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ATTAINMENT'S

**Hands-On Math**

**Instructor's Guide**

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DON BASTIAN

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## About the Author

Don Bastian is the founder and CEO of Attainment Company, publisher of the Hands-On Math curriculum. Don has helped develop many diverse products as an author, project manager, and producer—including GoTalks, the Explore Series, and Academic Work Activities. Before founding Attainment, Don was a coordinator at a vocational training facility for adults with disabilities. There he created work skill development kits, which became the core of Attainment's original product line.



GoTalks



Explore Series Books



Academic Work Activities

## Overview

**Hands-On Math (HOM)** is a supplemental math curriculum primarily intended for students of any age with intellectual disability and/or autism. It's based on two premises: (a) students with disabilities learn well when their hands are purposefully engaged, and (b) math manipulatives help students grasp abstract concepts. The HOM curriculum is supplemental because it doesn't systematically address math standards for any particular grade band. Rather, it's a skills-based program focusing on fundamental math concepts. HOM covers a considerable range—from counting to solving two-digit addition problems. The scope and sequence, however, doesn't address every skill in that continuum. It focuses on skills that can be successfully taught with the manipulatives included.

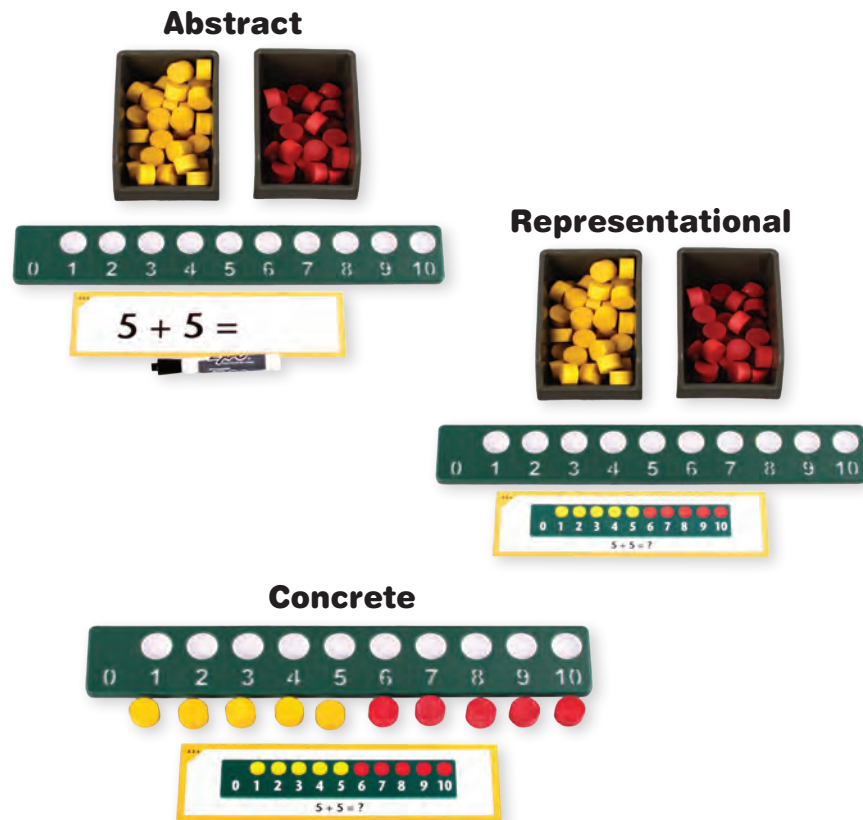
The heart of HOM is a set of four number lines used in combination to demonstrate concepts and help solve related math problems. The number lines have slots to accommodate pegs. A small peg represents one, and a large peg represents ten. The number lines are durable and quick to set up, while the pegs are easy to manipulate.



## Overview (cont.)

HOM has 60 lessons organized into Skill Areas and Activities. The three Skill Areas (**Counting**, **Sets**, and **Categories, Symbols, and Patterns**) are divided into five Activities. Each Activity contains four lessons. Both Activities and lessons progress in difficulty. For example, the first Activity in the Counting Skill Area is One-to-One Correspondence, while the last is Identifying Number Words. In the first lesson in One-to-One Correspondence, students count within 5, while in the final lesson, students count forward from a number other than 1. These progressions across Skill Areas and Activities allow the 60 lessons to be equally divided into three difficulty Levels.

Lessons have a three-step teaching sequence: **Abstract**, **Representational**, and **Concrete**. Abstract learners who successfully complete the lesson attain its objective by demonstrating understanding of the underlying math concept. Representational learners are provided picture cues or other hints to help them complete the lesson. Concrete learners are exposed to the math concept incidentally, and can complete the lesson without knowing any of the math.



# Materials

## Instructor's Guide

Provides step-by-step instructions for the 60 Hands-On-Math lessons, appendixes present Activity Cards and supplemental resources.

## PDF on CD with Classroom license for printouts

Includes four folders: Assessment Forms, Supplemental Lesson Resources, Activity and Concept Cards (standard and supplemental), Complete Instructor's Guide.

