# School Recycling Club SHIP

## (Supporting Home Instruction Program)

# Lesson Plan 3

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|---|---|
| Grade Level: | 7-8 |
| Lesson: | I.A.3—How Does Packaging Contribute to Waste? Potato Cakes |
| Source: | *3Rs of the Common Core* |
| Activity/Craft: | How to Make Ice Cream in a Bag |
| Video Link: | How the Foods You Eat Affect Your Brain (https://www.youtube.com/watch?v=xyQY8a-ng6g) |
| Video Link 2: | The Extraordinary Life & Times of a Strawberry (https://www.youtube.com/watch?v=jKQPL16WjHs) |

# Lesson Matrix Grades 7-8
## 3R's of the Common Core

| Lesson | Leading Question | Objective | Common Core Alignments | | Skills |
|---|---|---|---|---|---|
| **7-8**<br>**Throwing It All Away**<br>**I.A.1** | What do you know about the solid waste we produce? | • Understand the sources, content and magnitude of the solid waste problem | **Grade 7**<br>CCRI.7.1<br>CC.W.7.7<br>CC.SL.7.1<br>CC.7.RP.3 | **Grade 8**<br>CC.RI.8.1<br>CC.W.8.7<br>CC.SL.8.1 | • Communicating<br>• Comparing multiple solutions<br>• Sharing research and writing<br>• Applying mathematical concepts |
| **7-8**<br>**School Trash Analysis**<br>**I.A.2** | What are all the things we throw away? | • Analyze waste producing habits in order to begin changing them | **Grade 7**<br>CC.SL.7.4<br>CC.W.7.4<br>CC.7.SP.1 | **Grade 8**<br>CC.SL.8.4<br>CC.W.8.4<br>CC.8.SP.1 | • Analyzing<br>• Applying mathematical concepts<br>• Investigating |
| **7-8**<br>**Potato Cakes**<br>**I.A.3** | Could we save energy and other natural resources by choosing one product or packaging over another? | • Examine the complexities of food processing and packaging | **Grade 7**<br>CC.RI.7.4<br>CC.SL.7.4<br>CC.W.7.4<br>CC.7.EE.3<br>CC.7.RP.1 | **Grade 8**<br>CC.RI.8.4<br>CC.SL.8.4<br>CC.W.8.4 | • Applying ideas to solve problems<br>• Collaborating<br>• Researching<br>• Using mathematical and computational thinking |
| **7-8**<br>**Resource Protection Game**<br>**I.B.1** | How do our activities impact on our environment? | • Identify the ecological impacts of some of the solid waste management practices on natural resources | **Grade 7**<br>CC.RI.7.4<br>CC.SL.7.1<br>CC.W.7.7 | **Grade 8**<br>CC.RI.8.4<br>CC.SL.8.1<br>CC.W.8.7 | • Collaborating<br>• Gathering information<br>• Problem solving |
| **7-8**<br>**Trash Timeline**<br>**I.C.1** | What can the waste we produce tell us about ourselves? | • Examine and classify various forms of evidence in the study of current trash and that of a past culture | **Grade 7**<br>CC.RI.7.8<br>CC.SL.7.4<br>CC.W.7.6 | **Grade 8**<br>CC.RI.8.8<br>CC.SL.8.4<br>CC.W.8.6 | • Analyzing<br>• Collaborating<br>• Sharing research and writing |
| **7-8**<br>**Art Reflecting the Environment**<br>**I.C.2** | Why do people create art?<br>What is the difference between "art" and "waste"? | • Understand the visual artist as a recorder of history and ideas<br>• Identify society's impact on artistic expression<br>• Identify potential ways artistic expression can impact society | **Grade 7**<br>CC.RI.7.1<br>CC.SL.7.5<br>CC.W.7.6 | **Grade 8**<br>CC.RI.8.1<br>CC.SL.8.5<br>CC.W.8.6 | • Analyzing<br>• Applying ideas to solve problems<br>• Questioning<br>• Sharing research and writing |
| **7-8**<br>**Waste Walk**<br>**II.A.1** | What is litter? | • Document and categorize litter in their neighborhood<br>• Explore ways to get people to stop littering | **Grade 7**<br>CC.RI.7.4<br>CC.W.7.2<br>CC.7.SP.1 | **Grade 8**<br>CC.RI.8.4<br>CC.W.8.2<br>CC.8.SP.1 | • Applying mathematical concepts<br>• Collecting data<br>• Interviewing<br>• Problem solving |

