Math Makes Sense

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
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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.

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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

**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

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

Preparing Materials

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

Numeral 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, ...

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
• Count backwards from 10
• Use a calculator to explore counting, to solve problems, ...

Lesson 1: Count to Ten
Lesson 2: Using a Calculator
Lesson 3: Number Search
Lesson 4: Number Arrangements
Lesson 5: One and Two More, One and Two Less
Lesson 6: Fantastic Five
Lesson 7: Terrific Ten

Lesson 4: Count to Ten
Lesson 2: Using a Calculator
Lesson 3: Number Search
Lesson 4: Number Arrangements
Lesson 5: One and Two More, One and Two Less
Lesson 6: Fantastic Five
Lesson 7: Terrific Ten

Lesson 4: Count to Ten
Lesson 2: Using a Calculator
Lesson 3: Number Search
Lesson 4: Number Arrangements
Lesson 5: One and Two More, One and Two Less
Lesson 6: Fantastic Five
Lesson 7: Terrific Ten
Activity Bank
• Card Matching • Make It Match
• Listen to the Pennies! • Counting to Zero

Activity Bank
• What Is the Number? • What’s My Number?
• How Many Are Missing? • Number Hunt!

Activity Bank
• Make Your Own Dot Cards • Bean Number Stories!
• Ways to Show Number 8! • Building 9!

Activity Bank
• Card Matching • More or Less
• One More and One Less! • Number Chant!

Activity Bank
• Roll a Number • Ten-Frame on
• Name in a Frame 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
• Go, Go Domino!
• Mixed Up Number Book
• We Can Make “10 and …”

Activity Bank
• Gift Bag Grab!
• Closer to 10 or 20?
• Our Estimating Questions
• Class Vote
# Planning for Instruction

**Suggested Unit Time: 4 weeks**

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Time</th>
<th>Lesson Materials</th>
<th>Activity Bank</th>
</tr>
</thead>
</table>
| **Launch**  
Demonstrate prior knowledge of numbers | 20–30 min | collection of small classroom objects (counters, keys, shells, buttons) | |
| **Curriculum Cluster 1: Counting, Reading, and Recording Numbers**  
**Lesson 1:** Count to Ten  
Count forwards and backwards from zero to ten | 60–90 min | 0 to 10 numeral and number word cards, bags, counters, Snap Cubes, Lego, marbles, blocks |  
- Number Match  
- Listen to the Pennies!  
- Make It Match  
- Counting to Zero |
| **Lesson 2:** Using a Calculator  
Display numerals on a calculator | 45–60 min | calculators, numeral cards (1 to 10), number word cards (one to ten) | |
| **Lesson 3:** Number Search  
Identify and order groups of numbers from 1 to 10 | 60–90 min | numeral cards, number word cards, stamps, stamp pad, stickers, paper |  
- What Is the Number?  
- What’s My Number?  
- Number Hunt! |
| **Curriculum Cluster 2: Number Meanings and Relationships to 10**  
**Lesson 4:** Number Arrangements  
Recognize numbers in different arrangements | 60–90 min | counters (beads, toothpicks, buttons, stickers) |  
- Make Your Own Dot Cards  
- Ways to Show Number 8!  
- Bean Number Stories!  
- Building 9! |
| **Lesson 5:** One and Two More, One and Two Less  
Identify numbers that are one/two more and one/two less | 60–90 min | counters or concrete objects, optional: overhead projector |  
- Card Matching  
- One More and One Less!  
- More or Less Number Chant! |
| **Lesson 6:** Fantastic Five  
Investigate number meanings using a five-frame | 45–60 min | counters, optional: overhead projector | |
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity Bank Materials</th>
<th>Program Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>20–100 min</td>
<td>numeral cards, number word cards, dot cards</td>
<td>Big Math Book, page 6: Count to Ten</td>
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<td>10 pennies, glass jar</td>
<td>Student page 17: Number Relationships</td>
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<tr>
<td></td>
<td>numeral cards (0 to 7), number word cards (zero to seven), pocket chart</td>
<td>Student page 18: Dear Family</td>
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<td>number cube labelled 1 to 6, small objects (e.g., keys, counters, buttons, shells)</td>
<td>Student page 19: Count the Fish</td>
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<tr>
<td>20–100 min</td>
<td>small box and various counting materials (e.g., crayons, pencils, paper clips)</td>
<td>Big Math Book, page 7: Count Forwards, Count Backwards</td>
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<td>sets of objects (e.g., 9 calculators, 3 erasers, 8 crayons), tray or table, cloth or paper, optional: overhead projector</td>
<td>Student page 20: At the Pond</td>
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<td>dot cards, counters or Snap Cubes</td>
<td>Student page 21: Count the Birds</td>
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<td>numeral cards (0 to 10), number word cards (zero to ten), dot cards (0 to 10)</td>
<td>LM 12: Numbers to 5</td>
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<td>LM 13: Numbers 6 to 10</td>
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<td>20–100 min</td>
<td>blank cards, bingo dabbers or stickers</td>
<td>Big Math Book, page 8: The Calculator</td>
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<td>Snap Cubes</td>
<td>Student page 22: My Calculator</td>
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<td>two-coloured beans or two-coloured counters, plastic cups, cardboard or plastic placemats</td>
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<td>glue, toothpicks, heavy paper (manila, light cardboard), markers</td>
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<tr>
<td>20–100 min</td>
<td>dot cards, chart showing numerals 1 to 10</td>
<td>Big Math Book, page 9: What Is in the Fridge?</td>
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<td>dot cards, counters</td>
<td>Student page 23: Number Search</td>
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<td>dot cards (1 to 6), pocket chart or chart paper</td>
<td>Student page 24: Number Pictures</td>
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<td>LM 14: Numbers 0 to 2</td>
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<td>LM 15: Numbers 3 to 6</td>
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<td>LM 16: Numbers 7 to 10</td>
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# Planning for Instruction

