



## Sustainable Development Goal 12: Responsible Consumption and Production

### Investigation 4B:

### COMPARING FOOD PACKAGED AS SINGLE SERVE VERSUS IN BULK

**Learning Outcome:** Measure single serve and bulk items and their packaging to calculate and compare a product, waste, and cost ratios.

#### Materials

- scale
- bowl to hold items on the scale
- food items, with prices

#### What to Do

1. Make some observations of the item packaged in bulk and as single serve.
  - a. How are they each packaged?
  - b. When they are each empty, how should the packaging be disposed of?
2. Analyze the bulk item:
  - a. Place the empty bowl on the scale and record its mass.
  - b. Open the package and empty the contents into the bowl.
  - c. Using the scale, record the mass of the bowl with the food in it.
  - d. Subtract the mass of the empty bowl from the full bowl to determine the mass of the food that was inside the package.
  - e. Record the mass of the empty packaging used for the bulk item.
3. Using the same steps as #2, analyze the single serve portion item.
4. Compare the amount of packaging to the amount of the item when packaged in bulk versus single serve.
  - a. Calculate the ratio of the item to the bulk packaging by dividing the mass of the bulk packaging by the mass of the item inside the bulk packaging.
  - b. Calculate the ratio of the item to the single serve packaging by dividing the mass of the single serve packaging by the mass of the item inside the single serve packaging.
  - c. What do you notice about the amount of packaging compared to chips for the bulk item and for the single serve item?
5. Compare the cost for the same mass of item when packaged in bulk vs. single serve by calculating the cost per 1 g for the single serve item and the bulk item.

What do you notice about the cost when the item is purchased in bulk vs. as single serve?

6. How many packages of the single serve item would it take to get the same amount as inside the bulk package? How much would that cost?

### Consider

1. Compare the difference in cost between bulk and single-serve items. What would be the justification for the difference in cost?
  2. What items do you think are better to buy in bulk instead of in smaller servings?
  3. When would it make more sense to buy smaller servings of items instead of in bulk?
  4. How could the packaging for the bulk or single serve item be more sustainably produced?
2. Results:
    - a. How many single serve packages did it take to get the same mass inside the package as the bulk item?
    - b. How much packaging was generated from the single serve items, and how does that compare to the bulk packaging?
  3. Compare the costs for the same amount of the item:
    - a. What was the cost of the bulk item?
    - b. Calculate the cost of the single serve items for the same weight of items in the bulk package.

### Optional Facilitator Demonstration



Credit: [www.rawpixel.com](http://www.rawpixel.com), ID 6271178

1. Before the demonstration begins, make a prediction: How many single serve packages do you predict it will take to get approximately the same mass as inside the bulk item?

### Extensions

1. **Testing Variables:** Investigate how variables impact packaging by comparing other single serve and bulk items like shampoo, spices, rubber bands, etc. How many single serve packages does it take for the same mass of interior contents as the bulk item? How does the amount and mass of packaging compare for all the single serve items and the bulk item?
2. **Applying Concepts:** List items you have at home in bulk and as single serve portions. Recognize that other factors like cost and storage space may come into play rather than sustainability when your family is purchasing items. Assess your list and determine which items may be possible to buy in bulk.