| Lesson | Leading Question | Objective | Common Core Alignments | | Skills |
|---|---|---|---|---|---|
| **7-8**<br>**Recovering Recyclables**<br>**II.A.2** | How can mixed trash be separated for recycling? | • Devise materials recovery systems for recovering recyclables from the waste stream | **Grade 7**<br>CC.RI.7.1<br>CC.SL.7.4<br>CC.W.7.4 | **Grade 8**<br>CC.RI.8.1<br>CC.SL.8.4<br>CC.W.8.4 | • Applying ideas to solve problems<br>• Comparing multiple solutions<br>• Developing models |
| **7-8**<br>**Trash Haulers**<br>**II.A.3** | How much does waste disposal cost? | • Investigate the efficiency and costs of solid waste collection<br>• Assess advantages/disadvantages of operating a recycling business and/or a curbside recycling program | **Grade 7**<br>CC.SL.7.1<br>CC.W.7.4<br>CC.7.NS.3 | **Grade 8**<br>CC.SL.8.1<br>CC.W.8.4<br>CC.8.SP.1 | • Gathering information<br>• Interviewing<br>• Sharing research and writing<br>• Using mathematical and computational thinking |
| **7-8**<br>**Mini-Landfills**<br>**II.B.1** | What are some of the possible hazards that might result from an improperly designed landfill? | • Learn how a sanitary landfill is made and operates<br>• Understand some of the associated pollution problems | **Grade 7**<br>CC.RST.6-8.3<br>CC.SL.7.4<br>CC.WHST.6-8.7<br>CC.7.G.6 | **Grade 8**<br>CC.RST.6-8.3<br>CC.SL.8.4<br>CC.WHST.6-8.7<br>CC.8.G.9 | • Applying mathematical concepts<br>• Developing models<br>• Observing<br>• Providing evidence |
| **7-8**<br>**Landfill Soil**<br>**II.B.2** | Why is it important to test the soils of a potential landfill site? | • Determine the importance of soil studies prior to the siting of landfills | **Grade 7**<br>CC.SL.7.1<br>CC.W.7.4<br>CC.W.7.7<br>CC.7.RP.3 | **Grade 8**<br>CC.SL.8.1<br>CC.W.8.4<br>CC.W.8.7<br>CC.8.F.5 | • Carrying out investigations<br>• Developing models<br>• Observing<br>• Sharing research and writing<br>• Using mathematical and computational thinking |
| **7-8**<br>**Burning Waste: Then and Now**<br>**II.B.3** | Why do we burn trash? | • Research the historical perspective of burning solid waste<br>• Examine the reasons for these changes over the decades | **Grade 7**<br>CC.RI.7.1<br>CC.SL.7.4<br>CC.W.7.4 | **Grade 8**<br>CC.RI.8.7<br>CC.SL.8.1<br>CC.W.8.6 | • Sharing research and writing<br>• Analyzing<br>• Comparing multiple solutions<br>• Collaborating |
| **7-8**<br>**Packaging Design**<br>**III.A.1** | How could packaging be designed to waste less? | • Explore parameters of packaging design<br>• Use guidelines in their own design project | **Grade 7**<br>CC.RST.6-8.8<br>CC.SL.7.4<br>CC.WHST.6-8.7<br>CC.7.G.6 | **Grade 8**<br>CC.RST.6-8.8<br>CC.SL.8.5<br>CC.WHST.6-8.6<br>CC.8.G.9 | • Applying ideas to solve problems<br>• Designing<br>• Researching<br>• Using mathematics |