<table>
<thead>
<tr>
<th>Lesson</th>
<th>Time</th>
<th>Lesson Materials</th>
<th>Activity Bank</th>
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</thead>
<tbody>
<tr>
<td><strong>Lesson 7: Terrific Ten</strong></td>
<td>60–90 min</td>
<td>counters</td>
<td>• Roll a Number</td>
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<tr>
<td>Investigate number meanings using a ten-frame</td>
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<td>• Name in a Frame</td>
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<td></td>
<td>• Ten-Frame on the Floor!</td>
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<tr>
<td><strong>Curriculum Cluster 3: Number Meaning and Relationships to 20</strong></td>
<td>Suggested Time: 4 to 6 days</td>
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<tr>
<td><strong>Lesson 8: Represent Numbers 10 to 20</strong></td>
<td>60–90 min</td>
<td>counters, two-part mat, optional: overhead projector</td>
<td>• Hopscotch Plans</td>
</tr>
<tr>
<td>Represent numbers from 10 to 20 in different arrangements</td>
<td></td>
<td></td>
<td>• Go, Go Domino!</td>
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<td></td>
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<td>• Mixed Up Number Book</td>
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<td>• We Can Make “10 and …”</td>
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<tr>
<td><strong>Lesson 9: Estimate Numbers</strong></td>
<td>60–90 min</td>
<td>counters (toothpicks, Snap Cubes, beads, buttons, paper clips), bags, red and white counters, dot cards, beans, container, optional: overhead projector</td>
<td>• Gift Bag Grab!</td>
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<tr>
<td>Estimate numbers to 20</td>
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<td>• Our Estimating Questions</td>
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<td>• Closer to 10 or 20†</td>
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<td>• Class Vote</td>
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<tr>
<td><strong>Lesson 10: Strategies Tool Kit</strong></td>
<td>45–60 min</td>
<td>counters, blocks (red and yellow), red and yellow crayons</td>
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<td>Use “make a model” to solve a problem</td>
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<td><strong>Unit Assessment</strong></td>
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<tr>
<td><strong>Lesson 11: Show What You Know</strong></td>
<td>45–120 min</td>
<td>numeral cards, number word cards, dot cards, five-frames, ten-frames, counters, Snap Cubes, two-part mat, calculator</td>
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<td>Demonstrate what has been learned</td>
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<tr>
<td>Time</td>
<td>Activity Bank Materials</td>
<td>Program Resources</td>
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<tr>
<td>20–100 min</td>
<td>two 0 to 5 number cubes for each pair of children, ten-frames, counters, paper, pencils</td>
<td><strong>Big Math Book, page 11: Ten-Frames</strong></td>
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<td></td>
<td>small blank counters, or circles of paper, pencils</td>
<td><strong>Student page 31: Terrific Ten!</strong></td>
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<td>masking tape (or large plastic sheet or tablecloth and a permanent marker), two number cubes labelled 1 to 6</td>
<td><strong>Student page 32: Ten-Frame Numbers</strong></td>
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<td><strong>LM 18: Ten-Frame</strong></td>
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<tr>
<td><strong>Big Math Book, page 11: Ten-Frames</strong></td>
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<td><strong>Student page 33: I Can Make 16!</strong></td>
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<td><strong>Student page 34: Numbers to 20</strong></td>
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<td><strong>Student page 35: Show Numbers to 20</strong></td>
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<td><strong>LM 19: Domino Cards</strong></td>
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<td><strong>Student page 36: About How Many?</strong></td>
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<td><strong>Student page 37: I Can Estimate!</strong></td>
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<td><strong>Big Math Book, page 12: How Many Apples?</strong></td>
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<td><strong>Student page 38: How Many Apples?</strong></td>
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<td><strong>Student page 39: What Is in the Backpack?</strong></td>
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<td><strong>Student page 40: Show What You Know about 12</strong></td>
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<td><strong>Student page 41: 12! 12! 12!</strong></td>
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<td><strong>Student page 42: My Journal</strong></td>
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# Planning for Assessment

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<th>Purpose</th>
<th>Assessment Process</th>
<th>Recording and Reporting</th>
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<tr>
<td><strong>Diagnostic</strong></td>
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<tr>
<td>Launch</td>
<td>Watch and listen during Launch</td>
<td>AM 1: Diagnostic Checklist</td>
</tr>
<tr>
<td>Diagnostic Assessment</td>
<td>Conference and scaffold for selected children</td>
<td>AM 2: Diagnostic Conference for Selected Children</td>
</tr>
<tr>
<td><strong>Formative</strong></td>
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<tr>
<td>End of Lesson</td>
<td>Watch and listen during lessons; scaffold as needed</td>
<td>AM 3.1, AM 3.2, AM 3.3: Ongoing Observations Checklist</td>
</tr>
<tr>
<td>Assessment for Learning</td>
<td>Question; conduct informal conferences and interviews;</td>
<td>GAM 2: Inquiry Process Rubric or GAM 3: Inquiry Process Checklist</td>
</tr>
<tr>
<td>&quot;What to Look For&quot;</td>
<td>provide feedback; scaffold as needed (see GAM 11:</td>
<td>GAM 9 and GAM 10: Observation Records 1 and 2</td>
</tr>
<tr>
<td>&quot;What to Do&quot;</td>
<td>Conference Prompts)</td>
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<tr>
<td><strong>Summative</strong></td>
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<tr>
<td>Show What You Know</td>
<td>Conduct performance assessment (Lesson 11)</td>
<td>AM 4: Performance Task Rubric</td>
</tr>
<tr>
<td>Evaluating Student Learning:</td>
<td>Prompt children’s self-assessment</td>
<td>GAM 4: What I Learned or GAM 5: Looking Ahead</td>
</tr>
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<td>Preparing to Report, p. 52</td>
<td>Review assessment records</td>
<td>AM 5: Number Relationships Rubric</td>
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<td></td>
<td>Add Unit results to ongoing records</td>
<td>AM 6: Unit Summary</td>
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<tr>
<td><strong>Learning Skills</strong></td>
<td>Observe and record throughout Unit</td>
<td>GAM 6: Learning Skills Record or GAM 7: Learning Skills Checklist</td>
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<td>GAM 8: Working Together</td>
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</tbody>
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## 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
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.
Lesson 14

