HEART
MATH TUTORING

Lessons and Activities for

Counting

Volunteer Check-Out Materials

COUNTING AND NUMBER RECOGNITION
Concept Overview

CONCEPT GOALS
Student will be able to:

1. Count objects consistently and accurately.

2. Recognize and understand numerals.

3. Determine "one more" and "one less" without counting.

4. Recognize that smaller numbers are contained within larger numbers.

5. Solve word problems that involve counting.

END OF PROGRAM ASSESSMENT
Knowing how students will be assessed can help guide instruction.

Example: Student will be asked to count out a pile of cubes (between 20 and 30) and report the number counted with ease. Then he/she will be asked to say the resulting number when one cube is taken away, without recounting the pile.

KEY POINTS
The information below may assist you in helping your student.

- "Counting is more than reciting a rote sequence and recognizing numerals. Counting is finding out 'how many.'" – Kathy Richardson, How Children Learn Number Concepts: A Guide to the Critical Learning Phases, 2012.

    o For example, when you place three counters out for a child and have them count them "One, Two, Three", he/she may have named or labeled the first object, "One," and the next object "Two," and the next, "Three." When you ask him/her to show you three, instead of scooping up all three counters and showing you three, he/she will show you the one counter that he/she labeled "Three."

    o Young children also often do not realize that they need to keep track of what has and has not been counted.

- Students need practice associating real objects with numerals to discover meaning behind quantities.

- Hands-on practice with real objects should help students become able to tell whether an estimate is reasonable, count consistently and accurately, and see and use relationships between numbers.

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Connecting Students & Volunteers
for Results that Count

GOALS

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1. Count objects consistently and accurately.
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3. Solve word problems that involve counting.

ACTIVITIES

The time required to complete each activity will vary from student to student. Allow student to move at his/her own pace. If more time is needed, lessons can be carried over to the next tutoring session.

Counting and Rearranging Objects

Counting Stories

Red Cards Win!

Word Problems

MATERIALS ENCLOSED
Blank Ten Frame

MATERIALS TO GET
Connecting Cubes (2 bags, different colors)

Yellow Number Cube (1-6)

Deck of Cards

Paper and pencil

WRAP-UP
- Compliment student for hard work and provide stickers as a reward.
- Discuss with student the lesson goals that were practiced today.
- Ask student two of the following questions on the way back to class:
  - What was hard about today?
  - What did you feel confident about?
  - Where did you see improvement?
  - What do you still need to practice?
  - How do you feel about your effort today?
- Encourage students to practice counting objects at home.
- Record brief notes on progress log.

Counting and Rearranging Objects

Materials: Connecting Cubes (1 bag) / Yellow Number Cube (1-6) / Blank Ten Frame

Purpose: Student practices building the same number in different ways to discover that object distribution does not affect the quantity.
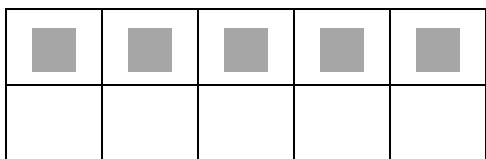
PART I:

Ask student to roll the Number Cube and to put that number of Connecting Cubes on the Ten Frame.

Rearrange the cubes on the frame and ask,

"How many cubes are on the ten frame now?"

Ask student to rearrange the cubes in a third way. If student struggles, ask questions to prompt thinking.

Example for 5

Repeat by rolling the Number Cube to generate several more numbers.

PART II:

Ask student to roll the Number Cube and to hold up his/her fingers to show the number on the cube. Then ask student to use different fingers to show the same number. If student struggles, ask questions to prompt thinking.

Example for 6:
Student shows:
    One hand with 5 fingers and one hand with 1 finger.
    Both hands with 3 fingers.
    One hand with 4 fingers and one hand with 2 fingers

Counting and Rearranging Objects /
Counting and Number Recognition

Counting Stories

> **Materials:** Connecting Cubes (2 bags, different colors)
>
> **Purpose:** Student practices counting to tell *how many*.

NOTE: *The stories below are not meant to be used as addition problems but rather should be used to allow student to practice counting by ones.*

Tell student,

> **"Today we are going to make up stories that require counting. Then you will use cubes to show the story and find the answer."**

Share some of the suggested situations below. Ask student to pick one of the situations or to make up his/her own.

Fish in the ocean	Children on the playground
Tigers in a cage	Students on a bus
Ducks on a pond	Birds in a tree
Dinosaurs out for a walk	

Make up a story that involves counting and ask student to model the story using counters as shown in examples below:

Example 1:
Tutor says,

> **"3 girls and 4 boys are riding on the bus."**

Wait for student to use 3 cubes to represent boys and 4 cubes to represent girls.

Then ask,

> **"How many children were riding on the bus?"**

Student should count all of the cubes.