## Lesson Matrix Grade 7-8

### 3R's of the Common Core

# Lesson Matrix Grades 7-8
## 3R's of the Common Core

| Lesson | Leading Question | Objective | Common Core Alignments | | Skills |
|---|---|---|---|---|---|
| **7-8 Source Separating III.B.1** | What is the best way to sort and store our recyclables? | • Investigate current containers and make proposals<br>• Design containers for the easy and efficient source separation of recyclables, as needed | **Grade 7**<br>CC.RST.6-8.2<br>CC.SL.7.4<br>CC.WHST.6-8.4<br>CC.7.G.6 | **Grade 8**<br>CC.RST.6-8.2<br>CC.SL.8.4<br>CC.WHST.6-8.4<br>CC.8.G.9 | • Applying mathematical concepts<br>• Collaborating<br>• Developing models<br>• Problem solving |
| **7-8 Graphing Recyclables III.B.2** | Do recycling businesses pay us for the materials we collect? | • Examine how fluctuating markets and different offered prices affect the fate of recycling | **Grade 7**<br>CC.SL.7.1<br>CC.WHST.6-8.4<br>CC.WHST.6-8.7<br>CC.7.SP.7 | **Grade 8**<br>CC.SL.8.1<br>CC.WHST.6-8.6<br>CC.WHST.6-8.7<br>CC.8.SP.4 | • Communicating<br>• Evaluating<br>• Graphing data<br>• Investigating |
| **7-8 Destination Recycle III.B.3** | When you recycle where does it all go? What does it become? | • Identify the destination and fate of their states recyclables | **Grade 7**<br>CC.RST.6-8.2<br>CC.SL.7.1<br>CC.WHST.6-8.4 | **Grade 8**<br>CC.RST.6-8.2<br>CC.SL.8.4<br>CC.WHST.6-8.7 | • Gathering information<br>• Interviewing<br>• Problem solving<br>• Sharing research and writing |
| **7-8 Making Good Compost III.C.1** | What are the essential ingredients for a successful compost? | • Conduct experiments testing the effects of too little water, nutrients, air, and imbalance of material on producing successful compost<br>• Learn the basic principles necessary to construct a good compost pile | **Grade 7**<br>CC.RST.6-8.3<br>CC.SL.7.4<br>CC.WHST.6-8.4 | **Grade 8**<br>CC.RST.6-8.3<br>CC.SL.8.5<br>CC.WHST.6-8.6 | • Collaborating<br>• Collecting data<br>• Communicating information<br>• Synthesizing |

# How Much Does Packaging Contribute to Our Waste?

### Concept
Extensive packaging and processing uses up limited natural resources and increase the amount of solid waste requiring disposal.

### Objective
Students will examine the complexities of food processing and packaging.

### Method
Students will survey different food products.

### Materials
Attached handouts

### Subjects
Language Arts, Social Studies, Environmental Education, Mathematics

### Skills
Applying ideas to solve problems, collaborating, researching, using mathematical and computational thinking

### Time
Two classes, outside assignment

### Vocabulary
Packaging, food processing, natural resources, energy

### 3R's of the Common Core
*Parallel Activities*
K-3, Too Much Packaging
4-6, The Story of…
9-12, Packaging Preferences
*Information*
Packaging
*Resources*
Green Consumption, Consumerism and Sustainable Development

## Background
In 1974, the Environmental Action Foundation published research showing that the energy used to produce the packaging used annually by McDonald's fast food restaurants was equal to the amount of energy required to supply Boston, Washington, San Francisco and Pittsburgh residents for one year. Since the 1970s and 1980s, McDonald's and packaging manufacturers in general, have tried to make plastic packaging more lightweight and use more recycled and recyclable materials. According to Plasticpackagingfacts.org "Since 1977, the two-liter plastic soft drink bottle has gone from 68 grams to 47 grams, representing a 31 percent reduction per bottle. This saved more than 180 million pounds of packaging in 2006—just for two-liter soft drink bottles alone. The one-gallon plastic milk jug has gone on a similar diet, weighing 30 percent less today than 20 years ago." According to McDonald's website, by 2020, 100% of McDonald's packaging will be from recycled sources. McDonald's website keeps their sustainability reports archived.

Follow the link below to learn more about McDonald's changing business practices and sustainability goals: http://www.aboutmcdonalds.com/mcd/sustainability/sustainability_CR_reports.html.

