

Properties of Paper/Consumer Testing

Subject(s): Science

Grade Level: Intermediate/Secondary

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Middle School

Time Required: 1 hour

Lesson Objectives: (1) Investigate properties of paper grocery bags. (2) Test and compare properties of paper and plastic grocery bags (3) Evaluate personal use of paper and plastic bags

Materials Needed: Paper and plastic grocery bags, Books, bricks or other heavy items, Spray bottle with water, Balloons (10-15), Consumer Testing Lab sheets

Procedure:

1. Introduction/Discussion “Have you ever been carrying a bag of groceries and had the bag break or tear on you? Do some grocery bags hold up better than others do? What properties are important in a grocery bag?”

“When you make a choice between paper or plastic bags, you are making choice that affects you, the cost of your groceries and the environment. This activity will have you taking a closer look at grocery bags and the properties that determine their use by consumers.”

2. Consumer testing: Note: Tests can be done as demonstrations in front of class with volunteer participation or could be done in small groups of students depending on time and grocery bag resources.

Procedure:

The Strength Test

1. While one student holds the paper bag up, place books, bricks or other heavy objects into the bag one at a time until it breaks or tears. Record results (# of books) on Consumer Testing Lab sheet.
2. Repeat with a plastic bag.

The Wet Test

1. Spray a paper bag with water and follow Step 1 from Strength Test.
2. Repeat with a plastic bag.

The Volume Test

1. While one student holds paper bag up, place air-filled balloons into bag one at a time until the bag is full. Record results (# of balloons) on Consumer Testing Lab sheet.
2. Repeat with a plastic bag.

The Carrying Test

1. Place three books into a paper bag. Carry the bag around the room, making observations on how easy the bag is to carry. Record observations on Consumer Testing Lab sheet.
2. Repeat with a plastic bag.

Learning from the Forest

Extensions:

1. Students contact area grocery stores and request information on amount of paper and plastic bags used in a week.
2. Students write questions and survey 5 consumers about their choice between paper or plastic. Graph and present results to class.
3. Add other types of bags to testing process (i.e., string, cloth)
4. Students choose and design two additional tests to conduct and compare.

Discussion:

1. Based on the test results, which type of bag performs better? Is this the bag that you regularly choose?
2. What other qualities are important when choosing between paper and plastic bags?
3. What other information or issues influence consumers' choices of bags?

| Test Results | | |
|---------------------|-----------|-------------|
| | Paper Bag | Plastic Bag |
| The Strength Test | | |
| The Wet Test | | |
| The Volume Test | | |
| The Carrying Test | | |