Example 2:
Tutor says,

> **"One dinosaur walked down to the lake and met five more dinosaurs at the lake."**

Wait for student to use cubes to act out the story.

Then ask,

"How many dinosaurs were at the lake?"

Repeat with several more stories.   Encourage student to make up his/her own counting stories.

Counting Stories / Counting and Number Recognition

Red Cards Win!

Materials: Deck of Cards / Paper and pencil

Purpose: Student practices counting to tell *how many*.

Ask student to count out 26 cards for each player.

Each player sorts his/her cards by color and counts how many of each color he/she has.

The player with more red cards is the winner!

Play several times, writing on paper to keep track of "wins."

NOTE: *If student struggles, play with fewer cards.*

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Word Problems

> **Materials:** Connecting Cubes (2 bags, different colors)/ Paper and pencil
>
> **Purpose:** Student practices understanding and solving word problems that require counting.

Together with student, read the problems below. Ask student to solve the problem. Encourage him/her to use drawings, cubes, or fingers to represent objects as a way to better understand the problem.

1. There are 3 blue fish and 7 green fish. Count the fish.

2. Use the blocks to measure the line below. How many blocks do you need?

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NOTE: At this level, the problems above are not meant to be used to practice addition computation but rather should be used to allow student to practice counting by ones.

Word Problems (1) / Counting and Number Recognition

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GOALS

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3. Solve word problems that involve counting.

ACTIVITIES

The time required to complete each activity will vary from student to student. Allow student to move at his/her own pace. If more time is needed, lessons can be carried over to the next tutoring session.

Make – Break – Match

Large Handfuls

Word Problems

MATERIALS ENCLOSED
Number Line (1-10)

Number Cards (1-30)

Ten Frame Cards for Counting

MATERIALS TO GET
Connecting Cubes (3 bags of one color, 1 bag of a different color)

10 Red bowls

2 Yellow Dot Cubes (1-6)

Paper and pencil

WRAP-UP
- Compliment student for hard work and provide stickers as a reward.
- Discuss with student the lesson goals that were practiced today.
- Ask student two of the following questions on the way back to class:
    o What was hard about today?
    o What did you feel confident about?
    o Where did you see improvement?
    o What do you still need to practice?
    o How do you feel about your effort today?
- Encourage students to practice counting objects at home.
- Record brief notes on progress log.

Make – Break – Match

Materials: Connecting Cubes (3 bags of the same color) / Number Line (1-10) / 10 Red bowls / Ten Frame Cards for Counting / 2 Yellow Dot Cubes (1-6)

Purpose: Student practices counting out quantities and relating quantities to numbers.

PART I: Making Towers

Place a Number Line (1-10) on the table in front of student and ask him/her to make a tower to match each number, starting with 1 and going in order to 10. Feel free to help him/her create the towers to speed up the process.

After each tower is made, ask student to place the tower behind the matching number as shown below.

NOTE: *If student struggles to count out the correct number, encourage him/her to go slowly and to count out loud as he/she collects each cube.*

When all the towers have been made, ask student to describe what the towers look like.

Compliment student on his/her answer. Emphasize the number relationships by saying,

Make – Break – Match / Counting and Number Recognition

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"Going up, each tower has *one more* than the tower before it. Going down, each tower has *one less*."

PART II: Breaking Towers

Ask student to pick one of the towers, break the cubes apart and put them in a pile. Have student count the cubes as he/she does so.   Place a bowl over the cubes to hide them.

Repeat until all the towers have been broken apart and all the cubes are hidden under the bowls.

PART III: The Matching Game

Mix up the bowls so no one can remember which quantity is under which bowl.

Place the Ten Frame Cards face down on the table. Tutor and student take turns turning over a Ten Frame Card and then choosing a bowl to try to find the matching quantity.

Ask student to count the quantity on the Ten Frame Card and then to count the quantity under the bowl for each turn. If someone makes a match, he/she keeps the card and removes that bowl of cubes out of play. If a match is not made, the card goes back to the bottom of the stack.

The person with the most Ten Frame Cards at the end is the winner.

Variation:

Play the Matching Game using 2 Yellow Dot Cubes (1-6) instead of Ten Frame Cards. Roll the cubes, count the dots, and find a match. If 11 or 12 are rolled, let the student count the dots, but know that there will not be a matching bowl.

PLEASE RETURN 20 SAME COLOR CONNECTING CUBES TO EACH BAG.

Make – Break – Match / Counting and Number Recognition

Large Handfuls

Materials: Connecting Cubes (3 bags of the same color) / Number Cards (1–30) / Number Line (1-10) / Paper and pencil

Purpose: Student practices keeping track of an unorganized pile and counting to find out how many.

PART I: Counting by 1s

Break apart 60 Connecting Cubes and place in pile on table. Ask student to take <u>3 handfuls</u> of Connecting Cubes and place them in a separate pile (about 15 cubes).