## Leading Question
Could we save energy and other natural resources by choosing one product or packaging over another?

## Procedure
1. Examine the list of 17 different potato products. Discuss the questions on the handout or have students fill them out.
2. Working in pairs and using a chart similar to the potato chart, have students choose a form of fresh food to investigate at a local grocery store. Students will write and gather information to present to their classmates.
3. After the investigation, have students meet in small groups to discuss their results. Then each group shares their research reports with the teacher and class for discussion.

## Evaluation
What percentage of the cost of packaged foods do you think is due to the packaging? Which of your favorite foods could you buy without packaging? How could food packaging be reduced?

## Common Core Alignments

### GRADE 7

**CC.RI.7.4**
Reading Informational Text:
Craft & Structure

**CC.SL.7.4**
Speaking & Listening:
Presentation of Knowledge & Ideas

**CC.W.7.4**
Writing:
Production & Distribution of Writing

**CC.7.EE.3**
Mathematics
Expressions and Equations

**CC.7.RP.1**
Mathematics
Ratios and proportional Relationship

### GRADE 8

**CC.RI.8.4**
Reading Informational Text:
Craft & Structure

**CC.SL.8.4**
Speaking & Listening:
Presentation of Knowledge & Ideas

**CC.W.8.4**
Writing:
Production & Distribution of Writing

## Classroom Activities

A. Take a field trip to a co-op. Compare the different product choices, packaging, sales methods and philosophies between conventional and cooperative shopping.

B. Research differences in nutritional value between the different foods discussed.

C. Discuss the influence of advertising and packaging design on purchasing decisions.

D. Develop a list of commonly used plastic packaging types. Have the students figure out what was used for the same purpose before plastic was readily available. What are some of the pros and cons of the two types?

# How Much Does Packaging Contribute to Our Waste?

**Name:**_____ **Date:** _____

1. Which forms of the product are most highly processed and packaged?

2. Which are most expensive per pound?

3. Which form of product would you purchase if you were interested in reducing solid waste?

4. Which form of the product would you purchase if you were interested in saving money?

5. Which form of packaging do you think:

    a. Uses the most energy?

    b. Saves the most energy?

6. What are the relationships between cost and the amount of packaging and processing in a product?

7. What conclusions can you make about these relationships?

8. Looking at the product form with the most packaging, is all this packaging necessary?

9. Which packaging:

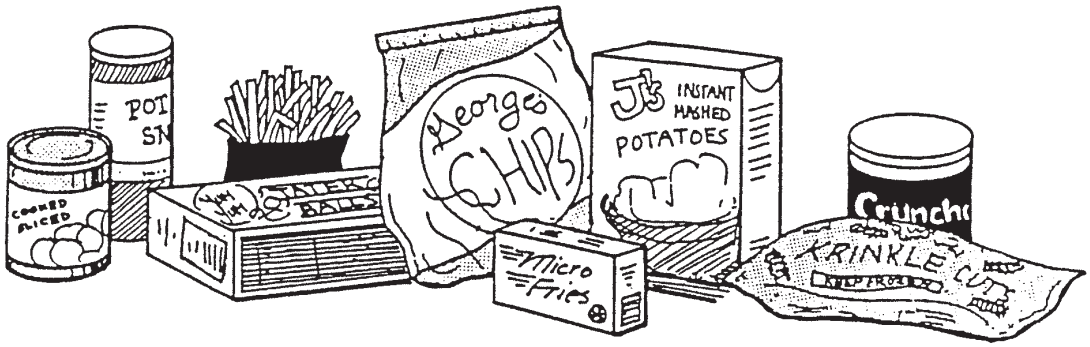
    a. Weighs the least per pound of product?

    b. Takes up the least space in the landfill?

    c. Decomposes most or least quickly?

    d. Doesn't produce toxic materials when it breaks down?