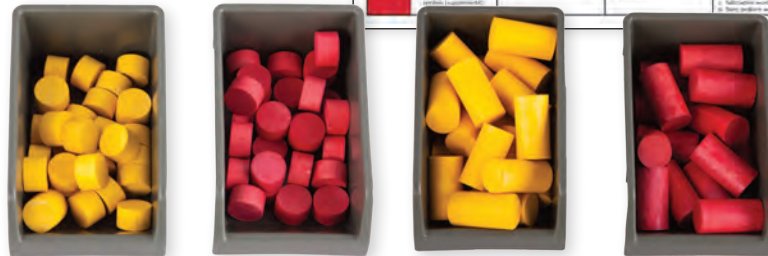
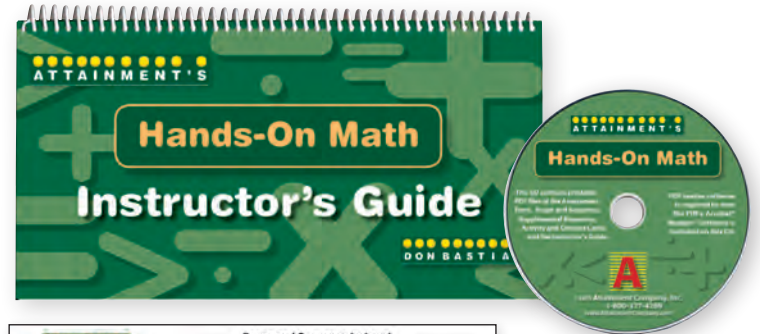
## Scope and Sequence Guide

One side is arranged by Level and the other side by Skill Area.

## Bins with pegs

Includes 30 small yellow and red pegs, and 20 large yellow and red pegs.

Replacement and additional parts are available.



## Materials (cont.)

### Number Line 0-10

The most commonly used number line.

### Number Line 11-20

Combines with number line 0-10 for counting, operational, and pattern lessons.

### Number Line 10-100

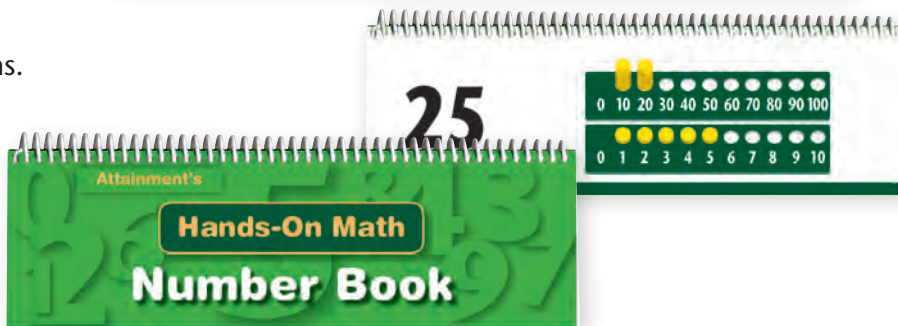
Combines with number line 0-10 to represent numbers within 100. The only number line to use large pegs.

### Number Line Extension 1-9

Combines with 0-10 number line in addition regrouping lessons.

### Number Book

Illustrated book that includes four sections: Numbers 0-100, Skip Counting, Even and Odd, and Number Words.



## Materials (cont.)

### 60 Activity Cards

Laminated for writing with dry erase marker.

### Symbol Cards

Nine two-sided cards with symbols and describing words.

### 3 foam number dice

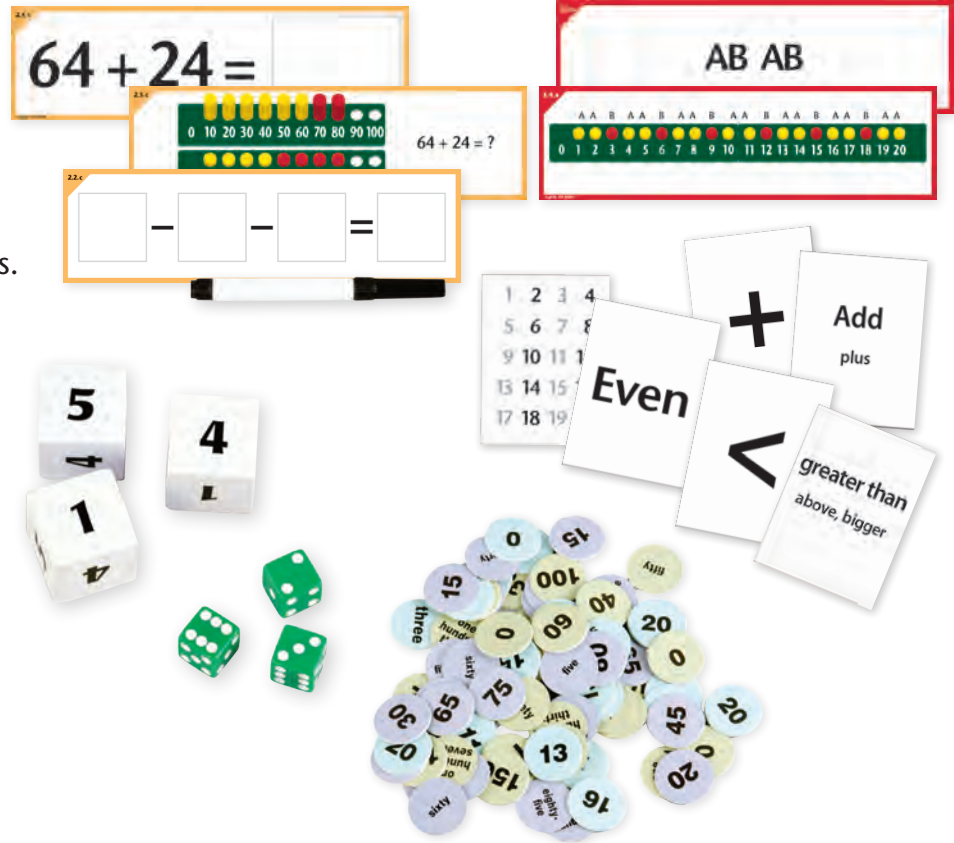
Large format foam dice showing numerals 0–5.

### Standard dice

Standard dot pattern dice commonly used in games.

### 0-100 number disks

Disks show numeral on one side and corresponding number word on the other.





