUPPORTING STRAND

Data Management and  
Probability

## Mathematics Background

### What Are the Big Ideas?

This first unit on number focuses on number relationships. Children develop meaning for whole numbers by building, comparing, and ordering sets.

- Building sets allows children to explore the meaning of a number and to see that a quantity can be arranged in many different ways. Through explorations, children come to an understanding that moving objects in a set has no effect on the number of the objects. This understanding is known as conservation of number. As children build these sets, they practise counting, both forwards and backwards, and begin to learn to count on to quicken the process. Counting on requires a child to hold on to a quantity and to count on, beginning with the next number in the sequence. It is an important developmental milestone.
- Comparing and ordering sets is key to understanding the relationships between whole numbers and to developing the concept of “more than” and “less than.” Thinking about number relationships also involves breaking down a quantity into its parts and examining how those parts combine to make the number. For example, the number 6 can be broken down into 3 and 3, 2 and 4, 1 and 5, 6 and 0; 3 and 2 and 1; and 2 and 2 and 2. This forms the basis for early concepts of addition and subtraction.
- Children need numerous opportunities to estimate and solve simple problems involving number. When children estimate, they are simply using prior knowledge to make a reasonable guess. Teaching children how to use a referent or anchor, such as 5 or 10, helps them to develop number relationships through comparison. For example, “If this much is 5, then I think the whole thing must be 12.”

### Across the Strands

The early explorations of whole numbers and their relationships form the foundation for all other conceptual understandings in mathematics, impacting a child’s developing number sense—an intuitive feel for quantity, a capacity to estimate, and the ability to understand and apply operations.

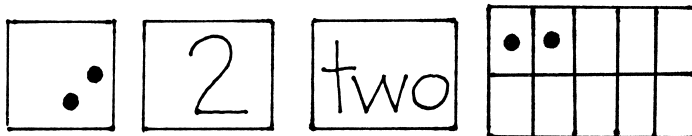
## Curriculum across the Grades

Kindergarten	Grade 1	Grade 2
<p>Children demonstrate understanding of groups and whole numbers.</p> <p>Children count orally to 30, and record numerals from 1 to 10.</p>	<p>Unit 2: Children explore number relationships to 20.</p> <p>Unit 4: Children explore addition and subtraction facts to 12.</p> <p>Unit 7: Children identify number patterns to 50.</p> <p>Unit 10: Children explore place value and number applications to 100 and demonstrate addition and subtraction facts to 20.</p>	<p>Children develop an understanding of place value by representing, comparing, and ordering whole numbers and recall addition and subtraction facts to 18.</p>

### Preparing Materials

Make two-sided beans by spray painting one side of each bean, or use a commercial set of two-colour counters.

Numerals cards, number word cards, and dot cards found on *LMs 3 to 10* can be copied onto heavy paper, laminated, and then cut. The cards can be placed in plastic bags with top seals for the children to use. Using dot cards provides opportunities for pattern recognition activities. One complete set of dot cards will serve small groups of 4 to 6 children.



The five- and ten-frames are best duplicated onto heavy paper and laminated for durability. These frames help children relate numbers to the anchors of 5 and 10. Every child will need a copy of each frame. References to dot cards and five- and ten-frame cards are made in the Mathematics Centres, lessons, and Activity Banks.

Children can use any of these materials as a way of representing the same number in different ways.

# Curriculum Overview

## Cluster 1: Counting, Reading, and Recording Numbers

### Overall Expectations

- Understand whole numbers by exploring number relationships using concrete materials
- Understand numerals, ... and the corresponding words, and demonstrate the ability to print them
- Compare and order whole numbers using concrete materials and drawings to develop number meanings
- Solve simple problems involving counting ...
- Use a calculator to explore counting ...

### Specific Expectations

- Read and print numerals from 0 to 100 (up to 10 here)
- Read and print number words to ten
- Demonstrate the conservation of number
- Demonstrate the one-to-one correspondence between number and objects when counting
- Count by 1's ... using a variety of ways
- Count backwards from 10
- Use a calculator to explore counting, to solve problems, ...

Launch

**Lesson 1:**  
Count to Ten

**Lesson 2:**  
Using a Calculator

**Lesson 3:**  
Number Search

## Cluster 2: Number Meanings and Relationships to 10

### Overall Expectations

- Understand whole numbers by exploring number relationships using concrete materials
- Understand numerals, ... and the corresponding words, and demonstrate the ability to print them
- Compare and order whole numbers using concrete materials and drawings to develop number meanings
- Solve simple problems involving counting ...

### Specific Expectations

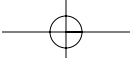
- Read and print numerals from 0 to 100 (up to 10 here)
- Read and print number words to ten
- Demonstrate the conservation of number
- Demonstrate the one-to-one correspondence between number and objects when counting
- Count by 1's ... using a variety of ways
- Compare, ... and represent whole numbers to 50 (up to 20) using concrete materials and drawings
- Investigate number meanings

**Lesson 4:**  
Number Arrangements

**Lesson 5:**  
One and Two More,  
One and Two Less

**Lesson 6:**  
Fantastic Five

**Lesson 7:**  
Terrific Ten



**Activity Bank**

- Number Match
- Listen to the Pennies!
- Make It Match
- Counting to Zero

**Activity Bank**

- What Is the Number?
- How Many Are Missing?
- What's My Number?
- Number Hunt!



**Activity Bank**

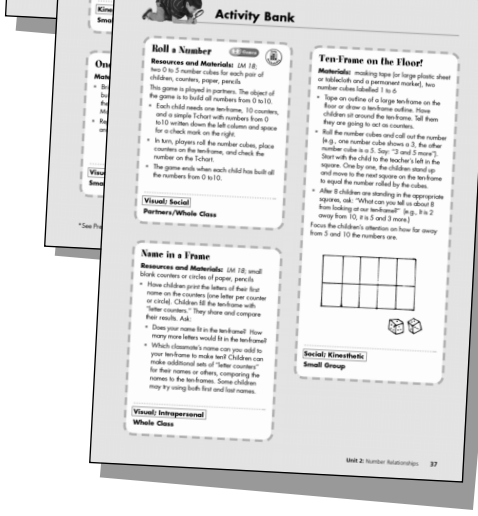
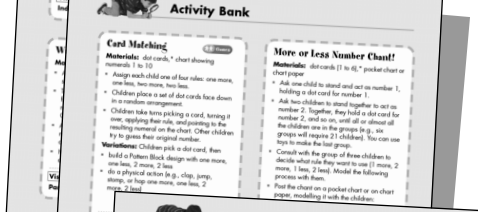
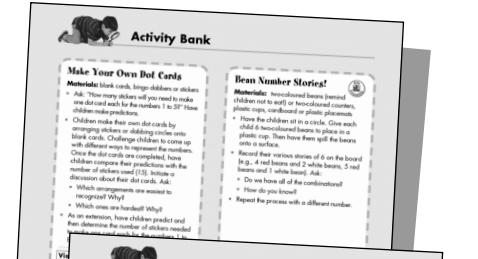
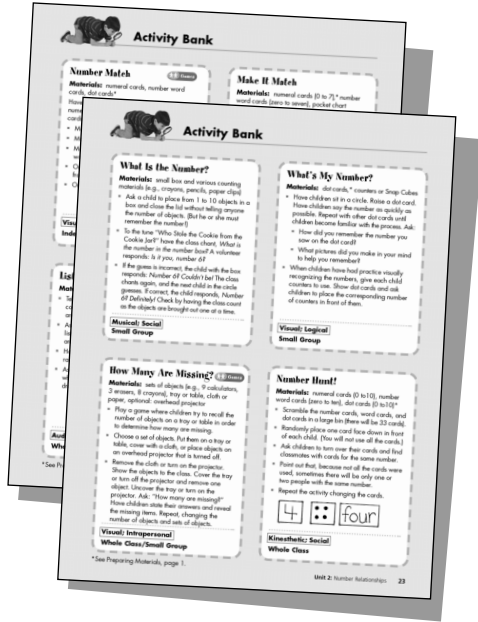
- Make Your Own Dot Cards
- Ways to Show Number 8!
- Bean Number Stories!
- Building 9!

**Activity Bank**

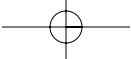
- Card Matching
- One More and One Less!
- More or Less Number Chant!

**Activity Bank**

- Roll a Number
- Name in a Frame
- Ten-Frame on the Floor!



(continued)



# Curriculum Overview

## Cluster 3: Number Meanings and Relationships to 20

### Overall Expectations

- Understand whole numbers by exploring number relationships using concrete materials
- Understand numerals, ... and the corresponding words, and demonstrate the ability to print them
- Compare and order whole numbers using concrete materials and drawings to develop number meanings
- Estimate quantity in everyday life
- Solve simple problems involving counting, ...

### Specific Expectations

- Read and print numerals from 0 to 100 (up to 20 here)
- Read and print number words to ten
- Demonstrate the one-to-one correspondence between number and objects when counting
- Count by 1's ... using a variety of ways
- Compare, order, and represent whole numbers to 50 (up to 20 here) using concrete materials and drawings
- Investigate number meanings
- Estimate the number of objects and check the reasonableness of an estimate by counting

### Lesson 8:

Represent Numbers  
10 to 20

### Lesson 9:

Estimate Numbers

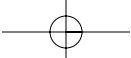
### Lesson 10:

Strategies Tool Kit

### Lesson 11:

Show What You Know





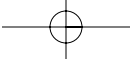
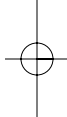
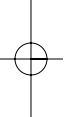
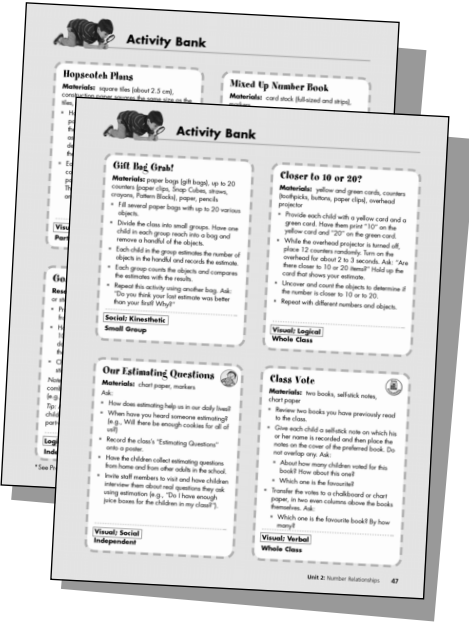
**Activity Bank**

- Hopscotch Plans
- Mixed Up Number Book
- Go, Go Domino!
- We Can Make "10 and ..."

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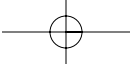
**Activity Bank**

- Gift Bag Grab!
- Closer to 10 or 20?
- Our Estimating Questions
- Class Vote



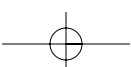
# Planning for Instruction Suggested Unit Time: 4 weeks

Lesson	Time	Lesson Materials	Activity Bank
<b>Launch</b> <i>Demonstrate prior knowledge of numbers</i>	20–30 min	collection of small classroom objects (counters, keys, shells, buttons)	
<b>Curriculum Cluster 1: Counting, Reading, and Recording Numbers</b>			<b>Suggested Time: 4 to 6 days</b>
<b>Lesson 1:</b> Count to Ten <i>Count forwards and backwards from zero to ten</i>	60–90 min	0 to 10 numeral and number word cards, bags, counters, Snap Cubes, Lego, marbles, blocks	<ul style="list-style-type: none"> <li>▪ Number Match</li> <li>▪ Listen to the Pennies!</li> <li>▪ Make It Match</li> <li>▪ Counting to Zero</li> </ul>
<b>Lesson 2:</b> Using a Calculator <i>Display numerals on a calculator</i>	45–60 min	calculators, numeral cards (1 to 10), number word cards (one to ten)	
<b>Lesson 3:</b> Number Search <i>Identify and order groups of numbers from 1 to 10</i>	60–90 min	numeral cards, number word cards, stamps, stamp pad, stickers, paper	<ul style="list-style-type: none"> <li>▪ What Is the Number?</li> <li>▪ How Many Are Missing?</li> <li>▪ What's My Number?</li> <li>▪ Number Hunt!</li> </ul>
<b>Curriculum Cluster 2: Number Meanings and Relationships to 10</b>			<b>Suggested Time: 5 to 7 days</b>
<b>Lesson 4:</b> Number Arrangements <i>Recognize numbers in different arrangements</i>	60–90 min	counters (beads, toothpicks, buttons, stickers)	<ul style="list-style-type: none"> <li>▪ Make Your Own Dot Cards</li> <li>▪ Ways to Show Number 8!</li> <li>▪ Bean Number Stories!</li> <li>▪ Building 9!</li> </ul>
<b>Lesson 5:</b> One and Two More, One and Two Less <i>Identify numbers that are one/two more and one/two less</i>	60–90 min	counters or concrete objects, optional: overhead projector	<ul style="list-style-type: none"> <li>▪ Card Matching</li> <li>▪ One More and One Less!</li> <li>▪ More or Less Number Chant!</li> </ul>
<b>Lesson 6:</b> Fantastic Five <i>Investigate number meanings using a five-frame</i>	45–60 min	counters, optional: overhead projector	



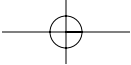
Time	Activity Bank Materials	Program Resources
		<i>Big Math Book, page 6: Count to Ten</i> <i>Student page 17: Number Relationships</i> <i>Student page 18: Dear Family</i> <i>Student page 19: Count the Fish</i>
20–100 min	numeral cards, number word cards, dot cards 10 pennies, glass jar numeral cards (0 to 7), number word cards (zero to seven), pocket chart number cube labelled 1 to 6, small objects (e.g., keys, counters, buttons, shells), small boxes (tins or other containers)	<i>Big Math Book, page 7: Count Forwards, Count Backwards</i> <i>Student page 20: At the Pond</i> <i>Student page 21: Count the Birds</i> <i>LM 12: Numbers to 5</i> <i>LM 13: Numbers 6 to 10</i>
		<i>Big Math Book, page 8: The Calculator</i> <i>Student page 22: My Calculator</i>
20–100 min	small box and various counting materials (e.g., crayons, pencils, paper clips) sets of objects (e.g., 9 calculators, 3 erasers, 8 crayons), tray or table, cloth or paper, optional: overhead projector dot cards, counters or Snap Cubes numeral cards (0 to 10), number word cards (zero to ten), dot cards (0 to 10)	<i>Big Math Book, page 9: What Is in the Fridge?</i> <i>Student page 23: Number Search</i> <i>Student page 24: Number Pictures</i> <i>LM 14: Numbers 0 to 2</i> <i>LM 15: Numbers 3 to 6</i> <i>LM 16: Numbers 7 to 10</i>
20–100 min	blank cards, bingo dabbers or stickers Snap Cubes two-coloured beans or two-coloured counters, plastic cups, cardboard or plastic placemats glue, toothpicks, heavy paper (manila, light cardboard), markers	<i>Big Math Book, page 10: Number Arrangements</i> <i>Student page 25: I Can Build Numbers</i> <i>Student page 26: Pictures of 6</i> <i>Student page 27: Ways to Show 7</i>
20–100 min	dot cards, chart showing numerals 1 to 10 dot cards, counters dot cards (1 to 6), pocket chart or chart paper	<i>Student page 28: More or Less</i> <i>Student page 29: Number Challenge</i>
		<i>Student page 30: Fantastic Five!</i> <i>LM 17: Five-Frame</i>

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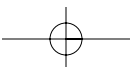


# Planning for Instruction

Lesson	Time	Lesson Materials	Activity Bank
<b>Lesson 7:</b> Terrific Ten <i>Investigate number meanings using a ten-frame</i>	60–90 min	counters	<ul style="list-style-type: none"> <li>▪ Roll a Number</li> <li>▪ Name in a Frame</li> <li>▪ Ten-Frame on the Floor!</li> </ul>
<b>Curriculum Cluster 3: Number Meaning and Relationships to 20 Suggested Time: 4 to 6 days</b>			
<b>Lesson 8:</b> Represent Numbers 10 to 20 <i>Represent numbers from 10 to 20 in different arrangements</i>	60–90 min	counters, two-part mat, optional: overhead projector	<ul style="list-style-type: none"> <li>▪ Hopscotch Plans</li> <li>▪ Go, Go Domino!</li> <li>▪ Mixed Up Number Book</li> <li>▪ We Can Make “10 and ...”</li> </ul>
<b>Lesson 9:</b> Estimate Numbers <i>Estimate numbers to 20</i>	60–90 min	counters (toothpicks, Snap Cubes, beads, buttons, paper clips), bags, red and white counters, dot cards, beans, container, optional: overhead projector	<ul style="list-style-type: none"> <li>▪ Gift Bag Grab!</li> <li>▪ Our Estimating Questions</li> <li>▪ Closer to 10 or 20?</li> <li>▪ Class Vote</li> </ul>
<b>Lesson 10:</b> Strategies Tool Kit <i>Use “make a model” to solve a problem</i>	45–60 min	counters, blocks (red and yellow), red and yellow crayons	
<b>Unit Assessment Suggested Time: 1 to 2 days</b>			
<b>Lesson 11:</b> Show What You Know <i>Demonstrate what has been learned</i>	45–120 min	numeral cards, number word cards, dot cards, five-frames, ten-frames, counters, Snap Cubes, two-part mat, calculator	



Time	Activity Bank Materials	Program Resources
20–100 min	two 0 to 5 number cubes for each pair of children, ten-frames, counters, paper, pencils small blank counters, or circles of paper, pencils masking tape (or large plastic sheet or tablecloth and a permanent marker), two number cubes labelled 1 to 6	<i>Big Math Book, page 11: Ten-Frames</i> <i>Student page 31: Terrific Ten!</i> <i>Student page 32: Ten-Frame Numbers</i> <i>LM 18: Ten-Frame</i>
20–100 min	square tiles (about 2.5 cm), construction paper squares the same size as the tiles, paper, glue sticks, markers markers or stickers card stock (full-sized and strips), markers string or masking tape, dot cards	<i>Student page 33: I Can Make 16!</i> <i>Student page 34: Numbers to 20</i> <i>Student page 35: Show Numbers to 20</i> <i>LM 19: Domino Cards</i>
20–100 min	paper bags (gift bags), up to 20 counters (paper clips, Snap Cubes, straws, crayons, Pattern Blocks), paper, pencils chart paper, markers yellow and green cards, counters (toothpicks, buttons, paper clips), overhead projector two books, self-stick notes, chart paper	<i>Student page 36: About How Many?</i> <i>Student page 37: I Can Estimate!</i>
		<i>Big Math Book, page 12: How Many Apples?</i> <i>Student page 38: How Many Apples?</i> <i>Student page 39: What Is in the Backpack?</i>
		<i>Student page 40: Show What You Know about 12</i> <i>Student page 41: 12! 12! 12!</i> <i>Student page 42: My Journal</i>



# Planning for Assessment

Purpose	Assessment Process	Recording and Reporting
<b>Diagnostic</b> Launch <i>Diagnostic Assessment</i>	Watch and listen during Launch	<i>AM 1: Diagnostic Checklist</i>
	Conference and scaffold for selected children (mid-unit)	<i>AM 2: Diagnostic Conference for Selected Children</i>
<b>Formative</b> End of Lesson <i>Assessment for Learning</i> <ul style="list-style-type: none"> <li>▪ <i>What to Look For</i></li> <li>▪ <i>What to Do</i></li> </ul>	Watch and listen during lessons; scaffold as needed	<i>AM 3.1, AM 3.2, AM 3.3: Ongoing Observations Checklist</i>
	Question; conduct informal conferences and interviews; provide feedback; scaffold as needed (see <i>GAM 11: Conference Prompts</i> )	<i>GAM 2: Inquiry Process Rubric or GAM 3: Inquiry Process Checklist</i> <i>GAM 9 and GAM 10: Observation Records 1 and 2</i>
	Review Student pages and other practice work; provide feedback; scaffold as needed; select key pieces	<i>GAM 12: Work Sample Record or GAM 13: Collaborative Work Sample Record</i>
	Prompt self-assessment	<i>GAM 1: I Am a Problem Solver</i>
<b>Summative</b> Show What You Know <i>Evaluating Student Learning: Preparing to Report, p. 52</i>	Conduct performance assessment (Lesson 11)	<i>AM 4: Performance Task Rubric</i>
	Prompt children's self-assessment	<i>GAM 4: What I Learned or GAM 5: Looking Ahead</i>
	Review assessment records	<i>AM 5: Number Relationships Rubric</i> <i>AM 6: Unit Summary</i>
	Add Unit results to ongoing records	<i>GAM 14: Summary Class Record: Strands, GAM 15: Summary Class Record: Achievement Categories, or GAM 16: Summary Record: Individual</i>
<b>Learning Skills</b>	Observe and record throughout Unit	<i>GAM 6: Learning Skills Record or GAM 7: Learning Skills Checklist</i> <i>GAM 8: Working Together</i>

## Achievement Levels

- R** – not demonstrated
- 1** – limited; simple strategies; major errors; unclearly
- 2** – partial; somewhat appropriate strategies; several minor errors; some clarity
- 3** – appropriate; appropriate strategies; few minor errors; clearly
- 4** – thorough; rarely makes errors; innovative strategies; clearly and precisely



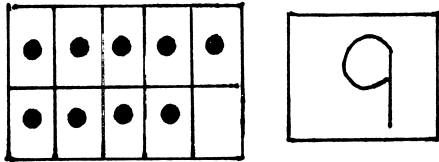
# Mathematics Centres

## Same Number, Different Ways

(appropriate for use after Lesson 3)

**Materials:** LMs 3 to 10, 17, and 18, heavy paper, plastic bags with top seals

- Have children use numeral cards, number word cards, dot cards, five- and ten-frames to represent numbers in different ways.



**Visual**

## Numbers Everywhere!

(appropriate for use after Lesson 1)

**Materials:** draw-and-stamp programs, paper, computers

- Children use a computer draw-and-stamp program to create a number page. Have them divide their page into 2 or 4 parts using the line tool. Then they select the letter stamp tool (below the eraser tool on the toolbar), and click on the down arrow (to the right of the alphabet strip) to find the number stamps.
- Children choose a number and click on it. The computer will display the number. They can then stamp their number on the page and illustrate it using stamps or other graphics. They will enjoy changing the background colour and letter colour for their "Numbers Everywhere!" page.

**Visual; Logical**

## Calculator Fun

(appropriate for use after Lesson 2)



**Materials:** calculators, paper and pencils, 10 to 12 small objects (e.g., toys, counters, shells)

Place several calculators and countable objects at the Centre.

- Have children work in pairs. One child counts and records a number of objects using pictures, numbers, or words. The other child presses the corresponding numeral on the calculator keypad, pressing the **ON/C** button between numbers.
- Children take turns recording a number of objects, reading the number, and displaying it on the calculator.

**Visual; Kinesthetic**

## Which Number Wins?



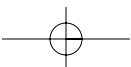
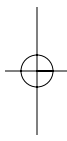
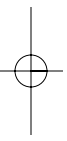
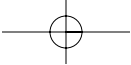
(appropriate for use after Lesson 4)



**Resources and Materials:** LM 11; number cubes labelled 0 to 5, crayons

- Have children work in pairs. Each child numbers the columns from 0 to 5 on the grid paper.
- Children take turns rolling a number cube. After each roll, they colour in one square in the column that matches the number on the cube.
- The activity continues until an entire column is coloured in.
- To vary the activity, use a number cube labelled 5 to 10 and have children record rolls on appropriately labelled grid paper.

