

Mathematics: The Language of STEM

Count to Build

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CONTENT AND TASK DECISIONS

Grade Level(s): Kindergarten

Description of the Task: Students will count the required number of blocks, as designated on a job card, and build the given object using a specific number of blocks.

Indiana Mathematics Content Standards:

K.NS.1: Count to at least 100 by ones and tens and count on by one from any number.

K.NS.4: Say the number names in standard order when counting objects, pairing each object with one and only one number name and each number name with one and only one object. Understand that the last number name said describes the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.

Indiana Mathematics Process Standards:

PS.1 Make sense of problems and persevere in solving them. Students will be counting the number of blocks required and determining how to make the object they have chosen. It may take several times of creating to get the desired outcome.

Mathematics Content Goals:

Students will understand that they can count out a specific number of legos and create an object with them.

Language Objectives:

Construct/compose objects using legos and count the number of legos and name the object made with a partner so he/she can create the same or similar object.

Materials:

Lego blocks (size and variety of your choice)

Building Challenge Centers by Scissors & Crayons on Teachers Pay Teachers (\$3.50) (There is also a writing component included in this packet.)

THE LESSON

Before:

- **Activate prior knowledge:** Read “The Most Magnificent Thing” by Ashley Spires to introduce perseverance. Play a counting to 100 song from youtube.com, Dr. Jean and Jack Hartman have videos where the students sing and move along to the video while counting to 100. Observe students that struggle with counting. “Today we are going to be counting a specific number of lego blocks and making an object with that number of blocks. You will have the choice of making a tower, bug, house, or rocket with your blocks. You may choose to work by yourself or with a partner, but you will share your object with a friend when you are finished.”
- **Be sure the problem is understood:** Ask the students to explain to you, in their words, what they are expected to do with the lego blocks. They really only have two steps for this, (1) is to count out the lego blocks and (2) create the object.
- **Establish clear expectations:** Explain that the students will need to explain to their partner or a friend how many blocks they counted to use and what object they created. Remind the students that the blocks are used to create either a tower, bug, house, or rocket.

**Modifications for EL/IEP learners or high ability students:

EL or IEP learners can be given the lower number of blocks for their objects since the cards provide for different levels. To help with counting they can be given 10 index cards for the bug creation and they have to place a lego on each card so they will have 10, this will help with 1:1 correspondence also. They also should be working with a partner.

High Ability learners can be given the larger number of blocks (100) for creating their objects and could also complete the writing activities that go along with some of the lessons.

This lesson could also be completed with a buddy class, as long as they let the children build and create and just help monitor the counting.

During: Students will determine the object they want to build and the number of lego blocks they will need (they will choose a card with the specifications). They may also choose where to work in the classroom (table or floor) and if they want to work with a partner or alone. They will have sharing time with a partner or friend if they work alone.

- **Let go:** Circulate around the room and make sure students are not having problems counting out the blocks, are working on the required task, and are following the expectations provided.
- **Listen actively:** Listen to conversations occurring and be sure to question students to challenge them in their problem solving. Only ask questions that will help them think about what they are doing, do not provide suggestions or ideas to them.
- **Provide appropriate support:** Ask any or all of the following questions to the students as they are working:
 - How many blocks did you choose to work with today?
 - Which object are you making?
 - Is there another way you could make your object?
 - Would it be easier with more or less lego blocks?
 - What would you like to change about your object?

- **Provide worthwhile extensions:** If students finish early, they will have more choices of objects to create, that do not have specific number of block requirements. They can create an animal, robot, or race car. Another choice is to have a brown bag with lego blocks in it and they take the bag and use the blocks inside to create an object of their choice.

After: In this portion of the lesson, students should work as a community of learners, discussing, justifying, and challenging various solutions to the problem all have just worked on. Here is where much of the learning will occur. It is critical to plan sufficient time for a discussion and make sure the During portion does not go on for too long.

- **Promote a mathematical community of learners:** Discuss, as a group, what went well and what was a struggle. Discuss the importance of trying and trying again if it didn't work the first time. Ask if there is anything they would do different the next time. Have the students share their objects with a partner/friend and allow any that want to share with the class to have that opportunity.
- **Listen actively without evaluation:** Allow and encourage students to ask each other questions and critiques. Listen carefully to the discussions to help guide further lessons.
- **Make connections:**
 - How many blocks did you use for your object?
 - Would it make a difference to have more or fewer?
 - What did you notice about the size of the lego blocks?
 - Did you notice any patterns in your objects?
 - Did you notice that you used any shapes to create your object?
- **Summarize main ideas:** We will make sure to use the appropriate mathematical terms when sharing our objects. After sharing we will take a picture of each object created with a number card telling how many blocks were used and print them in book form to leave at a math center for others to try to replicate. This activity can be used for math centers after being used as a class lesson. We will focus on how we need to try many times to make things work the way we want, it may not happen the first time. Take time to compare any problems with the "magnificent thing" that was created in the book read before the lesson.

ASSESSMENT

Observe: I will be watching students for correct counting, ability to create (with or without) a picture/diagram to follow, and how they persevere through the challenges.

Ask:

- How do you feel about your object?
- Was it easy for you to get the correct number of lego blocks or did you need some help?
- Did you like working independently? or Was it easier to work with a partner?
- Do you think you could do it yourself next time? or Do you think it would work better if you had a partner to work with?
- What was the best part of this activity for you?
- What was the most challenging part of this activity for you?
- What did you learn?
- Would you like to try this again?