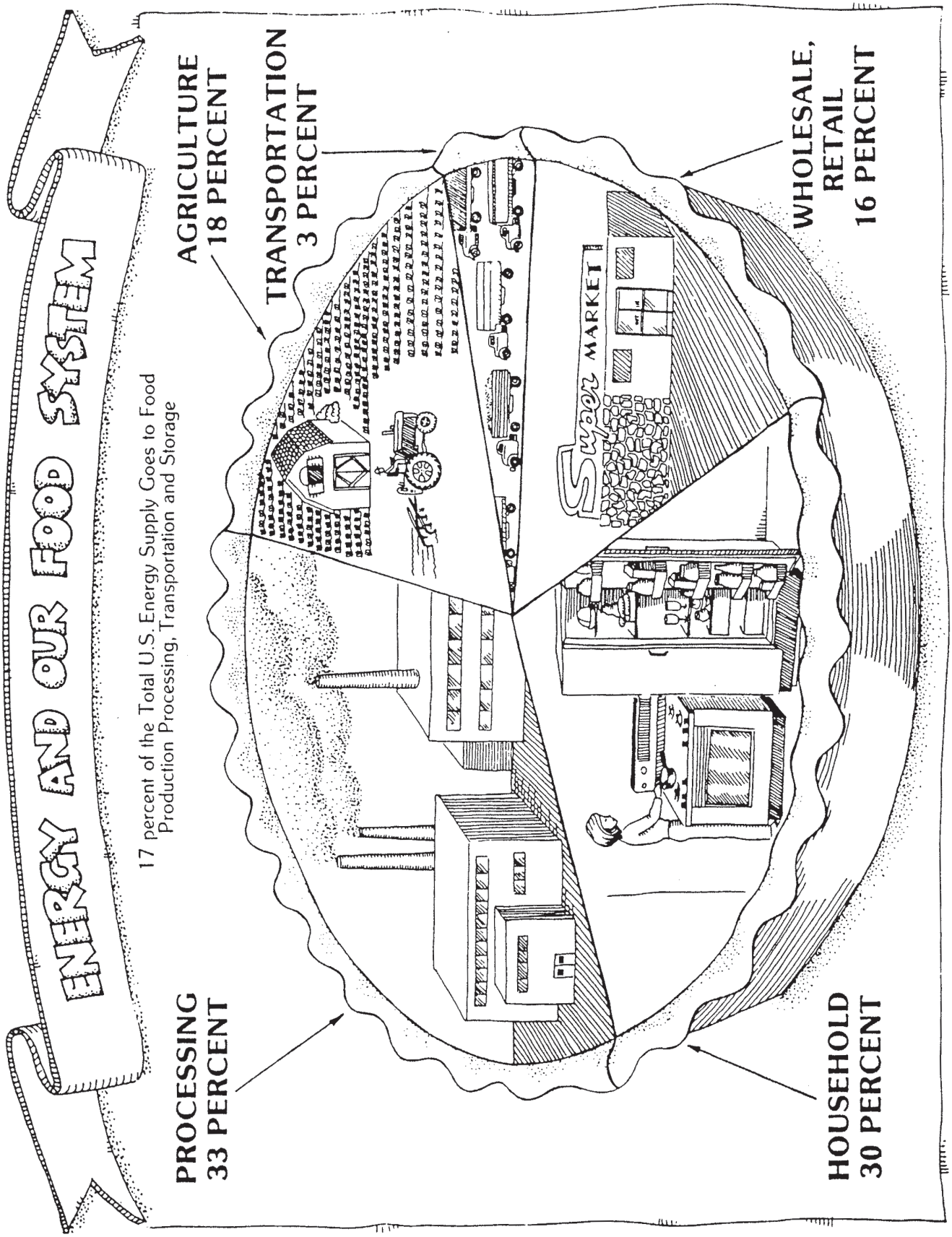
10. Which of these products will you buy in the future? What criteria will you use for making your decisions about what to buy and what not to buy?