## Lesson Structure

All the lesson descriptions in this Guide have the same structure. They are divided into two sections. The top, color coded by Skill Area, includes the lesson number and title, Lesson Objective, and an overview titled Narrative. Each lesson number (e.g., 2.3.a) includes the Skill Area (first term), the Activity (second term), and the specific lesson (third term). Related Skills refers you to similar HOM lessons.

The bottom section is divided into Concrete, Representational, and Abstract lesson options. Each has a photo and instructions for Teacher Setup. HOM follows the “two minute rule”—your prep time is always under two minutes. Accordingly, you can teach multiple lessons or cycle through lesson options in a single math period. The Student Procedure can be read to the student as is, or use as a guide to create your own script.

### 1.2.d Identify any numeral within 100

Level Two

#### Lesson objective

Identify a numeral 0–100 and represent it by placing pegs in number lines.

*Related skills: Skip count by 10s (1.4.c), Add and subtract 0–100 (2.3.b and c)*

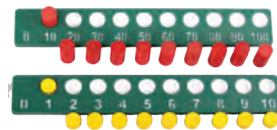
#### Materials

- 0–10 and 10–100 number lines
- Bins with large and small yellow pegs
- Number Book

#### Narrative

Introduces the use of the 10–100 and 0–10 number line in the same lesson. Students place pegs in the number lines to represent numerals 0–100, with large pegs representing 10s and small pegs 1s.

#### Concrete



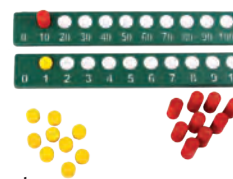
#### Teacher setup

Place 1 small yellow peg in the 0–10 number line and 9 additional pegs in a row in front. Do the same arrangement for large red pegs and the 10–100 number line.

#### Student procedure

Place the pegs in the number lines.

#### Representational



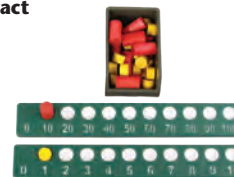
#### Teacher setup

Arrange 9 small yellow and large red pegs in separate groups in front of the 0–10 and 10–100 number lines. Place 1 small yellow peg in the 0–10 and 1 large red peg in the 10–100 number line as a sample.

#### Student procedure

Place the pegs in the correct number line by following the sample peg.

#### Abstract



#### Teacher setup

Place a bin with small yellow and large red pegs mixed together behind the 0–10 and 10–100 number lines. Place 1 small yellow peg in the 0–10 and 1 large red peg in the 10–100 number line as a sample.

#### Student procedure

Place the pegs in the correct number line by following the sample peg.

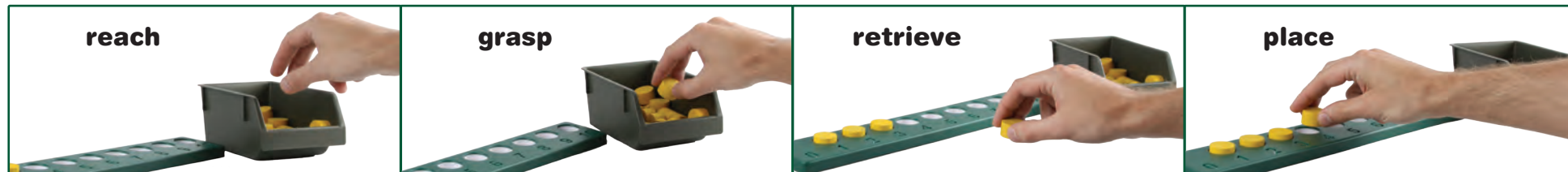
## How to Use

Hands-On Math (HOM) makes math concepts more explicit by representing them with pegs placed in number lines. These materials help students count, create sets and patterns, compare numbers, sort and categorize, and solve addition and subtraction problems. Not all math skills, however, are easily demonstrated with number lines. Some HOM lessons, like Number Words (1.5.a-d) and Math Words and Symbols (3.5.a-d), use different materials. Other essential concepts, like measurement, are not addressed in HOM. For these reasons, HOM is considered a supplemental skills-based curriculum that complements your standards-based curriculum.

Two fundamental skills are prerequisite to HOM lessons. Categorizing lessons (3.1.a-d), where students sort pegs into

number lines, are a good introduction to these fundamental skills. The first is the reach-grasp-retrieve-place sequence performed by taking a peg from the table or bin and placing it in the appropriate slot of a number line. This sequence can be difficult to learn for some students with significant physical or attentional challenges.

The second is the ability to consistently distinguish the color and size differences among the pegs. Students will need to learn that large and small pegs represent different quantities (10s and 1s), and that yellow and red pegs can represent different terms in an equation.



## How to Use (cont.)

The Concrete, Representational, and Abstract (CRA) options provide a high-to-low sequence of instructional support. You can follow the CRA sequence to introduce a lesson or select the option that best fits the student. When in doubt, teach Representational. Move to Concrete if the lesson is too hard, and Abstract if it's too easy. Your goal is for all students to become Abstract learners, though this may be unattainable for some students with some lessons.

Complete the Teacher Setup before you introduce a lesson. Then follow the explain-model-guide-observe-adjust process. Explain by reading or paraphrasing the Student Procedure in the lesson description. Model the procedure for the student slowly. Guide the student through the lesson, giving prompts as needed. Observe the student completing the task independently. Adjust the lesson to present a unique problem to solve.

Three approaches help you select which HOM lessons to teach.

1. Assign a level to each student. This approach incorporates lessons from all three Skill Areas.
2. Teach lessons within a specific Skill Area or Activity. Some Activities have lessons at three levels (Skip Counting, ABAB Patterns), while others at just one (Categorize, Advanced Addition).
3. Select lessons that complement your standards-based math curriculum.

