



Math Perspectives

Teacher Development Center

Linking Assessment to instruction

## 4: Number Arrangements Assessment

### Linking Assessment to instruction

The following charts outline suggested activities for each instructional level of the *Number Arrangements* assessment. They refer you to particular activities from the *Developing Number Concepts* (DNC) series of books. The DNC series includes both teacher-directed and independent activities specifically designed to meet the varied needs of students. The suggested activities are coded for easy access. For example, “1:2-23” refers to Book 1, Chapter 2, Activity Number 23.

Please note – these charts provide a quick-overview of activities for instruction. For complete background information, please refer to these other helpful resources:

*Math Time: The Learning Environment* by Kathy Richardson

*Developing Number Concepts* by Kathy Richardson

### For Professional Development Opportunities

Contact Math Perspectives Teacher Development Center: [www.mathperspectives.com](http://www.mathperspectives.com)

### Suggested Reading

For additional information that will support your instruction, read the following sections from *Developing Number Concepts Book Two: Addition and Subtraction*:

- What You Need to Know About Addition and Subtraction (p. xvii-xxii)
- Internalizing Number Combinations to 10 (p. 42-44)
- Goals for Children’s Learning (p. 44)
- Meeting the Range of Needs (p. 47)
- Classroom Scenes (p. 48-54)
- About the Activities (p. 54-55)

### Providing Appropriate Instruction

When helping children develop proficiency with identifying and combining parts, it is important to recognize that competency develops over time. Present a variety of activities, allowing children to create and look for parts of numbers using many different models over several days or even weeks. This will help them make generalizations and integrate the idea that numbers are composed of parts into their thinking. Let their responses dictate the amount of time you spend before moving on to the next level.

- **Teacher-Directed Small-Group Work**

Choose 3 or 4 activities and present them in a 10-15 minute small-group session to provide the children with a variety of experiences. Do the same tasks for several days. Occasionally replace one of the tasks with a new one. Adjust the size of the numbers according to the children's responses. Usually work with just one group a day so you have time to interact with the children while they work at the Independent Stations.

- **Independent Station Work**

Give children opportunities to choose from among several activities. These choices should be available for several weeks. During this time, the children will be developing proficiency and moving to larger numbers, as they are able. Interact with the children as they work, supporting them and challenging them as needed.

## **NUMBER ARRANGEMENTS**

This assessment determines where children are in the process of learning number combinations. Children go through 3 levels in learning to add numbers. They first learn to recognize small groups up to 5 without counting. Next, they begin to see these small groups within a larger number. Finally, they learn to recognize one part and count on from there or combine the parts to determine the total.

The assessment begins with the highest level (Combining Parts) to determine whether children can combine parts of numbers to find the total. If children do not combine parts but instead count all the dots, they are asked to identify whatever groups they can see within the larger number (Identifying Parts). If they don't see small groups within the number, they are shown small groups of up to 5 dots to see if they can recognize these groups when they are not a part of a larger number (Recognizing Small Parts).

Many of the same activities are used for all the levels, but the way children work with these activities will vary depending on their level of understanding and their interactions with the teacher while they are working.

### **Recognizes Small Groups**

#### **Needs Prerequisite (N)**

**(N)** – Does not recognize any groups without counting, or makes 2 or more errors.

*This indicates that children need to have opportunities to work with small groups of objects. Begin with numbers that are small enough for them to realize that they can recognize the groups without counting- for some children this will be a group of 2.*

TEACHER-DIRECTED ACTIVITIES	
1:1-13	<i>Tell Me Fast</i>
1:1-10	<i>Hunt for It</i>
1:1-9	<i>Hide it</i>
1:1-12	<i>Find a Match</i>

### Needs Instruction (I)

(I) – Recognizes 1 group without counting. May make 1 error.

### Needs Practice (P)

(P) – Recognizes 2 or 3 groups without counting.

*The following activities are appropriate for children who need instruction and who need practice. Give children experiences until they can recognize a variety of groups up to 5 or 6 without counting.*

TEACHER-DIRECTED ACTIVITIES	
1:1-13	<i>Tell Me Fast</i>
1:1-10	<i>Hunt for It</i>
1:1-9	<i>Hide it</i>
1:1-12	<i>Find a Match</i>
2:3-2	<i>Instant Recognition of Number Arrangements</i>
2:3-3	<i>Instant Recognition of Number Shapes</i>
2:3-4	<i>Instant Recognition of Number Trains</i>

### Ready to Apply (A)

(A) – Recognizes groups without counting.

*Go on to focus on learning combination for numbers as described below.*

### Identifies Parts of Numbers

When children are asked to determine how many altogether in a group of dots, those who add the parts to get the total will identify those parts when they explain how they got the total. For example, “I saw 3 and 2, and that was 5.” However, some children count all the dots. We can’t tell through their explanation whether they can see parts of the number or not. So, we ask, “What groups do you see?”

### Needs Prerequisite (N)

(N) – Does not identify groups of 3 or larger.

*These children should work with the activities described above for Recognizing Small Numbers.*

### Needs Instruction (I)

(I) – Is able to see groups of 3 or larger on 2 of the 6 cards.