Ask student,

> **"How many cubes do you think are there? Make a guess or estimate, before counting."**

Ask student to count the cubes. When student finishes counting, ask,

> **"How many are there?"**

If student struggles, help him/her recount or correct errors.

Find the Number Card that matches and place it beside the pile as a label.

Discuss whether the initial estimate was close to the actual number of Connecting Cubes. Reference Number Line as a visual aid if needed.

Repeat several times, asking students to take out larger handfuls of Connecting Cubes (quantities up to 30).

Notice the following things about your student and compliment him/her as progress is made.
- *Does student realize the importance of keeping track of the cubes while counting (no double-counting or missing any cubes)?*
- *Does student know "how many" after counting?*
- *Does student correct his/her estimate while counting, if his/her estimate was significantly off?*

PART II: Grouping by 2s, 5s and 10s

Tell student,

> **"Sometimes organizing objects into groups helps when you are counting.   Let's try it."**

NOTE: *Some students will not yet trust that the total remains the same despite how the cubes are arranged or grouped. This activity helps address that misconception.*

Ask student to take <u>3 or 4 handfuls</u> of cubes (about 15 – 30 cubes) and put them in a pile. Put aside any remaining cubes and work only with the selected pile throughout the remainder of the activity.

Ask student to count the cubes <u>one at a time</u> and to write the total on a piece of paper.

Ask student to organize the cubes into groups of 2 and count again. If there are an odd number of cubes, explain that the extra cube must be added on at the end.

Some students will know the sequence of counting by 2s easily (2, 4, 6, 8, 10) and others will need to count by ones despite the organized piles of 2. Either way is fine.

Then ask,

"Is that the same amount you counted before?"

Put the cubes back into an unorganized pile.

Ask student to organize the cubes into groups of 5 and count again. If there are leftovers at the end, explain how to count them.

Some students will know the sequence of counting by 5s (5, 10, 15, etc.) and others will need to count by ones despite the organized piles of 5. Either way is fine.

Then ask,

"Is that the same amount you counted before?"

Ask student to organize the cubes into groups of 10 and count again. If there are leftovers at the end, explain how to count them.

Some students will know the sequence of counting by 10s (10, 20, etc.) and others will need to count by ones despite the organized piles of 10. Either way is fine.

Repeat several times with different large piles.

PLEASE RETURN 20 SAME COLOR CONNECTING CUBES TO EACH BAG.

Large Handfuls / Counting and Number Recognition

Word Problems

Materials: Connecting Cubes (2 bags, different colors) / Paper and pencil

Purpose: Student practices understanding and solving word problems that require counting.

Together with student, read the problems below. Ask student to solve the problem. Encourage him/her to use drawings, cubes, or fingers to represent objects as a way to better understand the problem.

1. Which circle has 9 squares inside it?
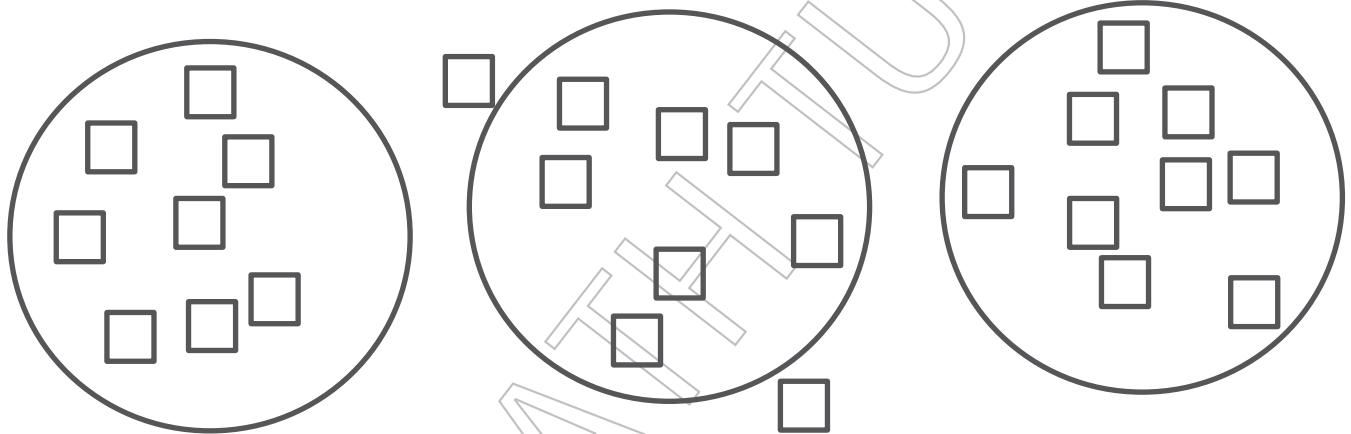
2. There are 6 boys and 4 girls in Mrs. Brown's art class. Count the students.