HOM lessons can be presented individually or in small groups of up to four students. You can teach multiple trials of a lesson by quickly adjusting the materials presented. For example, flip to a different Number Book page or change Activity Cards. You can also set up lessons for pairs of students to work on together, independent of the teacher.

# Progress Monitoring Forms

Use the **Assessment Form** to determine if students understand the underlying concepts of HOM lessons. Assess with everyday classroom materials, like a whiteboard and counters. Focus on lessons, no more than 20, clustered in a similar difficulty level.

**Hands-On Math**

Student: James J.

Teacher: Mrs. Kind Date: 4/29

**KEY:**  
**Y** = Able to perform  
**N** = Not able to perform

## Assessment Form

	LEVEL ONE		LEVEL TWO		LEVEL THREE	
	Y	N	Y	N	Y	N
1.1. Count with one-to-one correspondence						
1.1.a. Within 5	✓		1.1.c. Within 20		✓	
1.1.b. Within 10	✓		1.1.d. Counting forward (from a number other than one)		✓	
1.2. Identify numerals			1.2.c. Within 100 multiples of 10		✓	
1.2.a. Within 10	✓		1.2.d. Within 100		✓	
1.2.b. Within 20	✓					
1.3. Subitize			1.3.c. Within 12 rolling dice			
1.3.a. Within 3	✓		1.3.d. Within 18 rolling dice			
1.3.b. Within 6		✓				
1.4. Skip count			1.4.a. By 2s		✓	
1.4.a. By 2s			1.4.b. By 5s			1.4.d. Even and odd
1.4.b. By 10s			1.4.c. By 10s			
1.5. Identify number words (supplemental)			1.5.a. Zero-ten			1.5.c. Multiples of 10
1.5.a. Zero-ten			1.5.b. Zero-twenty			1.5.d. Within one hundred
2.1. Create sets			2.1.a. Within 5		✓	
2.1.a. Within 5			2.1.b. Within 10		✓	
2.1.b. Within 10			2.1.c. Within 20			2.1.d. Create two sets then add
2.2. Add and subtract 0-20			2.2.a. Within 10			2.2.d. Solve for unknown
2.2.a. Within 10			2.2.b. Within 20			
2.2.b. Within 20			2.2.c. Three terms			
2.3. Add and subtract 0-100			2.3.a. Multiple of tens			2.3.c. Two terms with two digits
2.3.a. Multiple of tens			2.3.b. One term with two digits			2.3.d. Solve for unknown
2.3.b. One term with two digits						
2.4. Advanced addition						2.4.a. Within 20 with regrouping
2.4.a. Within 20 with regrouping						2.4.b. Within 100 with regrouping
2.4.b. Within 100 with regrouping						2.4.c. Three addends with regrouping
2.4.c. Three addends with regrouping						2.4.d. Multiplication, within 20
2.4.d. Multiplication, within 20						
2.5. Solve story problems (supplemental)			2.5.a. Add within 20			2.5.c. Add within 100
2.5.a. Add within 20			2.5.b. Subtract within 20			2.5.d. Subtract within 100
2.5.b. Subtract within 20						
3.1. Categorize			3.1.a. Sort 2 items with a cue redundancy		✓	
3.1.a. Sort 2 items with a cue redundancy			3.1.b. Sort 2 items with cues constant		✓	
3.1.b. Sort 2 items with cues constant			3.1.c. Sort 2 items with an irrelevant cue		✓	
3.1.c. Sort 2 items with an irrelevant cue			3.1.d. Sort 4 items		✓	
3.1.d. Sort 4 items						
3.2. Identify comparison symbols			3.2.a. Equals		✓	
3.2.a. Equals			3.2.b. Less		✓	3.2.c. Greater
3.2.b. Less						3.2.d. Combination
3.3. Make ABAB patterns			3.3.a. Duplicate			
3.3.a. Duplicate			3.3.b. Extend			3.3.d. Create
3.3.b. Extend						
3.4. Make more patterns			3.4.a. Duplicate			3.4.c. Complete
3.4.a. Duplicate						3.4.d. Create
3.5. Identify Math words and symbols (Supplemental)						3.5.b. Addition words
3.5.a. Operation symbols						3.5.c. Subtraction words
						3.5.d. Story problem words

# Progress Monitoring Forms

The **Student Performance Data Sheet** tracks participation and progress in HOM lessons. It monitors the lesson option (Abstract, Representational, Concrete), individual or group instruction, and successful completion—plus a plan for future instruction.

**Hands-On Math**

## Student Performance Data Sheet

Student: Lebron J.

Teacher: Mrs. Kind

### KEY

 choices

Option: **C**oncrete, **R**epresentational, **A**bstract  
 Setting: **I**ndividual, **G**roup  
 Completion: **Y**es, **N**o  
 Plan: Select appropriate action

