

# Chip Challenge Event Rules

## Description:

A team of students will design and test a container for shipping a single “Pringles” potato chip, via FedEx, UPS, or other specialty service other than USPS. Upon arrival the packages will be evaluated and scored using the format in the scoring section. The goal is to design the package that has the smallest volume/mass and protects the chip so that it arrives at its destination undamaged.

## Rules and Regulations:

1. Students will use 1 (regular) Pringles potato chip and materials of their choosing to create a device that will protect the chip on its journey through the postal system. The outer package (box) must be constructed using single-ply cardboard rather than 2-ply or reinforced cardboard materials.

NOTE: Acceptable cardboard includes the type used for Kleenex or cereal boxes. Thick or reinforced cardboard, such as jewelry boxes and special shipping boxes, are not acceptable. You are also not allowed to add materials to the outside of the box except the tape used to seal the box for shipping!

2. Students may choose a variety of items for packing materials; however, the materials cannot be wood, metal, glass, or hard plastic and must not leave a wet or greasy spot on a paper towel.

3. The chip must be a plain Pringles chip and may not be modified in any way.

4. The package must have a mass less than 300 grams in the “ready to mail” form, which means it is loaded with a chip and sealed with tape. Students should take into account the mass of the chip and tape as they prepare their chip containers to make sure they don’t go over the limit.

5. An entry form must be completed for each package, which includes unpacking instructions. The entry form cannot be a part of the packing material or container.

6. Once the package is completed and a single chip has been “loaded”, the package must be sealed with tape. Package must be clearly labeled on the outside with the group number and names of the group members. The following measurements must be made by the sending team after the package is ready to mail (sealed with tape) and recorded on their entry form:

(1) Mass of the package rounded to the nearest tenth of a gram.

(2) Volume of the package in cubic centimeters. Measurements should be taken to the nearest tenth of a centimeter.

NOTE: All measurements must be made using the “ready to mail” form!

### **Mailing Procedure:**

Packages must be mailed with a mail service agreed upon by the Chip Pals, such as FedEx, UPS, USPS, or other specialty mail service. All the packages must be packed in one large box or several boxes if you have a large number of groups. The box must be large enough to allow the small packages to move freely. All the entry forms must be sealed in one envelope and mailed at the same time as the box with the packages. Chip Pals are not allowed to open the packages until they have received the entry forms!

### **Scoring Procedures:**

Once the entry forms and all of the packages have been received, the receiving teams may open the individual packages under their teacher's supervision. Receiving teams should review the unpacking instructions on the entry form before opening the package. Receiving teams will need to determine the rating of the chip using the rating scale and record that information on the entry form.

### **Overall Score:**

Final scores will be divided into two categories: Perfect Pringles and Pringles Pieces. Receiving teams will need to use the information on the entry form to calculate the final score. The lowest overall score will be the one used to determine the winner. In the case of a tie, the package with the smallest mass will be declared the winner.

$$\text{Final Score} = [\text{Mass (g)} \times \text{Volume (cm}^3)] \div \text{Rating}$$

### **Scoring Examples:**

Team 1:

Mass = 145 g

Volume = 240 cu. cm

Rating = 100 (perfect chip)

SCORE =  $(145 \times 240) \div 100 = 348$  points

Team 2:

Mass = 145 g

Volume = 240 cu. cm

Rating = 50 (cracked chip) Score:  $(145 \times 240) \div$

$50 = 696$  points

# **Chip Challenge**

## **Final Check List for Teachers**

- (1) Are all the outer packages (box) made out of single-ply cardboard not 2-ply or reinforced?
- (2) Are the materials acceptable?
  - No wood, metal, glass, or hard plastic materials have been used.
  - Materials do not leave a wet or greasy mark on a paper towel.
  - The chip has not been modified in any way.
- (3) Does each package contain only 1 Pringles potato chip?
- (4) Are the entry forms complete?
  - Team members have included the basic information (team name, team number, members, school, & grades)
  - Team members have written unpacking instructions.
  - Team members have recorded mass and volume of the “ready to mail” packages.  
NOTE: “Ready to mail” refers to packages that are loaded with a chip and sealed with tape. (You do not have to wrap each package in mailing paper with Version B.)
- (5) Did the students include their team number (listed on entry form) and the names of the group members on the outside of each package?
- (6) Are you ready to mail the box and entry forms?
  - Did you pack the packages in a box large enough to allow them to move freely?
  - Did you write the To/From addresses on the outside of the box?
  - Did you write “Chip Challenge” on the outside of the box?  
NOTE: No other information is allowed on the outside of the box, such as “Fragile” or “Handle with Care”.
  - Did you put all the forms (entry and school information page) in one envelope?  
Make a copy for your records!

Note for teachers:

Make copies of all entry forms for your records. Enclose all forms (entry forms and the school information page) in a separate envelope and mail with your box. Receiving teams are not allowed to open packages until all the forms and packages have been received!