**Visual; Social**







UNIT

2

# Launch

## FOCUS

Demonstrate prior knowledge of numbers

## MATERIALS

collection of small classroom objects (counters, keys, shells, buttons)

## PROGRAM RESOURCES

*Big Math Book, page 6:*  
*Count to Ten*

*Student page 17: Number Relationships*

*Student page 18: Dear Family*

*Student page 19: Count the Fish*



## DIAGNOSTIC ASSESSMENT

Simple counting games using a number cube and 10 counters can help with number recognition.

To guide your observations, use *Assessment Master 1: Diagnostic Checklist*.

Tell children they are going to be learning about numbers and invite them to share what they already know (e.g., count with numbers, there are many of them, see them in elevators, telephones, on clocks).

Display *Big Math Book, page 6*. Ask:

- What do you see on this page? (e.g., aquarium, numeral, number of objects)
- What do you notice about the picture? (groups of different items)

Have the children find examples of objects that represent numbers from 1 to 10. If not noted, draw the children's attention to the numeral 7 on the page. Ask: "What could we add to the page to represent seven?" (e.g., 7 shells, 7 marbles)

Present a collection of no more than 10 small classroom objects. Ask:

- How can you use these objects to make up questions about number?

As questions are asked such as, "How many objects are there? Have the children count the objects to find the answers. Enlist the children's help, for example, "Let's count: 1, 2, and 3."

Support children who are having difficulty by modelling one-to-one correspondence, touching each object as you count with the children.

Have children complete *Student page 19*. Bring them together to share their work.

Some children may enjoy creating their own "Count the Fish" pages where they draw a number of fish and invite other children to determine how many there are.

## TEACHING TIP

Model the skills of counting, conservation of number, and counting forwards. Introduce and use a variety of materials so that children see numbers represented in different ways, shapes, and sizes. Think aloud when demonstrating these skills so children can "hear" how mathematicians think.



## HOME CONNECTION

Send home *Student pages 17 and 18* to introduce the Unit learning goals to families.



LESSON

1

# Count to Ten

**CURRICULUM FOCUS**

Count forwards and backwards from zero to ten  
1m12(N), 1m15(N)

**MATH WORD WALL**

zero to ten

**MATERIALS**

0 to 10 numeral cards and number word cards, bags, counters, Snap Cubes, Lego, marbles, blocks

**PROGRAM RESOURCES**

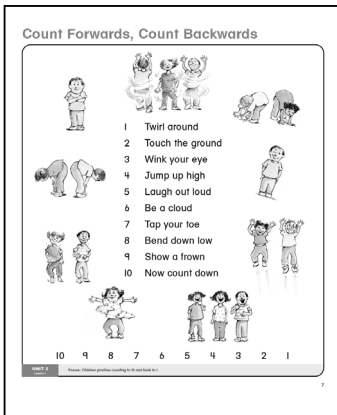
*Big Math Book, page 7:*  
*Count Forwards, Count Backwards*

*Student page 20: At the Pond*

*Student page 21: Count the Birds*

*LM 12: Numbers to 5*

*LM 13: Numbers 6 to 10*



**BEFORE Get Started**

Tell children they are going to practise counting by counting one another. Have 6 children stand. Ask:

- How can we find out how many children there are?

Have the class count aloud. “One, two, three...” Ask children to think of two ways each number can be recorded (6, six). Have the same children rearrange themselves and ask the class how many children there are now. Encourage the children to see that the number of children remains the same. Repeat for other numbers to 10.

Display *Big Math Book, page 7*. Have children act out the number chant as they count forwards and backwards from 10.



**DURING Explore**

Have children work in pairs. Provide each pair with a bag containing from 3 to 9 objects. Have numeral and number word cards available.

**Problem Prompt**

How many objects are in your bag?  
Can you find the cards that match?

Have the children find the numeral and number word card that matches the number of objects in their bags.

**Show and Share**

Have each pair state the number of objects in their bags and show the corresponding numeral and number word cards. Ask:

- How did you know which numeral and number cards would match?

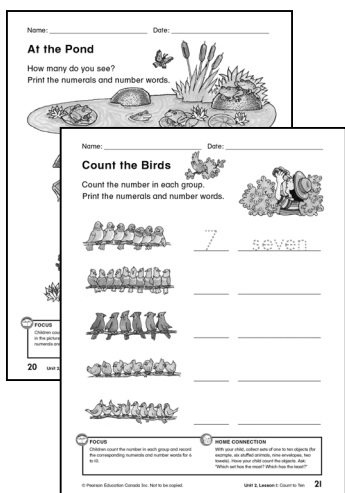
Encourage children to describe how they counted the objects. Have pairs of children who had the same number of objects compare their findings. Ask:

- How are the collections the same? (show the same number)
- How are the collections different? (e.g., different materials, colours)

Use one of the children’s collections to model counting backwards.

**TEACHING TIP**

At this early grade, children have varying counting experiences. For those who are still experiencing difficulty counting forwards to 10, you may wish to delay counting backwards.



## AFTER Connect and Reflect

Review with the children that, when they count, the last number word names the quantity. Ask:

- What ways can we record numbers? (e.g., numerals, words, drawings)
- What happens to the number of objects when you move or rearrange them? (number remains the same)

Begin a co-operative journal with a chart titled “About Numbers.” As children offer ideas, clarify their thinking by rephrasing (I think you are saying that...), questioning, and modelling.

## Practice

### Reinforcement

Read directions with the children and have them complete *Student pages 20 and 21* where they record number words and numerals to 10. For additional practice, see dot cards on *LMs 3 to 11*.

### Extra Support: Procedures

Have children practise forming numerals using different materials. Have them print a numeral in glue on a piece of paper. Sprinkle sand or salt over the numeral to make a numeral card. Other materials such as Plasticine or modelling clay can be used.

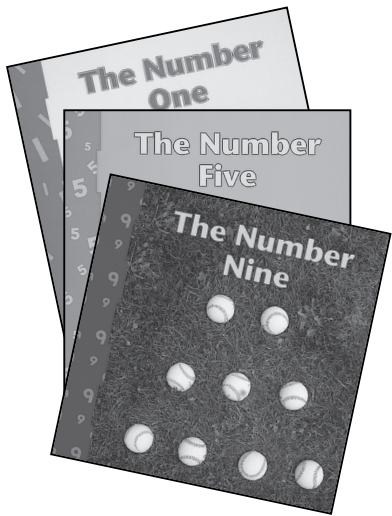
Children can practise and apply their number skills at the Mathematics Centres (see *Numbers Everywhere!*, page 11).

### Extension Games

Children can use dominoes to play a variety of games to extend their number sense and spatial understanding. For example, they can match the total on each domino to a numeral card. Or children can sort the dominoes, find all the 8’s, and put them in a pile with an accompanying number word card.

## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>▪ demonstrate 1:1 correspondence when counting</li> <li>▪ recognize that moving objects doesn’t change the number (conservation)</li> <li>▪ match numerals, number words, and sets</li> </ul> <div data-bbox="352 1985 896 2112" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.1: Ongoing Observations Checklist.</i></p> </div>	<p>Children who have difficulty with 1:1 matching and conservation are likely to need practice building number sets with concrete objects.</p> <ul style="list-style-type: none"> <li>▪ Give children a collection of small objects and ask them to “build 4.” If they are able to create a set of 4, re-arrange their set and ask, “How many do you have now?” If they do not immediately say, “Four,” repeat the activity. This time, as you re-arrange the objects, count them orally. Have children move them again, counting orally.</li> </ul>



### FROM THE LIBRARY

Stella Blackstone, *Grandma Went to Market: A Round-the-World Counting Rhyme* (Houghton Mifflin, 1996)

Jane Cabrera, *Over in the Meadow* (Holiday House, 2000)

Lois Ehlert, *Fish Eyes: A Book You Can Count On* (Red Wagon Books, Harcourt, 2001)

Saxon Freymann and Joost Elffers, *One Lonely Sea Horse* (Scholastic Press, 2000)

Tana Hoban, *Let's Count* (Greenwillow Books, 1999)

Jackie French Koller and Lynn Munsinger, *One Monkey Too Many* (Harcourt, 1999)

Bill Martin Jr., and John Archambault, *Knots on a Counting Rope* (Henry Holt and Company, 1987)



## LITERACY LINKS



**Resources:** collection of counting books, including Addison Wesley Mathematics Little Books 1–10, Emergent level (Addison Wesley, 2002)

Begin a collection of counting books that give children opportunities to count aloud and that represent numbers in different ways (e.g., numerals, dot patterns, words, pictures). Set up a special display of counting books. Encourage the children to bring books from home to add to the collection. Have children practise reading them independently. Talk about the variety of ways counting is made fun and interesting (e.g., rhymes, songs, questions, illustrations).

*Note:* Everyone around the world counts. Make sure that counting books from around the world are included in your collection.

## NUMBERS EVERY DAY

Do a “Before and After” cheer with children. Explain to them that you will name a number and they are to say the number that comes after. “I say 9. You say 10.” Repeat for other numbers. Make it more challenging by making it a “2 before” and “2 after” cheer. “I say 3. You say 5.”



## CROSS-CURRICULAR CONNECTIONS

### Science

**Materials:** pictures of adult animals

Have children learn about animal families. Provide each child with a picture of an adult animal. Each child researches, with help, the number of offspring that this animal is likely to have. Have children use their findings to illustrate a page of a counting book, showing the mother and number of babies.

### Art/Drama



**Materials:** egg cartons, scissors, markers, stickers

Provide children with egg cartons. Have them cut them up and decorate them in order to make a set of ten finger puppets. Using the finger puppets, teach the children how to re-enact the following fingerplays such as “Ten Little Monkeys,” “Ten in the Bed,” “This Old Man.”



## Activity Bank

### Number Match



**Materials:** numeral cards, number word cards, dot cards\*

Have children work on their own using sets of numeral cards, number word cards, and dot cards to 10.

- Match dot patterns with number words.
- Match numerals with number words.
- Match numerals, dot patterns, and number words.
- Order number words from zero to ten and from ten to zero.
- Order dot cards from 0 to 10.

**Visual; Spatial**  
**Independent**

### Make It Match

**Materials:** numeral cards (0 to 7),\* number word cards (zero to seven), pocket chart

- Place numeral cards 0 to 7 randomly on the floor. Place number word cards zero to seven along a ledge or in a pocket chart. Have a volunteer choose a number on the floor and form a group of children totalling that number. A child from the group finds the number word card that matches the number of children in the group.
- Continue with other volunteers choosing a number and making a group.

*Note:* Children who have not yet had a turn can form a new group, count the number in their group, and find the corresponding numeral and number word cards.

**Kinesthetic**  
**Small Group**

### Listen to the Pennies!

**Materials:** 10 pennies, glass jar

- Tell children they are going to practise counting to 10 by listening to pennies as they are dropped into a glass jar.
- Ask children to put their heads down, listening carefully as the pennies (0 to 10) are dropped into a jar.
- Have the children identify the number by raising the correct number of fingers.
- Ask them to raise their heads and, as a whole class, count the pennies as they are dropped into the jar.

**Auditory**  
**Whole Class**

### Counting to Zero



**Materials:** number cube labelled 1 to 6, small objects (e.g., keys, counters, buttons, shells), small boxes (tins or other containers)

Children work in groups of three. Each group has a number cube and a collection of up to 10 objects. The purpose of the game is to have no objects remaining at the end or to get to zero.

- Each player rolls a number cube in turn and removes the corresponding number of objects from the collection. When there are no objects left, the game is over.
- Groups can compete with themselves to find the number of rolls it takes to fill the box. They can repeat the game.

**Social**  
**Small Group**

\*See Preparing Materials, page 1.



# Using a Calculator

## CURRICULUM FOCUS

Display numerals on a calculator

1m12(N), 1m15(N),  
1m16(N), 1m24(N)

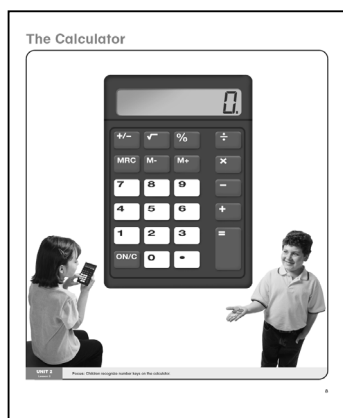
## MATERIALS

calculators, numeral cards (1 to 10), number word cards (one to ten)

## PROGRAM RESOURCES

*Big Math Book, page 8: The Calculator*

*Student page 22: My Calculator*



## BEFORE Get Started

Distribute calculators for small groups to examine. Ask:

- What do you notice? (numerals, letters, words)

Tell the children they will be learning to use a calculator. Show them *Big Math Book, page 8*. Ask:

- What can you tell me about this picture?
- Where have you seen someone use a calculator? (e.g., counting money; doing homework)
- What do you notice about the numerals on the calculator keys? (numerals 0 to 9)

## DURING Explore



Provide a calculator for each child or pair of children. Allow time for exploration and ask:

“What did you discover?” (e.g., how to turn it on and off, how to display numerals)

Demonstrate using **ON/C** to clear the display. Have children use the keypad to make numerals appear on the display; then clear the display.

Say a number from 0 to 10 and have children use their calculators to display it. Allow sufficient time for children to become comfortable using the calculator. Then have children work in pairs to solve a problem using a calculator.

### Problem Prompt

How can you make your calculator display the same number as your partner is showing?

First, one partner displays a number; then the other matches it. Ask children to begin with numbers between 0 and 10. They can then explore displaying and matching larger numbers.

### Show and Share

Bring the children together to share their findings. Ask one pair to demonstrate and explain the keys that were pressed to show their number.

## AFTER Connect and Reflect

Gather the children together to talk about entering numbers on the calculator. Ask:

- Why do you press **ON/C** before entering a number? (clears display)
- How did you get your calculator to display the same number as your classmate's? (press the matching numeral key)
- How would you teach someone to use a calculator? (show keys, explain what keys do)

## Practice

### Reinforcement

Provide children with calculators to refer to as they record numerals on the calculator keypad shown on *Student page 22*. Scribe for children as required. After they complete this page, have children read their sentences.

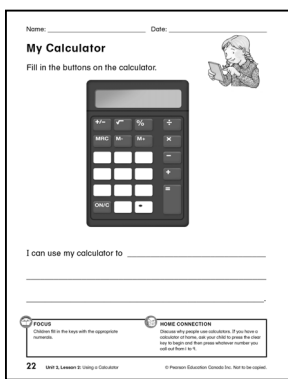
### Extra Support: Procedures

Provide children with number word cards for zero to ten, in order and face up, and the corresponding numeral cards, in order and face down. Have children read the number word, press the matching numeral key, and turn the numeral card over to check.

Children can practise and apply their calculator skills at the Mathematics Centres (see Calculator Fun, page 11).

### Extension

Have children explore how to display teen numbers on the calculator and explain the order in which the keys have to be pressed.



## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>▪ recognize numerals from 0 to 10</li> <li>▪ explore ways of displaying numerals on a calculator</li> </ul> <div data-bbox="352 1923 896 2050" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.1: Ongoing Observations Checklist.</i></p> </div>	<p>Children who have difficulty with the activities in this lesson may need more concrete experiences with number. Using a calculator is relatively abstract. Try activities that help children make connections to what they already know.</p> <ul style="list-style-type: none"> <li>▪ Have children say each number aloud as they display it on their calculators.</li> <li>▪ Display a number between 0 and 10, and have children represent the number using concrete materials.</li> </ul>



## LESSON

## 3

# Number Search

## CURRICULUM FOCUS

Identify and order groups of numbers from 1 to 10  
1m11(N), 1m12(N),  
1m14(N)

## MATH WORD WALL

count  
number

## MATERIALS

numeral cards, number word cards, stamps, stamp pad, stickers, paper

## PROGRAM RESOURCES

*Big Math Book, page 9:*

*What Is in the Fridge?*

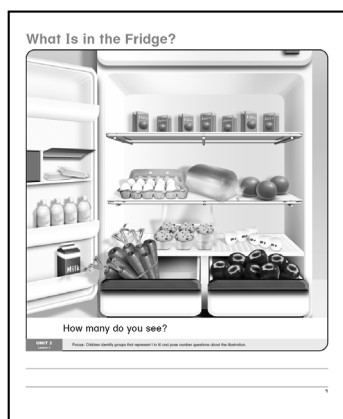
*Student page 23: Number Search*

*Student page 24: Number Pictures*

*LM 14: Numbers 0 to 2*

*LM 15: Numbers 3 to 6*

*LM 16: Numbers 7 to 10*



## BEFORE Get Started

Explain to children that they are going to practise identifying groups of numbers from zero to 10 so that they can make a number book.

Display *Big Math Book, page 9*. Ask:

- What do you notice?
- What number questions could you ask about this picture?

Draw children's attention to the question on the page: "What do you see that are in groups of 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10?" Allow time for the children to locate and name them. Record the numbers in order on the *Big Math Book* page, printing the numeral and number word each time. Have the children read them in order from 1 to 10.

## DURING Explore

Explain to the children that they will be making their own number books. Provide each child with pages copied from *Line Masters 14* to *16*. Ask them to arrange their pages in order from 0 to 10, referring to the chart for any needed assistance.

### Problem Prompt

How can you use pictures (stickers or stamps) to make a number book for 0 to 10?

Explain that the children are to draw simple pictures (use stickers or stamps) to match the numeral on each page and trace the outlined number word. Have available materials for children to use to model each number.

*Note:* Children who are confident with numbers can extend their books to 20 (or more).

## Show and Share

Have children share their number books with the class. Direct children to turn to their pages for 6. Ask:

- What is the same about your pages? (all show 6 objects)
- What is different? (e.g., pictures, arrangements)

## AFTER Connect and Reflect

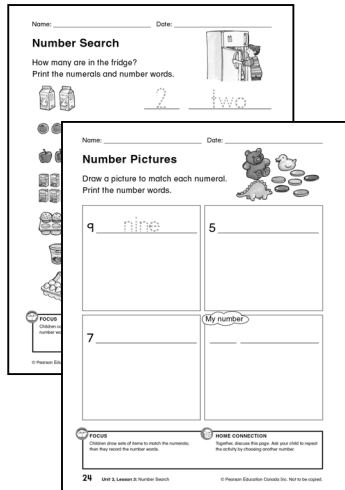
Review and list with the children the different ways they know of representing numbers in a co-operative journal.

Prompt children to think about a number such as 6. Ask: "Where do you see 6?" (e.g., 6 buttons on a card, 6 rolls)



I can make numbers by:

- counting
- naming the totals
- drawing the number of objects
- printing numerals
- printing number words



## Practice

### Reinforcement

Read directions on *Student page 23* and have children record numerals and number words. On *Student page 24*, have children draw or stamp pictures to represent the number and describe their number to a partner.

### Extra Support: Procedures

Children can practise and apply their number recognition skills (see *Same Number, Different Ways*, page 11). Have them play a matching game using numeral and number word cards. Children take turns turning over 2 cards, one at a time, trying to find a match. The game is over when all matches have been made. Vary the game and include dot cards.

### Extension

Children can create number challenge posters for a number from 1 to 10. Have children draw the number of objects on the top half of the page. On the bottom half, children print the matching numeral and number word. The “answers” are covered by folding the paper (bottom half is folded behind the top half) or covering the answer with a self-stick note.

## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>demonstrate 1:1 correspondence when counting</li> <li>represent numbers to 10 orally, in numerals, words, and pictures</li> </ul> <div data-bbox="352 1745 896 1876" style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.1: Ongoing Observations Checklist.</i></p> </div>	<p>Continue to provide practice building number sets and counting with concrete objects.</p> <ul style="list-style-type: none"> <li>Children who have not yet developed 1:1 correspondence may benefit from experiences involving sound, touch, and movement (e.g., dropping coins in a jar one at a time while counting).</li> </ul> <p>Several of the Mathematics Centres (page 11) focus on practice with numerals, number words, and pictures.</p> <ul style="list-style-type: none"> <li>Modify the activities (e.g., restrict numbers first to 0 to 5; when children are comfortable add one or two at a time, until they are comfortable with 0 to 10.)</li> <li>Allow children who are having difficulty to write numerals in wet sand or in shaving cream.</li> </ul>

**FROM THE LIBRARY**

Ruth Brown, *Ten Seeds*  
(Random House, 2001)

Pamela Duncan Edwards,  
*Roar! A Noisy Counting  
Book* (HarperCollins, 2000)

Cathryn Falwell, *Turtle  
Splash! Countdown at the  
Pond* (HarperCollins, 2001)

Christine Loomis, *One Cow  
Coughs: A Counting Book for  
the Sick and Miserable*  
(Ticknor and Fields, 1994)

Susie MacDonald, *Look  
Whooo's Counting*  
(Scholastic Books, 2000)

Keith R. Potter, *Count us in: a  
1 to 10 book* (Rainforest  
Books, 1999)

Marilyn Singer, *Quiet Night*  
(Clarion Books, 2002)

Audrey Wood, *There Were  
Ten in the Bed* (Child's Play  
International, 2002)

**LITERACY LINKS**

**Resources:** collection of counting backwards books

Gather books about counting backwards to read aloud or place on display for independent reading. Talk about how counting backwards is important to the story.

**NUMBERS EVERY DAY**

When waiting in line, assign the children a counting number from one to ten. Have them count out loud and turn to face backwards when they say their own number. Starting at ten, have them count out loud and, when they say their own number, have them face forwards again.

**CROSS-CURRICULAR CONNECTIONS****Science**

**Materials:** picture or copy of a maple leaf, number cards, leaf pictures

Show the children a copy or picture of a maple leaf. Ask: "How is the maple leaf like the shape of your hand?" Have them determine how many "fingers" the maple leaf has. Provide the children with number cards and a collection of leaf pictures that are indigenous to the local environment (e.g., oak, chestnut, birch). Have them discuss how to identify the leaves according to the number of parts or smaller leaves. Ask them to sort the leaves and order them from most complex to simplest.

**Music**

**Materials:** large numeral cards from 1 to 10

Sing "This Old Man" with the class, inviting them to include actions and clapping. Pass out the numeral cards for children to hold up at the appropriate times as the song is sung again. At the end of the song, have them count backwards and hold up the numeral cards.



## Activity Bank

### What Is the Number?

**Materials:** small box and various counting materials (e.g., crayons, pencils, paper clips)

- Ask a child to place from 1 to 10 objects in a box and close the lid without telling anyone the number of objects. (But he or she must remember the number!)
- To the tune “Who Stole the Cookie from the Cookie Jar?” have the class chant, *What is the number in the number box? A volunteer responds: Is it you, number 6?*
- If the guess is incorrect, the child with the box responds: *Number 6? Couldn't be!* The class chants again, and the next child in the circle guesses. If correct, the child responds, *Number 6? Definitely!* Check by having the class count as the objects are brought out one at a time.

**Musical; Social**  
**Small Group**

### What's My Number?

**Materials:** dot cards,\* counters or Snap Cubes

- Have children sit in a circle. Raise a dot card. Have children say the number as quickly as possible. Repeat with other dot cards until children become familiar with the process. Ask:
  - How did you remember the number you saw on the dot card?
  - What pictures did you make in your mind to help you remember?
- When children have had practice visually recognizing the numbers, give each child counters to use. Show dot cards and ask children to place the corresponding number of counters in front of them.

**Visual; Logical**  
**Small Group**

### How Many Are Missing? Games

**Materials:** sets of objects (e.g., 9 calculators, 3 erasers, 8 crayons), tray or table, cloth or paper, optional: overhead projector

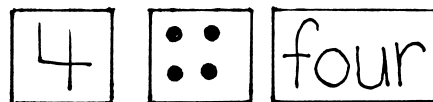
- Play a game where children try to recall the number of objects on a tray or table in order to determine how many are missing.
- Choose a set of objects. Put them on a tray or table, cover with a cloth, or place objects on an overhead projector that is turned off.
- Remove the cloth or turn on the projector. Show the objects to the class. Cover the tray or turn off the projector and remove one object. Uncover the tray or turn on the projector. Ask: “How many are missing?” Have children state their answers and reveal the missing items. Repeat, changing the number of objects and sets of objects.