DATE	LESSON #	OPTION	SETTING	COMPLETION	NOTES	PLAN		
5/2	Sets-10 2.1.b	C R A	I G	Y N	Well done!	Repeat lesson <input type="checkbox"/>	Move to lesson # <u>2.1.c</u>	Change Option to C R A
5/3	Sets-20 2.1.c	C R (A)	(I) G	Y (N)	Gets the concept but loses concentration beyond 10.	Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # _____	Change Option to C R A
5/3	Add-20 2.2.c	C (R) A	I (G)	(Y) N	They had fun! First time with an addition lesson.	Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # _____	Change Option to C R A
5/4	2.1.c	C (R) A	(I) G	(Y) N	Try abstract option next. He can do this!	Repeat lesson <input type="checkbox"/>	Move to lesson # _____	Change Option to C R (A)
5/15	2.1.c	C R (A)	(I) G	Y (N)	Close!	Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # _____	Change Option to C R A
5/15	2.2.c	C (R) A	I (G)	Y (N)		Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # _____	Change Option to C R A
5/16	2.2.c	C (R) A	(I) G	(Y) N	No problem!	Repeat lesson <input type="checkbox"/>	Move to lesson # _____	Change Option to C R (A)
5/16	2.1.c	C R (A)	(I) G	(Y) N	He did it perfectly. Repeat next month.	Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # <u>1.4.a</u>	Change Option to C R A
5/22	2.2.c	C R (A)	(I) G	Y (N)	Close. Still uses the yellow pegs for the second addend.	Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # _____	Change Option to C R A
5/22	Skip count by 2 2.1.b	C (R) A	I (G)	Y N	Good start. One to one next time.	Repeat lesson <input checked="" type="checkbox"/>	Move to lesson # _____	Change Option to C R A
5/23	1.4.a	C (R) A	(I) G	(Y) N		Repeat lesson <input type="checkbox"/>	Move to lesson # _____	Change Option to C R (A)

## 1. Counting and Numbers

**Counting and Numbers** lessons progress in difficulty from counting with one-to-one correspondence to skip counting.

### Count with One-to-One Correspondence

The four lessons have similar setups and procedures. In Abstract, students respond to a verbal prompt from the teacher (“Count to 5”) or roll a number die. In Representational, the teacher lines up pegs to be counted in front of the number line(s). Pegs are already in the number line in the Concrete option.

### Identify Numerals

Lessons (1.2.a–d) use the **Number Book** for all students. Abstract learners focus on the numeral (with the picture covered), while Representational learners follow the picture. For Concrete learners, pegs matching the numeral are placed in front of the number line(s). A hand-written numeral can be substituted for the Number Book in the Abstract option.

### Subitize

In the first two lessons, Abstract students identify the number of pegs under a bin when it’s lifted momentarily by the teacher. Representational learners identify the number of yellow dots printed on the back of an **Activity Card** when it’s turned over briefly by the teacher or a student. Pegs are prearranged on the Activity Card in the Concrete option. Students identify dot patterns on dice in the remaining two lessons.

### Skip Count

The first three lessons have similar setups and procedures, each using the Skip Count pages in the Number Book. Abstract learners must follow written instructions (“Skip count by 2s to 10”), since the picture is covered. Representational learners can follow the picture. Pegs matching the picture are placed in front of the number line(s) for Concrete learners. Even and odd numbers are addressed in the final lesson. Abstract and Representational students sort Number Disks (0–20) into bins. Pegs are arranged on the Activity Cards in the Concrete option.

The supplemental lessons introduce words for numerals (0–100) using the **Number Sheets** and **Number Disks**. The Number Book has a section on number words that can be integrated into these lessons.

### Challenge Lessons

Review the ideas below to develop more challenging lessons.

1. Write numerals on small sticky notes, and have students place them over the matching words in the Number Book.
2. Place a peg in any number line slot, and have students count backward from that number. This activity prepares them for subtraction.
3. Arrange coins on the table so students can:
  - Count to 20 by placing pennies in the 0–10 and 11–20 number lines.
  - Skip count by 10s using dimes in the 10–100 number line.
  - Count by 5s to 100 by placing two nickels in each slot of the 10–100 number line.

## 1.1.a One-to-one correspondence within 5

Level One

### Lesson objective

Count up to 5 by placing pegs in the number line in sequence, beginning with the first slot.

*Related skills: Subitize within 6 (Lesson 1.3.b), Identify numerals within 10 (Lesson 1.2.a)*

### Materials

- 0–10 number line
- Bin with small yellow pegs

### Narrative

Introduces one-to-one correspondence. Students place small pegs in number line slots in sequence, beginning with the first slot. The last occupied slot shows the number of pegs counted.

### Concrete



#### Teacher setup

Place up to 5 small yellow pegs in the 0–10 number line.

### Representational



#### Teacher setup

Place up to 5 small yellow pegs in a row in front of the 0–10 number line.

### Abstract



#### Teacher setup

Place the bin with small yellow pegs behind the 0–10 number line.

### Student procedure

Count the pegs placed in the number line. Begin with the first peg, and touch and say the number of each peg as it's counted.

### Student procedure

Place the pegs in the number line in sequence, beginning with the first slot. Count and say the number of each peg as it's placed.

### Student procedure

Follow the teacher's prompt to count to a number up to 5. Take the pegs from the bin, and place them in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed.

## 1.1.b One-to-one correspondence within 10

Level One

### Lesson objective

Count up to 10 by placing pegs in the number line in sequence, beginning with the first slot.

*Related skills: One-to-one correspondence within 5 (previous lesson), Subitize within 6 (Lesson 1.3.b), Identify numerals within 10 (Lesson 1.2.a)*

### Materials

- 0–10 number line
- Bin with small yellow pegs

### Narrative

Expands one-to-one correspondence counting to 10. Students place small pegs in number line slots in sequence, beginning with the first slot. The last occupied slot shows the number of pegs counted.

### Concrete



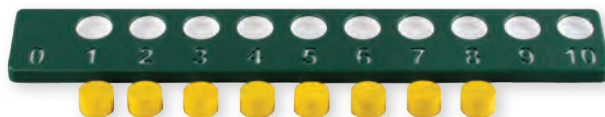
### Teacher setup

Place up to 10 small yellow pegs in the 0–10 number line.

### Student procedure

Count the pegs placed in the number line. Begin with the first peg, and touch and say the number of each peg as it's counted.

### Representational



### Teacher setup

Place up to 10 small yellow pegs in a row in front of the 0–10 number line.

### Student procedure

Place the pegs in the number line in sequence, beginning with the first slot. Count and say the number of each peg as it's placed.