NOTE: *At this level, the problems above are not meant to be used to practice addition computation but rather should be used to allow student to practice counting by ones.*

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GOALS

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1. Count objects consistently and accurately.
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3. Determine "one more" and "one less" without counting.
4. Solve word problems that involve counting.

ACTIVITIES

The time required to complete each activity will vary from student to student. Allow student to move at his/her own pace. If more time is needed, lessons can be carried over to the next tutoring session.

Show and Build

Show Me the Number

Where on the Number Line?

Knowing One More and One Less

Word Problems

MATERIALS ENCLOSED
Number Cards (1–30)

Number Line (1–30)

Blank Ten Frame

Ten Frame Cards for Counting

MATERIALS TO GET
Connecting Cubes (2 bags of one color, 1 bag of different color)

+/- Cube

Paper and pencil

WRAP-UP
- Compliment student for hard work and provide stickers as a reward.
- Discuss with student the lesson goals that were practiced today.
- Ask student two of the following questions on the way back to class:
  - What was hard about today?
  - What did you feel confident about?
  - Where did you see improvement?
  - What do you still need to practice?
  - How do you feel about your effort today?
- Encourage students to practice counting objects at home.
- Record brief notes on progress log.

Show and Build

> **Materials:** Connecting Cubes (1 bag) / Blank Ten Frame / Ten Frame Cards for Counting / Paper and pencil
>
> **Purpose:** Student practices counting and experiments with number relationships.

PART I: Show and Build

Tell student,

> **"You played a matching game recently with Ten Frame Cards and cubes. Today we are going to use the same cards to play 'Show and Build'.**
>
> **I am going to show you a Ten Frame Card and ask you to build what you see on your Blank Ten Frame.   Then I'm going to show you a second Ten Frame Card and ask you to change your cubes to match the second Ten Frame Card.**
>
> **Let's give it a try."**

Example for changing 5 to 7:

Show student a Ten Frame Card with 5 dots and ask him/her to use cubes to fill his Blank Ten Frame to match it. Then show student a Ten Frame Card with 7 dots and ask him/her to change the cubes on his/her Ten Frame to match the second card. Leave the 5 and 7 Ten Frame Cards on the table for student to examine if needed.

Ask student,

> **"How many cubes did you put on the Ten Frame to start out?"**
>
> **"How many cubes do you have on your Ten Frame now?"**
>
> **"What did you do to change to the second number?"**

NOTE: *The goal is to allow student to practice counting and to* experiment *with number relationships. Allow student to perform the tasks however he/she chooses. Many students will struggle to explain how they changed the cubes. If student struggles, ask questions to prompt thinking. Some possible student answers are provided below:*

> *"I started over and put 7 cubes on the Ten Frame."*
>
> *"I counted the cubes that were on the frame and I continued to add cubes until I had 7."*
>
> *"I knew I had 5 cubes, so I added two more to make the 7."*

Show and Build / Counting and Number Recognition

Repeat this activity using different Ten Frame Cards for as long as it seems challenging to student, sometimes changing to larger numbers and sometime changing to smaller numbers.

PART II: Flash and Build

If student is successful with the above activity, change it by showing the second Ten Frame Card quickly. Allow enough time for student to count the dots on the card, but do not leave the cards on the table while student is working with the cubes.

If student struggles, bring the cards back out for closer examination.

Repeat the activity using different Ten Frame Cards.

PART III :   Write and Build to 10

If student is successful with the above activities, ask him/her to build numbers on the Blank Ten Frame as follows:

- Write down a number between 1 and 10 and ask student to build it.
- Write down a second number between 1 and 10 and ask student to change the cubes on the frame to make the second number.

Ask student,

"What did you do to change the first number to the second?"

NOTE: *The goal is to allow student to practice counting and to experiment with number relationships. Allow student to perform the task however he/she chooses. If student struggles, ask questions to prompt thinking.*

Repeat activity several times, sometimes changing to larger numbers and sometimes changing to smaller numbers.

Show and Build / Counting and Number Recognition

Show Me the Number

Materials: Connecting Cubes (2 bags of the same color) / Number Cards (1-30) / Number Line (1-30)

Purpose: Student practices counting out a particular quantity.

NOTE: Counting out a particular quantity is a different skill from counting a group of objects to determine how many. It requires students to remember the requested number while counting and therefore attribute meaning to that number. Often, students will count past the requested number, begin to self-correct, and only later be able to easily count out the particular quantity.

Tell student,

> **"Today we're going to use Connecting Cubes to represent different objects and you are going to show me the number of objects I ask for."**

Ask student to decide what he/she wants the Connecting Cubes to represent. Offer suggestions if needed (candy, animals, stickers, children, etc.).

> **"Let's pretend these cubes represent _____."**

Ask student to show you various quantities, beginning with numbers between 5 -15, progressing to numbers between 15 – 25 and then to numbers between 25 – 35, as student is able.