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 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.

14 Unit 2: Number Relationships
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  

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

<table>
<thead>
<tr>
<th>What to Look For</th>
<th>What to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence that children</td>
<td>Children who have difficulty with 1:1 matching and conservation are likely to need practice building number sets with concrete objects.</td>
</tr>
<tr>
<td>- demonstrate 1:1 correspondence when counting</td>
<td>- 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.</td>
</tr>
<tr>
<td>- recognize that moving objects doesn’t change the number (conservation)</td>
<td></td>
</tr>
<tr>
<td>- match numerals, number words, and sets</td>
<td></td>
</tr>
</tbody>
</table>

To guide observations and facilitate reporting, use Assessment Master 3.1: Ongoing Observations Checklist.
**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 practice 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

Listen to the Pennies!

Materials: 10 pennies, glass jar

- Tell children they are going to practice 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

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 totaling 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

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.
LESSON

Using a 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 Promp
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.

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

LESSON Using a Calculator

MATH GRADE 1 TG Unit 2_7 8/8/03 10:14 AM Page 18
**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.

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**Assessment for Learning**

**What to Look For**

- Evidence that children recognize numerals from 0 to 10
- Explore ways of displaying numerals on a calculator

**What to Do**

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.

- Have children say each number aloud as they display it on their calculators.
- Display a number between 0 and 10, and have children represent the number using concrete materials.

To guide observations and facilitate reporting, use Assessment Master 3.1: Ongoing Observations Checklist.
LESSON 3

Number Search

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.

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)
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

<table>
<thead>
<tr>
<th>What to Look For</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Evidence that children</td>
<td>Continue to provide practice building number sets and counting with concrete objects.</td>
</tr>
<tr>
<td>■ demonstrate 1:1 correspondence when counting</td>
<td>■ 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). Several of the Mathematics Centres (page 11) focus on practice with numerals, number words, and pictures.</td>
</tr>
<tr>
<td>■ represent numbers to 10 orally, in numerals, words, and pictures</td>
<td>■ 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.)</td>
</tr>
<tr>
<td></td>
<td>■ Allow children who are having difficulty to write numerals in wet sand or in shaving cream.</td>
</tr>
</tbody>
</table>

To guide observations and facilitate reporting, use Assessment Master 3.1: Ongoing Observations Checklist.
FROM THE LIBRARY

Ruth Brown, Ten Seeds (Random House, 2001)


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 Whoo’s Counting (Scholastic Books, 2000)


Marilyn Singer, Quiet Night (Clarion Books, 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.

Visual; Intrapersonal
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.

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

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

**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?

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**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*
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

<table>
<thead>
<tr>
<th>What to Look For</th>
<th>What to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence that children</td>
<td>Support the development of conservation of number.</td>
</tr>
<tr>
<td>■ create more than one arrangement to represent the same number</td>
<td>■ Compare the same number of small objects and large objects and talk about them (e.g., 6 shoes or 6 people is still 6).</td>
</tr>
<tr>
<td>■ understand that the number of objects remains the same but the arrangements or type of objects can change</td>
<td>■ 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.]</td>
</tr>
<tr>
<td>■ use language such as more than, less than, same as</td>
<td>■ 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?</td>
</tr>
</tbody>
</table>

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.
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.
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.
Unit 2: Number Relationships

**What to Look For**
- can use concrete objects to demonstrate 1 or 2 more or less
- identify 1 or 2 more or less relationships among numbers or sets
- identify 1 or 2 less relationships among numbers or sets

**What to Do**
- 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.
- 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.”

**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**

**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

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.
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)

**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?

**Social; Musical**
**Small Group/Whole Class**

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**

*See Preparing Materials, page 1.
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

<table>
<thead>
<tr>
<th>What to Look For</th>
<th>What to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence that children</td>
<td>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 7 again, then ask for 7. Say: “7 is 5 and 2 more.” Practise the numbers 8, 9, and 10 in the same way.</td>
</tr>
<tr>
<td>build numbers to 10 on a five-frame</td>
<td>Build a number by holding your fingers behind your back and then showing the number to the children. Ask them to name it quickly.</td>
</tr>
<tr>
<td>describe the numbers as “5 and …” or “… less than 5” rather than recounting from 1 each time</td>
<td></td>
</tr>
</tbody>
</table>

To guide observations and facilitate reporting, use Assessment Master 3.2: Ongoing Observations Checklist.
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.

