



Math Perspectives

Teacher Development Center

Linking Assessment to instruction

3: More/Less Trains Assessment

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The following charts outline suggested activities for each instructional level of the *More/Less Trains* 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

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Suggested Reading

For additional information that will support your instruction, read the following sections from *Developing Number Concepts Book One: Counting, Comparing and Pattern*:

- What You Need to Know About the Concepts of More and Less (pp. 126-128)
- Goals for Children’s Learning (p. 132)
- Meeting the Range of Needs (pp.133-134)
- Classroom Scenes (pp. 134-142)

Providing Appropriate Instruction

When you are helping children develop proficiency comparing numbers, it is important to recognize that competency develops over time. Present a variety of activities, allowing children to experience the concepts in many ways over several weeks. This will help them make generalizations and integrate their ideas about number relationships. Let their responses dictate the amount of instructional time you provide before moving on.

- **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.

MORE/LESS TRAINS

Several levels of understanding are assessed with the *More/Less Trains* assessment.

Level 1: Using One Train to Determine Another

The first part of the assessment uses Unifix cube trains that are lined up so the relationships between the trains are more visible. The children are assessed to see if they can use what they know about the number of cubes in one train to figure out the number of cubes in the second train. Seeing this relationship is a prerequisite for comparing the trains to determine how many more or less one is than the other.

Level 2: Finding the Difference between Trains

Once the student knows the number in both trains, s/he is asked to tell how many more (or less) one train is than the other.

Level 3: Finding the Difference between Groups

If the students are able to tell how many more or less one train is than the other, they will then be asked to compare groups that are not organized. When groups are not lined up, the relationships are less apparent, so comparing is more difficult.

Level 1: Using One Train to Determine Another

Needs Prerequisite (N)

(N) - Uses one train to figure out the other (0 out of 3) times.

At this stage, children do not use one train to help them figure out the other train. They count to find out how many every time, indicating that they see the numbers as separate entities.

*To get more information about their ability to see how one number relates to another, assess using **Assessment 2: Changing Numbers**.*

Needs Instruction (I)

(I) – Uses one train to figure out the other (1 out of 3 times), usually when the difference is 1.

At this stage, the children are just beginning to notice that they can use what they know about one train to help them figure out the other. They use the relationship between the trains just once. Most often they notice this when the difference is only one cube.

Needs Practice (P)

(P) – Uses one train to figure out the other (2 out of 3 times). May count all 1 time or make an error.

At this stage, the children use what they know about one train to help them figure out the other most of the time but still need more practice. Most often they will be able to use one train to figure out a longer train, but not a shorter train.

The following tasks can be used for children who need instruction as well as those who need practice. Focus on providing opportunities for children to look for parts of two groups that are the same. This will help them attend to what is different more easily.

TEACHER-DIRECTED ACTIVITIES	
1:1-20	<i>Towers, Towers, Towers</i>
1:3-1	<i>Is It More or Is It Less?</i>
1:3-2	<i>Stacks</i>
1:3-5	<i>Graph and See</i>

INDEPENDENT ACTIVITIES	
1:1-27	<i>Build a Staircase</i>
1:3-13	<i>Stack, Tell, Spin, and Win</i>
1:3-14	<i>Two-Color Grab-Bag Station</i>
1:3-20	<i>Sort and Compare Colors</i>

Ready to Apply (A)

(A) – Uses one train to figure out the other train (3 out of 3 times).

When children see that one number is related to another and can use that information, they are ready to begin learning particular relationships and how to determine how many more or less one number is than another.

Level 2: Finding the Difference between Trains

The process for learning to tell how many more and how many less is a long and complex one. Children may be able to tell how many more but not how many less. They may be able to tell how many more or less when the differences are one or two but not if larger. Be aware of these different competency levels as you provide experiences to children.

Needs Prerequisite (N)

(N) – Tells “how many more or less” 0 (out of 3) times (Usually tells the number in the group with more).

*To get more information about children’s ability to see relationships between numbers, assess with **Assessment 2: Changing Numbers**.*

Needs Instruction (I)

(I) – Tells “how many more or less” 1 (out of 3) times.

Needs Practice (P)

(P) – Tells how many more or less 2 times with 1 error, **or** matches the cubes to find the difference 2 or 3 times.

(P+) – Tells how many more or less 2 times and finds out by matching 1 time.