**Visual; Intrapersonal**  
**Whole Class/Small Group**

### Number Hunt!

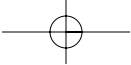
**Materials:** numeral cards (0 to 10), number word cards (zero to ten), dot cards (0 to 10)\*

- Scramble the number cards, word cards, and dot cards in a large bin (there will be 33 cards).
- Randomly place one card face down in front of each child. (You will not use all the cards.)
- Ask children to turn over their cards and find classmates with cards for the same number.
- Point out that, because not all the cards were used, sometimes there will be only one or two people with the same number.
- Repeat the activity changing the cards.



**Kinesthetic; Social**  
**Whole Class**

\*See Preparing Materials, page 1.



LESSON

4

# Number Arrangements

### CURRICULUM FOCUS

Recognize numbers in different arrangements

1m11(N), 1m13(N),  
1m15(N), 1m18(N)

### MATERIALS

counters (beads, toothpicks, buttons, stickers)

### PROGRAM RESOURCES

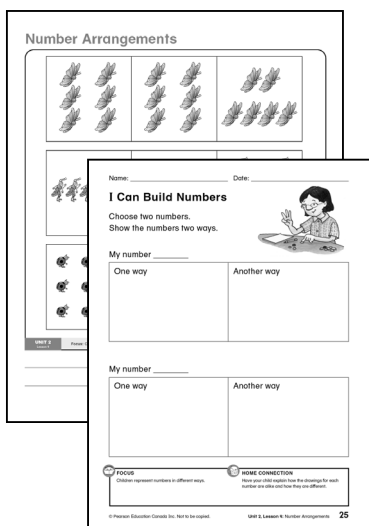
*Big Math Book, page 10:*

*Number Arrangements*

*Student page 25: I Can Build Numbers*

*Student page 26: Pictures of 6*

*Student page 27: Ways to Show 7*



### BEFORE Get Started

Tell children they will be learning more about numbers. Ask:

- What is 6? What do you know about 6? (e.g., I am 6 years old.)

Accept children's developing language and understanding, rephrasing and clarifying when necessary.

Display *Big Math Book, page 10*. Ask:

- What do you notice about the objects on the page?
- Which sets or groups of objects are the same? How are they the same?
- Which ones are different? How are they different?

Draw children's attention to one row at a time. Ask:

- How many butterflies are in each of the squares?
- Which boxes have the same number of ladybugs? (They all do.)
- How can the same number of things look different? (Move them around.)
- What other ways can the ladybugs be arranged?

Discuss each row. Notice any children who have difficulty understanding that the same number of objects can look different. You may want to have them work with you in a small group during the following Explore activity.

### DURING Explore

Have children work in pairs building arrangements of numbers. Demonstrate an arrangement for the number 3. Ask children to suggest and then demonstrate other ways of showing 3, using counters.

#### Problem Prompt

How many different ways can you show the number 5?

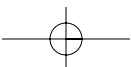
Have volunteers show their arrangements for 5. Next, have children work independently to create number arrangements for 6, 7, 8, and 9.

Have children choose any two of the numbers they built and represent them in two different ways on *Student page 25*. Ask them to record the corresponding numerals.

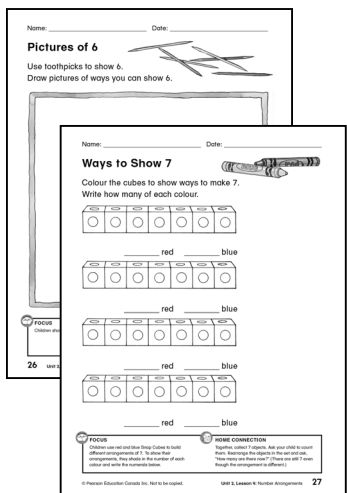
### Show and Share

Look at all the arrangements for one number at a time (e.g., all the children who made 5). Have the children show their pages and then ask:

- How did you think of your arrangements?
- Which of these arrangements are the same? different?



**TEACHING TIP**  
Using the overhead projector is another way to model and discuss different number arrangements with children.



**AFTER Connect and Reflect**

Review with the children that a number can be represented in many ways. Ask again: “What is 6? What do you know about 6?”

Record children’s answers in the class co-operative journal, questioning and clarifying as needed.

**Practice**

*Reinforcement*

Provide materials for children to use as they complete *Student page 26*. Have children complete *Student page 27* using red and blue Snap Cubes. After the pages are done, ask children to share and describe their work.

*Extra Support: ESL*

Children can practise their number skills at the Mathematics Centres (see *Which Number Wins?* page 11). Because this game requires little language, children who are learning English can participate easily. Games such as this one, where ESL children can be paired with children who are fluent, provide engaging and supportive opportunities for children to interact, model the language of their peers, and gain confidence.

*Extension*

Have children create number arrangements. Children begin by building one number from two smaller sets and labelling the quantities. (*Note:* Some children may know and be ready to use the symbols  $+$ ,  $-$ , and  $=$ , but this is not required at this point.) Then, ask them to record or tell a story to accompany their sets.

**Assessment for Learning**

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>create more than one arrangement to represent the same number</li> <li>understand that the number of objects remains the same but the arrangements or type of objects can change (conservation)</li> <li>use language such as <i>more than</i>, <i>less than</i>, <i>same as</i></li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To record observations and facilitate reporting, use Assessment Master 3.2: Ongoing Observations Checklist. To gather information about children who are having difficulty, use Assessment Master 2: Diagnostic Conference for Selected Children.</i></p> </div>	<p>Support the development of conservation of number.</p> <ul style="list-style-type: none"> <li>Compare the same number of small objects and large objects and talk about them (e.g., 6 shoes or 6 people is still 6).</li> <li>Give children experiences in which they create as many possible configurations of a number as possible. Talking about the configuration will help to solidify the concept of conservation. (There are 4 up top and 2 below. That’s 6.)</li> <li>Have children play and practise at home and school with everyday objects. Count the cans in the grocery bag. How many? Take them out and put them on the table. How many now?</li> </ul>

**FROM THE LIBRARY**

Suzanne Aker, *What Comes in 2's, 3's & 4's?* (Aladdin Library, 1992)

Molly Bang, *Ten, Nine, Eight* (Mulberry Books, 1983)

Donald Crews, *Ten Black Dots* (HarperCollins, 1995)

Kathy Mallat, *Seven Stars More!* (Walker and Co., 1998)

Barbara B. McGrath, *The M & M Counting Book* (Charlesbridge, 1994)

Barbara B. McGrath, *The Cheerios Counting Book* (Scholastic, 1998)

**LITERACY LINKS**

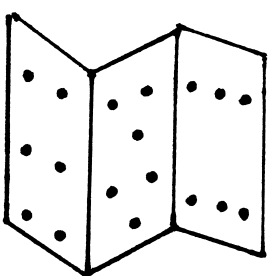


**Materials:** large sheets of paper, crayons, pencils, counters, optional: stickers

Fold pages for an accordion book ahead of time or give oral step-by-step instructions for children to follow:

1. Fold a large paper in half and in half again.
2. Open the paper and bend the top back to the first fold line.
3. Turn the paper over and bend it back to the next fold line.
4. Continue folding back and forth to the end of the paper.

Children can make an accordion booklet showing a variety of grouping arrangements for a number of their choice between 6 and 10.



Display these books for children to read with one another and set counters on the objects for practice with the number arrangements.

**NUMBERS EVERY DAY**



Use dot cards that represent numbers 1 to 5. Briefly raise a dot card. Ask: "How many did you see? How were the dots arranged?" Allow time for the children to name the number and describe the arrangement of dots. Children can play "What's my number, Cucumber?" with a partner. They show a dot card quickly to a classmate, who names it as quickly as possible.

**CROSS-CURRICULAR CONNECTION**

**Science**

**Materials:** different types of beans and other dried seeds (e.g., sunflower, lima bean, sweet pea, dried peas or beans), brown paper, clear containers, sets of number cards for 3, 5, 7, 9, optional: recording sheet

Place mixed collections of beans and seeds in containers for children to explore and sort. Provide them with circles of brown paper or have them draw a circle to represent holes in the earth for planting the seeds. Ask them to pick a number card and make as many different designs for that number as they can. You may wish them to draw their number arrangements on the recording sheet.





## Activity Bank

### Make Your Own Dot Cards

**Materials:** blank cards, bingo dabbers or stickers

- Ask: "How many stickers will you need to make one dot card each for the numbers 1 to 5?" Have children make predictions.
- Children make their own dot cards by arranging stickers or dabbing circles onto blank cards. Challenge children to come up with different ways to represent the numbers. Once the dot cards are completed, have children compare their predictions with the number of stickers used (15). Initiate a discussion about their dot cards. Ask:
  - Which arrangements are easiest to recognize? Why?
  - Which ones are hardest? Why?
- As an extension, have children predict and then determine the number of stickers needed to make one card each for the numbers 1 to 8, or 1 to 10.

**Visual; Social**

**Independent/Small Group**

### Bean Number Stories!



**Materials:** two-coloured beans (remind children not to eat!) or two-coloured counters, plastic cups, cardboard or plastic placemats

- Have the children sit in a circle. Give each child 6 two-coloured beans to place in a plastic cup. Then have them spill the beans onto a surface.
- Record their various stories of 6 on the board (e.g., 4 red beans and 2 white beans, 5 red beans and 1 white bean). Ask:
  - Do we have all of the combinations?
  - How do you know?
- Repeat the process with a different number.

**Visual; Verbal**

**Whole Class/Small Group**

### Ways to Show Number 8!

**Materials:** Snap Cubes

- Ask children to sit in a circle and give them a small container of Snap Cubes.
- Tell children they will work with a partner to find how many ways they can show the number 8 using a variety of colours of Snap Cubes.
- Ask children to describe what they notice (the number of objects remains the same but the colours can change).
- Have them record their number arrangements and share their findings.

**Visual; Social**

**Partners**

### Building 9!

**Materials:** glue, toothpicks, heavy paper (manila, light cardboard), markers

- Have children arrange 9 toothpicks on heavy paper in as many different ways as they can.
- Have them glue the arrangements onto the paper and record the numeral 9 below each number arrangement.
- Display the arrangements. Ask:
  - Which arrangements are the same?
  - Are there any arrangements that only one person thought of?

**Visual; Intrapersonal**

**Whole Class**



## LESSON

## 5

# One and Two More, One and Two Less

## CURRICULUM FOCUS

Identify numbers that are one/two more and one/two less

1m11(N), 1m14(N),  
1m19(N), 1m20(N)

## MATH WORD WALL

more  
less

## MATERIALS

counters or concrete objects,  
optional: overhead projector

## PROGRAM RESOURCES

*Student page 28: More  
or Less*

*Student page 29: Number  
Challenge*

## BEFORE Get Started

Explain to children that they are going to learn more about counting and comparing numbers.

Tell them they are to discover the number rule. Use an overhead projector, or concrete objects large enough for everyone to see.

Explain that when they know your rule, they silently raise a thumb.

- Make a set of five, and ask: "How many?" Add another object, and ask: "How many now?" Leave the set visible. Make a set of two. Add one. "If you have guessed my rule, raise a thumb."

Continue with other sets until most children are holding up their thumbs. Have a volunteer state the number rule. (I added one more to each set.)

After the rule has been named, do another example. Build 8. "If my rule is one more, then what number will I build next?" Build 9.

- Review each set, saying together: "9 is 1 more than 8"; "3 is 1 more than 2," and so on.
- Repeat the activity, removing one counter from each set. Again, ask children to guess the rule (one less; took one away), and chant together: "4 is one less than 5."

Provide counters and build a set of 3 together. Ask the children to follow as you add 1, saying: "4 is 1 more than 3." Repeat, adding 2, saying: "5 is 2 more than 3." Continue, removing first 1, saying: "2 is 1 less than 3," and then removing 2, saying: "1 is 2 less than 3."

## DURING Explore

Provide children with counters to use while playing "What's my number?"

### *Problem Prompt*

How can you use the clues to guess the number?

Children build the number, after listening to clues such as: "My number is 1 more than 3. My number is 1 less than 5. Guess my number."

Children take turns building a number of their choice, then offering clues for others to guess the number.

### **Show and Share**

Ask the children to share their strategies for determining numbers 1 and 2 more and 1 and 2 less. For example, I put one more counter beside 2 counters and I have 3 counters.



## AFTER Connect and Reflect

Review with the children that they can:

- compare quantities and tell which ones are more or less
- add one or two to a set to make larger numbers
- remove one or two from a set to make smaller numbers

## Practice

### Reinforcement

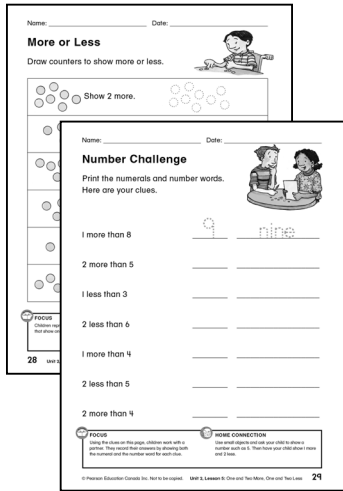
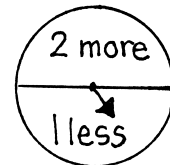
Provide counters for children to use when finding numbers on *Student pages 28 and 29*.

### Extra Support: Concepts

Children make a group using up to 8 counters. They roll a number cube whose sides are labelled “1 more” or “1 less,” and either add or remove one counter. Another number cube can be used whose sides are labelled “2 more,” “2 less.”

### Extension

Children can play Number Towers, alone or in partners, using wood cubes or Pattern Blocks, and a 2 more/1 less, 2 less/1 more spinner. They begin by building a tower of 3 blocks, spin, and add or remove blocks as indicated. If a player cannot remove any more blocks (when the tower has one block and he or she spins 2 less), the player misses a turn. The object is to get to 20 blocks without toppling the tower (if playing alone) or to see who can build the tallest tower (if playing in partners).



## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>▪ can use concrete objects to demonstrate 1 or 2 more or less</li> <li>▪ identify 1 or 2 more or less relationships among numbers or sets</li> <li>▪ identify 1 or 2 less relationships among numbers or sets</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.2: Ongoing Observations Checklist. To gather information about children who are having difficulty, use Assessment Master 2: Diagnostic Conference for Selected Children.</i></p> </div>	<ul style="list-style-type: none"> <li>▪ When building sets with 1 or 2 more, use a different colour of counter as a cue. Use small numbers for the start set, such as 3, 4, and 5, which can be easily recognized.</li> <li>▪ When constructing sets of 1 or 2 less, children must remember the initial quantity in order to compare with the new one. Trace around objects in the initial set, then remove 1 or 2, leaving the outlines visible. This provides a visual reminder of the original set. “1 less than 4 is 3.”</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> </div>

**FROM THE LIBRARY**

Jenny Feely, *My Orchestra, I Will Be ...*, *Musical Chairs, Too Many Rabbits*, *The Count On It Books* (Addison Wesley, 2002)

Eric Hill, *Spot Can Count* (Penguin Books, 1999)

Mara Van der Meer, *How Many Monsters? A Monster Counting Book* (Raincoast Books, 2000)

Matthew Van Fleet, *One Yellow Lion* (Dial Books for Young Readers, 1992)

Kim Michelle Toft, *One Less Fish* (Charlesbridge Publishing, 1998)

Jane Walker, *Ten Little Penguins: A Pop-Up Counting Book* (Dell, 1994)

**LITERACY LINKS**

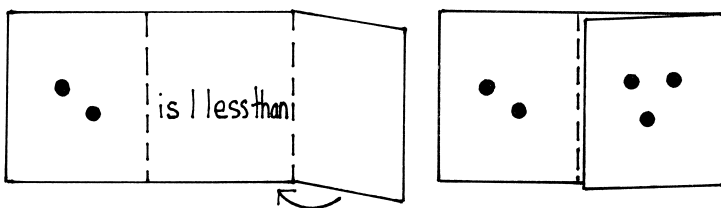
**Materials:** letter-sized paper, card strips, crayons, pencils

Prepare materials for each child to use in making a “lift and see book”:

- card strips saying “is 1 more than,” “is 2 more than,” “is 1 less than,” “is 2 less than”
- letter paper folded along the short sides in thirds

Distribute materials to the children and help them with the following instructions:

- Ask children to open their paper. On the left-hand third of the paper, have them draw a number of items from 1 to 10.
- Ask them to copy the phrase from their card strip onto the middle third of the paper.
- Show children how to close the right third of the paper into the middle so that it covers the phrase.
- Now have children draw the items that fit the illustration and phrase onto that third.

**NUMBERS EVERY DAY**

Choose a number such as 9. Have children discuss different ways they can describe 9. (e.g., 9 is 2 more than 7; 9 is 1 less than 10; 9 is my brother’s age).

**CROSS-CURRICULAR CONNECTION****Art**

**Materials:** large cards saying “one more,” “two more,” “one less,” “two less”

Display the cards on a chalkboard ledge. Work with volunteers to dramatize a “more or less” scenario. For example, two children pretend they are playing ball. Two more children come and say, “Can we play, too?” Someone from the class chooses the appropriate card. Invite small groups of children to dramatize their own scenarios.





## Activity Bank

### Card Matching



**Materials:** dot cards,\* chart showing numerals 1 to 10

- Assign each child one of four rules: one more, one less, two more, two less.
- Children place a set of dot cards face down in a random arrangement.
- Children take turns picking a card, turning it over, applying their rule, and pointing to the resulting numeral on the chart. Other children try to guess their original number.

**Variations:** Children pick a dot card, then

- build a Pattern Block design with one more, one less, 2 more, 2 less
- do a physical action (e.g., clap, jump, stomp, or hop one more, one less, 2 more, 2 less)

**Kinesthetic; Social**

**Small Group**

### One More and One Less!

**Materials:** dot cards,\* counters

- Briefly show a dot card. Ask the children to build the number using counters. Have them then represent the number that is one more. Model as “1 more than 5 is 6.”
- Repeat the activity with one less, two more, and two less.

**Visual; Intrapersonal**

**Small Group/Whole Class**

### More or Less Number Chant!

**Materials:** dot cards (1 to 6),\* pocket chart or chart paper

- Ask one child to stand and act as number 1, holding a dot card for number 1.
- Ask two children to stand together to act as number 2. Together, they hold a dot card for number 2, and so on, until all or almost all the children are in the groups (e.g., six groups will require 21 children). You can use toys to make the last group.
- Consult with the group of three children to decide what rule they want to use (1 more, 2 more, 1 less, 2 less). Model the following process with them.
- Post the chant on a pocket chart or on chart paper, modelling it with the children:  
*We are number 3, number 3, number 3.*  
*We are number 3—where’s the group that has 1 less (or 1 more)?*
- After identifying the group, explain that it is their turn. Support them as they choose either a “1 or 2 more” or “1 or 2 less” chant, for example:  
*We are number 4, number 4, number 4.*  
*We are number 4—where’s the group that has 2 less?*

*Note:* The child who is 1 will always chant for 1 or 2 more, and the largest group will always chant for 1 or 2 less.

**Social; Musical**

**Small Group/Whole Class**

\*See Preparing Materials, page 1.



## LESSON

## 6

# Fantastic Five

## CURRICULUM FOCUS

Investigate number meanings using a five-frame  
1m11(N), 1m19(N)

## MATERIALS

counters, optional: overhead projector

## PROGRAM RESOURCES

*Student page 30: Fantastic Five!*

*LM 17: Five-Frame*

## BEFORE Get Started

Tell children that one way to describe numbers is to compare them to other numbers, especially familiar numbers like 5. Ask:

- Where do you see 5?
- Why is it a number that most people know a lot about?

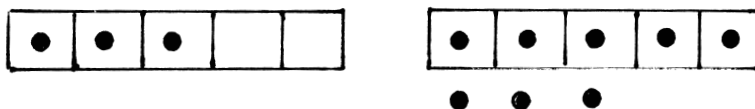
Display a five-frame on the board or on an overhead projector and demonstrate how to use it to represent 5.

Explain that you put only one counter in each section of the five-frame. Provide each child with a five-frame and 5 counters.

Ask: "How can you represent 3 on the five-frame?" Children fill in 3 on their five-frames using their counters. Have children show their five-frames. Ask: "What can you tell about 3 from looking at the five-frame?" (It is 2 away from 5, 2 spaces are left.)

## DURING Explore

Ask: "How do you think we could show numbers that are bigger than 5 on the five-frame?" (put in 5, then put the rest beside the five-frame)



Invite a child to show how they would make 6 (fill the 5-frame and put one counter beside it).

Continue with other numbers between 6 and 10 until children are comfortable with the process. As each number is represented, describe it as "5 and . . ." (e.g., when 6 is represented, say: "6 is 5 and 1").

Play "5 and . . ."

### *Problem Prompt*

Can you make numbers from 6 to 10 on a five-frame?

Call out a number between 5 and 10. Have children build it on a five-frame and describe the number as "5 and . . ." Repeat the activity several times building different numbers to 10.

### Show and Share

Bring children together to talk about using the five-frame. Ask:

- What numbers were hardest to build on the five-frame? Why? Tell me what strategies you used—how did you decide how many counters would be outside the frame?

### AFTER Connect and Reflect

Review with the children that they can describe all the numbers from 6 to 10 as “5 and ... ” or “... and 5.”

Have children explain and demonstrate how to use the five-frame to build each number from 0 to 10, in order (e.g., 5 is 5 and 0; 1 is 4 less than 5; 10 is 5 more than 5.) Ask children to talk about each number and how it relates to 5.

### Practice

#### Reinforcement

Review the directions for *Student page 30* with the children and then have them build numbers on five-frames and complete the sentences.

#### Extra Support: Concepts

Children can play Double Fives! A pair of children has 2 five-frames and a number cube labelled 0 to 5. Each child takes a turn rolling the number cube and filling in a five-frame. Children must role the exact number to fill the remaining spaces on the five-frame. Once both frames are filled, the game is over.

#### Extension

Have children work in pairs to make up a game using 3 or 4 five-frames and some counters. They can also use spinners, cubes, or dot cards.

## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>build numbers to 10 on a five-frame</li> <li>describe the numbers as “5 and ...” or “... less than 5” rather than recounting from 1 each time</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.2: Ongoing Observations Checklist.</i></p> </div>	<ul style="list-style-type: none"> <li>Have children show numbers “more than 5” or “less than 5” using their fingers. Talk about the fast way to show 5 with one hand, then have them show you 6 without moving or changing the 5 hand. Practise the language “6 is 5 and 1 more.” Have children show you 5 again, then ask for 7. Say: “7 is 5 and 2 more.” Practise the numbers 8, 9, and 10 in the same way.</li> <li>Build a number by holding your fingers behind your back and then showing the number to the children. Ask them to name it quickly.</li> </ul>



# Terrific Ten

## CURRICULUM FOCUS

Investigate number meanings using a ten-frame  
1m19(N)

## MATERIALS

counters

## PROGRAM RESOURCES

*Big Math Book, page 11:*  
*Ten-Frames*

*Student page 31: Terrific Ten!*

*Student page 32: Ten-Frame Numbers*

*LM 18: Ten-Frame*

## BEFORE Get Started

Tell children that mathematicians look for strategies that make counting and thinking about numbers easier, and review how they used five-frames in the previous lesson.