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**Assessment for Learning**

<table>
<thead>
<tr>
<th>What to Look For</th>
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<tr>
<td>Evidence that children</td>
<td>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.</td>
</tr>
<tr>
<td>- build 0 to 10 accurately on a ten-frame</td>
<td></td>
</tr>
<tr>
<td>- leave the 5 row intact when building the numbers 6 to 10</td>
<td></td>
</tr>
<tr>
<td>- describe the numbers as “… less than 10”</td>
<td></td>
</tr>
</tbody>
</table>

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


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).
### 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**

### Roll a Number

**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**

### 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**

### Unit 2: Number Relationships

#### Roll a Number

**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**

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**Unit 2: Number Relationships**

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**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 teen 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**

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

**Problem Prompt**

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

**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**

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<tr>
<th>What to Look For</th>
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<tbody>
<tr>
<td>Evidence that children</td>
<td>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.</td>
</tr>
<tr>
<td>- accurately represent numbers 10 to 20 as a “10 and...” combination</td>
<td>- 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”).</td>
</tr>
<tr>
<td>- understand that the order (10 and or or and 10) doesn’t matter</td>
<td></td>
</tr>
<tr>
<td>- understand that numbers can be built from combinations of smaller numbers (part-part-whole)</td>
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</tbody>
</table>

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

**FROM THE LIBRARY**

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

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


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


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

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


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

**Activity Bank**

### 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**

*See Preparing Materials, page 1.*

### 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**

### 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**

### 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**
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.
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.

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

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.

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?
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

<table>
<thead>
<tr>
<th>What to Look For</th>
<th>What to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence that children</td>
<td>• Provide additional practice with smaller sets, especially sets of “5 and some more.”</td>
</tr>
<tr>
<td>▪ make reasonable estimates of objects between 10 and 20</td>
<td>• 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.”).</td>
</tr>
<tr>
<td>▪ use referents such as 5 and 10 when estimating (using known to estimate unknown)</td>
<td>• Invite children to think aloud for you as they estimate.</td>
</tr>
<tr>
<td>▪ compare sets using more and less</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>What to Look For</th>
<th>What to Do</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence that children</td>
<td>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.</td>
</tr>
<tr>
<td>use 8 objects to model apples</td>
<td>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 …?)</td>
</tr>
<tr>
<td>build 2 sets</td>
<td></td>
</tr>
<tr>
<td>create more than one solution</td>
<td></td>
</tr>
<tr>
<td>explain their solution and can model it for others</td>
<td></td>
</tr>
<tr>
<td>self-correct as needed</td>
<td></td>
</tr>
</tbody>
</table>

To guide observations and facilitate reporting, use GAM 2: Inquiry Process Rubric or GAM 3: Inquiry Process Checklist.
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, calculator). 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, 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.

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).
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
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:

<table>
<thead>
<tr>
<th>Strand: NUMBER SENSE AND NUMERATION</th>
<th>Most Consistent Level of Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concepts</td>
</tr>
<tr>
<td>Ongoing observations</td>
<td>4</td>
</tr>
<tr>
<td>Strategies Tool Kit (Lesson 10)</td>
<td>-</td>
</tr>
<tr>
<td>Portfolio or work samples; conferences</td>
<td>3</td>
</tr>
<tr>
<td>Performance task (Lesson 11)</td>
<td>3</td>
</tr>
</tbody>
</table>

Achievement Level for reporting on this strand 3
### Recording

<table>
<thead>
<tr>
<th>How to Report</th>
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</thead>
<tbody>
<tr>
<td><strong>Ongoing observations for each cluster</strong></td>
</tr>
<tr>
<td>Teachers who have used AM 3, AM 3.2 and AM 3.3: Ongoing Observations Checklist 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.</td>
</tr>
</tbody>
</table>

| **Performance on problem-solving tasks** |
| Teachers who used GAM 2: Inquiry Process Rubric or GAM 3: Inquiry Process Checklist with Strategies Tool Kit (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). |

| **Portfolio or work samples; conferences** |
| 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 AM 5: Number Relationships Rubric. |

| **Performance task** |
| Because this occurs at the end of the unit (Lesson 11), it should offer a useful snapshot of children’s achievement. Use AM 4: Performance Task Rubric. |

| **Children’s self-assessment** |
| 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.
Unit 2: Number Relationships

Assessment Master 1 Diagnostic Checklist

During Launch activities, use this form to note observations about children who appear to have difficulty.

<table>
<thead>
<tr>
<th>Name</th>
<th>Counts orally to 10</th>
<th>Counts with 1:1</th>
<th>Recognizes numerals to 10</th>
<th>Identifies sets with more/less/same</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>CATEGORIES</th>
<th>OBSERVATIONS AND COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Understanding of concepts</strong></td>
<td></td>
</tr>
<tr>
<td>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:</td>
<td></td>
</tr>
<tr>
<td>• About how many blocks do you think you have?</td>
<td></td>
</tr>
<tr>
<td>• Now count them for me. How many are there all together?</td>
<td></td>
</tr>
<tr>
<td>• Put the bigger ones on one side and the smaller ones on the other. Which has more?</td>
<td></td>
</tr>
<tr>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td>Notice the child's confidence and ability to</td>
<td></td>
</tr>
<tr>
<td>• make a reasonable estimate</td>
<td></td>
</tr>
<tr>
<td>• use 1:1 correspondence to count the blocks</td>
<td></td>
</tr>
<tr>
<td>• recognize that the size of the blocks does not affect which set has more (conservation)</td>
<td></td>
</tr>
<tr>
<td>• recognize that moving the blocks does not change the number (conservation)</td>
<td></td>
</tr>
<tr>
<td>• recognize that they can build a number from smaller numbers</td>
<td></td>
</tr>
<tr>
<td><strong>Problem solving</strong></td>
<td></td>
</tr>
<tr>
<td>Say:</td>
<td></td>
</tr>
<tr>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td>Notice the child's confidence and ability to</td>
<td></td>
</tr>
<tr>
<td>• attempt to generate another design or configuration for the same number.</td>
<td></td>
</tr>
<tr>
<td><strong>Application of procedures</strong></td>
<td></td>
</tr>
<tr>
<td>Ask each child to count his or her blocks again. If he or she is able to count forwards with few errors, say:</td>
<td></td>
</tr>
<tr>
<td>• 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.</td>
<td></td>
</tr>
<tr>
<td>Notice the child's confidence and ability to</td>
<td></td>
</tr>
<tr>
<td>• know which numbers follow in sequence forwards</td>
<td></td>
</tr>
<tr>
<td>• know which numbers follow in sequence backwards</td>
<td></td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>Say:</td>
<td></td>
</tr>
<tr>
<td>• You did a lot of work and thinking about numbers today. Tell me all the things you did with the blocks.</td>
<td></td>
</tr>
<tr>
<td>Notice the child's confidence and ability to</td>
<td></td>
</tr>
<tr>
<td>• use number words to 10 orally</td>
<td></td>
</tr>
<tr>
<td>• use appropriate language (e.g., more, less, number)</td>
<td></td>
</tr>
</tbody>
</table>
Unit 2: Number Relationships