*Provide experiences where children are asked to look for and describe the parts they see.*

TEACHER-DIRECTED ACTIVITIES	
2: 3:2	<i>Instant Recognition of Number Arrangements</i>
2: 3-3	<i>Instant Recognition of Number Shapes</i>

INDEPENDENT ACTIVITIES	
2:2-14	<i>Number Arrangements: Using Cubes, Level 1</i>
2:2-15	<i>Number Arrangements: Using Color Tiles, Level 1</i>
2:2-16	<i>Number Arrangements: Using Toothpicks, Level 1</i>
2:2-17	<i>Number Arrangements: Using Collections, Level 1</i>
2:2-18	<i>Counting Boards: Making Up Number-Combination Stories, Level 1</i>

### Needs Practice (P)

(P) – Is able to identify groups of 3 on 5 or 6 of the 6 cards.

*Focus on finding the largest group they can. Also look for specific groups, including groups of 4 and 5. For example: Show a group of 4 and say, “Can you find a group that looks like this?”*

TEACHER-DIRECTED ACTIVITIES	
2:3-2	<i>Instant Recognition of Number Arrangements</i>
2: 3-3	<i>Instant Recognition of Number Shapes</i>

INDEPENDENT ACTIVITIES	
2:2-14	<i>Number Arrangements: Using Cubes, Level 1</i>
2:2-15	<i>Number Arrangements: Using Color Tiles, Level 1</i>
2:2-16	<i>Number Arrangements: Using Toothpicks, Level 1</i>
2:2-17	<i>Number Arrangements: Using Collections, Level 1</i>
2:2-18	<i>Counting Boards: Making Up Number Combination Stories, Level 1</i>

### Ready to Apply (A)

(A) – Is able to see parts of 4 or more on at least 2 cards and 3 or more on the rest of the cards.

## Combines Parts of Numbers

### Needs Prerequisite (N)

(N) – Counts all to determine the total number of dots most of the time (5 or 6 out of 6 cards) or makes 3 or more errors.

*Focus on recognizing groups of 2, 3 and 4 dots. Then add in some groups of 5. Present a variety of arrangements made with many different materials.*

TEACHER-DIRECTED ACTIVITIES	
2:3-2	<i>Instant Recognition of Number Arrangements (to 5)</i>
2:3-3	<i>Instant Recognition of Number Shapes (to 6)</i>

INDEPENDENT ACTIVITIES	
2:2-14	<i>Number Arrangements: Using Cubes (to 5)</i>
2:2-15	<i>Number Arrangements: Using Color Tiles (to 5)</i>
2:2-16	<i>Number Arrangements: Using Toothpicks (to 5)</i>
2:2-17	<i>Number Arrangements: Using Collections (to 5)</i>

### Needs Instruction (I)

**(I)** – Does not use parts to find the total number of dots for most of the cards; counts all to find out for 4 out of the 6 cards.

*Focus on finding the parts they know within the larger numbers.*

TEACHER-DIRECTED ACTIVITIES	
2:3-2	<i>Instant Recognition of Number Arrangements</i>
2:3-3	<i>Instant Recognition of Number Shapes</i>

INDEPENDENT ACTIVITIES	
2:2-14	<i>Number Arrangements: Using Cubes, Level 1</i>
2:2-15	<i>Number Arrangements: Using Color Tiles, Level 1</i>
2:2-16	<i>Number Arrangements: Using Toothpicks, Level 1</i>
2:2-17	<i>Number Arrangements: Using Collections, Level 1</i>
2:2-18	<i>Counting Boards: Making Up Number-Combination Stories, Level 1</i>

### Needs Practice (P-, P, P+)

*At this stage, children are using parts of numbers to find out how many for some of the cards with various levels of proficiency.*

**(P-)** – Begins to recognize they know some groups without counting but still counts all of the dots on 3 out of the 6 cards. May make 2 errors.

**(P)** – Recognizes more and more groups and only counts all of the dots on 1 or 2 out of the 6 cards. Adds without counting or counts on for the rest of the cards. May make 1 error.

**(P+)** – Uses parts of numbers to find out how many for all 6 cards. Counts on for 3 cards. May add without counting for more than 3 cards, but makes an error. Does not count all for any of the cards.

*Focus on developing an awareness of the combinations they know. Also have them predict how many they think the total will be before counting on.*

<b>TEACHER-DIRECTED ACTIVITIES</b>	
2:3-2	<i>Instant Recognition of Number Arrangements</i>
2:3-3	<i>Instant Recognition of Number Shapes</i>

<b>INDEPENDENT ACTIVITIES</b>	
2:2-14	<i>Number Arrangements: Using Cubes, Levels 1 and 2</i>
2:2-15	<i>Number Arrangements: Using Color Tiles, Levels 1 and 2</i>
2:2-16	<i>Number Arrangements: Using Toothpicks, Levels 1 and 2</i>
2:2-17	<i>Number Arrangements: Using Collections, Levels 1 and 2</i>
2:2-18	<i>Counting Boards: Making Up Number-Combination Stories, Level 1</i>
2:2-19	<i>Number Shape Arrangements, Levels 1 and 2</i>
2:2-22	<i>Number-Train Arrangements, Levels 1 and 2</i>
2:3-17	<i>Describing Shape Puzzles</i>
2:2-27	<i>Building and Rebuilding</i>

### **Ready to Apply**

**(A)** – Uses the parts of numbers to find out how many for all the cards. Adds parts for 4 or more cards. May count on for 2 of the cards but does not count all for any of the cards.

To get more information about what is appropriate for them at the next level, assess using *Assessment 5: Combination Trains*.