

School _____

Sponsor Teacher _____

Objective:

Design and test a package to safely ship a single Pringles Potato Chip through the TESD Internal Postal Service to the Finals school site. Upon arrival, the chips will be evaluated and scored according to the rubric on these pages.

Goal:

Engineer the package to have the smallest mass and volume, while protecting the chip so it arrives at its destination undamaged.

Rules (adapted from those first used by Charlie Lindgren)

1. Student or group not to exceed three students will use one (regular) Pringles Potato Chip.
2. No substance may be applied to the chip, or the chip altered in any way.
3. The chip must be recoverable and edible (but please don't eat it) when received by the Finals school site.
4. Students will work individually or in small groups to design and test the package.
5. No pre-made Pringles containers should be used (ex. specially designed Pringles containers for lunch boxes, Pringles cans, etc.)
6. All packages will be sent via the TESD Transportation Dept. from Home site to Fair final site.
7. Package must be clearly labeled on the outside with the sending school and student names. (If special unpacking instructions are needed they should also be included).
8. Packages will be evaluated and scored based upon their arrival condition, mass and volume of packaging. Students will also receive points for their documentation of their Engineering processes.
9. Pre-submittal of Engineering Notebook to site facilitator is required for before mailing package.
10. Notebooks will be due April 24th. Submittal of ALL papers due at final April 29th.

School _____

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_____**Scoring:** (adapted from Westside Impact and Pringles Challenge as applicable)**Performance Rubric**

Three measurements must be collected in order to score a package for the Pringles Challenge.

1. Mass - measured in Kg to at least 3 significant figures
2. Volume - measured in cubic centimeters to at least 3 significant figures
3. Intactness score of the chip as determined by the evaluating school, according to the chart below

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

Pringle Score

The overall score of the package will be used to compare packages. The formula for calculate the overall score will be as follows:

$$\text{Pringle Score} = \frac{\text{Intactness Score}}{(\text{Mass in kg} \times \text{Volume in cc})} \times 100 = \boxed{}$$

Example:

- a) A perfect chip = Intactness of 100
- b) Mass = 256 grams or 0.256 kg
- c) Volume = 250 cc (2.5×10^2)

$$\text{Overall Score} = (100 / (.256 \times 250)) = 100/64 = 1.56 \text{ (when rounded to 3 significant figures)}$$

Overall Score will be multiplied by 100 to arrive at a Performance Score

Project Rubric

I. Research Problem The following are clearly stated and explained in student words:

Description of a practical need or problem to be solved	0	1	2	3	4	5
Definition of criteria for proposed solution	0	1	2	3	4	5
Explanation of constraints	0	1	2	3	4	5
					Subtotal Points	_____

II. Design and Methodology The following are clearly stated and explained:

Exploration of alternatives to answer need or problem	0	1	2	3	4	5
Identification of a solution	0	1	2	3	4	5
Development of a prototype/model	0	1	2	3	4	5
					Subtotal Points	_____

III. Execution: Construction and Testing

Prototype demonstrates intended design	0	1	2	3	4	5
Prototype has been tested in multiple conditions/trials	0	1	2	3	4	5
Prototype demonstrates engineering skill and completeness	0	1	2	3	4	5
					Subtotal Points	_____

IV. Technology

Technology utilized to research the problem	0	1	2	3	4	5
Technology impacted the design and methodology of the project	0	1	2	3	4	5
Technology used to aide in construction, testing, and execution of the project.	0	1	2	3	4	5
Technology enhanced the quality of the project	0	1	2	3	4	5
					Subtotal Points	_____

V. Creativity:

Project is based on a unique idea, problem or question	0	1	2	3	4	5
Idea, problem or question is handled or interpreted in a unique manner	0	1	2	3	4	5
Materials are used in a unique or ingenious manner	0	1	2	3	4	5
Project is displayed in a unique manner	0	1	2	3	4	5
					Subtotal Points	_____

VI. Organization:

Material is logically categorized/organized	0	1	2	3	4	5
Graphics and legends are clear	0	1	2	3	4	5
Supporting documentation is displayed	0	1	2	3	4	5
					Subtotal Points	_____

Performance Points

TOTAL PROJECT POINTS

(from Performance Rubric)

(Project Rubric + Performance Rubric)

Winners of challenge will be determined by highest scores in Total Project Scores

Scientists' Notebook Daily Entry

TITLE

Purpose* (Big Idea)

- What do you have to investigate or figure out in this lesson that is related to the big idea?
- What will be the main question that will guide your learning?
- What..., How..., Does... are good beginnings*

DIAGRAM

* Actual size and label the parts.

PREDICTION/ HYPOTHESIS*

- What do you think will happen (USING PRIOR KNOWLEDGE)
- If I do ... then... will happen because...*
- I think ... because*

DATA/Observations*

- Record the data in a way that will make sense to you later
Paragraph, Bullets, Table/Chart, Drawings, Graphs, etc.
- Title and label diagrams and pictures
- Measurements should be specific, accurate, and units labeled
- NEVER erase your work: Simply cross out any errors

CLAIMS AND EVIDENCE*

Claims	Evidence

- State your claim based on your evidence (data collected from observations)
- What do you claim to be true?
- How can you prove what you are stating? (Back it up)
.....I know this to be true because I observed.....
.....I claim that when, then (happens)

CONCLUSION/REFLECTION*

- Restate the focus question as a topic sentence
In this investigation...
In this inquiry...
I (we) learned that....
- Use details from your claims and evidence (data) chart to answer the focus question.
- Every claim must be supported by evidence.
I (we) liked/did not like because
My (our) prediction that.....wasbecause....
This reminds me (us) of..... because....
I (we) discovered that.....
Now I (we) think that....because
- Refer back to your hypothesis
- My hypothesis was correct/incorrect because...*
- Record your thoughts after the experiment (Understandings, Likes, Related Thinking, Connections)
- Include a summative sentence that can be a restatement in different words of the topic sentence.

Next Steps

- What new questions do you have to extend your learning?