Date: _____________

**Assessment Master 3.1 Ongoing Observations Checklist**

<table>
<thead>
<tr>
<th>Name</th>
<th>Cluster 1: Lesson 1</th>
<th>Cluster 1: Lesson 2</th>
<th>Cluster 1: Lesson 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>uses 1:1 correspondence to count</td>
<td>knows moving objects does not change number</td>
<td>matches numerals, number words, sets</td>
</tr>
<tr>
<td></td>
<td>UC</td>
<td>UC</td>
<td>AP</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

**PS** – Problem Solving  **UC** – Understanding of Concepts  **AP** – Application of Procedures  **CM** – Communication
**Assessment Master 3.2**  
**Ongoing Observations Checklist**

<table>
<thead>
<tr>
<th>Name</th>
<th>Cluster 2: Lesson 4</th>
<th>Cluster 2: Lesson 5</th>
<th>Cluster 2: Lesson 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>makes one number in different ways</td>
<td>knows re-arranging doesn’t change number</td>
<td>uses appropriate language</td>
</tr>
<tr>
<td></td>
<td>PS</td>
<td>UC</td>
<td>CM</td>
</tr>
<tr>
<td></td>
<td>Cluster 2: Lesson 5</td>
<td>identifies 1 or 2 more relationships</td>
<td>identifies 1 or 2 less relationships</td>
</tr>
<tr>
<td></td>
<td>UC</td>
<td>AP</td>
<td>AP</td>
</tr>
<tr>
<td></td>
<td>Cluster 2: Lesson 6</td>
<td>uses “5 and…” or “less than 5”</td>
<td>builds 0 to 10 on five-frame</td>
</tr>
<tr>
<td></td>
<td>AP</td>
<td>UC</td>
<td>AP</td>
</tr>
</tbody>
</table>
Assessment Master 3.3  Ongoing Observations Checklist

<table>
<thead>
<tr>
<th>Name</th>
<th>Cluster 2: Lesson 7</th>
<th>Cluster 3: Lesson 8</th>
<th>Cluster 3: Lesson 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>builds 0 to 10 on ten-frame</td>
<td>leaves five row intact for 6 to 10</td>
<td>describes 0 to 9 as “... less than 10”</td>
</tr>
<tr>
<td>AP</td>
<td>UC</td>
<td>AP</td>
<td>UC</td>
</tr>
<tr>
<td></td>
<td>see “10 and ...” is same as “... and 10”</td>
<td>builds numbers from smaller parts</td>
<td>shows 10 to 20 as “10 and ...”</td>
</tr>
<tr>
<td>UC</td>
<td>UC</td>
<td>AP</td>
<td>PS</td>
</tr>
<tr>
<td></td>
<td>uses referents of 5, 10 to estimate</td>
<td>makes reasonable estimates up to 20</td>
<td>compares sets using “more”, “less”</td>
</tr>
<tr>
<td>AP</td>
<td>UC</td>
<td>AP</td>
<td>AP</td>
</tr>
</tbody>
</table>
# Assessment Master 4