Display *Big Math Book, page 11* and ask:

- When we used a five-frame, what did we compare the numbers to? (5)
- What do you think we will do with a ten-frame? (compare to 10)
- How did you use the five-frame to show 6? (plus 1 more)
- How do you think we show 6 on a ten-frame?

Invite children's suggestions as you demonstrate building numbers between 0 and 10 on a ten-frame. Remind children to

- place only one counter in each section
- fill the frame from left to right (demonstrate) and not skip any spaces (just like a book, which goes from left to right, and you always keep going—you don't go back)
- start in the top row; when it is full, start the next one

## DURING Explore

Provide each child with counters and a ten-frame. Call out numbers between 0 and 9 and have children represent and describe them in relation to 10 (e.g., 8 is 2 less than 10).

### Problem Prompt

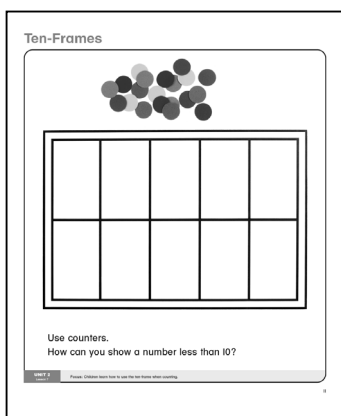
What do you have to add to make 10?

When children are comfortable with the ten-frame and making comparisons to 10 with few errors, play the game "Make 10." Call out a number between 0 and 9. Children build the number on their ten-frame and then respond by calling out the number required to make 10 (e.g., 6; children build 6 on the ten-frame and say "4").

### Show and Share

Bring children together to talk about using the ten-frame. Ask:

- Was it easier to make "5 and ..." or "less than 10"? Why?
- Which numbers were harder or easier to build?



## AFTER Connect and Reflect

Review the procedure for using the ten-frame with the children. Have a volunteer describe how to use the frame to the class, explaining that only one counter is allowed in each section, the frame is filled from left to right, no spaces are skipped, and you start in the top row; when it is full, you start the next row.

### Practice

#### Reinforcement

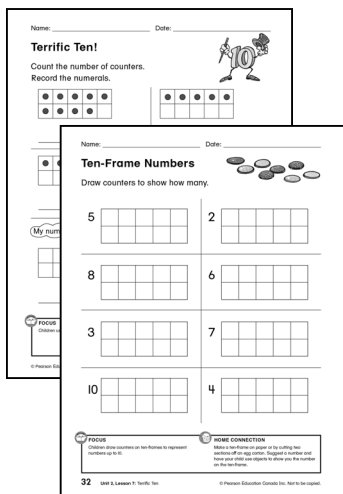
Review the directions for *Student page 31*, in which children build numbers on ten-frames and complete the sentences. On *Student page 32*, children draw counters on ten-frames to represent numbers to 10.

#### Extra Support: ESL

Children who are learning English can consolidate their knowledge of number names through activities such as building a number between 0 and 10 on a five-frame or ten-frame, and then finding and saying the number word that matches.

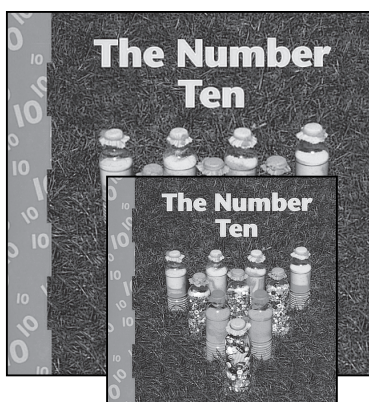
#### Extension

Provide each child with *LM 18* and 20 counters. Have children look for “number partners” when they are building numbers on ten-frames. Have children tell what they notice about the numbers to another child. Number partners are 1 and 9; 2 and 8; 3 and 7; and 4 and 6. Have children describe what they notice.



## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>build 0 to 10 accurately on a ten-frame</li> <li>leave the 5 row intact when building the numbers 6 to 10</li> <li>describe the numbers as “... less than 10”</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.3: Ongoing Observations Checklist.</i></p> </div>	<ul style="list-style-type: none"> <li>Children who are not yet ready to think flexibly about the numbers on a five- or ten-frame require more practice and experience reinforcing conservation and comparison. Have them count out the number of counters first; then have them transfer these to a ten-frame. Ten-frame flash cards can promote instant recognition of the quantities without counting.</li> </ul>



### FROM THE LIBRARY

Jack Beers, *Bears, Ten by Ten* (Addison Wesley, 2002)

Jack Beers, *Fingers Go Five by Five* (Addison Wesley, 2002)

## LITERACY LINKS



**Resources and Materials:** Barbara Taragan, *The Number Ten*, Addison Wesley Mathematics Little Books, Emergent level (Addison Wesley, 2004) (lap book and little book copies); paper strips, black marker

Introduce *The Number Ten* as a book about games involving ten. In a shared reading, read the story and talk about the illustrated games. To work with groups made of 10, ask:

- 4 marbles are in the cup. How many more need to roll in to make 10? (page 3)
- 6 squares are blue. How many pink ones did they draw to make 10? (page 4)
- If I pick up 5 green jacks, how many pink ones do I need to have 10? (page 5)

For each page, write new sentences on strips to tell about making 10 (e.g., I roll 4 marbles and 6 more marbles to make 10). Together, read the book, with its new text. Have children read the little book version of the book with a partner.



## NUMBERS EVERY DAY

**Materials:** dot cards (from Preparing Materials, page 1)

Hold up a dot card for up to 3 seconds. Ask: “How many did you see? How were the dots arranged?” Allow time for the children to name the number and describe the arrangement of dots.

## CROSS-CURRICULAR CONNECTIONS

### Art

**Materials:** paper, paints, brushes

Have the children trace their hands and cut out the tracings. Using one hand cut-out, have them design a Fantastic Five creature. Using two hand cut-outs, have them design a Fantastic Ten creature.

### Science

**Materials:** building materials (e.g., toothpicks, bread tags, spools, craft sticks, straws, cardboard pieces, Plasticine)

Have each child choose 10 objects to glue together to create a “Number Ten” structure. With partners, ask them to discuss possible functions for their structures and share various ways of counting the 10 objects (e.g., starting with 6 and counting 4 more).







## Activity Bank

### Roll a Number

 Games



**Resources and Materials:** LM 18; two 0 to 5 number cubes for each pair of children, counters, paper, pencils

This game is played in partners. The object of the game is to build all numbers from 0 to 10.

- Each child needs one ten-frame, 10 counters, and a simple T-chart with numbers from 0 to 10 written down the left column and space for a check mark on the right.
- In turn, players roll the number cubes, place counters on the ten-frame, and check the number on the T-chart.
- The game ends when each child has built all the numbers from 0 to 10.

**Visual; Social**

**Partners/Whole Class**

### Name in a Frame

**Resources and Materials:** LM 18; small blank counters or circles of paper, pencils

- Have children print the letters of their first name on the counters (one letter per counter or circle). Children fill the ten-frame with "letter counters." They share and compare their results. Ask:
  - Does your name fit in the ten-frame? How many more letters would fit in the ten-frame?
  - Which classmate's name can you add to your ten-frame to make ten? Children can make additional sets of "letter counters" for their names or others, comparing the names to the ten-frames. Some children may try using both first and last names.

**Visual; Intrapersonal**

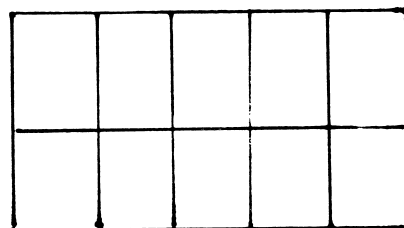
**Whole Class**

### Ten-Frame on the Floor!

**Materials:** masking tape (or large plastic sheet or tablecloth and a permanent marker), two number cubes labelled 1 to 6

- Tape an outline of a large ten-frame on the floor or draw a ten-frame outline. Have children sit around the ten-frame. Tell them they are going to act as counters.
- Roll the number cubes and call out the number (e.g., one number cube shows a 3, the other number cube is a 5. Say: "3 and 5 more"). Start with the child to the teacher's left in the square. One by one, the children stand up and move to the next square on the ten-frame to equal the number rolled by the cubes.
- After 8 children are standing in the appropriate squares, ask: "What can you tell us about 8 from looking at our ten-frame?" (e.g., It is 2 away from 10, it is 5 and 3 more.)

Focus the children's attention on how far away from 5 and 10 the numbers are.



**Social; Kinesthetic**

**Small Group**



## LESSON

## 8

# Represent Numbers 10 to 20

## CURRICULUM FOCUS

Represent numbers from 10 to 20 in different arrangements  
1m11(N), 1m14(N),  
1m19(N)

## MATERIALS

counters, two-part mat,  
optional: overhead projector

## PROGRAM RESOURCES

*Student page 33: I Can Make 16!*

*Student page 34: Numbers to 20*

*Student page 35: Show Numbers to 20*

## TEACHING TIP

There are many different ways to represent a number. So far, children have explored their own arrangements, familiar dot patterns, and five- and ten-frames to organize and show quantities. It is important to honour all different ways to think about number.

## BEFORE Get Started

Explain to children that they are going to learn about numbers greater than 10. Ask:

- What do you know about numbers that come between 10 and 20? (e.g., there are ten numbers, numbers in this range are in combinations of two)

Provide pairs of children with 20 counters and have them build and display a number that comes between 10 and 20. If they have grouped their counters, model by describing each group (e.g., “you built 15. You have five and five and five”).

Explain that you are going to show one way to build numbers between 10 and 20 on a two-part mat (this works well on an overhead transparency). On one side of the mat, ask children to help you count 10 counters. Arrange them in two rows of five. Confirm there are 10 by pointing to each row, saying, “10 is 5 and 5.”

On the other side of the mat, place 2 counters. Ask:

- How many are there together? (12)
- How did we build 12? (e.g., we made 10 and 2). Some children may say 5 and 5 and 2. Ask: “Is that the same as 10 and 2?”
- Confirm with children that 12 is 10 and 2. Then, turn the mat and have children “read” the combination in reverse: “12 is 2 and 10.” Confirm that it is still 12. Ask:
- Are “10 and 2” and “2 and 10” the same? How do you know?

Choose numbers between 10 and 20 randomly without changing the ten on one side of the mat. Frequently refer to it as “a set of 10.”

## DURING Explore

### Problem Prompt

How can we build 16 using “10 and...”? What story can we tell?

Have children work in pairs building 16 by making “10 and...” on a two-part mat. Explain that children are to

- use their counters to show 16 as 10 and some more
- think of a story about the counters on their mat
- record their solution on *Student page 33*

### Show and Share

Invite pairs of children to display their mats and share their stories. Ask:

- How are your mats the same? Did anyone arrange his or her

- counters in a different way?
- How did you think of your story?
- What do you know about 16? What else can you tell me about 16?
- We showed 16 as 10 and 6. What other ways can we build 16?
- How could we build 16 on a ten-frame? (e.g., fill the ten-frame and put 6 beside; some children may suggest using two ten-frames)

As each number is shared, record it as “10 and \_\_\_\_\_ more.”

### AFTER **Connect and Reflect**

Review with the children the different ways to represent a number. Ask:

- What strategy can you use for building numbers between 10 and 20? (e.g., build “10 and...” starting with a group of 10 and adding more)
- What happens when you change the order of the numbers? (e.g., the value of numbers doesn’t change, 10 and 1 is the same as 1 and 10)

Add the children’s findings to the co-operative journal “About Numbers.”

### Practice

#### Reinforcement

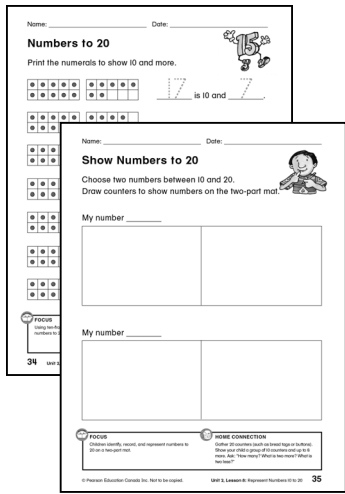
Review directions with the children and have them use counters and two-part mats when completing *Student pages 34 and 35*.

#### Extra Support: ESL

Support ESL children by modelling number stories, touching the objects as you say each part, and chanting them together (e.g., “10 and 2 is 12”; “12 is 10 and 2”).

#### Extension

Have children work in pairs, rolling two cubes numbered 0 to 5, and building the number on 2 ten-frames. The goal is to reach 20 first.



## Assessment for Learning

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>accurately represent numbers 10 to 20 as a “10 and...” combination</li> <li>understand that the order (10 and or and 10) doesn’t matter</li> <li>understand that numbers can be built from combinations of smaller numbers (part-part-whole)</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use Assessment Master 3.3: Ongoing Observations Checklist.</i></p> </div>	<ul style="list-style-type: none"> <li>Children build understanding of numbers through repeated opportunities to explore and represent them. Challenge the children to show a number in different arrangements in order to build number sense.</li> <li>The number 12, for instance, has a variety of possible arrangements. Model by thinking aloud and encourage children to tell you about their thinking, as well (e.g., “I made 3 boxes for my 12,” “I made my 12 into a smiley face”).</li> </ul>

**FROM THE LIBRARY**

Kate Duke, *Twenty Is Too Many* (Dutton, 2000)

Steven Schnur, *Night Lights* (Frances Foster Books, 2000)

Jan Thornhill, *The Wildlife 1–2–3: A Nature Counting Book* (Greey de Pencier, 2003)

Barbara Taragan, *The Number Eleven* (Addison Wesley, 2002)

Barbara Taragan, *The Number Twelve* (Addison Wesley, 2002)

Rick Walton, *How Many, How Many, How Many* (Candlewick Press, 1993)

**LITERACY LINKS**

**Resources and Materials:** Bill Martin, Jr., *Brown Bear, Brown Bear, What Do You See?* (Henry Holt, 2001); large construction paper sheets, magazines and catalogues, scissors, glue, coloured markers, materials (e.g., straws, toothpicks, buttons, bread tags)

Read *Brown Bear, Brown Bear* aloud and note the text pattern or adapt the pattern to suit a number book:

“Number, number, what do you see? I see \_\_\_\_\_ looking at me.”

Assign each child numbers from 10 to 20. Have them make big book pages featuring a large-sized numeral and the appropriate number of objects glued or drawn onto it. Have children write or dictate the completed sentence frame at the bottom of their pages. Compile the pages into books and read them with the whole class or during shared reading time. Place these big books in a centre along with the Addison Wesley Mathematics Little Books, Emergent level.

**NUMBERS EVERY DAY**

Use the classroom calendar and highlight the first 20 numerals. Place self-stick notes over several of the numbers. Begin counting from 1. When a covered number occurs, have children predict the number and then reveal it to the class. Continue counting to 20. Vary the activity by hiding different numbers.

**CROSS-CURRICULAR CONNECTION****Art**

**Materials:** cardboard squares, coloured markers, number cards 1 to 10, 2 boxes, two-part mat

On cardboard squares, have children write their names. Put the name cards and the number cards into separate boxes. Children pull 10 name cards and place them on one side of a two-part mat. Then they pull a number card from 1 to 10 and pull that many more names from the name card box. Children place the additional names on the other side of the two-part mat and say the number story aloud (e.g., “10 and 8 is 18”). Ask them to turn the mat around and reverse the story. Consider laminating the name/picture cards for future use in activities like making graphs.





## Activity Bank

### Hopscotch Plans

**Materials:** square tiles (about 2.5 cm), construction paper squares the same size as the tiles, paper, glue sticks, markers

- Have children work in pairs. Assign each pair a number between 10 and 20. Give them the same number of tiles as their assigned number. The task for each pair is to design a hopscotch “board” using all of the tiles.
- Each pair then records their plan by gluing construction paper squares onto a sheet of paper in the same arrangement as the tiles. They number the squares on the design sheet and show the start and finish squares.

**Visual; Social**

**Partners**

### Mixed Up Number Book

**Materials:** card stock (full-sized and strips), markers

- Make a class big book. Each page has full-sized card stock for the top and strips of card stock for the bottom.
- Assign the numbers from 10 to 20 to individual children or pairs. Children illustrate their numbers on the top portion. Illustrations should be simple and easy to reproduce. Children write the numeral on the smaller strips.
- Bind the book (spiral) with all the illustrations in order in the top section of the book. The bottom section of the book (also spiral-bound) has all the numbers, but in mixed-up order. When reading the book, children must flip to the correct number word to match the top illustration.

**Logical; Visual**

**Independent/Partners**

### Go, Go Domino!

**Resources and Materials:** LM 19; markers or stickers

- Provide each child with blank domino cards from LM 19.
- Have each child choose a number between 10 and 20. Have children make as many domino combinations for that number as they can.
- Children draw large dots or use markers or stickers to represent their number.

*Note:* Numbers in the low teens have fewer combinations and will take less time to complete (e.g., 12 has 7 possible combinations).

*Tip:* Assign numbers less than 10 to those children needing additional practice with part-part-whole relationships.

**Logical; Visual**

**Independent/Partners**

### We Can Make “10 and ...”

**Materials:** string or masking tape, dot cards\*

- Make a large, simple, two-part mat by placing a piece of string or masking tape down the centre of a section of the classroom carpet or floor.
- Count 10 children and have them sit on one side of the mat.
- Place dot cards from 0 to 10 face down on the floor outside the mat. One child selects a card and announces the number.
- Count enough children to equal the number on the dot card and ask them to sit on the other side of the mat.
- Together count the total number of children by ones. Chant together (e.g., *10 and 5 is 15*). Have the children switch sides. Chant: *5 and 10 is 15*. Repeat with other numbers in a random order without changing the 10 side of the mat.

**Verbal; Kinesthetic**

**Whole Class**

\*See Preparing Materials, page 1.



## LESSON

## 9

# Estimate Numbers

## CURRICULUM FOCUS

Estimate numbers to 20  
1m15 (N), 1m18 (N),  
1m27 (N)

## MATH WORD WALL

estimate

## MATERIALS

counters (toothpicks, Snap Cubes, beads, buttons, paper clips), bags, red and white counters, dot cards, beans, container, optional: overhead projector

## PROGRAM RESOURCES

*Student page 36: About How Many?*

*Student page 37: I Can Estimate!*

## BEFORE Get Started

Explain to children that they are going to estimate the number of objects they see. Discuss the importance of making estimates (e.g., sometimes there are too many objects to count, sometimes you don't have time to count, estimating can help you check your counting). Explain that there is no right or wrong answer when estimating.

Scatter 14 countable objects on the overhead projector or on the floor. After two or three seconds, turn off the overhead or put a large piece of paper over the objects, and ask: "About how many objects did you see?"

Identify the least and greatest estimates, and say: "Your estimates ranged from \_\_\_\_ to \_\_\_\_."

Refer to the 14 objects and ask: "How can I arrange them so that it will be easier to decide how many there are?" (e.g., put them into groups, put in five at a time, put them in rows). Have children close their eyes while the objects are arranged into one set of 5, with the remaining 9 scattered. Give children a two- to three-second look, and repeat estimating, again identifying the range.

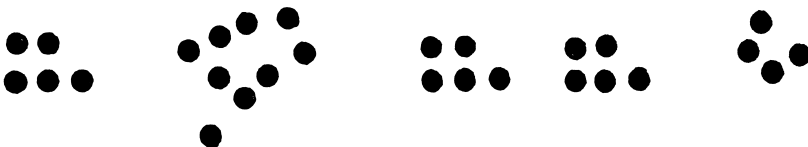
Repeat the activity, using the objects organized into two sets of 5, with the remaining 4 scattered. Have children make estimates. Again, identify the range. Have a child count the number of objects aloud. Compare the estimates with the number. Point out that the estimates are getting closer. Ask:

- Why do you think our estimates got closer to the actual number?

Uncover the objects (or turn on the overhead) and count aloud together. Repeat the activity with different numbers and different objects.

## TRY THIS

See the Literacy Links on page 46. You may want to introduce the lesson by sharing the book *Twenty, More or Less* with children.



**DURING Explore**

**TEACHING TIP**

Children need time to process the questions you ask and to consider their responses. Ensure that you provide sufficient “wait time” so that they can develop thoughtful answers. Waiting for a child to answer, rather than immediately scaffolding or calling on another child, lets children know that their thinking is important to you—that you are interested in more than getting a correct answer.

Have children work in pairs. Provide each pair with a bag of 10 counters, 5 red and 5 white. Tell children to feel the bag, look into it, spill the objects, sort them by colour, and count three times: once for red, once for white, and once for the total. Ask each pair to tell how many it has. Each pair keeps its sorted objects in front.

Give each pair a mystery bag with the same two colours of counters, but this time, children will not know the total number of counters in advance.

**Problem Prompt**

How many objects of each colour are in the bag now?

Allow children to peek into the bag and make estimates. They will make three estimates: the number of red counters, the number of white counters, and the total number. Ask:

- What might help you make your estimates? (e.g., look at the ones you counted earlier; try to see them in your head.)

Each child records the pair’s estimates on *Student page 36*. Have children spill out the counters and then count to check.

**Show and Share**




Ask children to share their estimates and the number of red and white counters. (*Note:* You may decide to record the class findings in a simple graph, but don’t divert attention from the focus on estimating.) Ask:



- What did you think about when you made your estimates?
- How close were your estimates?
- If I gave you another bag, do you think your estimates would get closer?

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

**About How Many?**

Estimate the number of cubes.  
Spill and count the cubes.

Cubes	Estimate	Count
	about _____	
	about _____	
	about _____	

There are  and  .

There are \_\_\_\_\_ cubes in all.

**FOCUS**  
Children estimate the number of red and white cubes in a bag that has 5 red and 5 white cubes. They spill the cubes, count each colour, and record the results.

**MAKE CONNECTIONS**  
Students connecting with 20–30 students, including students who have counted objects from 1 to 10. Ask: How many are there? Count to check. Repeat with a different number of objects.

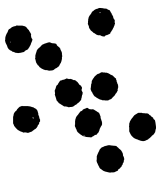
36 Unit 2: Number Relationships © Pearson Education, Inc. All rights reserved.

**AFTER** **Connect and Reflect**

Invite children to think of other estimating questions.

Explain that estimating is also a way that mathematicians check to make sure their solutions make sense. Provide a concrete example (e.g., scatter 9 objects on the floor, cover them up, and ask for estimates). Then count them aloud but make an obvious error (e.g., skipping from 6 to 17), so that you end at 19. Say: "Our estimate was \_\_\_\_\_, but I counted \_\_\_\_\_. What should I do?" (count again to check)

You may wish to think aloud to help children see you solve estimation problems. "That looks to be about 12. I can see one group of 5 and some more."



**Practice**

*Reinforcement*

Provide children with Snap Cubes and counters. Read directions and model the estimation activity on *Student page 37*. Once pages have been completed, have children share findings comparing estimates with results.

*Extra Support: Problem Solving*

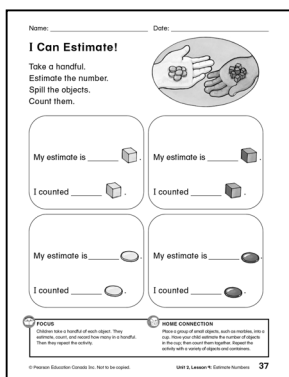
Children can work with smaller groups of objects and look for 5 or 10 when making their estimates.

Children can work in pairs flashing dot cards at each other and seeing how quickly each can correctly state the number of dots. Count to check their estimates.

*Extension*

Have children work in pairs. Each child scoops up a handful of counters from a container and puts them on a tabletop or other surface. Before counting, children estimate the number of counters they have scooped up and which child was able to hold the most counters in his or her hand.