Example:

> **"Please show me 9 fish."**

Student does not need to line up or connect the cubes. Rather, he/she should understand that a loose pile of 9 has the same value as a straight line of 9.

Watch student work until he/she stops counting and announces he/she is finished. Observe whether student correctly finishes at 9, counts past 9, counts past and self-corrects, or loses track of the number altogether. If student struggles:

- Ask student to count aloud so that you can help catch any mistakes.
- Ask student to set the cubes they have counted onto a piece of paper to encourage accuracy and organization.
- Suggest using Number Line (1-30) as a visual aid. Student can put one cube on each number of the line.
- For a student who struggles with organization, suggest he/she put the cubes onto a sheet of paper as he/she counts them. This will help the student keep track of which cubes have been included in the total count and which have not.

Give student help and additional practice, moving to higher numbers, as he/she is ready.

Variation:
Draw Number Cards between 10 and 30 to determine the amount student should count out.

Where on the Number Line?

Materials: Number Cards (1-20) / Paper and pencil

Purpose: Student practices putting numbers 1-20 in order to explore number relationships.

Shuffle and place Number Cards face down in a pile.

Student and tutor take turns picking a card from the pile and placing it on the table to make a single number line of 1 - 20.

Each card should be placed to the right or left of the cards already on the table according to where it would go on the number line, leaving the correct numbers of spaces between them.

When a number is picked that can go directly beside a number that is already on the table, the person who places that card gets a point. If it goes directly between two cards, the person gets two points.

Keep track of points using pencil and paper. The person with the most points after all the cards are placed is the winner.
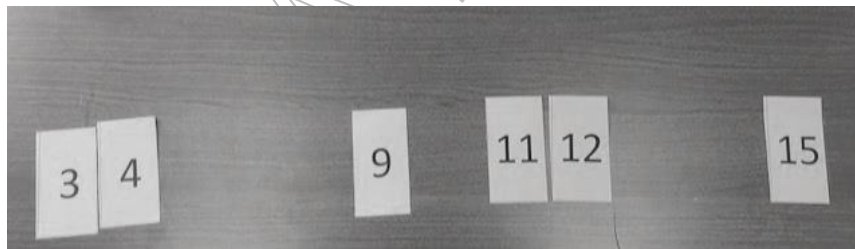
Knowing One More and One Less

**Materials:** Connecting Cubes (2 bags of the same color) / Number Cards (1-30) / Number Line (1-30) / +/- Cube

Purpose: Student practices knowing how many items result when adding one more or taking one away.

NOTE: *For the activity below, begin with low Number Cards but move to higher Number Cards as soon as student is able.*

Tell student:

> **"Pick a Number Card and build a train that has the same number of cubes."**

Put the Number Card visibly next to the train, as a label.
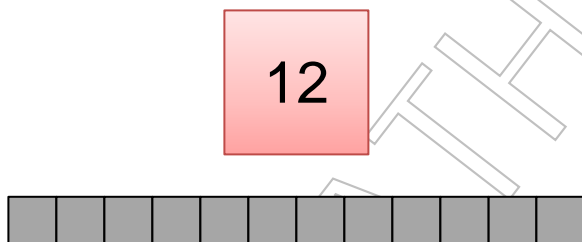
Ask student to roll the +/- Cube to determine whether one cube will be added to or taken away from the existing train.

Ask student to say how long the resulting train will be.

Example:
If student rolls a +, say,

> **"You rolled a +. If I add one cube to the train, how long will the new train be?"**

If student knows the new total without recounting, repeat the activity using a variety of Number Cards.

If student does not know the new total and/or guesses the wrong number, have student count the cubes in the train to figure out the answer and then explore the Number Line as a way to help

predict the answer as shown below.

Show student the Number Line and say,

"The Number Line can help you see what happens when we add or take away a cube. Point to the number that matches how long the train was at first, and then how long the train was after I added one more."

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Talk about the fact that the numbers are right beside each other.

Repeat activity for different length trains, allowing student to use the Number Line as a resource when necessary.

![HEART MATH TUTORING logo]

Word Problems

Materials: Connecting Cubes (2 bags, different colors) / Paper and pencil

Purpose: Student practices understanding and solving word problems that require counting.

Together with student, read the problems below. Ask student to solve the problem. Encourage him/her to use drawings, cubes, or fingers to represent objects as a way to better understand the problem.