## Performance Task Rubric

<table>
<thead>
<tr>
<th>Knowledge/Skills</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem solving</strong></td>
<td>• finds several ways to represent 12 using concrete objects</td>
<td>• with limited guidance to build 12 in more than one way</td>
<td>• independently builds 12 in three ways</td>
<td>• independently builds 12 in three ways; may use a more complex or innovative way (e.g., uses 3 sets)</td>
</tr>
<tr>
<td><strong>Understanding of concepts</strong></td>
<td>• shows understanding of conservation of number</td>
<td>• with assistance, recognizes that the same sets or objects, arranged in two ways, can both equal 12</td>
<td>• independently recognizes that the same sets or objects, arranged in various ways, can all equal 12</td>
<td>• independently and confidently recognizes that the same sets or objects, arranged in various ways, can all equal 12</td>
</tr>
<tr>
<td></td>
<td>• tells a number story that shows understanding that numbers can be built from combinations of smaller numbers (part-part-whole)</td>
<td>• tells a number story that shows very limited understanding of part-part-whole relationships</td>
<td>• tells a number story that shows limited understanding of part-part-whole relationships</td>
<td>• tells number stories that show in-depth understanding of part-part-whole concepts in various contexts</td>
</tr>
<tr>
<td><strong>Application of procedures</strong></td>
<td>• uses 1:1 correspondence</td>
<td>• needs assistance to represent 12 with 12 objects</td>
<td>• represents 12 with 12 objects</td>
<td>• represents 12 with 12 objects with ease</td>
</tr>
<tr>
<td></td>
<td>• records numerals to 20 and number words to 10 correctly</td>
<td>• records numerals to 20 and number words to 10 with major errors</td>
<td>• records numerals to 20 and number words to 10 with several minor errors</td>
<td>• records numerals to 20 and number words to 10 with practically no errors</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td>• uses appropriate language (e.g., more, less, number)</td>
<td>• uses limited appropriate language</td>
<td>• uses considerable appropriate language</td>
<td>• uses appropriate language</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>Knowledge/Skills</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problem solving</td>
<td>✗ needs assistance to attempt problems that involve:</td>
<td>✗ with limited assistance, uses an appropriate strategy to solve problems that involve:</td>
<td>✗ uses appropriate strategies to solve problems that involve:</td>
<td>✗ uses appropriate, often innovative, strategies to solve problems that involve:</td>
</tr>
<tr>
<td></td>
<td>- estimating quantity and counting</td>
<td>- estimating quantity and counting</td>
<td>- estimating quantity and counting</td>
<td>- estimating quantity and counting</td>
</tr>
<tr>
<td></td>
<td>- building the same number in different ways</td>
<td>- building the same number in different ways</td>
<td>- building the same number in different ways</td>
<td>- building the same number in different ways</td>
</tr>
<tr>
<td></td>
<td>- joining and separating</td>
<td>- joining and separating</td>
<td>- joining and separating</td>
<td>- joining and separating</td>
</tr>
<tr>
<td>Understanding of concepts</td>
<td>✗ with assistance, shows very limited understanding of:</td>
<td>✗ shows partial understanding of:</td>
<td>✗ shows understanding of:</td>
<td>✗ shows in-depth understanding, in a variety of contexts, of:</td>
</tr>
<tr>
<td></td>
<td>- one-to-one correspondence</td>
<td>- one-to-one correspondence</td>
<td>- one-to-one correspondence</td>
<td>- one-to-one correspondence</td>
</tr>
<tr>
<td></td>
<td>- conservation</td>
<td>- conservation</td>
<td>- conservation</td>
<td>- conservation</td>
</tr>
<tr>
<td></td>
<td>- more and less relationships</td>
<td>- more and less relationships</td>
<td>- more and less relationships</td>
<td>- more and less relationships</td>
</tr>
<tr>
<td></td>
<td>- part-part-whole relationships</td>
<td>- part-part-whole relationships</td>
<td>- part-part-whole relationships</td>
<td>- part-part-whole relationships</td>
</tr>
<tr>
<td>Application of procedures</td>
<td>✗ needs assistance</td>
<td>✗ needs limited assistance</td>
<td>✗ independently (may need some guidance)</td>
<td>✗ independently (may need limited guidance)</td>
</tr>
<tr>
<td></td>
<td>✗ major errors/omissions in:</td>
<td>✗ minor errors/omissions in:</td>
<td>✗ few errors/omissions in:</td>
<td>✗ very few or no errors/omissions in:</td>
</tr>
<tr>
<td></td>
<td>- counting to 20 by 1’s</td>
<td>- counting to 20 by 1’s</td>
<td>- counting to 20 by 1’s</td>
<td>- counting to 20 by 1’s</td>
</tr>
<tr>
<td></td>
<td>- counting backwards from 10</td>
<td>- counting backwards from 10</td>
<td>- counting backwards from 10</td>
<td>- counting backwards from 10</td>
</tr>
<tr>
<td></td>
<td>- reading, printing numerals to 20</td>
<td>- reading, printing numerals to 20</td>
<td>- reading, printing numerals to 20</td>
<td>- reading, printing numerals to 20</td>
</tr>
<tr>
<td></td>
<td>- reading and printing number words to ten</td>
<td>- reading and printing numerals to 20</td>
<td>- reading and printing number words to ten</td>
<td>- reading and printing number words to ten</td>
</tr>
<tr>
<td></td>
<td>- identifying 1 or 2 more or less</td>
<td>- identifying 1 or 2 more or less</td>
<td>- identifying 1 or 2 more or less</td>
<td>- identifying 1 or 2 more or less</td>
</tr>
<tr>
<td></td>
<td>- using a five- or ten-frame</td>
<td>- using a five- or ten-frame</td>
<td>- using a five- or ten-frame</td>
<td>- using a five- or ten-frame</td>
</tr>
<tr>
<td></td>
<td>- comparing sets</td>
<td>- comparing sets</td>
<td>- comparing sets</td>
<td>- comparing sets</td>
</tr>
<tr>
<td>Communication</td>
<td>✗ rarely uses appropriate language; unclear and imprecise</td>
<td>✗ sometimes uses appropriate language; somewhat clear and precise</td>
<td>✗ usually uses appropriate language; generally clear and precise</td>
<td>✗ confidently uses appropriate language; clear and precise</td>
</tr>
<tr>
<td></td>
<td>✗ uses appropriate language (e.g., more, less, numbers)</td>
<td>✗ uses appropriate language (e.g., more, less, numbers)</td>
<td>✗ uses appropriate language (e.g., more, less, numbers)</td>
<td>✗ uses appropriate language (e.g., more, less, numbers)</td>
</tr>
</tbody>
</table>
**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.

<table>
<thead>
<tr>
<th>Strand: NUMBER SENSE AND NUMERATION</th>
<th>Concepts</th>
<th>Procedures</th>
<th>Problem Solving</th>
<th>Communication</th>
<th>OVERALL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing observations:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategies Tool Kit (Lesson 10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Portfolio or work samples;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>conferences</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance task (Lesson 11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Self-assessment:**

**Strengths:**

**Needs:**

**Next steps:**
Unit 2: Number Relationships

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

We’re learning about numbers!