Count to check the estimates. Organize in ten-frame configurations to compare each partner's scoop. Establish how many more one partner had than the other.





## Assessment for Learning

### What to Look For

Evidence that children

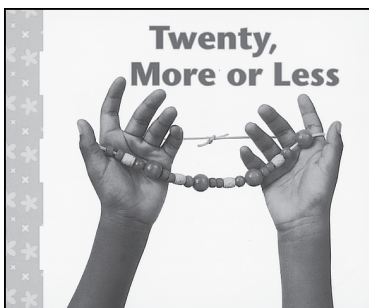
- make reasonable estimates of objects between 10 and 20
- use referents such as 5 and 10 when estimating (using known to estimate unknown)
- compare sets using more and less

*To guide observations and facilitate reporting, use Assessment Master 3.3: Ongoing Observations Checklist.*

### What to Do

- Provide additional practice with smaller sets, especially sets of “5 and some more.”
- Risk taking is an important part of estimating. Many children are afraid of being “wrong.” You can support them by thinking aloud so that they see how you solve estimation problems (e.g., “Let’s see. That looks like about 12 objects. I can see that little group is 5 and there are several more.” [Count] “There are 15—a few more than I thought. This group was bunched up and hard to see at first. My estimate of 12 was pretty good.”).
- Invite children to think aloud for you as they estimate.





## LITERACY LINKS



**Resources and Materials:** Linda Ekblad, *Twenty, More or Less*, Addison Wesley Mathematics Little Books, Early level (Addison Wesley, 2002); optional: craft materials listed in the book

Introduce the book as a “how-to book” for making a craft. Ask children to use the cover illustration to predict how the title might relate to this. Guide children in a first look at their books, noting its set-up (e.g., list of needed materials that always includes 20 items, picture of finished product, extra items). Read the book and discuss the questions, project by project. Encourage children to use group placement and colours as shapes to assist them in counting and estimating.

For page 16, lead children through the assembly process, using pages 14 and 15 as a reference, and ask:

- How many flowers can you make with these pipe cleaners?
- Will 20 petals be enough this time? Why or why not?
- How many circles will you need? How many small bits of clay? How do you know?

*Note:* Children who are experiencing difficulty counting and estimating the items may benefit from being given a plastic overlay and washable overhead pen to circle groups of 5 or 10 on the pages.

## NUMBERS EVERY DAY



Visit the cloakroom. Have the children estimate and then count the number of: hooks, coats, shoes, boots, or backpacks.

## CROSS-CURRICULAR CONNECTION

### Science

**Materials:** 15 to 20 small juice boxes, clear plastic recycling bag, sign, sentence frame

Cut the tops off juice boxes and rinse them out. Place them in a clear plastic recycling bag with a sign taped on saying, “About how many juice boxes are in this bag?” Have children ask estimating questions and record their estimates using the following frame:

- Is it more or less than \_\_\_\_?
- My estimate is \_\_\_\_ juice boxes.

Later, count the juice boxes with the class to find the exact number and then determine the closest estimate. Talk about the importance of recycling.





## Activity Bank

### Gift Bag Grab!

**Materials:** paper bags (gift bags), up to 20 counters (paper clips, Snap Cubes, straws, crayons, Pattern Blocks), paper, pencils

- Fill several paper bags with up to 20 various objects.
- Divide the class into small groups. Have one child in each group reach into a bag and remove a handful of the objects.
- Each child in the group estimates the number of objects in the handful and records the estimate.
- Each group counts the objects and compares the estimates with the results.
- Repeat this activity using another bag. Ask: "Do you think your last estimate was better than your first? Why?"

**Social; Kinesthetic**

**Small Group**

### Closer to 10 or 20?

**Materials:** yellow and green cards, counters (toothpicks, buttons, paper clips), overhead projector

- Provide each child with a yellow card and a green card. Have them print "10" on the yellow card and "20" on the green card.
- While the overhead projector is turned off, place 12 counters randomly. Turn on the overhead for about 2 to 3 seconds. Ask: "Are there closer to 10 or 20 items?" Hold up the card that shows your estimate.
- Uncover and count the objects to determine if the number is closer to 10 or to 20.
- Repeat with different numbers and objects.

**Visual; Logical**

**Whole Class**

### Our Estimating Questions

**Materials:** chart paper, markers

Ask:

- How does estimating help us in our daily lives?
- When have you heard someone estimating? (e.g., Will there be enough cookies for all of us?)
- Record the class's "Estimating Questions" onto a poster.
- Have the children collect estimating questions from home and from other adults in the school.
- Invite staff members to visit and have children interview them about real questions they ask using estimation (e.g., "Do I have enough juice boxes for the children in my class?").

**Visual; Social**

**Independent**

### Class Vote

**Materials:** two books, self-stick notes, chart paper

- Review two books you have previously read to the class.
- Give each child a self-stick note on which his or her name is recorded and then place the notes on the cover of the preferred book. Do not overlap any. Ask:
  - About how many children voted for this book? How about this one?
  - Which one is the favourite?
- Transfer the votes to a chalkboard or chart paper, in two even columns above the books themselves. Ask:
  - Which one is the favourite book? By how many?

**Visual; Verbal**

**Whole Class**



# Strategies Tool Kit

## CURRICULUM FOCUS

Use “make a model” to solve a problem

## MATERIALS

counters, blocks (red and yellow), red and yellow crayons

## PROGRAM RESOURCES

*Big Math Book, page 12:*

*How Many Apples?*

*Student page 38: How Many Apples?*

*Student page 39: What Is in the Backpack?*

## STRATEGIES TOOL KIT

Look for a pattern

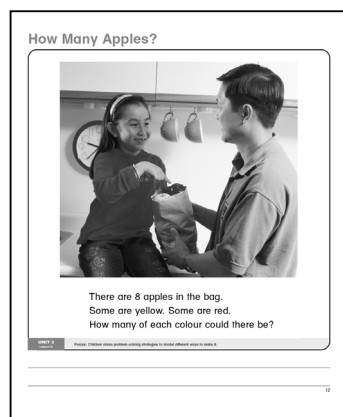
**Make a model**

Act it out

Use objects

Guess and check

Make a graph



## BEFORE Understand the Problem

Tell children that they are going to work in pairs to solve a problem about numbers. Show them *Big Math Book, page 12*.

### Problem Prompt

There are 8 apples in a bag. Some are yellow. Some are red. How many of each could there be?

Explain that children can use any materials that will help them solve the problem. Have them show their thinking in pictures, numbers, or words. Ask:

- What are you supposed to do or find out? (How many red and yellow apples?)
- Do you think there will be just one way to answer this? (We don't know. The problem didn't say *one way* and it didn't say *more than one way*.)
- What do we already know? (There are 8 apples. Some are red. Some are yellow.)
- How can we show our work? (e.g., pictures, numbers, number words, counters)

## DURING Make a Plan

Ask children to talk to a partner about ways they might be able to solve this problem. Have them share their ideas with the class. Suggest that one way would be to use objects for the different-coloured apples. Ask:

- How would your plan work? (e.g., We can use one red counter for a red apple and a yellow counter for a yellow apple.)
- How could you use the objects? (e.g., We can make 8 with 2 sets; we can use counters.)
- Would that solve the problem? (e.g., Yes, we could figure out how many red and how many yellow apples; no, we wouldn't have all the ways to make 8.)
- What else would you need to find out? (What other ways we can make 8.)
- How could you figure that out? (e.g., Start again; use a different number for the red apples; make a different arrangement for 8.)

## Carry Out the Plan


Have children work in pairs to solve the problem. Remind them that they can use any materials they want. When they are happy with

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

**How Many Apples?**

There are 8 apples in a bag.  
Some are yellow. Some are red.  
How many of each could there be?

Show your thinking in pictures, numbers, or words.



**FOCUS** Children figure out possible combinations of eight red and yellow apples. They explain the solutions using pictures, numbers, or words.

**HOME CONNECTION** When problem solving, your child may discover there are more than one answer. Ask your child to explain how he or she solved the problem.

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**TEACHING TIP**


Post the different problem-solving strategies children acquire throughout the year in the classroom.

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

**What Is in the Backpack?**

There are 7 things in the backpack.  
Some are books. Some are snacks.  
How many could be books? \_\_\_\_\_  
How many could be snacks? \_\_\_\_\_

Show your thinking in pictures, numbers, or words.



**FOCUS** Children figure out possible combinations of 7 books and snacks. They explain their solutions using pictures, numbers, or words.

**HOME CONNECTION** Use your child's work of books and snacks. Ask: How did you use your objects to find the answer to the backpack problem? Have you found other solutions?

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their solution or answer, they can show their thinking on *Student page 38*, using pictures, numbers, or words. Scribe for children as required.

**AFTER Look Back**

- Bring the children together to tell about their thinking. Ask:
- What ideas did you have about how to solve the problem?
  - Did you and your partner do the same thing?
  - What did you find out about the number of red and yellow apples?
  - Who had a different answer?
  - Who had more than one answer?
  - Does anyone think they have all possible answers? (If yes, how do you know?)
  - What other ways could you have solved this problem? (e.g., drawn pictures, estimated, figured it out in my head)

Explain that mathematicians are problem solvers. They know many different ways to solve problems. You may wish to have children complete *Generic Assessment Master 1: I Am a Problem Solver* and add it to their portfolios.

**Practice**

*Reinforcement*

Have children complete another similar problem on *Student page 39*.

*Extra Support: Problem Solving*

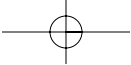
Repeat the problem-solving activity independently, or in a small, guided group with the teacher.

*Extension*

Ask pairs of children to create their own “how many of each” problems. Have them exchange problems with another partner and work out the solution.

**Assessment for Learning**

What to Look For	What to Do
<p>Evidence that children</p> <ul style="list-style-type: none"> <li>▪ use 8 objects to model apples</li> <li>▪ build 2 sets</li> <li>▪ create more than one solution</li> <li>▪ explain their solution and can model it for others</li> <li>▪ self-correct as needed</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><i>To guide observations and facilitate reporting, use GAM 2: Inquiry Process Rubric or GAM 3: Inquiry Process Checklist.</i></p> </div>	<p>Most children will be able to find more than one solution (e.g., often the double, 4 and 4, and one other) to this problem. Exposing children to the solutions of others allows them to consider more possibilities.</p> <p>It is helpful to repeat this problem in many contexts and with varying numbers. Using literature as a starting point can help to make the problem more meaningful and engaging (e.g., Little Red Riding Hood had cookies and cakes in her basket. There were 5 things in her basket. How many ...?)</p>



LESSON

11

# Show What You Know

**FOCUS**

Demonstrate what has been learned

**MATERIALS**

numeral cards, number word cards, dot cards, five-frames, ten-frames, counters, Snap Cubes, two-part mat, calculator

**PROGRAM RESOURCES**

*Student page 40: Show What You Know about 12*  
*Student page 41: 12! 12! 12!*  
*Student page 42: My Journal*

**BEFORE Get Started**

Review with children the different objects and materials they used to build numbers and solve problems (e.g., five-frame, ten-frame, two-part mat for “10 and ...” dot cards, counters, Snap Cubes, calculators). Ask:

- How did we use each of these things?
- How did they help us learn and think?

Tell children they are going to join you on a trip to the wonderful world of 12. Explain that in the “world of 12,” 12 is everywhere you look! Ask: “What are some of the different ways we might see 12?” (e.g., words, numerals, number stories, objects, designs)

**TRY THIS**

Have children create a “world of 12” in the classroom before beginning the performance task. Explain that in this world, 12 is everywhere you look, but it is represented in many different ways (e.g., words, numerals, number stories, objects, designs).

**DURING Explore**

*Part 1: Partners*

Children work in pairs to build 12 in at least two different ways. Their representations might include counters and a ten-frame, a design with two sets of counters or objects (some children may want to use more than two sets), any manipulatives or materials in the classroom (could include people).

Encourage children to build 12 in original ways.

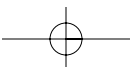
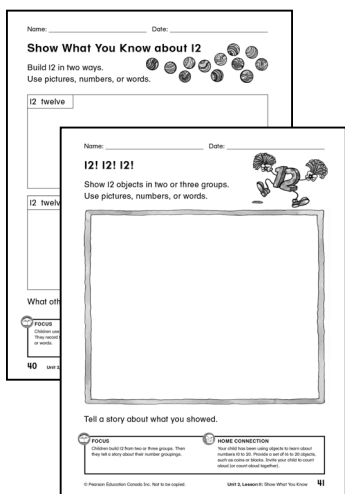
Children use pictures, numbers, or words to record their thinking on *Student page 40*. As children complete this task, ask them to tell about their thinking.

*Note:* Choose a smaller number for children having difficulty, or have them work in a small group. Provide assistance when needed.

*Part 2: Individual*

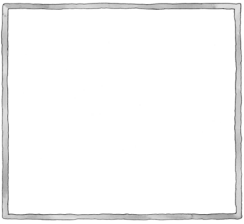
Children work individually to build another arrangement for 12, using two sets of objects. Have them choose the materials, or provide materials such as counters or Snap Cubes.

- They build 12 by making two or three groups.
- They record their arrangement for 12 on *Student page 41* using pictures, numerals, or words.
- Ask each child to think of a story about their arrangement that they can tell to the class.



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

**My Journal**  
Tell what you learned about numbers.  
Use pictures, numbers, or words.



**PRICE**  
Children who can tell about what they learned about number relationships.

**HOME CONNECTION**  
Have your child draw a picture about what you learned? What do you want to practice?

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### Show and Share

As children complete the task, ask:

- Tell me about your thinking. How did you decide to build 12 that way?
- What ways did a lot of people use (build the same way)?
- What ways were different? How are they different?

Have children share their designs and tell their number stories.

### AFTER Connect and Reflect

Ask: “What do you know about 12?” Make a collaborative list of everything the class knows about 12 (e.g., 10 and 2, one more than 11, 2 less than 14, 5 and 7, 4 and 8).

Prompt children to think about 12 outside of school. Ask:

- What else do you know that is 12? (e.g., sister’s age, eggs come in a carton of 12, donuts come in a box of 12)

Have children complete *Student page 42*. Some children may need the help of a scribe.

### Take It Further Games

Have children work in pairs or small groups making a game whose object is to reach “12.” Provide materials (e.g., number cubes, dot cards, counters). Children may have difficulty getting started and may have to be reminded of other games they have played (see *Counting to Zero*, page 17).

### Assessment Check

Look for evidence that children

- Find several ways to represent 12 using concrete objects.
- Show understanding of conservation of number (recognize that sets arranged in various ways could all equal 12).
- Tell a number story that shows an understanding that numbers can be built from combinations of smaller numbers (part-part-whole).
- Correctly represent 12 with 12 objects (1:1 correspondence).
- Print numerals to 20 and number words to ten correctly.
- Explain their thinking clearly, using appropriate language (e.g., *more*, *less*, *set*, *number*).

Refer to Assessment Master 4: Performance Task Rubric and Assessment Master 6: Unit Summary.

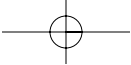
# Evaluating Student Learning: Preparing to Report

This unit provides an opportunity to report on the **Number Sense and Numeration** strand. *Assessment Master 6: Unit Summary* provides a comprehensive format for recording and summarizing evidence teachers may have collected.

Here is one example of a completed summary chart for this Unit:

Strand: <b>NUMBER SENSE AND NUMERATION</b>	Most Consistent Level of Achievement				OVERALL
	Concepts	Procedures	Problem solving	Communication	
<b>Ongoing observations</b>	4	3	3	3	3
<b>Strategies Tool Kit</b> (Lesson 10)	-	-	3	-	3
<b>Portfolio or work samples; conferences</b>	3	2	3	3	3
<b>Performance task</b> (Lesson 11)	3	2	3	3	3
<b>Achievement Level for reporting on this strand</b>					<b>3</b>





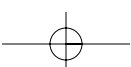
Recording	How to Report
<b>Ongoing observations for each cluster</b>	Teachers who have used <i>AM 3</i> , <i>AM 3.2</i> and <i>AM 3.3: Ongoing Observations Checklist</i> can determine the most consistent level achieved in each cluster and enter it in the chart. Teachers can choose whether to summarize information by achievement category, or simply enter an overall level.
<b>Performance on problem-solving tasks</b>	Teachers who used <i>GAM 2: Inquiry Process Rubric</i> or <i>GAM 3: Inquiry Process Checklist</i> with <i>Strategies Tool Kit</i> (Lesson 10) can transfer the results to the summary form. Teachers may choose to enter a level only in the Problem-solving column (and, perhaps, Communication).
<b>Portfolio or work samples; conferences</b>	This is the longest unit in the book. Work that was completed near the end of the unit should be weighted more heavily than that done earlier in the unit. Teachers may guide their decision making by using <i>AM 5: Number Relationships Rubric</i> .
<b>Performance task</b>	Because this occurs at the end of the unit (Lesson 11), it should offer a useful snapshot of children's achievement. Use <i>AM 4: Performance Task Rubric</i> .
<b>Children's self-assessment</b>	Opportunities to quote a child's oral or written words about their own progress may come from conferences, in-class discussions, journals, or other written reflections. For example: "I am very good at counting." "I like making groups of 10." "I am good at showing big numbers like 19."

**Learning Skills**

Ongoing throughout a reporting period, rather than being broken down by units or strands. Use *GAM 6: Learning Skills Record* and *GAM 7: Learning Skills Checklist*.

**Ongoing Records**

Record evaluations of children's achievement over several clusters, a reporting period, or a school year. Use *GAM 14: Summary Class Record: Strands*; *GAM 15: Summary Class Record: Achievement Categories*; and *GAM 16: Summary Record: Individual*.





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

**Assessment Master 2****Diagnostic Conference  
for Selected Children**

This outline is intended for use with children whose progress is a concern at the midway point of the unit (e.g., Lesson 5). It can be used with an individual child or a small group of children who appear to be having difficulty with basic concepts and procedures.

CATEGORIES	OBSERVATIONS AND COMMENTS
<p><b>Understanding of concepts</b> Give each child 5 to 9 blocks or cubes or other objects in two clearly different sizes. The number of small blocks should be equal to or greater than the number of larger blocks (e.g., 4 small ones; 3 big ones). Ask:</p> <ul style="list-style-type: none"> <li>• <i>About how many blocks do you think you have?</i></li> <li>• <i>Now count them for me. How many are there all together?</i></li> <li>• <i>Put the bigger ones on one side and the smaller ones on the other. Which has more?</i></li> <li>• <i>Use your blocks to build a design for [a number smaller than the total number of blocks]. Use some big ones and some small ones. Tell me about your design.</i></li> </ul> <p>Notice the child's confidence and ability to</p> <ul style="list-style-type: none"> <li>• make a reasonable estimate</li> <li>• use 1:1 correspondence to count the blocks</li> <li>• recognize that the size of the blocks does not affect which set has more (conservation)</li> <li>• recognize that moving the blocks does not change the number (conservation)</li> <li>• recognize that they can build a number from smaller numbers</li> </ul>	
<p><b>Problem solving</b> Say:</p> <ul style="list-style-type: none"> <li>• <i>Let's look at your number design again. Could you make this same number with a different design? You can use some of the other blocks if you want.</i></li> </ul> <p>Notice the child's confidence and ability to</p> <ul style="list-style-type: none"> <li>• attempt to generate another design or configuration for the same number.</li> </ul>	
<p><b>Application of procedures</b> Ask each child to count his or her blocks again. If he or she is able to count forwards with few errors, say:</p> <ul style="list-style-type: none"> <li>• <i>This time, count them again and when you get to the highest number, count back down to 0. Like this: 1-2-3-3-2-1.</i></li> </ul> <p>Notice the child's confidence and ability to</p> <ul style="list-style-type: none"> <li>• know which numbers follow in sequence forwards</li> <li>• know which numbers follow in sequence backwards</li> </ul>	
<p><b>Communication</b> Say:</p> <ul style="list-style-type: none"> <li>• <i>You did a lot of work and thinking about numbers today. Tell me all the things you did with the blocks.</i></li> </ul> <p>Notice the child's confidence and ability to</p> <ul style="list-style-type: none"> <li>• use number words to 10 orally</li> <li>• use appropriate language (e.g., more, less, number)</li> </ul>	







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

## Assessment Master 4 Performance Task Rubric

Knowledge/Skills	Level 1	Level 2	Level 3	Level 4
<b>Problem solving</b> <ul style="list-style-type: none"> <li>finds several ways to represent 12 using concrete objects</li> </ul>	<input type="checkbox"/> needs one-to-one guidance to build 12 in more than one way	<input type="checkbox"/> with limited prompting, builds 12 in three ways	<input type="checkbox"/> independently builds 12 in three ways	<input type="checkbox"/> independently builds 12 in three ways; may use a more complex or innovative way (e.g., uses 3 sets)
<b>Understanding of concepts</b> <ul style="list-style-type: none"> <li>shows understanding of conservation of number</li> </ul>	<input type="checkbox"/> with assistance, recognizes that the same sets or objects, arranged in two ways, can both equal 12	<input type="checkbox"/> with limited assistance, recognizes that the same sets or objects, arranged in two ways, can both equal 12	<input type="checkbox"/> independently recognizes that the same sets or objects, arranged in various ways, can all equal 12	<input type="checkbox"/> independently and confidently recognizes that the same sets or objects, arranged in various ways, can all equal 12
<ul style="list-style-type: none"> <li>tells a number story that shows understanding that numbers can be built from combinations of smaller numbers (part-part-whole)</li> </ul>	<input type="checkbox"/> tells a number story that shows very limited understanding of part-part-whole relationships	<input type="checkbox"/> tells a number story that shows limited understanding of part-part-whole relationships	<input type="checkbox"/> tells a number story that shows understanding of part-part-whole relationships	<input type="checkbox"/> tells number stories that show in-depth understanding of part-part-whole concepts in various contexts
<b>Application of procedures</b> <ul style="list-style-type: none"> <li>uses 1:1 correspondence</li> </ul>	<input type="checkbox"/> needs assistance to represent 12 with 12 objects	<input type="checkbox"/> with limited assistance, represents 12 with 12 objects	<input type="checkbox"/> represents 12 with 12 objects	<input type="checkbox"/> represents 12 with 12 objects with ease
<ul style="list-style-type: none"> <li>records numerals to 20 and number words to 10 correctly</li> </ul>	<input type="checkbox"/> records numerals to 20 and number words to 10 with major errors	<input type="checkbox"/> records numerals to 20 and number words to 10 with several minor errors	<input type="checkbox"/> records numerals to 20 and number words to 10 with few minor errors	<input type="checkbox"/> records numerals to 20 and number words to 10 with practically no errors
<b>Communication</b> <ul style="list-style-type: none"> <li>uses appropriate language (e.g., more, less, number)</li> </ul>	<input type="checkbox"/> uses limited appropriate language	<input type="checkbox"/> uses some appropriate language	<input type="checkbox"/> uses considerable appropriate language	<input type="checkbox"/> uses appropriate language

Unit 2: Number Relationships

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

## Assessment Master 5 **Number Relationships Rubric**

This rubric can be used to assess and summarize children’s achievement of the expectations associated with this unit.

