**Packing Crayons**

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| In this lesson students solve a problem where skip counting by 5s and 10s is required to solve a real world problem. Students have some previous practice with skip counting to numbers beyond 100.  |

**NC Mathematics Standard(s):**

**NC.2.NBT.2: Count within 1000; skip-count by 5s, 10s, and 100s.**

**Standards for Mathematical Practice:**

#### Make sense of problems and persevere in solving them.

#### 4. Model with mathematics

####  6. Attend to precision.

####  7. Look for and make use of structure.

 8. Look for and express regularity in repeated reasoning.

**Student Outcomes:**

* I can skip count by 5s and 10s beyond 100.
* I can understand how skip counting is useful in everyday counting.
* I can compare patterns when skip counting by 5s and 10s.

**Math Language:**

* skip counting
* digits
* count by

**Materials:**

* A copy of the tasks for each student. You will need to copy it front and back.
* Have a variety of manipulatives available for students to use, such as blank hundred boards and dry erase markers.
* Teacher may choose to have hundred boards that go up to 500 available to students.

**Advance Preparation**:

* Copy the 2 page task for each student.

**Launch:** The Crayon Factory (10 minutes)

* Ask students to think about how they have seen crayons packaged and how many were in those packages. Possible answers are: clear bags of 3 for restaurants, boxes of 8, 12, 24, 64.
* Show students a video clip of crayons being packaged in the factory, using following link <https://www.today.com/video/inside-the-crayola-factory-see-how-the-iconic-crayons-are-made-893853251852>.

**Introduce the task using the task sheet.**

The Crayon factory packed 5 crayons per box to sell to a restaurant. They shipped 43 boxes of crayons to the restaurant. How many crayons were being shipped to the restaurant? What if the Crayon Factory packed 10 crayons per box, how many crayons would be in 43 boxes?

Ask the students

* *How many crayon boxes did the restaurant receive?*
* *How many crayons come in each individual box?*
* *How can you use the information you have to answer the question?*

**Explore:**

1. **How many crayons**? (20 minutes)
2. Have students work with a partner to solve the tasks.
3. Observe how students solve the tasks and if they are able to fluently count by 5s and 10s. How are students recording as they solve? Do students have a good understanding of place value? Once students solve the first task, can they relate the answer to the second task with 10 crayons in a box?
4. Questions to ask during your observation:
	* *What is your strategy? Why did you choose that strategy?*
	* If students did not skip count, ask:  *How is your solution related to skip counting?*
	* *Could you explain what each \_\_\_\_\_\_\_\_\_ represents? (base 10 blocks, drawings, counters, etc)*
	* If students use manipulatives to solve the task, ask them to try to record their thinking on paper.
	* *What patterns do you notice as you skip count by 5 or 10?*
	* *What is your next step?*
	* *How many boxes of crayons does this number represent?*

4. As you observe, find samples of students who have skip counted correctly and represented their thinking visually (i.e. pictures, number line, numbers recorded as a pattern (5,10,15,20…), table). Decide the order in which you would like students to share their work. You may decide to start with examples that use manipulatives, then connect those strategies to written work involving pictures, then to written sequences of numbers.

**Discuss:**

Reflect (10 minutes)

Have students return to the carpet or to their seats for discussion.

1. Sharing: Have several pairs of students share their representations and explain their thinking to the rest of the class. Make connections between different representations explicit for the whole class. *How is \_\_\_\_ strategy similar to \_\_\_\_ strategy?*
2. Discussion: *How did skip counting help you solve this problem? What patterns did you notice when skip counting by 5s? What patterns did you notice when skip counting by 10s? Do you see any similarities between counting by 5s and by 10s? What challenges did you have when solving these tasks? How could we use a chart to record our skip counting in a way that is easy to read?* A possible representation would be a table with 3 columns. (boxes, packs of 5, packs of 10) This would allow students to compare and see correlations between counting by 5s and 10s. *What patterns do you see in the table?*

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| **Number of Boxes** | **Packs of 5** | **Packs of 10** |
| 12345 | 510152025 | 1020304050 |

**Evaluation of Student Understanding**

**Informal Evaluation:** The teacher should walk around and observe each pair of students. Take note of how fluent students are in skip counting. Are students able to skip count correctly? Are students able to record their counting in an organized way?

**Formal Evaluation/Exit Ticket:** Have students copy the following skip counting sequences on a sheet of paper and continue them.

1. Skip count by 5s

465, 470, 475, \_\_\_\_\_\_, \_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_,

 2. Skip count by 10s

640, 650, 660, \_\_\_\_\_\_, \_\_\_\_\_\_, \_\_\_\_\_\_, \_\_\_\_\_\_,

**Meeting the Needs of the Range of Learners**

**Intervention:** Students who need interventions could use a 100s board that ranges from 1 to 1000.) Students who have difficulty might need some extra small group practice with the teacher.

**Extension:** Have students skip count by 10s when the ones digit is not 0.

**Possible Misconceptions/Suggestions:**

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| **Possible Misconceptions** | **Suggestions** |
| * student doesn’t know how to skip count past 100.
* Students may count each individual crayon.
 | * Use base ten blocks so that the student can see adding 5 ones. They can trade 10 ones for a ten. Each time they add 5, they should write the new number down so they can see how the ones and tens places are changed. Talk about the number patterns they notice.
* Prompt students to think of a more efficient way to count by fives or tens.
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**Possible Solutions:**

Task 1: 215 crayons Task 2: 430 crayons

**Activity Sheet**

**Solve and show your thinking**

The Crayon Factory packed crayons to sell to a restaurant. They packed 5 crayons in each box. They shipped 43 boxes of crayons to the restaurant. How many crayons did the restaurant receive?

**They**





**Activity Sheet**

**Solve and show your thinking**

If the Crayon Factory packed 10 crayons in each of the 43 boxes, how many crayons would the restaurant receive?

**They**