We can count.

We are learning to make estimates.

We are learning about more and less.

Math_Gr1 BLM U2 kids 5  8/8/03  10:34 AM  Page 62
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.

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.”

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?”

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

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.”
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
```
<table>
<thead>
<tr>
<th>zero</th>
<th>six</th>
</tr>
</thead>
<tbody>
<tr>
<td>one</td>
<td>seven</td>
</tr>
<tr>
<td>two</td>
<td>eight</td>
</tr>
<tr>
<td>three</td>
<td>nine</td>
</tr>
<tr>
<td>four</td>
<td>ten</td>
</tr>
<tr>
<td>five</td>
<td></td>
</tr>
</tbody>
</table>

Unit 2: Number Relationships
Unit 2: Number Relationships

Name: __________________________   Date: _________________________

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

![Dot Cards Diagram]

---

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Unit 2: Number Relationships

Name: __________________________   Date: _________________________

**Line Master 6**  Dot Cards

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Unit 2: Number Relationships

Name: __________________________   Date: _________________________

**Dot Cards**

![Dot Cards Image]
Unit 2: Number Relationships

Name: __________________________   Date: _________________________

**Dot Cards**

![Dot Cards Image]

---

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Unit 2: Number Relationships

Name: __________________________   Date: _________________________

Dot Cards

Line Master 10
Unit 2: Number Relationships

Name: __________________________   Date: _________________________

Grid Paper
Name: __________________________   Date: _________________________

**Line Master 12  Numbers to 5**

How many? Print the numerals.

Draw apples in each basket.

<table>
<thead>
<tr>
<th>Numerals</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5

3
Unit 2: Number Relationships

Name: __________________________   Date: __________________________

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

How many? Print the numerals.

Draw fish in the sea.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Name: __________________________   Date: _________________________

**Line Master 14**  **Numbers 0 to 2**

<table>
<thead>
<tr>
<th>My Number Book</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>zero</td>
</tr>
<tr>
<td>1</td>
<td>one</td>
</tr>
<tr>
<td>2</td>
<td>two</td>
</tr>
</tbody>
</table>
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
### Numbers 7 to 10

<table>
<thead>
<tr>
<th></th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>seven</td>
<td>eight</td>
</tr>
<tr>
<td></td>
<td>nine</td>
<td>ten</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>nine</td>
<td>ten</td>
</tr>
</tbody>
</table>
Unit 2: Number Relationships

Name: __________________________   Date: _________________________

**Line Master 17**  Five-Frame

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---

---
Unit 2: Number Relationships

Name: __________________________   Date: _________________________

Line Master 18  Ten-Frame

---

---
Line Master 19  Domino Cards

[Blank rectangles for domino cards]
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.
### Inquiry Process Rubric

<table>
<thead>
<tr>
<th>Knowledge/Skills</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understands the problem</td>
<td>• states the problem in own words</td>
<td>• provides an unclear restatement of the problem</td>
<td>• restates the problem clearly</td>
<td>• restates the problem clearly and thoroughly</td>
</tr>
<tr>
<td></td>
<td>• identifies the information given</td>
<td>• accurately identifies little of the information given</td>
<td>• accurately identifies some of the information given</td>
<td>• accurately identifies most of the information given</td>
</tr>
<tr>
<td>Makes a plan</td>
<td>• asks questions and makes predictions</td>
<td>• offers few appropriate questions and/or predictions</td>
<td>• offers appropriate questions and/or predictions</td>
<td>• offers appropriate and extensive questions and/or predictions</td>
</tr>
<tr>
<td></td>
<td>• chooses a strategy</td>
<td>• with assistance, chooses an appropriate strategy from those suggested</td>
<td>• independently chooses an appropriate strategy</td>
<td>• independently chooses an appropriate strategy; may be innovative</td>
</tr>
<tr>
<td>Carries out the plan</td>
<td>• applies procedures accurately</td>
<td>• applies procedures with several major errors</td>
<td>• applies procedures with several minor errors</td>
<td>• applies most procedures with very few or no errors</td>
</tr>
<tr>
<td></td>
<td>• monitors results; revises and adapts as needed</td>
<td>• with assistance, monitors results</td>
<td>• monitors results; revises and adapts appropriately</td>
<td>• monitors results effectively; may revise and adapt in innovative ways</td>
</tr>
<tr>
<td>Looks back</td>
<td>• explains the solution</td>
<td>• gives an unclear explanation of the solution</td>
<td>• explains the solution with some clarity</td>
<td>• explains the solution clearly, precisely, and confidently</td>
</tr>
<tr>
<td></td>
<td>• evaluates reasonableness of the solution</td>
<td>• with assistance, may partially evaluate the solution</td>
<td>• evaluates the solution using logical reasoning</td>
<td>• evaluates the solution using logical and thorough reasoning</td>
</tr>
<tr>
<td></td>
<td>• considers extensions or variations</td>
<td>• with assistance, suggests simple variations</td>
<td>• independently suggests appropriate extensions or variations</td>
<td>• independently suggests complex or innovative extensions or variations</td>
</tr>
</tbody>
</table>

**Additionally Supported by: Math_Gr1 GAM sampler  8/14/03  11:32 AM  Page 86**
### GAM 3 Inquiry Process Checklist

<table>
<thead>
<tr>
<th>Name</th>
<th>Understands the problem</th>
<th>Makes a plan</th>
<th>Carries out the plan</th>
<th>Looks back</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>restates problem in own words</td>
<td>asks questions; makes predictions</td>
<td>applies procedures accurately</td>
<td>knows when plan is/is not working</td>
</tr>
<tr>
<td></td>
<td>identifies information given</td>
<td>chooses a strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
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
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.
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

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