Knowledge/Skills	Level 1	Level 2	Level 3	Level 4
<p><b>Problem solving</b></p> <ul style="list-style-type: none"> <li>uses appropriate strategies to solve simple problems involving numbers and their relationships</li> </ul>	<ul style="list-style-type: none"> <li>needs assistance to attempt problems that involve:                             <ul style="list-style-type: none"> <li>estimating quantity and counting</li> <li>building the same number in different ways</li> <li>joining and separating</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>with limited assistance, uses an appropriate strategy to solve problems that involve:                             <ul style="list-style-type: none"> <li>estimating quantity and counting</li> <li>building the same number in different ways</li> <li>joining and separating</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>uses appropriate strategies to solve problems that involve:                             <ul style="list-style-type: none"> <li>estimating quantity and counting</li> <li>building the same number in different ways</li> <li>joining and separating</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>uses appropriate, often innovative, strategies to solve problems that involve:                             <ul style="list-style-type: none"> <li>estimating quantity and counting</li> <li>building the same number in different ways</li> <li>joining and separating</li> </ul> </li> </ul>
<p><b>Understanding of concepts</b></p> <ul style="list-style-type: none"> <li>shows understanding of number concepts by demonstrating with concrete objects, explaining orally, telling number stories, and/or recording in pictures, numbers, or words</li> </ul>	<ul style="list-style-type: none"> <li>with assistance, shows very limited understanding of:                             <ul style="list-style-type: none"> <li>one-to-one correspondence</li> <li>conservation</li> <li>more and less relationships</li> <li>part-part-whole relationships</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>shows partial understanding of:                             <ul style="list-style-type: none"> <li>one-to-one correspondence</li> <li>conservation</li> <li>more and less relationships</li> <li>part-part-whole relationships</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>shows understanding of:                             <ul style="list-style-type: none"> <li>one-to-one correspondence</li> <li>conservation</li> <li>more and less relationships</li> <li>part-part-whole relationships</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>shows in-depth understanding, in a variety of contexts, of:                             <ul style="list-style-type: none"> <li>one-to-one correspondence</li> <li>conservation</li> <li>more and less relationships</li> <li>part-part-whole relationships</li> </ul> </li> </ul>
<p><b>Application of procedures</b></p> <ul style="list-style-type: none"> <li>accurately counts objects; reads and prints numerals to 20 and number words to ten; compares and orders quantities to 20 using objects and drawings</li> </ul>	<ul style="list-style-type: none"> <li>needs assistance</li> <li>major errors/ omissions in:                             <ul style="list-style-type: none"> <li>counting to 20 by 1’s</li> <li>counting backwards from 10</li> <li>reading, printing numerals to 20</li> <li>reading and printing number words to ten</li> <li>identifying 1 or 2 more or less</li> <li>using a five- or ten-frame</li> <li>comparing sets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>needs limited assistance</li> <li>minor errors/ omissions in:                             <ul style="list-style-type: none"> <li>counting to 20 by 1’s</li> <li>counting backwards from 10</li> <li>reading, printing numerals to 20</li> <li>reading and printing number words to ten</li> <li>identifying 1 or 2 more or less</li> <li>using a five- or ten-frame</li> <li>comparing sets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>independently (may need some guidance)</li> <li>few errors/ omissions in:                             <ul style="list-style-type: none"> <li>counting to 20 by 1’s</li> <li>counting backwards from 10</li> <li>reading, printing numerals to 20</li> <li>reading and printing number words to ten</li> <li>identifying 1 or 2 more or less</li> <li>using a five- or ten-frame</li> <li>comparing sets</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>independently (may need limited guidance)</li> <li>very few or no errors/omissions in:                             <ul style="list-style-type: none"> <li>counting to 20 by 1’s</li> <li>counting backwards from 10</li> <li>reading, printing numerals to 20</li> <li>reading and printing number words to ten</li> <li>identifying 1 or 2 more or less</li> <li>using a five- or ten-frame</li> <li>comparing sets</li> </ul> </li> </ul>
<p><b>Communication</b></p> <ul style="list-style-type: none"> <li>uses appropriate language (e.g., more, less, numbers)</li> </ul>	<ul style="list-style-type: none"> <li>rarely uses appropriate language; unclear and imprecise</li> </ul>	<ul style="list-style-type: none"> <li>sometimes uses appropriate language; somewhat clear and precise</li> </ul>	<ul style="list-style-type: none"> <li>usually uses appropriate language; generally clear and precise</li> </ul>	<ul style="list-style-type: none"> <li>confidently uses appropriate language; clear and precise</li> </ul>



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

## Assessment Master 6 Unit Summary

Note that some cells may be blank. Also, you may prefer entering only *Overall* achievement in each row, rather than identifying a specific level for each category of achievement.



Strand: <b>NUMBER SENSE AND NUMERATION</b>	Most Consistent Level of Achievement*				
	Concepts	Procedures	Problem Solving	Communication	OVERALL
<b>Ongoing observations:</b>					
<b>Strategies Tool Kit</b> (Lesson 10)					
<b>Portfolio or work samples; conferences</b>					
<b>Performance task</b> (Lesson 11)					
<b>Achievement Level for reporting on this strand</b>					

\*Use Ontario Achievement Levels R, 1, 2, 3, 4.

**Self-assessment:**

**Strengths:**

**Needs:**

**Next steps:**

## Unit 2: Number Relationships

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

## Line Master I

**Number Relationships**

Unit 1: Sorting and Patterning
Unit 2: Number Relationships
Unit 3: Time, Temperature, and Money
Unit 4: Addition and Subtraction to 12
Unit 5: Data Management and Probability
Unit 6: 3-D and 2-D Geometry
Unit 7: Number Patterns
Unit 8: Linear Measurement and Area
Unit 9: Relating 2-D Figures and 3-D Objects
Unit 10: Place Value and Number Applications
Unit 11: Mass and Capacity

We're learning about numbers!



We can count.

We are learning to make estimates.

We are learning about *more* and *less*.

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

Line Master 2

## Dear Family

Your child is learning about number relationships. Your child can practise these concepts at home by doing the following activities.

Play “I Spy,” giving the number as a clue: “I spy, with my little eye, something that has 4 legs.” Your child might guess “table” or “chair.” Switch roles.

*Using small objects, ask your child to show you the numbers from 1 to 10.*

Your child is using “10 and ...” to represent numbers from 11 to 20. Count out 14 small objects. Ask your child to put 10 to one side; then count what is left: “14 is 10 and 4.”

Practise estimating, using 12 to 13 small, scattered objects (not in rows or groups). Ask: “Are these objects closer to 5 or 10? About how many are there? Count the number to check. Choose a different number of objects and repeat the activity.”

Gather 20 counters (bread tags, spools of thread). Show a group of counters to your child. This group should have between 10 and 18 objects. Ask: “How many? What is two more? What is two less?”

Unit 2: Number Relationships

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

Line Master 3

# Numeral Cards 0 to 20

0	1	2	3	
4	5	6	7	
8	9	10	11	
12	13	14	15	
16	17	18	19	20

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

Line Master 4

## Number Word Cards Zero to Ten

zero

six

one

seven

two

eight

three

nine

four


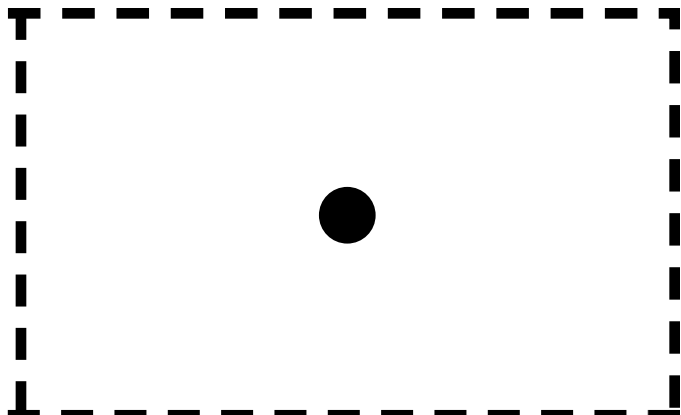
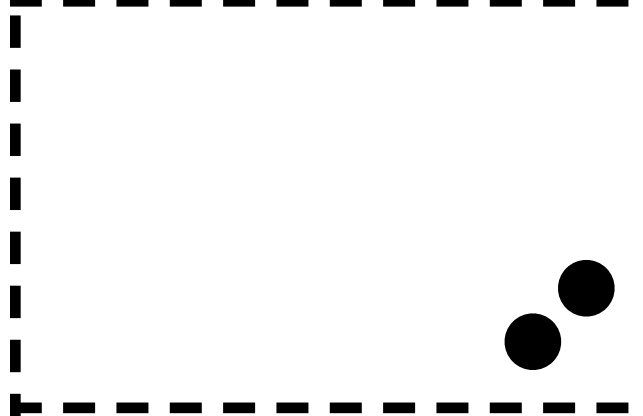
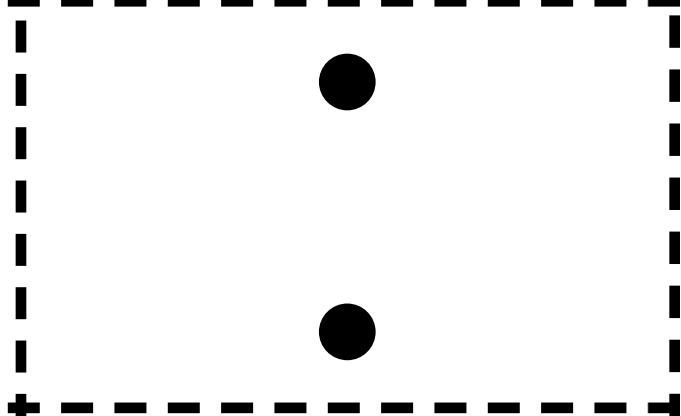
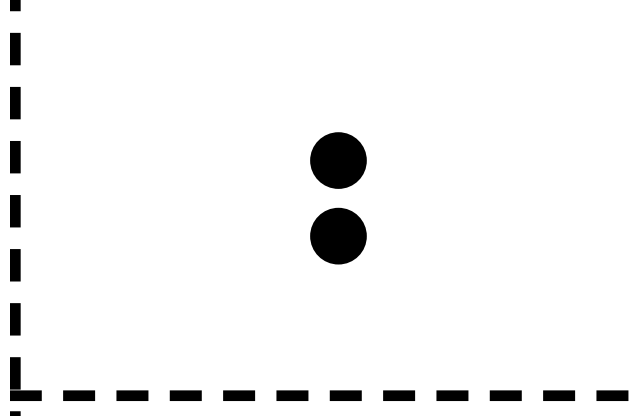
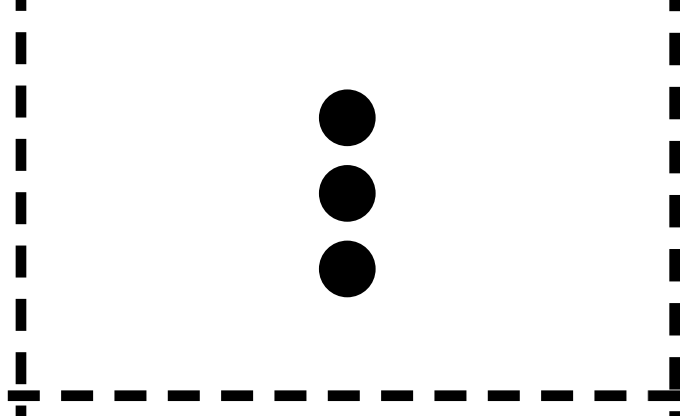
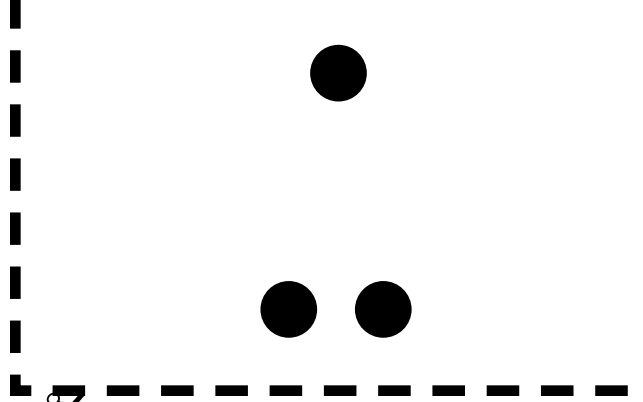
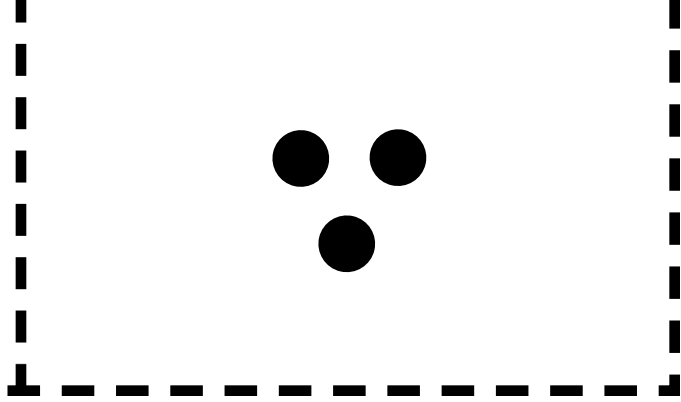
ten

five

Unit 2: Number Relationships

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

**Line Master 5** **Dot Cards**

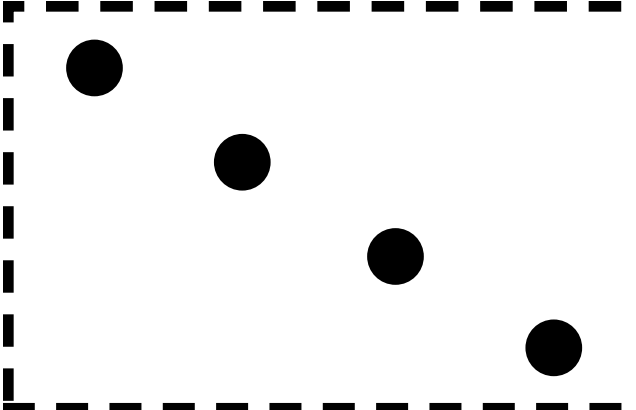
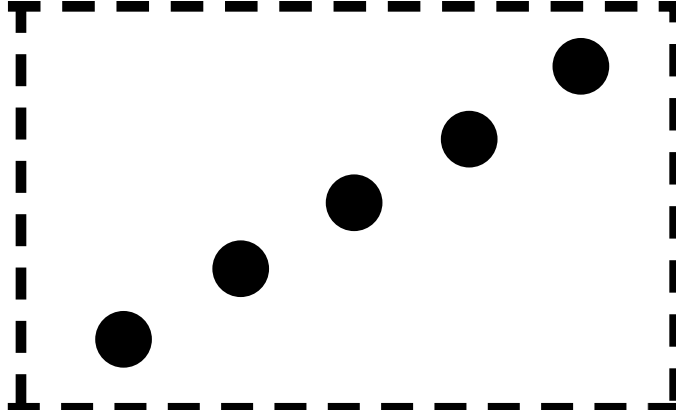
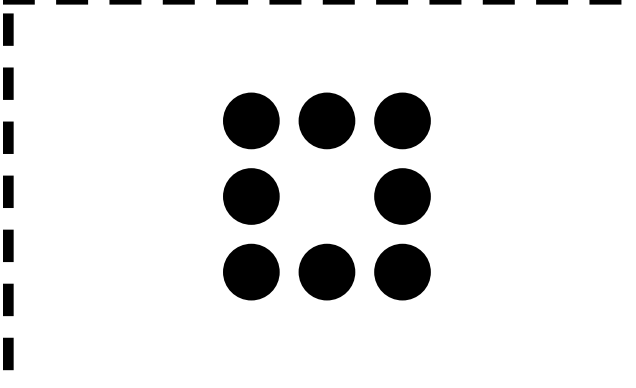
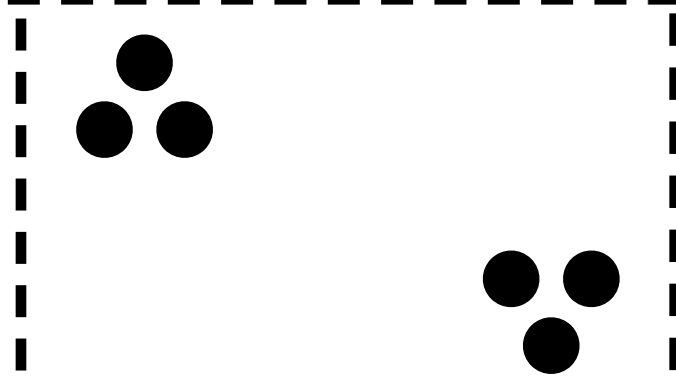
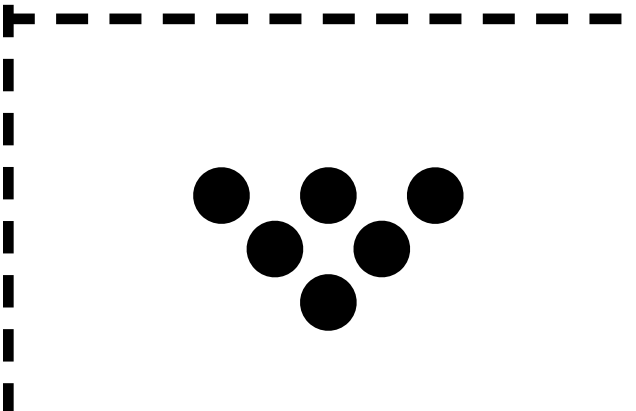
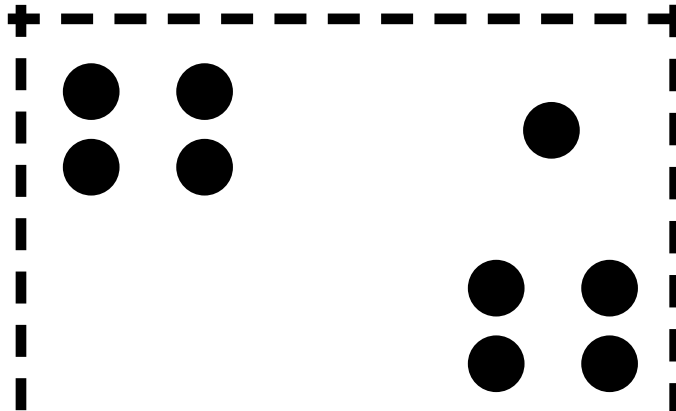
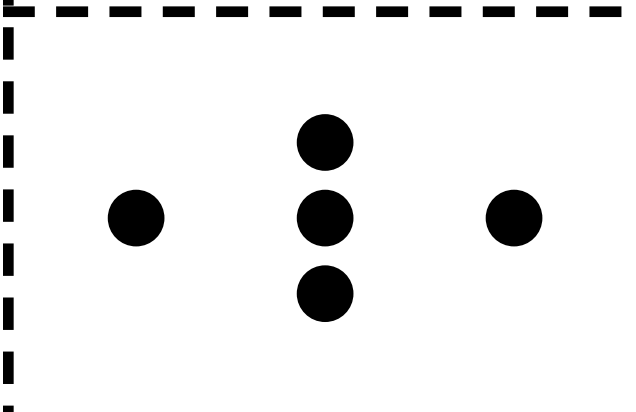
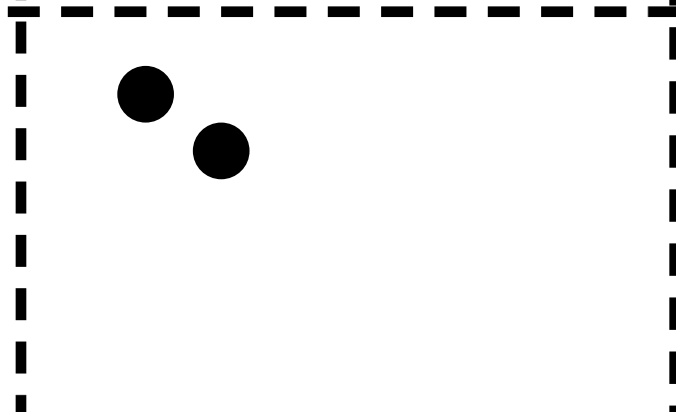
	
	
	
	



Name: \_\_\_\_\_ Date: \_\_\_\_\_

Line Master 6

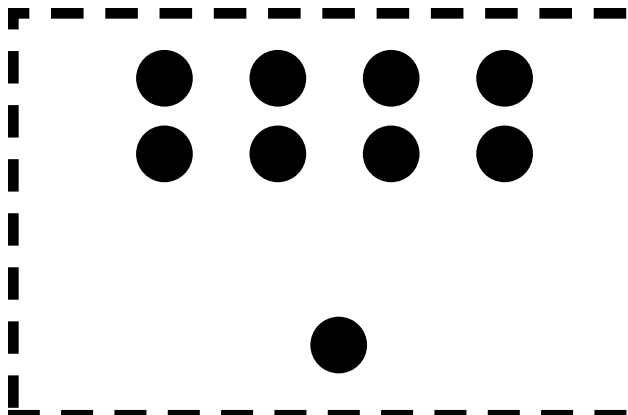
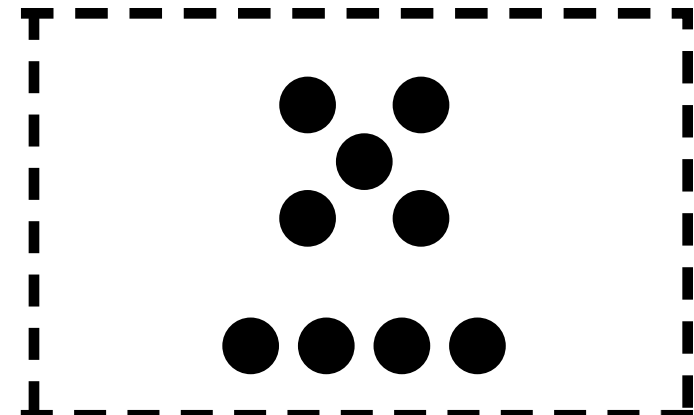
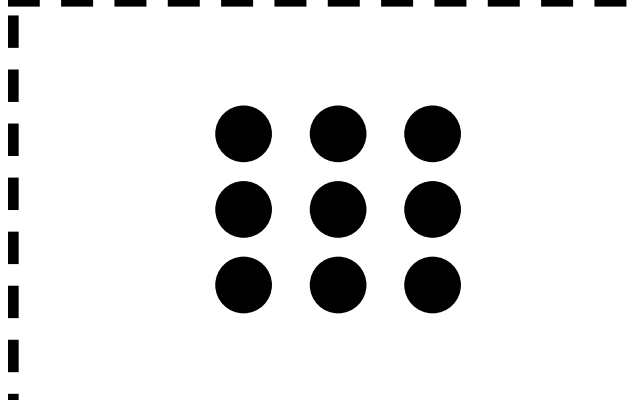
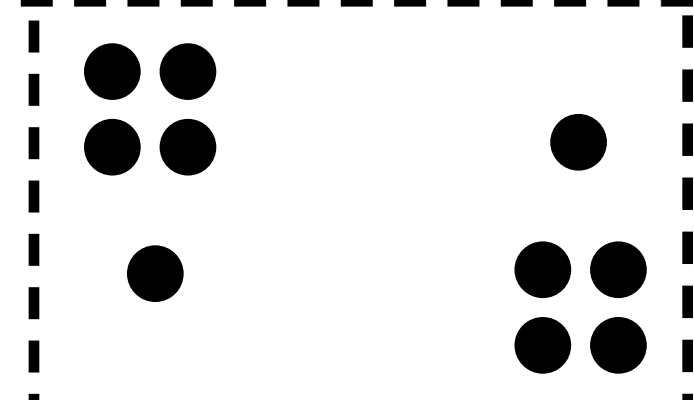
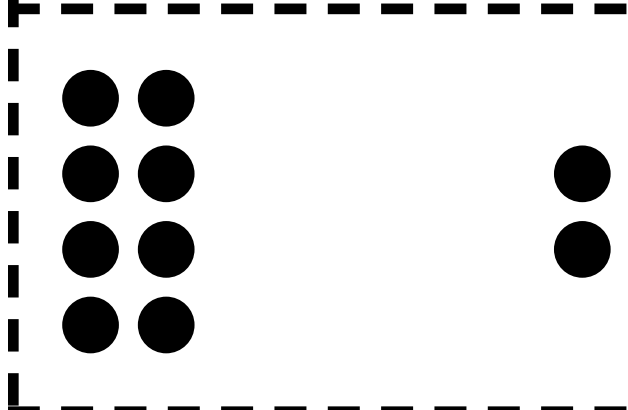
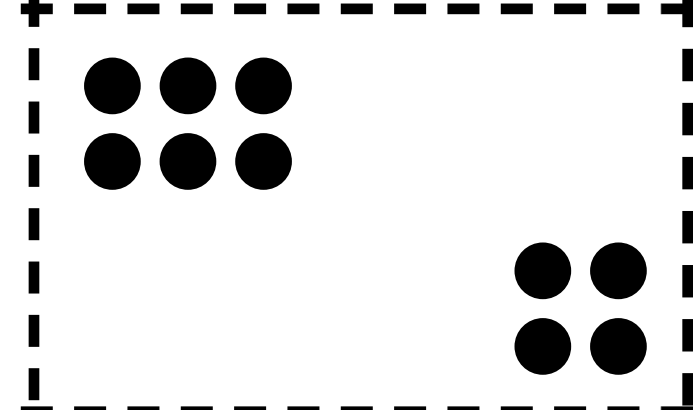
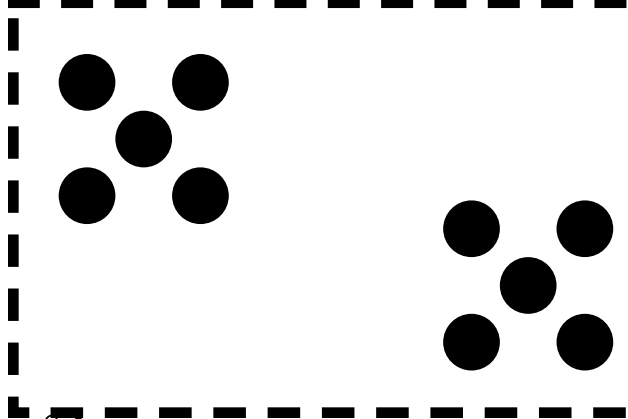
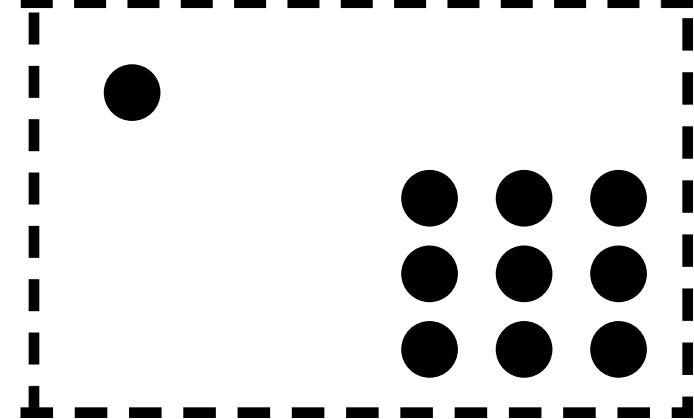
# Dot Cards