### Abstract



### Teacher setup

Place the bin with small yellow pegs behind the 0–10 number line.

### Student procedure

Follow the teacher's prompt to count to a number up to 10. Take the pegs from the bin, and place them in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed.



## 1.1.c One-to-one correspondence within 20

Level Two

### Lesson objective

Count up to 20 by placing pegs in the number line in sequence, beginning with the first slot.

*Related skills: One-to-one correspondence within 10 (previous lesson), Subitize within 18 (Lesson 1.3.d), Identify numerals within 20 (Lesson 1.2.b)*

### Materials

- 0–10 and 11–20 number lines
- Bin with small yellow pegs

### Narrative

Expands one-to-one correspondence counting to 20, while introducing the 11–20 number line. Students place small pegs in number line slots in sequence, beginning with the first slot. The last occupied slot shows the number of pegs counted.

### Concrete

### Representational

### Abstract



### Teacher setup

Place up to 20 small yellow pegs in a row in front of the 0–10 and 11–20 number lines.

### Teacher setup

Place the bin with small yellow pegs behind the 0–10 and 11–20 number lines.

### Teacher setup

Place up to 20 small yellow pegs in the 0–10 and 11–20 number lines.

### Student procedure

Count the pegs placed in the number line. Begin with the first peg, and touch and say the number of each peg as it's counted.

### Student procedure

Place the pegs in the number line in sequence, beginning with the first slot. Count and say the number of each peg as it's placed.

### Student procedure

Follow the teacher's prompt to count to a number up to 20. Take the pegs from the bin, and place them in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed.

## 1.1.d Counting forward from a number other than one

Level Three

### Lesson objective

Count forward from one number to another within 20 without starting over at 1.

*Related skills: Creating sets within 20 (2.1.c), Adding sets within 20 (2.2.c), Identifying numerals 0–20*

### Materials

- 0–10 and 11–20 number lines
- Bin with small yellow and small red pegs
- Number die

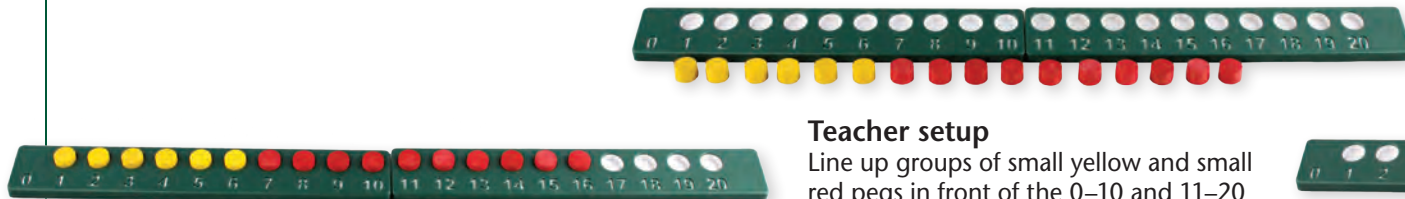
### Narrative

Introduces counting forward from a number without starting over from 1. Abstract students read numbers on a foam die. This more advanced skill boosts this lesson to Level Three.

### Concrete

### Representational

### Abstract



### Teacher setup

Line up groups of small yellow and small red pegs in front of the 0–10 and 11–20 number lines.



### Teacher setup

Place the bins with small yellow and small red pegs behind the 0–10 and 11–20 number lines. Place a foam number die in front.

### Teacher setup

Place a group of small yellow and small red pegs in the 0–10 and 11–20 number lines.

### Student procedure

Count the yellow pegs in the number line, and say or point to the total. Then count the red pegs beginning at the number where the yellow pegs left off. Say each number as it's counted.

### Student procedure

Count the yellow pegs as you place them in the number line in sequence. Then place the red pegs in the number line, counting forward from the number where the yellow pegs left off.

### Student procedure

Roll the die, and place the matching number of yellow pegs in the number line. Roll the die again, and place the red pegs, counting forward from where the yellow pegs left off. Keep rolling the die, changing the color of the pegs for each roll, until you reach 20.

## 1.2.a Counting within 10 by identifying numerals

Level One

### Lesson objective

Count up to 10 by identifying a numeral and placing the correct number of pegs in the number line.

*Related skills: Creating sets within 10 (2.1.b), Number words (2.5.a)*

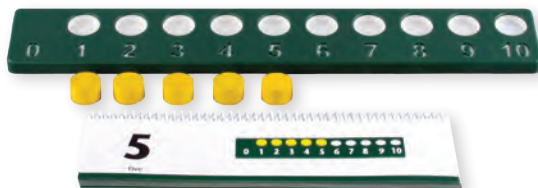
### Materials

- 0–10 number line
- Bin with small yellow pegs
- Number Book

### Narrative

Introduces identification of numerals and the Number Book. Use the cardboard shield to cover the Number Book's pictorial representation for Abstract learners.

### Concrete



### Teacher setup

Place up to 10 small yellow pegs in a row in front of the number line. Open the Number Book to the corresponding page, and place it in front of the pegs.

### Representational



### Teacher setup

Place the bin with small yellow pegs behind the number line. Open the Number Book to a 0–10 page, and place it in front of the number line.

### Abstract



### Teacher setup

Place the bin with small yellow pegs behind the number line. Open the Number Book to a 0–10 page, and place it in front of the number line. Cover the picture with the cardboard shield.

### Student procedure

Count the pegs as you place them in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed. Compare the completed number line with the picture in the Number Book.

### Student procedure

Count up to 10 by following the picture and placing the correct number of pegs in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed.

### Student procedure

Count up to 10 by identifying the numeral and placing the correct number of pegs in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed.