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

<table>
<thead>
<tr>
<th>E – Excellent</th>
<th>G – Good</th>
<th>S – Satisfactory</th>
<th>N – Needs Improvement</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Name</th>
<th>Works independently</th>
<th>Shows initiative</th>
<th>Completes tasks (work habits)</th>
<th>Asks questions (uses information)</th>
<th>Co-operates with others</th>
<th>Resolves conflicts appropriately</th>
<th>Participates in class, group activities</th>
<th>Assesses own work (sets goals)</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>
GAM 8 Working Together

My name __________________________

I worked with others to ________________________________

___________________________________________________

<table>
<thead>
<tr>
<th></th>
<th>yes</th>
<th>sometimes</th>
<th>no</th>
</tr>
</thead>
<tbody>
<tr>
<td>I shared.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I helped.</td>
<td>yes</td>
<td>sometimes</td>
<td>no</td>
</tr>
<tr>
<td>I listened.</td>
<td>yes</td>
<td>sometimes</td>
<td>no</td>
</tr>
<tr>
<td>I took turns.</td>
<td>yes</td>
<td>sometimes</td>
<td>no</td>
</tr>
<tr>
<td>We did good work together.</td>
<td>yes</td>
<td>sometimes</td>
<td>no</td>
</tr>
</tbody>
</table>

I am proud of ________________________________

___________________________________________________
**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 ______________

<table>
<thead>
<tr>
<th>Observation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name ____________________</td>
</tr>
<tr>
<td>*Focus: PS, UC, AP, CM</td>
</tr>
<tr>
<td>Observed strengths:</td>
</tr>
<tr>
<td>Observed needs:</td>
</tr>
<tr>
<td>Name ____________________</td>
</tr>
<tr>
<td>*Focus: PS, UC, AP, CM</td>
</tr>
<tr>
<td>Observed strengths:</td>
</tr>
<tr>
<td>Observed needs:</td>
</tr>
<tr>
<td>Name ____________________</td>
</tr>
<tr>
<td>*Focus: PS, UC, AP, CM</td>
</tr>
<tr>
<td>Observed strengths:</td>
</tr>
<tr>
<td>Observed needs:</td>
</tr>
</tbody>
</table>

*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  

Date: _________________________

---

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# 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** ________

<table>
<thead>
<tr>
<th>Observation Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Problem solving</strong></td>
</tr>
<tr>
<td><strong>Understanding of concepts</strong></td>
</tr>
<tr>
<td><strong>Application of procedures</strong></td>
</tr>
<tr>
<td><strong>Communication</strong></td>
</tr>
</tbody>
</table>

**Summary**  
*Strengths:*  
*Needs:*  
*Next steps:*
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.

### Problem solving
- Explain the problem to me.
- What have you tried?
- How did you decide where to start/what to do?
- Were there any places where you got stuck? How did you get going again?
- Why did you choose . . .?
- How did you solve . . .?
- Show/tell me about your thinking.
- Show me another way . . .
- What other ways could someone solve this problem?
- Have you found all possible solutions/answers?
- How do you know?
- What advice would you give someone else who had to solve a problem like this?
- Can you make up another problem like this for me to solve?

Here’s what I saw you do . . .

### Understanding of concepts
- Tell me what you know/learned about . . .
- Tell me about your thinking . . .
- How do you know . . .?
- Why does . . .?
- Tell me how you could . . .
- Show me . . .
- What do you predict/think will happen if . . .? Why?
- Does that make sense to you? Tell me why/why not.
- How could you explain this to someone who hadn’t learned it yet?
- Explain what you need to do . . .
- About how much/how many . . .? Tell me about your thinking—how did you decide on your estimate?
- What is the same/different . . .?
- What questions do you have about . . .?

### Application of procedures
- How many . . .?
- Show me how to . . .
- What answer/solution do you have?
- Does that make sense to you?
- How could you check?
- How did you get that answer/solution?
- Have you answered all the parts?
- Why is this important? How could you use […] outside of school?
- How is . . . connected to . . .?
- Have you done work like this before? Tell me about it.

### Communication
Can be observed as children respond, through speech, writing, and drawing, to questions such as those listed above. Also:
- Is there another way to say/show that?
- What do you call that? Does it have another name?
- How could you tell/show someone else what you learned/figured out?
- Tell me what you did.
**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 ______**

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

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

Name: __________________________   Date: _________________________
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)
### Summary Class Record: Strands

#### 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

#### Unit ______

<table>
<thead>
<tr>
<th>Name</th>
<th>Observations</th>
<th>Work samples</th>
<th>Performance assessment</th>
<th>Overall</th>
<th>Most consistent achievement level</th>
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</thead>
<tbody>
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### Additional Support

- 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 minor errors; innovative strategies; clearly and precisely

<table>
<thead>
<tr>
<th>Name</th>
<th>Level Achieved</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Problem solving</td>
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</tbody>
</table>

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### 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

<table>
<thead>
<tr>
<th>Category</th>
<th>Problem Solving</th>
<th>Understanding of Concepts</th>
<th>Application of Procedures</th>
<th>Communication</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NUMBER SENSE AND NUMERATION</strong></td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
</tr>
<tr>
<td><strong>MEASUREMENT</strong></td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
</tr>
<tr>
<td><strong>GEOMETRY AND SPATIAL SENSE</strong></td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
</tr>
<tr>
<td><strong>PATTERNING AND ALGEBRA</strong></td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
</tr>
<tr>
<td><strong>DATA/PROBABILITY</strong></td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
</tr>
<tr>
<td><strong>OVERALL</strong></td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
<td>level ☐</td>
</tr>
</tbody>
</table>
Program Authors

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