Unit 2: Number Relationships

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

**Line Master 7** **Dot Cards**



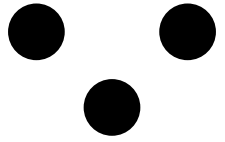
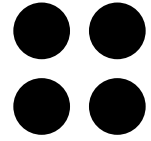
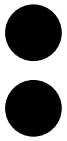
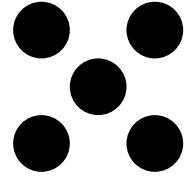

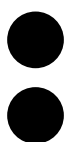

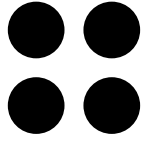
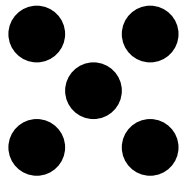
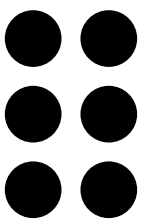

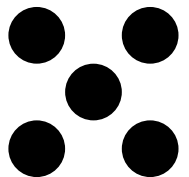




Name: \_\_\_\_\_ Date: \_\_\_\_\_

Line Master 8




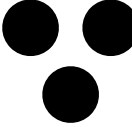

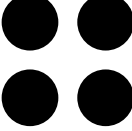

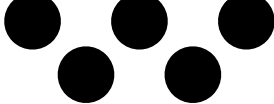

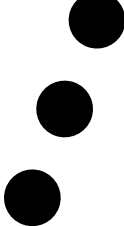
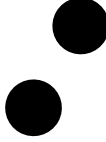
# Dot Cards

Unit 2: Number Relationships

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

Line Master 9 **Dot Cards**

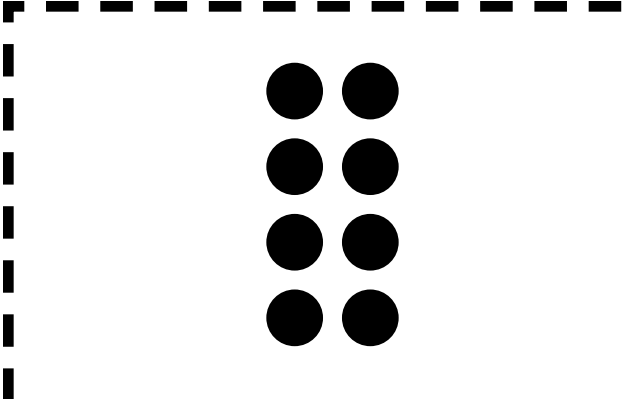
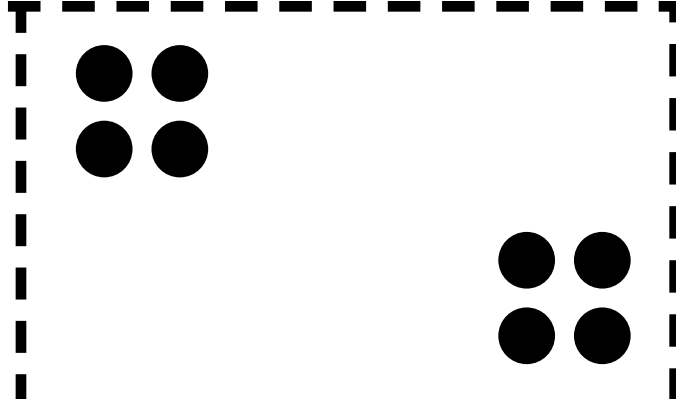
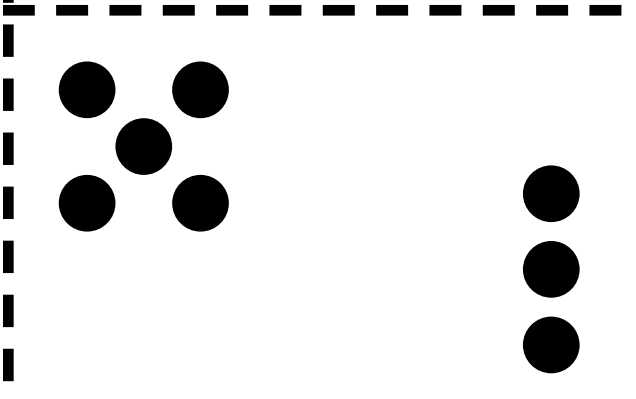
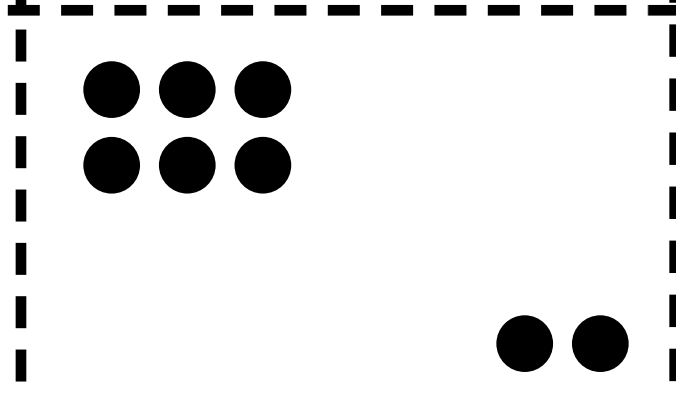
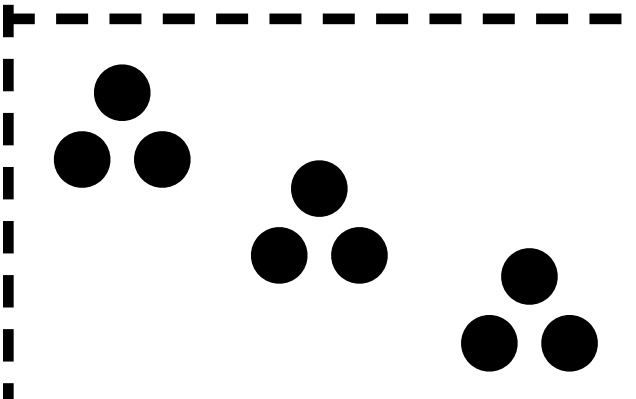
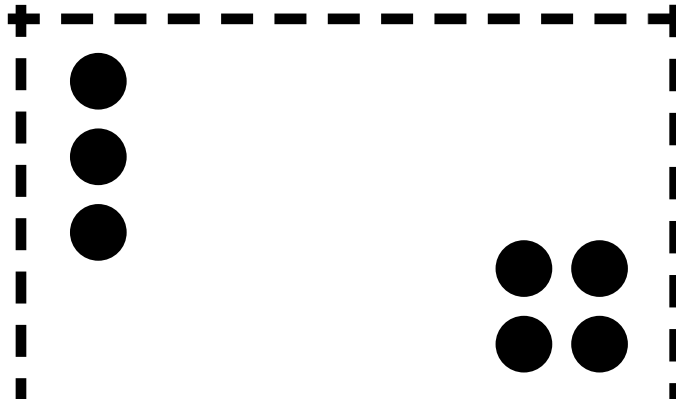
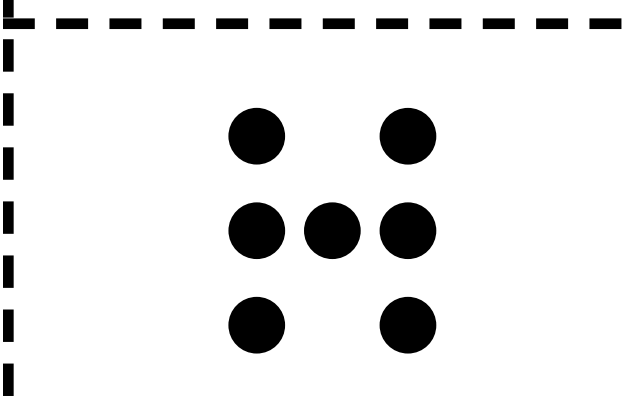
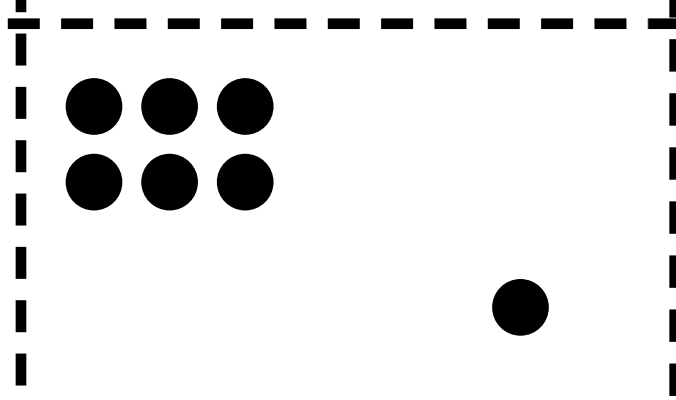
	
	
	
	
	
	

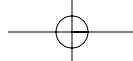


Name: \_\_\_\_\_ Date: \_\_\_\_\_

Line Master 10

# Dot Cards

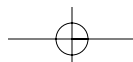
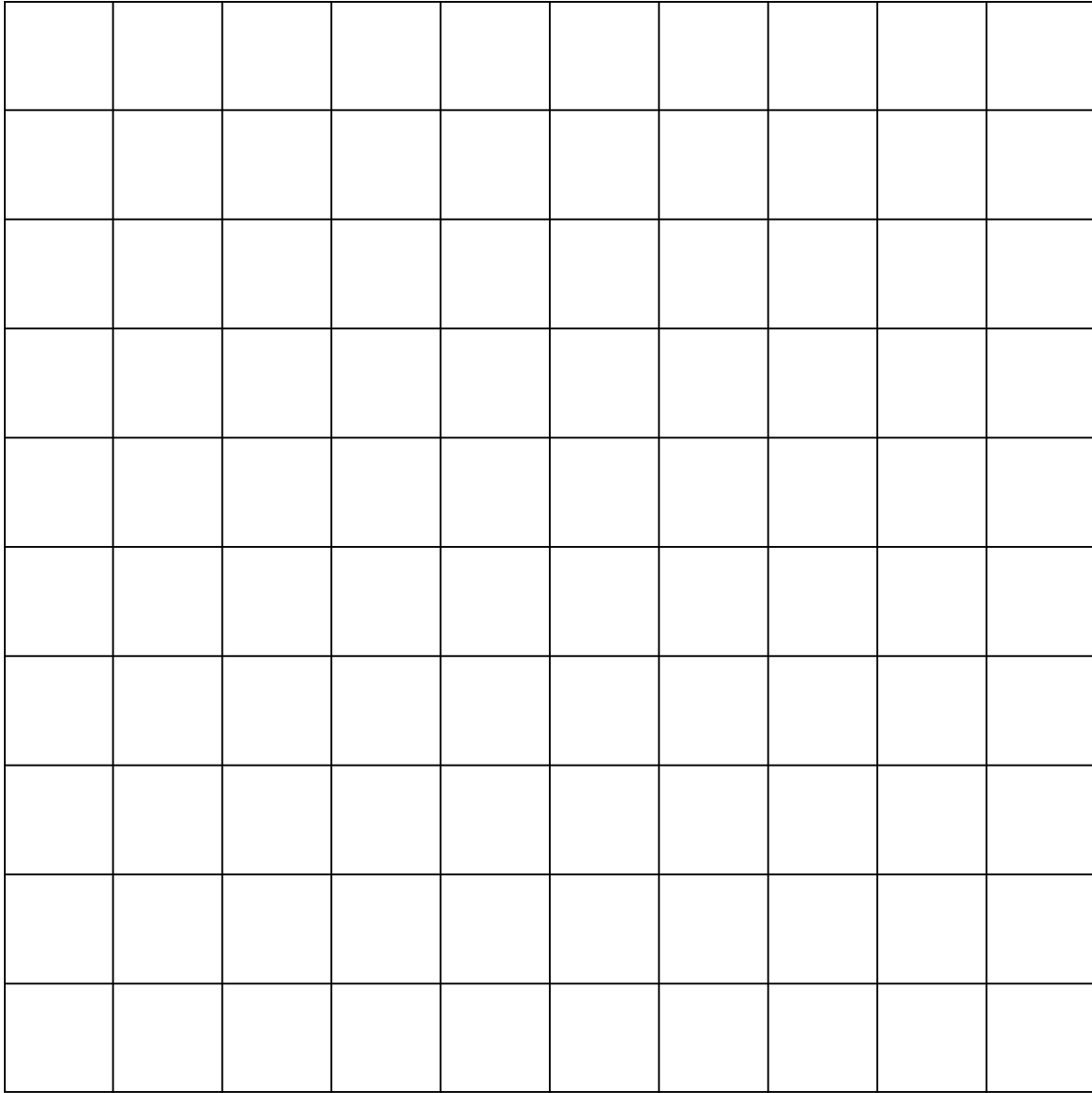


**Unit 2:** Number Relationships

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

**Line Master II**

# Grid Paper



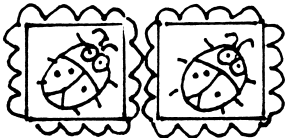
Name: \_\_\_\_\_ Date: \_\_\_\_\_

Line Master I2

# Numbers to 5

How many? Print the numerals.

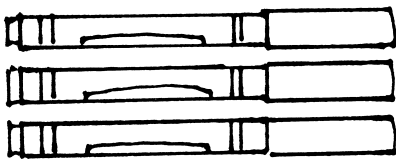
Numerals



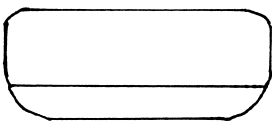
\_\_\_\_\_



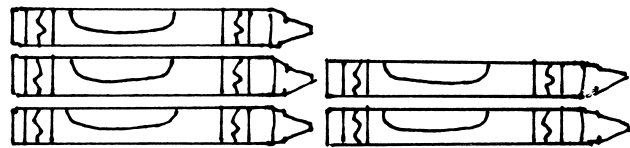
\_\_\_\_\_



\_\_\_\_\_



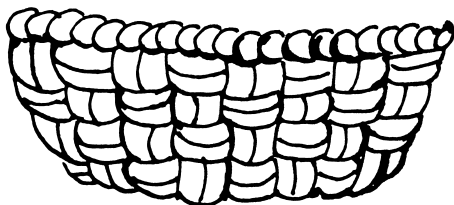
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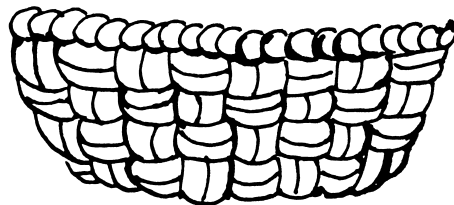
\_\_\_\_\_

Draw apples in each basket.

5



3



Unit 2: Number Relationships

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

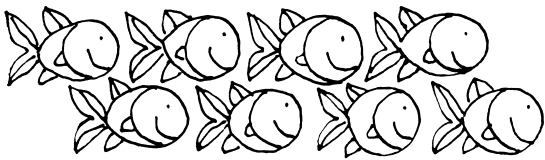
**Line Master I3** **Numbers 6 to 10**

How many? Print the numerals.

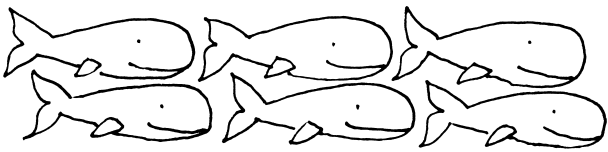
Numerals



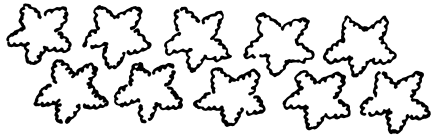
\_\_\_\_\_



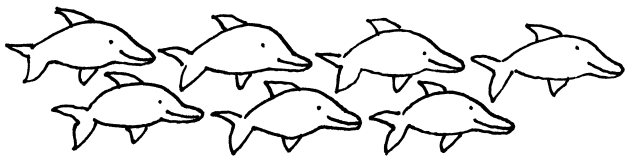
\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_



\_\_\_\_\_

Draw fish in the sea.

<p>9</p>	<p>6</p>
----------	----------

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

Line Master 14

# Numbers 0 to 2

<p>My Number Book</p>	<p>0</p> <p>zero zero</p>
<p>1</p> <p>one one</p>	<p>2</p> <p>two two</p>

Unit 2: Number Relationships

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

Line Master 15

# Numbers 3 to 6

3

4

three three

four four

5

6

five five

six six



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

Line Master 16

# Numbers 7 to 10

7

8

seven seven

eight

eight

9

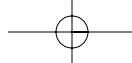
10

nine

nine

ten

ten

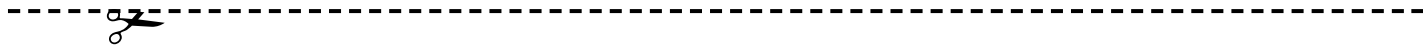


Unit 2: Number Relationships

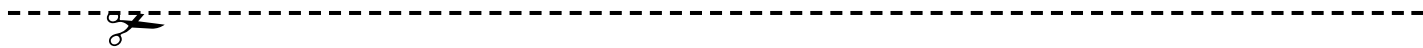
Name: \_\_\_\_\_ Date: \_\_\_\_\_

Line Master 17 **Five-Frame**

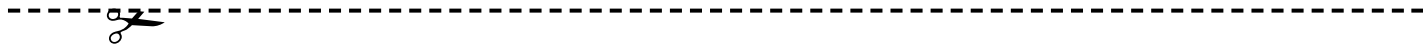
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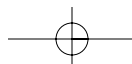
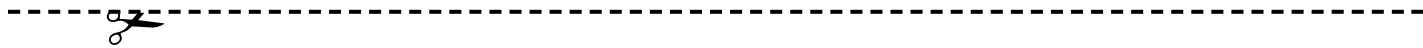
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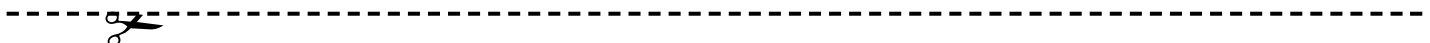
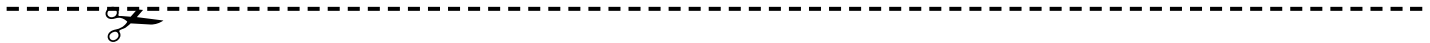
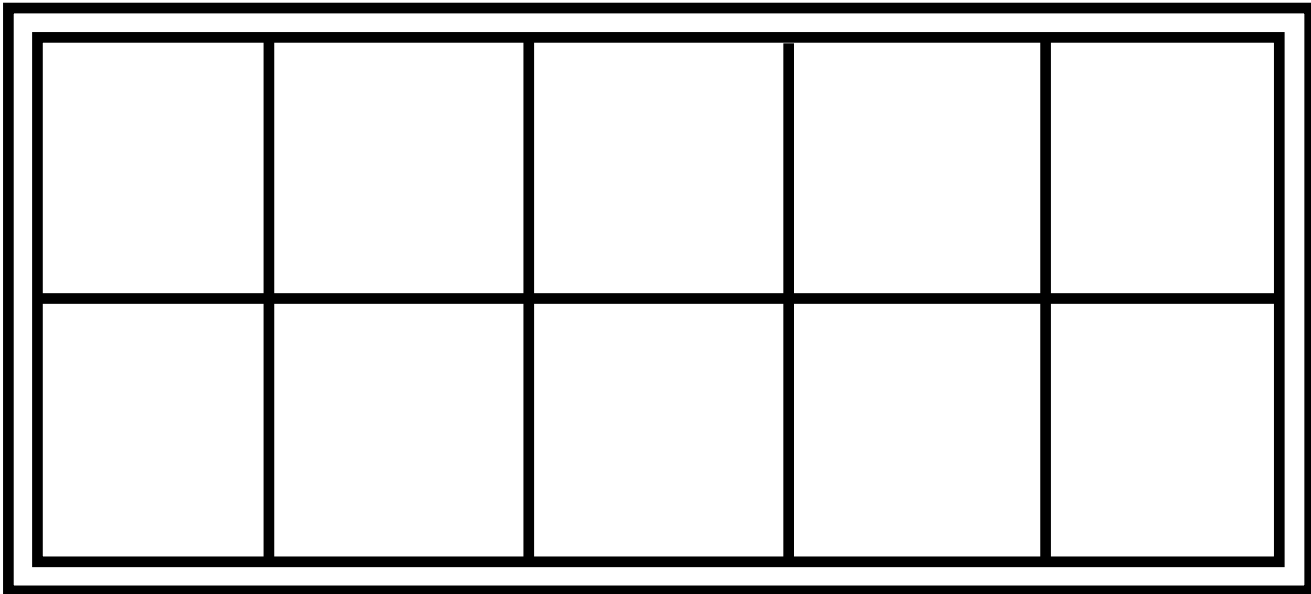
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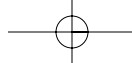