## 1.2.b Counting within 20 by identifying numerals

Level One

### Lesson objective

Count up to 20 by identifying a numeral and placing the correct number of pegs in the number line in sequence, beginning with the first slot.

*Related skills: Creating sets within 20 (2.1.c), Number words—a supplemental activity (2.5.a)*

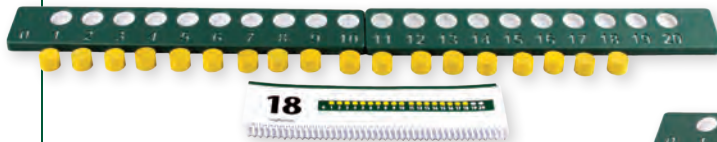
### Materials

- 0–10 and 11–20 number lines
- Bin with small yellow pegs
- Number Book

### Narrative

Expands counting by numeral identification to 20. Use the cardboard shield to cover the Number Book's pictorial representation for Abstract learners.

### Concrete



### Teacher setup

Place up to 20 small yellow pegs in a row in front of the number lines. Open the Number Book to the corresponding page, and place it in front of the pegs.

### Student procedure

Count up to 20 by placing the pegs in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed. Compare the completed number line with the picture.

### Representational



### Teacher setup

Place the bin with small yellow pegs behind the 0–20 number lines. Open the Number Book to a 0–20 page and place it in front of the number line.

### Student procedure

Count up to 20 by following the picture and placing the correct number of pegs in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed. Compare the completed number line with the picture to verify your work.

### Abstract



### Teacher setup

Place the bin with small yellow pegs behind the 0–20 number lines. Open the Number Book to a 0–20 page, and place it in front of the number lines. Cover the picture with the cardboard shield.

### Student procedure

Count up to 20 by identifying the numeral and placing the correct number of pegs in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed.

## 1.2.c Identify numerals within 100 multiples of 10

Level Two

### Lesson objective

Count up to 100 by identifying numerals that are multiples of 10 and placing pegs in a 10–100 number line.

*Related skills: Identify numerals within 10 (1.2.2), Skip count by 10s (1.4.c).*

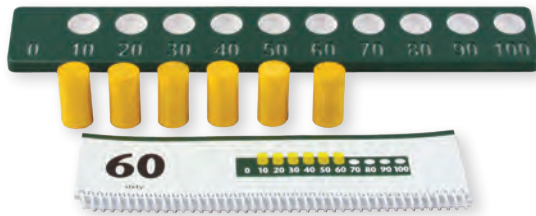
### Materials

- 10–100 number line
- Bin with large yellow pegs
- Number Book

### Narrative

Introduces large pegs to represent 10 and the 10–100 number line.

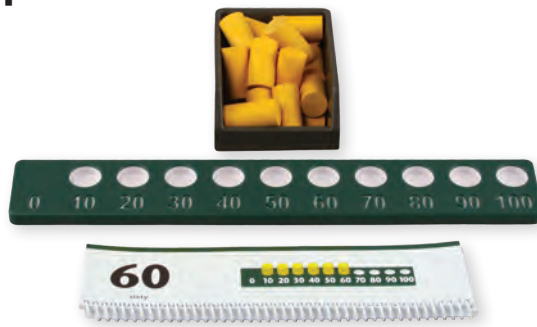
### Concrete



### Teacher setup

Place up to 10 large yellow pegs in a row in front of the 10–100 number line. Open the Number Book to show a multiple of 10, and place it in front of the pegs.

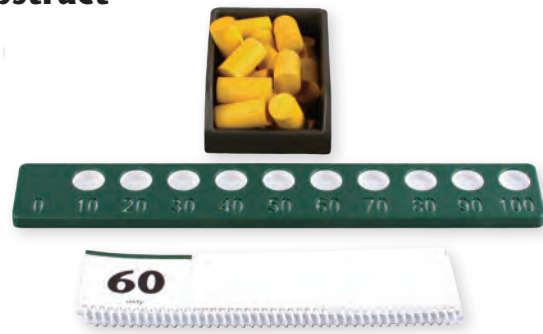
### Representational



### Teacher setup

Place the bin with large yellow pegs behind the 10–100 number line. Open the Number Book to show a multiple of 10.

### Abstract



### Teacher setup

Place the bin with large yellow pegs behind the 0–100 number line. Open the Number Book to a multiple of 10, and place it in front of the number line. Cover the picture with the cardboard shield.

### Student procedure

Count up to 100 by 10s by placing the large pegs in the number line in sequence, beginning with the first slot. Say the number of each peg as it's placed. Compare the completed number line with the picture.

### Student procedure

Count up to 100 by following the picture and placing the correct number of large pegs, each representing 10, in the number line. Compare the completed number line with the picture to verify your work.

### Student procedure

Count up to 100 by 10s by identifying the numeral in the picture. Place large pegs, each representing 10, in the number line to match the numeral. Say the number of each peg as it's placed.

## 1.2.d Identify any numeral within 100

Level Two

### Lesson objective

Identify a numeral 0–100, and represent it by placing pegs in number lines.

*Related skills: Skip count by 10s (1.4.c), Add and subtract 0–100 (2.3.b and c)*

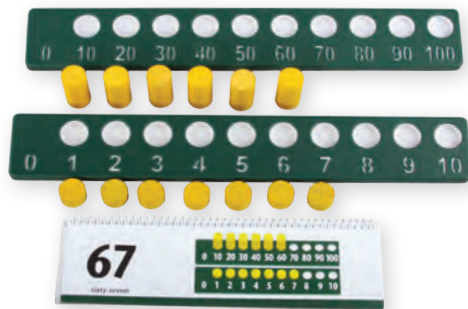
### Materials

- 0–10 and 10–100 number lines
- Bins with large and small yellow pegs
- Number Book

### Narrative

Introduces the use of the 10–100 and 0–10 number line in the same lesson. Students place pegs in the number lines to represent numerals 0–100, with large pegs representing 10s and small pegs 1s.

