FACTivity

Time Required

One class period

Materials Needed

1. One large raw potato
2. One 10-ounce bag of plain potato chips
3. One blank sheet of paper and a pencil for each group

The research question you will answer by doing this FACTivity is: "Does a baked potato or a 10 ounce bag of potato chips require more energy when it is produced for human consumption?" This question is similar to the question asked by the scientists in this research, except the scientists compared two doors instead of two kinds of potatoes. You may want to re-read the last paragraph of the "Introduction" to remind you of the scientists' research question.

When the scientists compared doors, they compared doors of equal utility. This means that both doors could serve the same purpose for an individual. When you compare two kinds of potatoes, are you comparing products that serve the same purpose for an individual? How do the two types of products (doors and potatoes) compare?

Method

The method you will use to answer the research question is:

Consider the following: Just as doors have a premanufacturing stage and a manufacturing stage, the two potato products have a preprocessing and a processing stage. Potatoes must be planted, grown, dug, and transported to a facility for processing before they can be shipped to a supermarket shelf.

In small groups, brainstorm the steps that must be taken before potatoes are shipped to a facility for processing. For both kinds of potato products, this preprocessing stage will be the same. Once the potatoes get to their facilities for processing, each type of potato will be processed differently. Write down the steps that must be taken, and identify the kind of energy needed for these steps.

Example:

STEP	ENERGY NEEDED
Plow field before planting	Diesel fuel for machinery
Plant potatoes	Diesel fuel for machinery

Once you have done this, you must now consider what kind of processing is needed to prepare each potato product and transport it to a store. In the case of the potato, processing may only include cleaning, sorting, bagging, and transporting. It takes more steps to create potato chips, even before they are placed in bags for shipping to stores. Although you may have never been to a potato chip processing plant, see if your group can imagine what steps must be taken from the time a potato arrives at the plant to the time it leaves the plant as a bag of potato chips. Use the same format to record the steps that you used when you imagined the steps required to get a potato to the processing plant. Remember to do this for a potato, as well as for the potato chips.

Remember that you must consider all steps needed before human consumption for both kinds of potatoes.

You should now have a good idea of the steps and types of energy required to process a potato and a bag of potato chips for human consumption.

As a class, compare the steps each group has developed for each type of potato. Discuss the amount of energy that might be required by each type of potato product. Although you will not know exactly how much energy each type of potato product requires for processing, you should have a good idea of which type of potato processing requires more energy.

Now answer your research question: Which potato product requires more energy to be processed for human consumption?

FACTivity: Go Outdoors

Time required

One class period

Materials needed

One 12″ new or used clay pot
One 12″ new or used clay saucer
One 12″ new or used plastic pot
One 12″ new or used plastic saucer
One new or used metal trash can lid (with no holes)
One large new or used sturdy plastic bucket
Acrylic sealant (brush-on or spray can)
Paint brush (if using brush-on sealant)
Heavy-duty outdoor glue
24″ rope
Two bricks (one preferably with holes)
Flat rock, about 4″ in diameter

In this FACTivity, you will answer the question: How does the energy use involved in the construction of three home-made bird baths compare when they are constructed?

This FACTivity involves a partial life-cycle inventory. The research article you read described a partial life-cycle inventory involving the manufacturing process up to production of the product. Complete life-cycle inventories include use, reuse, recycling, or disposal of the product. You will construct three bird baths from either new or recycled materials.

Method

The method you will use to answer the research question is:

Your class will construct three different bird baths using either new or used materials. After construction, each bird bath will be compared on the basis of whether its construction involved new or recycled materials.

Birdbath #1: Clay pot, clay saucer, sealant
Birdbath #2: Plastic pot, plastic saucer, glue, flat rock
Birdbath #3: Plastic bucket, metal trash can lid, bricks, rope

Divide into three groups. Each group will construct one birdbath. Construction and placement should occur at about the same place. Place your birdbaths in an area away from bushes or other low vegetation, but close to a tree if possible. Low vegetation may hide predators, and trees will provide a place for birds to perch.