Name: \_\_\_\_\_ Date: \_\_\_\_\_

Line Master 18

# Ten-Frame



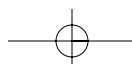
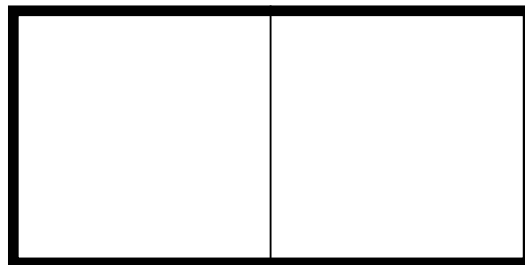
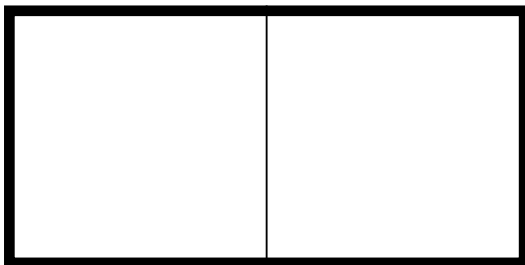
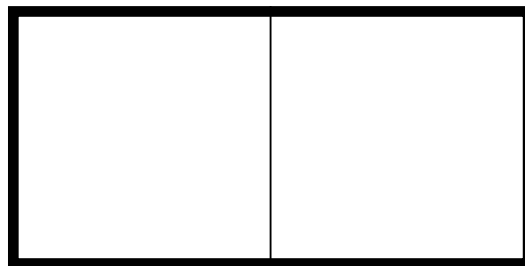
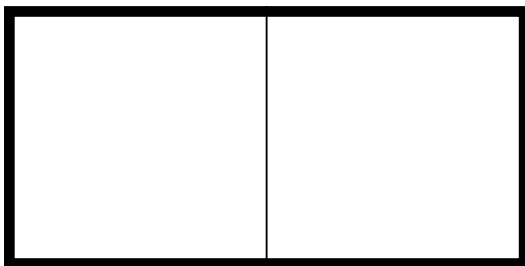
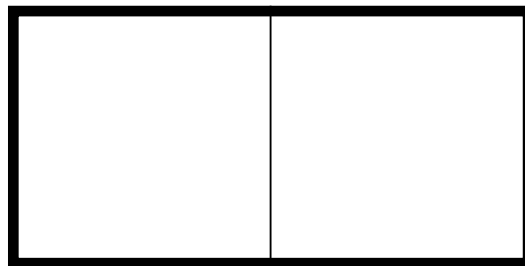
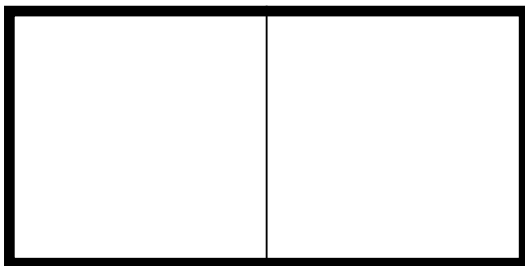
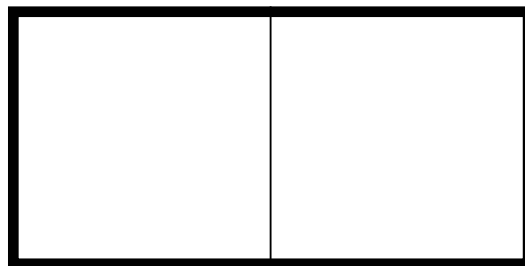
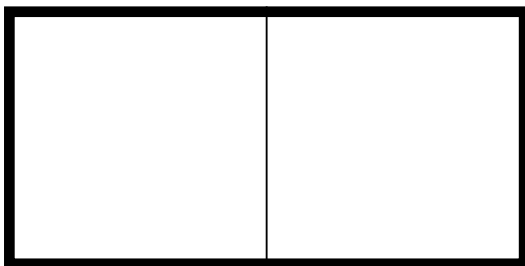
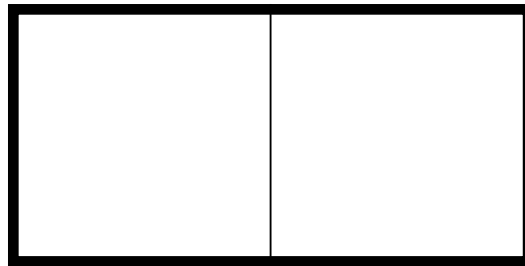
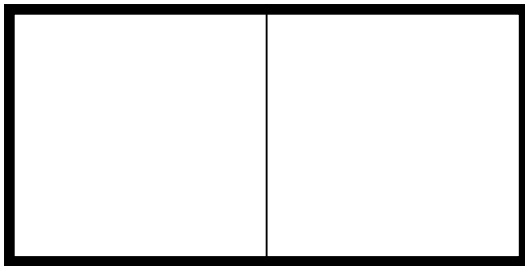


Unit 2: Number Relationships

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


Line Master 19

# Domino Cards



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

**GAM I I Am a Problem Solver**

Put  beside the things you can do.

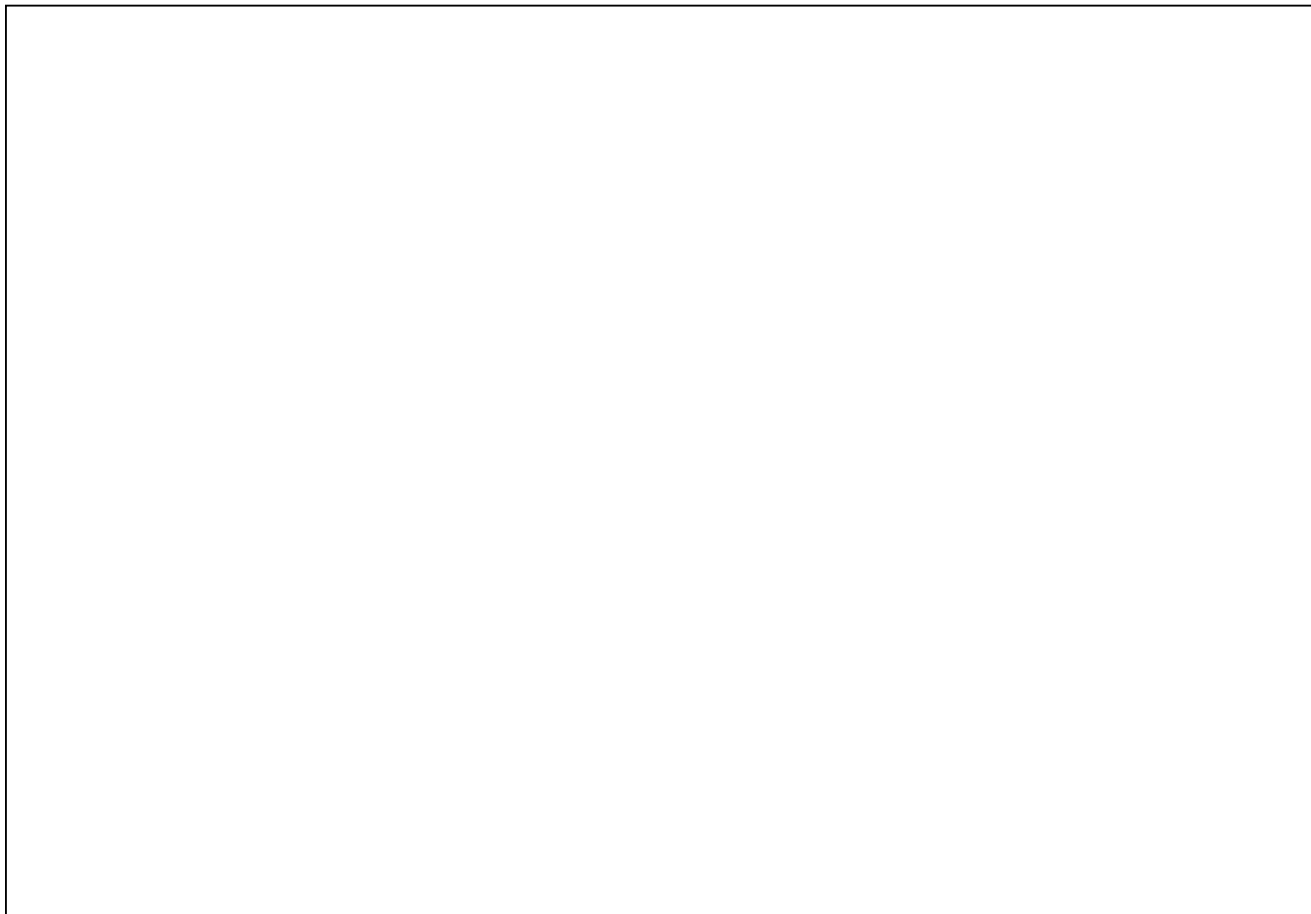
I can tell what the problem is.

I can make and use a plan.

I can check my work.

I can solve the problem!

Use pictures, numbers, or words to show how you solved the problem.



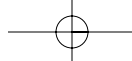
Additional Support

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

**GAM 2****Inquiry Process Rubric**

<b>Knowledge/Skills</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Level 4</b>
<b>Understands the problem</b> <ul style="list-style-type: none"> <li>states the problem in own words</li> </ul>	<input type="checkbox"/> provides an unclear restatement of the problem	<input type="checkbox"/> partially restates the problem	<input type="checkbox"/> restates the problem clearly	<input type="checkbox"/> restates the problem clearly and thoroughly
<ul style="list-style-type: none"> <li>identifies the information given</li> </ul>	<input type="checkbox"/> accurately identifies little of the information given	<input type="checkbox"/> accurately identifies some of the information given	<input type="checkbox"/> accurately identifies most of the information given	<input type="checkbox"/> accurately identifies all of the information given
<b>Makes a plan</b> <ul style="list-style-type: none"> <li>asks questions and makes predictions</li> </ul>	<input type="checkbox"/> offers few appropriate questions and/or predictions	<input type="checkbox"/> offers some appropriate questions and/or predictions	<input type="checkbox"/> offers appropriate questions and/or predictions	<input type="checkbox"/> offers appropriate and extensive questions and/or predictions
<ul style="list-style-type: none"> <li>chooses a strategy</li> </ul>	<input type="checkbox"/> with assistance, chooses an appropriate strategy from those suggested	<input type="checkbox"/> with limited assistance, chooses an appropriate strategy	<input type="checkbox"/> independently chooses an appropriate strategy	<input type="checkbox"/> independently chooses an appropriate strategy; may be innovative
<b>Carries out the plan</b> <ul style="list-style-type: none"> <li>applies procedures accurately</li> </ul>	<input type="checkbox"/> applies procedures with several major errors	<input type="checkbox"/> applies procedures with several minor errors	<input type="checkbox"/> applies most procedures with few minor errors	<input type="checkbox"/> applies most procedures with very few or no errors
<ul style="list-style-type: none"> <li>monitors results; revises and adapts as needed</li> </ul>	<input type="checkbox"/> with assistance, monitors results	<input type="checkbox"/> with limited assistance, monitors results; makes simple revisions	<input type="checkbox"/> monitors results; revises and adapts appropriately	<input type="checkbox"/> monitors results effectively; may revise and adapt in innovative ways
<b>Looks back</b> <ul style="list-style-type: none"> <li>explains the solution</li> </ul>	<input type="checkbox"/> gives an unclear explanation of the solution	<input type="checkbox"/> explains the solution with some clarity	<input type="checkbox"/> explains the solution clearly	<input type="checkbox"/> explains the solution clearly, precisely, and confidently
<ul style="list-style-type: none"> <li>evaluates reasonableness of the solution</li> </ul>	<input type="checkbox"/> with assistance, may partially evaluate the solution	<input type="checkbox"/> with limited assistance, may offer some evaluation of the solution using logical reasoning	<input type="checkbox"/> evaluates the solution using logical reasoning	<input type="checkbox"/> evaluates the solution using logical and thorough reasoning
<ul style="list-style-type: none"> <li>considers extensions or variations</li> </ul>	<input type="checkbox"/> with assistance, may suggest simple variations	<input type="checkbox"/> with limited assistance, suggests simple extensions or variations	<input type="checkbox"/> independently suggests appropriate extensions or variations	<input type="checkbox"/> independently suggests complex or innovative extensions or variations





Additional Support

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

**GAM 4** **What I Learned**

Use pictures, numbers, or words to tell about your favourite activity in this unit.

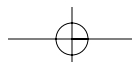
Show what you are doing, and tell what you are finding out. Finish the sentences at the bottom of the page.

Here is a picture of me

---

I found out

---





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

**GAM 5**

## Looking Ahead

Show something you are good at in math.  
Use pictures, numbers, or words.

Tell about something you want to learn in math.  
Use pictures, numbers, or words.

Additional Support

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

**GAM 6**

## Learning Skills Record

Record ongoing observations by noting brief comments as appropriate, and, if desired, enter a level to describe the child's performance.

**E** – Excellent**G** – Good**S** – Satisfactory**N** – Needs Improvement

Learning Skill	Observation		Observation	
	Level	Date/Comments	Level	Date/Comments
<b>Independent work</b> <i>Example: follows routines and instructions</i>				
<b>Initiative</b> <i>Example: interested and curious; shows self-confidence; observes, questions, explores</i>				
<b>Work habits</b> <i>Example: completes tasks; stays on task</i>				
<b>Use of information</b> <i>Example: asks questions to ensure understanding</i>				
<b>Co-operation</b> <i>Example: takes turns; works with others</i>				
<b>Conflict resolution</b> <i>Example: resolves conflicts in socially acceptable ways</i>				
<b>Class participation</b> <i>Example: participates in class, group activities; shares ideas; listens to others</i>				
<b>Problem solving</b> <i>Example: solves problems independently</i>				
<b>Goal setting</b> <i>Example: assesses own work</i>				

*Note:* Teachers may choose to use this form to accumulate observations about children's learning skills across all curriculum areas.

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

# GAM 7 Learning Skills Checklist

Record ongoing observations of children’s learning skills. Use checkmarks or dates to indicate when behaviours are observed, or use the following key:

**E** – Excellent      **G** – Good      **S** – Satisfactory      **N** – Needs Improvement

Name	Works independently	Shows initiative	Completes tasks (work habits)	Asks questions (uses information)	Co-operates with others	Resolves conflicts appropriately	Participates in class, group activities	Assesses own work (sets goals)

Additional Support

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

**GAM 8**

## Working Together

My name \_\_\_\_\_

I worked with others to \_\_\_\_\_

I shared.	yes	sometimes	no
I helped.	yes	sometimes	no
I listened.	yes	sometimes	no
I took turns.	yes	sometimes	no
We did good work together.	yes	sometimes	no

I am proud of \_\_\_\_\_

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

**GAM 9**

# Observation Record I

This form can be used to observe three children who are working together or who are in close proximity.

**Unit** \_\_\_\_\_ **Lesson** \_\_\_\_\_ **Activity** \_\_\_\_\_

	Observation Notes
<p><b>Name</b> _____</p> <p><b>*Focus: PS, UC, AP, CM</b></p> <p><b>Observed strengths:</b></p> <p><b>Observed needs:</b></p>	
<p><b>Name</b> _____</p> <p><b>*Focus: PS, UC, AP, CM</b></p> <p><b>Observed strengths:</b></p> <p><b>Observed needs:</b></p>	
<p><b>Name</b> _____</p> <p><b>*Focus: PS, UC, AP, CM</b></p> <p><b>Observed strengths:</b></p> <p><b>Observed needs:</b></p>	

\*Circle one or more to indicate the focus of your observations and notes:

**PS** – Problem Solving    **UC** – Understanding of Concepts    **AP** – Application of Procedures    **CM** – Communication

Additional Support

**GAM 10**

## Observation Record 2

Use this form to record ongoing observations over a period of time. You can record more than one date/observation in each category.

**Name:** \_\_\_\_\_ **Observation period from** \_\_\_\_\_ **to** \_\_\_\_\_

Observation Notes
<b>Problem solving</b>
<b>Understanding of concepts</b>
<b>Application of procedures</b>
<b>Communication</b>
<b>Summary</b> <i>Strengths:</i>  <i>Needs:</i>  <i>Next steps:</i>

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

**GAM II****Conference Prompts**

Teachers can select and develop questions and prompts such as the following to use during both formal and informal conferences and interviews with children. Answers will often provide evidence of more than one category.

*Note:* The questions are not intended to provide an overall sequence/conference outline. They are examples.

<p><b>Problem solving</b></p> <ul style="list-style-type: none"> <li>• Explain the problem to me.</li> <li>• What have you tried?</li> <li>• How did you decide where to start/what to do?</li> <li>• Were there any places where you got stuck? How did you get going again?</li> <li>• Why did you choose . . . ?</li> <li>• How did you solve . . . ?</li> <li>• Show/tell me about your thinking.</li> <li>• Show me another way . . .</li> <li>• What other ways could someone solve this problem?</li> <li>• Have you found all possible solutions/answers? How do you know?</li> <li>• What advice would you give someone else who had to solve a problem like this?</li> <li>• Can you make up another problem like this for me to solve?</li> </ul> <p>Here's what I saw you do . . .</p>	<p><b>Understanding of concepts</b></p> <ul style="list-style-type: none"> <li>• Tell me what you know/learned about . . .</li> <li>• Tell me about your thinking . . .</li> <li>• How do you know . . . ?</li> <li>• Why does . . . ?</li> <li>• Tell me how you could . . .</li> <li>• Show me . . .</li> <li>• What do you predict/think will happen if ...? Why?</li> <li>• Does that make sense to you? Tell me why/why not.</li> <li>• How could you explain this to someone who hadn't learned it yet?</li> <li>• Explain what you need to do . . .</li> <li>• About how much/how many . . . ? Tell me about your thinking—how did you decide on your estimate?</li> <li>• What is the same/different . . . ?</li> </ul> <p>What questions do you have about ...?.</p>
<p><b>Application of procedures</b></p> <ul style="list-style-type: none"> <li>• How many . . . ?</li> <li>• Show me how to . . .</li> <li>• What answer/solution do you have?</li> <li>• Does that make sense to you?</li> <li>• How could you check?</li> <li>• How did you get that answer/solution?</li> <li>• Have you answered all the parts?</li> <li>• Why is this important? How could you use [...] outside of school?</li> <li>• How is ... connected to ...?</li> <li>• Have you done work like this before? Tell me about it.</li> </ul>	<p><b>Communication</b></p> <p>Can be observed as children respond, through speech, writing, and drawing, to questions such as those listed above. Also:</p> <ul style="list-style-type: none"> <li>• Is there another way to say/show that?</li> <li>• What do you call that? Does it have another name?</li> <li>• How could you tell/show someone else what you learned/found out?</li> <li>• Tell me what you did.</li> </ul>

Additional Support

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

## GAM 12 Work Sample Record

Teachers can use this form to record key information about a portfolio or collection of work samples they select to keep as evidence of learning.

Unit \_\_\_\_\_

	<b>Strand (circle one or more)</b>	<b>Category (circle one or more)*</b>	<b>What this sample shows about student learning</b>
<b>Date:</b> _____ <b>Work Sample:</b>	Number Sense and Numeration Measurement Geometry and Spatial Sense Patterning and Algebra Data/Probability	PS UC AP CM	
<b>Date:</b> _____ <b>Work Sample:</b>	Number Sense and Numeration Measurement Geometry and Spatial Sense Patterning and Algebra Data/Probability	PS UC AP CM	
<b>Date:</b> _____ <b>Work Sample:</b>	Number Sense and Numeration Measurement Geometry and Spatial Sense Patterning and Algebra Data/Probability	PS UC AP CM	
<b>Date:</b> _____ <b>Work Sample:</b>	Number Sense and Numeration Measurement Geometry and Spatial Sense Patterning and Algebra Data/Probability	PS UC AP CM	

**PS** – Problem Solving    **UC** – Understanding of Concepts    **AP** – Application of Procedures    **CM** – Communication



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

GAM 13

## Collaborative Work Sample Record

**Child:**

Tell about your work. You can draw or write.

Tell what you are proud of.

**Teacher:**

This sample provides information about (check all that apply):

Problem solving  Understanding of concepts  Application of procedures  Communication

**Comments (e.g., strengths, needs, possible next steps)**



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

**GAM 15**

# Summary Class Record: Achievement Categories

Teachers can use this form to keep a class record of the levels achieved on various tasks and activities. Levels can be assigned based on observations, conferences, work samples, and/or performance assessment.

**Unit** \_\_\_\_\_ **Strand** \_\_\_\_\_

**Achievement Levels**

**R** – not demonstrated    **1** – limited; simple strategies; major errors; unclearly    **2** – partial; somewhat appropriate strategies; several minor errors; some clarity    **3** – appropriate; appropriate strategies; few minor errors; clearly    **4** – thorough; rarely makes errors; innovative strategies; clearly and precisely

Name	Level Achieved												Overall	
	Problem solving			Understanding of concepts			Application of procedures			Communication				

Additional Support

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

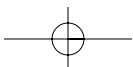
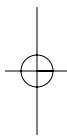
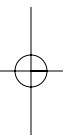
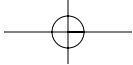
## GAM 16 Summary Record: Individual

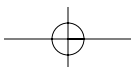
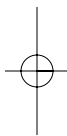
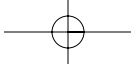
Teachers can use this form to maintain an ongoing record of child achievement. For each strand, use records of ongoing observations and conferences, work samples, and performance assessments to determine the level achieved for each category. Record category levels in the boxes, and comments in the space provided.

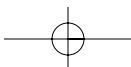
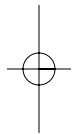
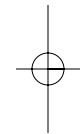
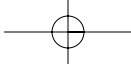
**Achievement Levels**

**R** – not demonstrated    **1** – limited; simple strategies; major errors; unclearly    **2** – partial; somewhat appropriate strategies; several minor errors; some clarity    **3** – appropriate; appropriate strategies; few minor errors; clearly    **4** – thorough; rarely makes errors; innovative strategies; clearly and precisely

Category	Most Consistent Level Achieved				
	Problem Solving	Understanding of Concepts	Application of Procedures	Communication	Overall
<b>NUMBER SENSE AND NUMERATION</b>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>
<b>MEASUREMENT</b>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>
<b>GEOMETRY AND SPATIAL SENSE</b>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>
<b>PATTERNING AND ALGEBRA</b>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>
<b>DATA/PROBABILITY</b>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>
<b>OVERALL</b>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>	level <input type="checkbox"/>







## Program Authors

Cathy Anderson  
 Maureen Dockendorf  
 Michelle Jackson  
 Sharon Jeroski  
 Brenda Lightburn  
 Carole Saundry  
 Michelle Skene

## Program Consultants

Craig Featherstone  
 Maggie Martin Connell  
 Trevor Brown

*Assessment Consultant*  
 Sharon Jeroski

*Primary Mathematics and Literacy  
 Consultant*  
 Pat Dickinson

*Elementary Mathematics Adviser*  
 John A. Van de Walle

*BC Early Numeracy Project Adviser*  
 Carole Saundry

## Contributors

Donna Beaumont  
 Lynn Bryan  
 Heather Spencer  
 Jennifer Travis

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