Notice that the instructional levels I, P, and P+ describe varying levels of proficiency comparing quantities. The activities for each instructional level are essentially the same but the questions, the size of the numbers and the differences between numbers can be varied to meet the children’s needs.

Children who are just beginning to notice the differences between numbers will need work with one more and one less and two more and two less before asking them to consider larger differences. When children find comparing trains difficult, use the language suggestions in the activities that children focus on what you want them to notice. Ask, “What do you have to do to make this train the same as that train?” or ask: “How many extras?”

Keep the size of the numbers and the differences small until they are successful. As they develop competency with each level, provide experiences with more challenging levels.

TEACHER-DIRECTED ACTIVITIES	
1:3-1	<i>Is it More or Is It Less? Level 2</i>
1:3-2	<i>Stacks, Level 2</i>
1:3-3	<i>Two-Color Grab Bag, Level 2</i>
1:3-5	<i>Graph and See, Level 2</i>
1:3-6	<i>Number Cards, Level 2</i>
1:3-7	<i>More-or-Less Spin It, Level 2</i>
1:3-9	<i>Build a Stack</i>
1:3-11	<i>More or Less</i>
1:3-12	<i>Roll and Spin</i>

INDEPENDENT ACTIVITIES	
1:3-13	<i>Stack, Tell, Spin, and Win</i>
1:3-15	<i>Comparing Lengths, Level 2</i>
1:3-14	<i>Two-Color Grab-Bag Station, Level 2</i>
1:3-18	<i>Comparing Handfuls, Level 2</i>
1:3-19	<i>Comparing Containers, Level 2</i>
1:3-10	<i>Grow, Shrink, and Compare (use 2 working space papers)</i>
1:3-20	<i>Sort and Compare Colors, Level 2</i>
1:3-21	<i>Comparing Numbers, Level 2</i>

Ready to Apply (A)

(A –) – Tells “how many more or less” (3 out of 3 times), with no errors.

Level 3: Differences between Groups

Needs Prerequisite (N)

(N) – Is unable to tell the difference between numbers (usually tells the number in the group with more).

Children who are able to tell the difference between the connecting trains that are lined up but cannot compare groups that are not lined up should work with groups that are just 1 or 2 more or less than the other. Ask them to think about how they could figure out the differences. This will give them the opportunity to consider matching the objects in the groups and seeing how many extras there are.

Needs Instruction (I)

(I) – Tells how many more or less 1 out of 3 times; may know the difference or match the cubes to find out.

Needs Practice (P, P+)

(P) – Tells how many more or less 2 times with 1 error, **or** they match the cubes to find the difference 2 or 3 times.

(P+) – Tells how many more or less 2 times and finds out by matching 1 time.

The same activities can be used for I, P, and P+. The size of the numbers and the size of the differences can be adapted to meet the children’s needs. Have the children experience some tasks that are not lined up along with those that are lined up.

TEACHER-DIRECTED ACTIVITIES	
1:3-4	<i>Spin and Peek, Level 2</i>
1:3-6	<i>Number Cards, Level 2 (vary by making groups instead of trains)</i>
1:3-8	<i>More-or-Less Counting Stories, Level 2</i>
1:3-10	<i>Grow, Shrink, and Compare (use 2 working space papers)</i>
1:3-11	<i>More or Less</i>
1:3-12	<i>Roll and Spin (vary by not connecting the cubes)</i>

INDEPENDENT ACTIVITIES	
1:3-15	<i>Comparing Lengths</i>
1:3-14	<i>Two-Color Grab-Bag Station, Level 2(vary by not connecting the cubes together)</i>
1:3-16	<i>Comparing Shape Puzzles, Level 2</i>
1:3-17	<i>Comparing Line Puzzles, Level 2</i>
1:3-18	<i>Comparing Handfuls, Level 2</i>
1:3-19	<i>Comparing Containers, Level 2</i>
1:3-10	<i>Grow, Shrink, and Compare (use 2 working space papers)</i>
1:3-20	<i>Sort and Compare Colors, Level 2</i>
1:3-21	<i>Comparing Numbers, Level 2(vary by not connecting the cubes)</i>

Ready to Apply (A)

(A –) – Tells how many more or less 3 (out of 3) times, with no errors.

Children who are ready to apply will be able to begin to learn relationships between numbers so they will be able to tell “How many more?” and “How many less?” one number is than another when the numbers are presented symbolically.