Math Tips for Carter’s Packaging Challenge

Some problems are more about process, than an exact answer. This is one of them!

The purpose of this exercise is for students to recognize there are many ways to make 12 (if you’re working with whole numbers) and many ways to represent 1 whole box (if you’re working with fractions).

Students may be confused about what the problem is asking and how to best get started. Here are some tips:

1. Three Reads: This strategy is great for students when struggling to grasp content. When possible, have students do the heavy lifting of reading and asking questions.
   a. The student reads the problem/situation the first time and tells what the problem is mostly about, for example, “We are supposed to fill up a box with different kinds of candy and chocolates”.
   b. The second time the student reads, the purpose is to hone into the mathematics of the problem. What kind of math will help in this situation? For example, “I think I could add different kinds of candies until the box is full and show my thinking with equations”.
   c. The third read is to determine what questions linger. The general category of “confections” may need clarification. Students may wonder what types of confections could go in a candy box (see step 2, below).

2. Brainstorm together, in partners, or in small groups to come up with types of confections that might go in the box and how they might be coded (with colors, abbreviations, initials, etc). Allow students to be creative and to share their thinking multiple times throughout the exercise.
   Need help brainstorming ideas? Go to https://www.rmcf.com/ Click “By Treat” to see what different types of confections are available at Rocky Mountain Chocolate Company. The visuals will support student understanding.

3. Model how information might be organized, but emphasize that students can experiment with tables, charts, color coding or any other method of organizing their data. For example, you might choose to draw a diagram with 12 parts to represent the candy box. Think aloud during the process: “Hmmm, I think I will start with some caramels and fill up half of my box. That would be 6 caramels or 6/12 of the total box. What else might I add? How about some truffles? I only want two of those because they are so rich, so now my box has 6/12 caramels plus 2/12 truffles. I have filled up 8 out of the 12 spaces or 8/12. If I add four key lime wedges, then my equation will look like this: 6/12 + 2/12 + 4/12 = 12/12 or 1 whole box”.

4. If this exercise occurs in just one class session, be sure to bring students together to share different strategies and noticings. This could also be a longer term project if kids get into it.
Strategy: Organize your thinking and persevere!

5. The actual answer to this problem matters much less than the process of persevering, finding more and more effective ways to organize thinking and recording equations that support mathematical concepts. A young child needs to know there are many ways to make and record a number like 12. Older kids need to recognize fractions that can add to one whole and that different fractions can have the same meaning, such as \(\frac{6}{12}\) and \(\frac{1}{2}\). As always, it’s better that students have the chance to find meaning on their own, so be sure to highlight student contributions during debrief (sharing time). Teachers often write down students’ thinking or post work examples as a way of encouraging students to adopt each others strategies over time. Practice language that can be adopted by students like, “Today I am going to try Jesse’s strategy of coding with colors. He was able to stay really organized that way” or “Mauricio organized his thinking by finding all of the options possible with chocolates before adding other candies. I think I will try that and record my equations like he did”.

6. For younger students, or if the material remains confusing, try working from concrete to more abstract. In other words, grab some manipulatives of different types and a box and model how to make 12 (or 10 or 24 or whatever) in different ways. Then show how to record the thinking that represents your models. Depending on your age group, you may draw a model or a table. A template of the empty candy box is provided on the next page for younger students. Older students should draw their own diagrams to track their thinking. Finally, some students will be ready to record equations (or number sentences) to represent their thinking.

7. This is meant to be an open problem that discourages the “I’m done” mentality. Encourage students to try different options and to perhaps adopt a strategy of a classmate as they continue to refine their work. “We don’t know YET!” is a good answer for students wanting to know whether or not they are correct. Checking with peers and explaining thinking will allow students to realize the great variety of options available and how they might be represented.

We don’t need a worksheet for every occasion and when possible students might be encouraged to work out of a notebook instead. That being said, PDF worksheets to are available at https://www.neuronmediaprojects.com/resources.html

12 frame and 10 frame templates are available on the next page as an option to print for primary students. Depending on the ability of the students, they may record number sentences or talk out their thinking with a classmate or teacher.
Strategy: Organize your thinking and persevere!