1. If you had 11 cherries and ate one, how many do you think would be left?

2. Sandy and Paul each earned stars on their classroom chart. How many stars are there in all?

Sandy	★	★	★	★	★	★	★
Paul	★	★	★	★			

NOTE: *At this level, the problems above are not meant to be used to practice addition computation but rather should be used to allow student to practice counting by ones.*

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1. Count objects consistently and accurately.
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3. Determine *one more* and *one less* without counting.
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ACTIVITIES

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Measuring Objects

Counting Forward and Backward Game

Mystery Train for Counting

Word Problems

MATERIALS ENCLOSED
Number Cards (1–30)

Number Line (1–30)

MATERIALS TO GET
Connecting Cubes (3 bags of one color, 1 bag of a different color)

Paper and pencil

WRAP-UP
- Compliment student for hard work and provide stickers as a reward.
- Discuss with student the lesson goals that were practiced today.
- Ask student two of the following questions on the way back to class:
    - What was hard about today?
    - What did you feel confident about?
    - Where did you see improvement?
    - What do you still need to practice?
    - How do you feel about your effort today?
- Encourage students to practice counting objects at home.
- Record brief notes on progress log.

Measuring Objects

Materials: Connecting Cubes (2 bags of the same color) / Paper and pencil

Purpose: Student practices counting numbers greater than 20 and estimating quantities.

Tell student,

> **"Today we are going to practice counting by measuring things with Connecting Cubes."**

Make a recording sheet that looks like the following:

Object	Length

Example 1:

Demonstrate how to measure the height of a chair by making a train of Connecting Cubes to match the height and counting the cubes in the train. Ask the student to tell you the height of the chair.

> **"The height is 22 Connecting Cubes long."**

Record on sheet:

Object	Length
Chair Height	22 Cubes

Example 2:

Ask student,

> **"How many cubes do you think match the length of your arm?"**

Notice whether student's estimate seems reasonable. Help student measure his/her arm by making a train of Connecting Cubes to match the length. Notice whether student adjusts his/her estimate while measuring.

If student's estimate was unreasonable and he/she does not adjust while measuring, prompt him/her while he is halfway through by asking,

Measuring Objects / Counting and Number Recognition

"Do you want to change your estimate?"

Add measurement to recording sheet:

Object	Length
Chair Height	22 cubes
My Arm	?? cubes
...	

Example 3:

Ask student,

"How many cubes do you think match the width of your desk/table?"

Notice whether student's estimate seems reasonable. Help student measure the desk/table by making a train of Connecting Cubes to match the length. Notice whether student adjusts his/her estimate while measuring.

If student's estimate was unreasonable and he/she does not adjust while measuring, prompt him/her when he is halfway through by asking,

"Do you want to change your estimate?"

Add to recording sheet:

Object	Length
Chair Height	22 cubes
My Arm	?? cubes
My Desk	?? cubes

***Other Examples*:**

Using other measurements that would be over 20 cubes, repeat with other objects student chooses. Examples may include side or height of the table, distance from knee to floor, etc. Make sure student is estimating first and then counting correctly.

Counting Forward and
Backward Game

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> **Materials:** Number Cards (1-30) / Number Line (1-30) / Connecting Cubes (2 bags of the same color)
>
> **Purpose:** Student practices counting forward and backward by one from a given number.

PART I: Knowing "One More"

Ask student to pick a Number Card between 11 and 30 (yellow or green) and ask if he/she can tell the number that is *one more* than the number on the card without starting at one and counting up from there.

If student is correct, he/she keeps the card.

If student struggles, he/she uses the Connecting Cubes to test and determine the correct answer. Student gives card back to tutor.

PART II: Knowing "One Less"

Same rules as Knowing "One More," but student tells the number that is *one less* than the card picked.

NOTE: Use Number Line as a visual aid only if needed.

Materials: Connecting Cubes (3 bags of one color, 1 bag of a different color)
/ Number Line (1-30) / Paper

Purpose: Student explores relationships between numbers by counting *on* rather than counting *all* to find the length of a second train.

Say to student,

> **"Today we are going to play a game called Mystery Trains. You have to figure out the length of mystery trains that I will make."**

Example 1:

Tell student:

> **"Please join 5 Connecting Cubes of one color together to make a train while I make the mystery trains."**

While student is building his/her train, tutor builds trains of 6, 8 and 10 cubes with a second color and hide the trains under a sheet of paper.

Tell student,

> **"I'm going to show you one of the mystery trains. Can you figure out how many cubes are in the mystery train *without* counting every cube in the train? You can use the train you made to help you measure."**

Move the train of 6 cubes out from under the paper. Place it beside the train of 5 and ask,

> **"How many cubes are in the mystery train?"**

Some students will count forward by one from the train of 5 to determine that there are 6. (This process is called *counting on*.) Others will count every cube in the train of 6 to figure out its length.

If student counts every cube in the train of 6 to determine its length, allow him/her to do so and acknowledge his/her correct answer. Then, help student see relationships between numbers by asking,

> **"I want to see if you can figure out the length of the mystery train without having to count every cube. Let's start with the train you made to help us measure.**
>
> **How many cubes are in the train you made?"** (Student answers *5*)

Mystery Trains for Counting /
Counting and Number Recognition

"Since you know there are 5 cubes in the train you made, how many cubes do you think are in the mystery train?"