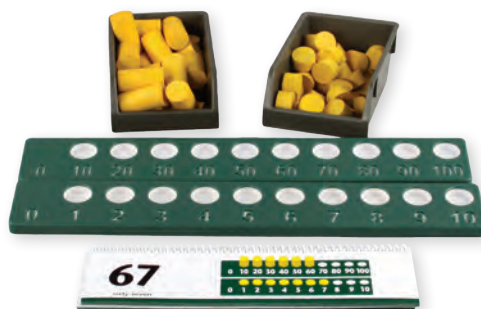
### Concrete



### Teacher setup

Place large yellow pegs in a row in front of the 10–100 number line, and small yellow pegs in front of the 0–10. Open the Number Book to a page matching the pegs, and place the Book in front of the other materials.

### Representational



### Teacher setup

Place bins with large and small yellow pegs behind the 10–100 and 0–10 number lines, with the 0–10 line in front. Open the Number Book to a 0–100 page, and place it in front of the other materials.

### Abstract



### Teacher setup

Place bins with large and small yellow pegs behind the 10–100 and 0–10 number lines, with the 0–10 line in front. Open the Number Book to a 0–100 page, and place it in front of the other materials. Cover the picture with the cardboard shield.

### Student procedure

Place the large pegs in the 10–100 number line and then the small pegs in the 0–10 number line. Say the number of each peg as it's placed. Compare the completed number line with the picture.

### Student procedure

Match the picture by placing large pegs in the 10–100 number line and small pegs in the 0–10 number line. Take pegs from the bins one at a time. Compare the completed number line with the picture to verify your work.

### Student procedure

Match the numeral by placing large pegs in the 10–100 number line and small pegs in the 0–10 number line. Take the pegs from the bins one at a time.

## 1.3.a Subitize within 3

## Level One

### Lesson objective

Identify the number of pegs in a small group (up to 3) at a glance.

*Related skills: Creating sets within 10 (2.1.b)*

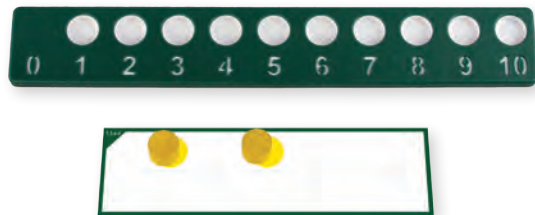
### Materials

- 0–10 number line
- Small yellow pegs
- Activity Cards 1.3.a–d
- Empty bin

### Narrative

Introduces subitizing and the use of Activity Cards for Concrete and Representational students. Abstract learners use an empty bin to cover and uncover the pegs.

### Concrete



#### Teacher setup

Place an Activity Card (1.3.a–d) showing up to 3 yellow dots face up in front of the 0–10 number line. Place small yellow pegs on the dots.

#### Student procedure

Identify and then say the number of pegs shown. Place them in the number line to verify your answer.

### Representational



#### Teacher setup

Place an Activity Card (1.3.a–d) showing up to 3 yellow dots face down in front of the 0–10 number line. Place a bin with small yellow pegs behind the number line.

#### Student procedure

Turn the Activity Card over for a moment to identify the number represented, and then turn it back to a face down position. Place pegs in the number line to match that number. Turn the Card face up to check your work.

### Abstract



#### Teacher setup

Place the bin with small yellow pegs behind the 0–10 number line. Place up to 3 pegs on the table to the right of the number line, and cover them with an empty bin with the front of the bin facing the student.

#### Student procedure

Lift the bin for a moment to identify the number of pegs, and then put the bin down. Place pegs in the number line to match that number. Lift the bin to check your work.

## 1.3.b Subitize within 6

Level One

### Lesson objective

Identify the number of pegs in a small group (up to 6) at a glance.

*Related skills: Creating sets within 10 (2.1.b)*

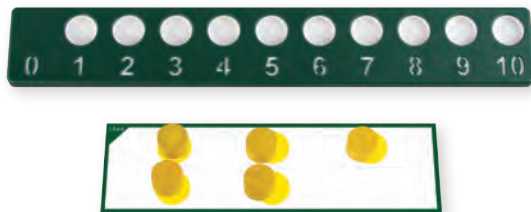
### Materials

- 0–10 number line
- Bin with small yellow pegs
- Activity Cards 1.3.a–d
- Empty bin

### Narrative

Increases the maximum number to subitize to 6. Activity Cards are used for Concrete and Representational students. Abstract students use an empty bin to cover and uncover the pegs.

### Concrete



#### Teacher setup

Place an Activity Card (1.3.a–d) showing up to 6 yellow dots face up in front of the 0–10 number line. Place small yellow pegs on the dots.

#### Student procedure

Identify and then say the number of pegs shown. Place them in the number line to check your work.

### Representational



#### Teacher setup

Place an Activity Card (1.3.a–d) showing up to 6 yellow dots face down in front of the 0–10 number line. Place a bin with small yellow pegs behind the number line.

#### Student procedure

Turn the Activity Card over for a moment to identify the number represented, and then turn it back to a face down position. Place pegs in the number line to match that number. Turn the Card face up to check your work.

### Abstract



#### Teacher setup

Place the bin with small yellow pegs behind the 0–10 number line. Place up to 6 pegs on the table to the right of the number line, and cover them with an empty bin with the front of the bin facing the student.

#### Student procedure

Lift the bin for a moment to identify the number of pegs, and then put the bin down. Place pegs in the number line to match that number. Lift the bin to check your work.