



TeachEngineering

STEM Curriculum for K-12

BIODEGRADABLE HUSK-BAG DESIGN CHALLENGE



Subscribe to our newsletter at TeachEngineering.org to stay up-to-date on everything TE!

Brought to you by



Standards:

- [State STEM Standards](#) The student examines the relationship of biotechnology to the development of commercial products. The student is expected to design an environmentally friendly, biodegradable potato chip bag.
- [ITEEA Standards](#) Provide a common set of developmentally appropriate expectations in the study of technology, including the engineering design process.
- [NGSS Standards](#) Design a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Learning Objectives:

- We will analyze a real-world environmental issue by calculating the volume of plastic pollutants from a single product.
- We will engineer a prototype to resolve the issues of the use of toxic plastic.
- We will learn, laugh and leap with academic growth!



What is your favorite bag of chips?

How many bags of chips did you eat this week? Month? Year?

Let's add up how many bags of potato chips were eaten in this room?

How many bags do you think are produced to meet the demands of customers?

What do you notice about the design of these bags of potato chips?



Why are we talking
about bags of potato
chips?

Why do we need to stop plastic pollution?

- <https://youtu.be/Yomf5pBN8dY>

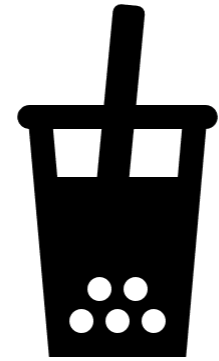
Plastic Pollution

What are the uses of plastic?



How much plastic do you see in this room?

Can we live without plastic?



Can we at least reduce our usage?

Background – Single-use Plastics

[Are you ready for a break up?](#) (video)

What can we do to use less plastic?

Have a purposeful discussion with your group to answer this question.
Be prepared to share out.

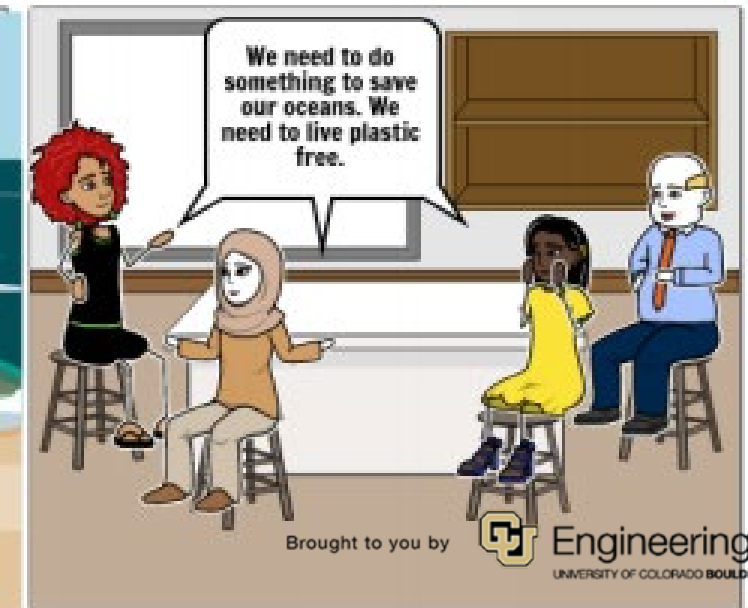
You do the math:

- Graph the data table in your Worksheet
- Find the equation of the line
- How many bags were sold in the last six years?

- Imagine how many bags of potato chips will be sold in the next six years.

Bio-DeHuskin Bags

By: Sciencelady0209



What can we do to use less plastic?

Let's start with a potato chip bag.

- Write ideas on how we can design a new potato chip bag that is biodegradable.

Words to know	Definition
pollutant	Contaminant introduced to the natural environment.
degradation	The reduction of a chemical.
biodegradable	Capable of being decomposed by bacteria.
Plastic Pollution	Accumulation of plastic in the environment.



Your job is to engineer a bio-degradable potato chip bag – plastic free!

Engineer a new bag.

Start, Now (20 minutes)

Quality control test

TEST	Run 1	Run 2	Run 3	% Score	Passed (100%)	Failed (<100)
Shake						
Toss						
Drop						
Tensile Strength						
Moisture Content						
Temperature						
Aesthetics/label						

Reflection time!

Answer these questions (Team share out)

- What worked?
- What didn't work?
- How can this be applied to the real world?
- Which biodegradable bag would you buy?
- Which group engineered the best quality bag?