If student does not use the length of the first train (5) to determine the length of the second (6), encourage further reflection by laying the train of 5 on the number line and putting the train of 6 beside it. Ask student to think again about where he/she could start counting to find the total. If student cannot figure it out, model the process of "counting on" from 5 to get 6.

Continue activity by showing student the other two mystery trains and asking the same questions.

Example 2:

Restart the activity, asking student to make a train of 7 cubes while tutor makes mystery trains of 8, 10 and 12.

Example 3:

Restart again, asking student to make a train of 11 cubes while tutor makes mystery trains of 10, 9, and 13. *In this example, student counts back from 11 to determine the length of the train of 10 and train of 9. Counting back may be difficult for student. Use the Number Line as a guide, if needed.*

Mystery Trains for Counting /
Counting and Number Recognition

![HEART MATH TUTORING]

Word Problems

Materials: Connecting Cubes (2 bags, different colors) / Paper and pencil

Purpose: Student practices understanding and solving word problems that require counting.

Together with student, read the problems below. Ask student to solve the problem. Encourage him/her to use drawings, cubes, or fingers to represent objects as a way to better understand the problem.

1. Write an equation that will help you find the total number of toys on the playground.
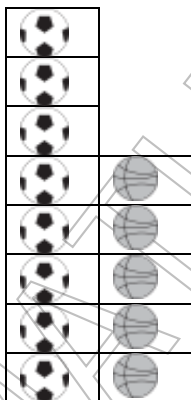
2. Carla had 7 red buttons. Her brother James had 6 blue buttons. How many buttons did they have?

NOTE: *At this level, the problems above are not meant to be used to practice addition computation but rather should be used to allow student to practice counting by ones.*

HEART MATH TUTORING

Connecting Students & Volunteers
for Results that Count

GOALS

Student will be able to:

1. Count objects consistently and accurately.
2. Recognize and understand numerals.
3. Determine *one more* and *one less* without counting
4. Recognize that smaller numbers are contained within larger numbers.
5. Solve word problems that involve counting.

ACTIVITIES

The time required to complete each activity will vary from student to student. Allow student to move at his/her own pace. If more time is needed, lessons can be carried over to the next tutoring session.

Number Cards for Counting

Cereal Game for Counting

Story Problems – One More / One Less

Word Problems

After this lesson is completed, check in with the Program Coordinator to determine if student is ready to move on to the next Concept Notebook.

MATERIALS ENCLOSED

Number Cards (1-30)

Number Line (1-10)

Number Line (1-30)

MATERIALS TO GET

Connecting Cubes (2 bags of one color, 2 bags of a different color)

1 Red bowl

Paper and pencil

WRAP-UP

- Compliment student for hard work and provide stickers as a reward.
- Discuss with student the lesson goals that were practiced today.
- Ask student two of the following questions on the way back to class:
  - What was hard about today?
  - What did you feel confident about?
  - Where did you see improvement?
  - What do you still need to practice?
  - How do you feel about your effort today?
- Encourage students to practice counting objects at home.
- Record brief notes on progress log.

HEART
MATH TUTORING

Number Cards for Counting

Materials: Connecting Cubes (1 bag) / Number Cards (1-10) / Number Line (1–10)

Purpose: Student experiments with number relationships, seeing that smaller numbers are contained within larger numbers and learning to *count on* rather than *count all* to add.

Using only Number Cards 1-10, place cards face down on the table.

Ask student to choose a card and make a tower of that height.

Ask student to choose a second card and *change the tower* to match the number on the second card.

> **"Change the tower to match the new number."**

Allow student to use whatever method he/she needs. Notice the following:

- When adding, does student add on to the original tower without recounting its cubes or does he/she need to start counting again from the beginning? Does student build a whole new stack?

- When subtracting, does student count back from the original tower, count up from the bottom and take off the extras, or guess and check?

Ultimately the goal is for student to add on or count back without recounting, but student needs to progress at his/her own speed.

After student changes the tower, ask him/her,

> **"What did you do to change the tower?"**

Repeat exercise with additional Number Cards.

To make this more fun, see if the student can get to 10 points, using Connecting Cubes as points each time the new tower is built correctly.

To make this easier, suggest placing the first tower on the Number Line and using it as a guide for adding and taking away cubes.

Cereal Game for Counting

> **Materials:** Connecting Cubes (2 bags of one color, 2 bags of a different color) / 1 Red bowl / Number Cards (1-30) / Number Line (1-30)
>
> **Purpose:** Student practices counting to tell *how many*.

Part I: Add One More

Tell student,

> **"Pretend these cubes are pieces of cereal and the bowl is your cereal bowl. Pick a Number Card and put that many pieces of cereal in the cereal bowl."**

Put the Number Card visibly next to the bowl, as a label.