## This Spud's For You

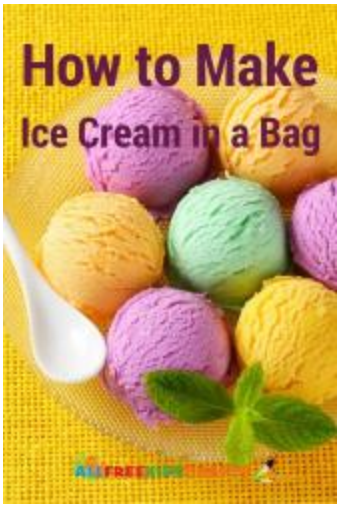
| PRODUCT* | PACKAGE SIZE | PRICE | PRICE PER POUND |
|---|---|---|---|
| Fresh Russet Potatoes | 10 lb | $4.99 | $ .50 |
| Fresh Russet Potatoes | 5 lb | 2.99 | .60 |
| Fresh Russet Potatoes | Loose | .99 | .99 |
| Hannaford's Canned Sliced Potatoes | 15 oz | .79 | .84 |
| Ore Ida Tater Tots | 2 lb | 2.89 | 1.45 |
| Ore Ida Mini Tater Tots | 1.75 lb | 2.89 | 1.65 |
| Hannaford's Crinkle Cut French Fries | 5 lb | 3.99 | .80 |
| Hannaford's Crinkle Cut French Fries | 2 lb | 1.69 | .85 |
| Small Order McDonald's French Fries | 2.6 oz | 1.68 | 10.33 |
| Medium Order McDonald's French Fries | 3.9 oz | 2.17 | 8.90 |
| Large Order McDonald's French Fries | 5.9 oz | 2.29 | 6.21 |
| Betty Crocker Mashed Potato Products | 4.7 oz | 1.09 | 3.71 |
| Hannaford Potato Sticks | 6 oz | 1.99 | 5.30 |
| Pringle's Potato Chips | 5.68 oz | 1.79 | 5.04 |
| Pringle's Potato Chips 18 pack | 12.69 oz | 7.59 | 9.56 |
| Lay's Potato Chips | 8 oz | 2.50 | 5.00 |
| Lay's Potato Chips 6 pack | 6 oz | 2.49 | 6.64 |

*All items priced on April 18, 2016, at Hannaford's website for online shopping in Manchester NH, McDonald's prices for NH calculated on fastfoodmenuprices.com


ENERGY AND OUR FOOD SYSTEM
17 percent of the Total U.S. Energy Supply Goes to Food Production Processing, Transportation and Storage
AGRICULTURE 18 PERCENT
TRANSPORTATION 3 PERCENT
WHOLESALE, RETAIL 16 PERCENT
PROCESSING 33 PERCENT
HOUSEHOLD 30 PERCENT
Super MARKET

From our friends at allfreekidscrafts.com

**How to Make Ice Cream in a Bag**




If your kids are craving a deliciously delightful craft to bust up boredom this summer, then we promise they'll absolutely adore this How to Make Ice Cream in a Bag recipe. This budget-friendly kids' recipe is made from ingredients that you probably have at home, meaning no last-minute trips to the store. Kids of all ages will love experimenting with making their own tasty treats by mixing a few simple ingredients together and shaking them up in a bag. Before they even know it, they'll be enjoying delectable ice cream that they can garnish with their favorite toppings like chocolate syrup, colorful sprinkles, and, of course, a cherry on top.

This DIY kids' craft is perfect for large groups of kids, making it perfect for classrooms, Girl Scout troops, or youth groups. This free craft for kids is an excellent project for elementary students, as it combines a fun hands-on project with beginner science and chemistry. This edible kids' craft teaches kids the chemistry behind ice, salt, and exothermic reactions, making it ideal for teachers. The best part about this easy recipe is that kids can enjoy their yummy desserts after their science lesson. Whether your kids make this cool homemade ice cream recipe at home or school, we guarantee this kids' craft is sure to become a quick favorite.

- **Estimated Cost:** Under $10
- **Time to Complete:** Under an hour
- **Materials:** Food
- **Primary Technique:** Food Crafting
- **Materials List**
  - 1/2 cup milk
  - 1/2 teaspoon vanilla extract
  - 1 tablespoon sugar
  - 4 cups crushed ice
  - 4 tablespoons Kosher salt
  - 2 quart-sized plastic bags
  - 1 gallon-sized freezer bag
  - Hand towels or gloves to keep freezing from freezing
  - Your favorite ice cream toppings!

For all the instructions, to go: https://www.allfreekidscrafts.com/Edible-Kids-Crafts/How-to-Make-Ice-Cream-in-a-Bag