

This is a great project to do with another school or organization. Each group will complete the challenge below and send via US Mail to the partner.

OBJECTIVE

For students to design and test a container for shipping a single potato chip via the US Postal Service. Upon arrival the packages will be evaluated and scored using the format included with this challenge.



THE POTATO CHIP CHALLENGE

CHALLENGE

Students will engineer a package with the smallest volume and smallest mass possible. The package will protect the chip so that it arrives at its destination with as little damage as possible. No pre-made packages can be used. (This includes iPhone boxes). There is a 3" x 5" limit on the size of the package.

MATERIALS

Low tech materials such as cardboard, cotton, newspaper, etc.

PROCEDURE

Working individually or in groups students will design a container for one single potato chip. The container should keep the potato chip from breaking when sent through the U.S. Mail. The container may not be larger than 3"x5".

All packages will be sent via the US Postal Service - First Class Mail. (please be aware there may be a surcharge for small packages if you stamp them yourself. It may be advisable to bring them to the post office for stamping!

Each package must be clearly labeled "Potato Chip Challenge" and addressed to the receiving school, in care of the particular teacher.

The sending school MAY write only "Fragile" or "Handle With Care" on the package.

It is strongly recommended that students keep a journal with detailed sketches, idea, and instructions.

Students will evaluate the box they receive from their partner group using the score card found with this lesson.

Exchange results with partner group. Depending where your partner group is, you can meet in person, via Skype or other online communication software, video tape and upload the results. or have the students come up with a way to communicate the results

*if you do not plan to partner with another group to mail the packages, consider doing a drop test instead with the finished designs. You can still use the same scorecard below.

EXTENSION

If partnering with a school from another region or county take this opportunity to integrate geography, history, and communication. Use this activity to teach traditional letter writing, or how to write a proper email. Students can create a video introducing themselves and describing where they live, what they do etc.

Consider partnering with a retirement community in your area. In addition to exchanging and evaluating potato chip container designs, students could interview and get to better know members of the community and its history.

Students could create a "documentary" of the challenge and incorporate things they have learned about their partners.

SCORING

For older students you may want to use this scoring method.

The formula uses three variables to calculate the final rating: mass (measured in grams), volume (measured in cm^3), and a numerical score assigned to how damaged the chip is when it arrives (see page 3).

Younger grades can use the Score Card without the formula.

THIS IS THE FORMULA:

$$\text{Final Score} = (\text{Chip Rating}) / (\text{Volume} * (\text{Mass}/1000))$$

<p>Perfectly Intact (100 Points)</p>	<p>Like it just left the factory</p>	
<p>Slightly Damaged (75 Points)</p>	<p>Cracked, but still in one piece</p>	
<p>Chipped Chip (50 Points)</p>	<p>Chipped along the edges, but less than 5 pieces</p>	
<p>Split Chip (25 Points)</p>	<p>The chip is broken into two fairly equal pieces</p>	
<p>Significantly Damaged (10 Points)</p>	<p>Chipped and/or cracked into less than 20 pieces</p>	
<p>Potato Dust (1 Point)</p>	<p>Too many to count/ more than 20 pieces</p>	