Add one cube to the bowl while saying,

> "**If I add one more piece of cereal, how much cereal will we have?**"

If student knows the new total without recounting, repeat activity with additional Number Cards.

If student does not know the new total and/or guesses the wrong number, have student count the cubes in the bowl to figure out the answer and explore the Number Line as a way to help predict the answer as shown below.

Show student the Number Line and say,

> **"The Number Line can help you see what happened when we add or take away a piece of cereal. Point to the number that matches how many pieces we had at first and then how many we had after I added one more."**

Talk about the fact that one number follows the other.

Repeat activity using a variety of Number Cards, encouraging student to use the Number Line as a resource if needed.

Part II: Take one away

Tell student:

> **"We are going to play the same game, but this time I will take one cube away.**

Pick a number card to get us started."

After student picks a card and fills his/her bowl with cubes to match the number, take away one cube while saying:

"**If I take away one piece of cereal, how much cereal will we have?**"

If student knows the new total without recounting, repeat activity using a variety of Number Cards.

If student does not know the new total and/or guesses the wrong number, refer to the Number Line and help student as described above.

Repeat activity using a variety of Number Cards.

Cereal Game for Counting /
Counting and Number Recognition

Story Problems –
One More / One Less

Materials: Connecting Cubes (2 bags of the same color) / Number Line (1-30) / Paper and pencil

Purpose: Student practices thinking about *one more / one less* without counting when numbers are presented out of sequence.

NOTE: *Students at this stage may not trust numbers enough to believe it is possible to know how many there will be before they count. Introducing numbers out of sequence and asking student to practice figuring out one more / one less gives them additional confidence.*

Part I: Knowing *One More*

Tell student,

> **Suzy picked out 9 lollipops at the candy store. Her mother told her to go back to the store and get 1 more lollipop. How many lollipops did Suzy have after she went back to the store?"**

Encourage student to answer the question without using any additional tools but allow time for the student to think. If student cannot answer, ask student to use a loose pile of Connecting Cubes to help him/her find the answer.

> **"Let's say this cube represents one lollipop. Can you show me how many lollipops Suzy picked out at the candy store?"**

Watch student count out the 9 cubes, then ask:

> **"How many will she have when she goes back to the store for one more lollipop?"**

Student should add one additional cube to the pile of 9. Observe whether he/she recounts the entire pile before stating the new total (10). If student recounts the pile, help him/her see the relationship between the numbers by suggesting:

> **"Let's look at another way we can see how many lollipops she will have. Look at the Number Line. What number represents how many lollipops Suzy had at first? What number represents how many she had after getting *one more*? Do you notice that the number 10 is right next to the number 9?"**

Story Problems – One More/One Less /
Counting and Number Recognition

Move to a problem with higher numbers. For example,

> **"There were 14 cars in the parking lot. One more car drove in. How many cars are in the parking lot?"**

Repeat the activity with numbers from 12-30 several times. The eventual goal is for the student to become comfortable answering this type of question (*one more*) without using the Number Line or needing to recount the entire pile.

Part II: Knowing *One Less*

Tell student,

> **"Let's try another story:**
>
> **Suzy is 9 years old. How old was Suzy last year? She had 1 less year."**

Encourage student to answer the question without using any additional tools. If necessary, introduce cubes or the Number Line to reinforce student's answer.

Repeat the activity with numbers from 12-30 several times. The eventual goal is for student to become comfortable answering this type of question (*one less*) without using the Number Line or needing to recount the entire pile.

Part III: Story Problems

Write down a number between 12-30 and ask the student to tell a story in which one item is added or taken away. When student tells the story correctly, compliment him/her and reinforce the idea that he/she knows how many items will result.

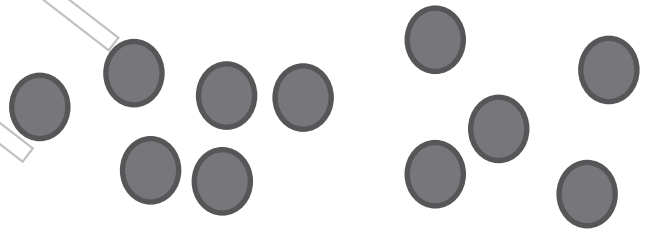If student seems ready, practice with stories where two items are added or taken away.

Story Problems – One More/One Less /
Counting and Number Recognition

Word Problems

Materials: Connecting Cubes (2 bags, different colors) / Paper and pencil

Purpose: Student practices understanding and solving word problems that require counting.

Together with student, read the problems below. Ask student to solve the problem. Encourage him/her to use drawings, cubes, or fingers to represent objects as a way to better understand the problem.

1. Fifteen children were playing outside. One went home.   How many children were there?

2. How many circles would there be if you added one more?

NOTE: At this level, the problems above are not meant to be used to practice addition computation but rather should be used to allow student to practice counting by ones.