



PLTW Engineering

**12/Design Challenge –
Beverage Can Transporter**

April 29, 2020



12/EDD

Lesson: 4/29/2020

Objective/Learning Target: Students will be able to apply the design process to invent a new product for transporting 6 beverage cans.



Gather supplies needed

Find these or similar supplies to start the challenge:

- 6 full cans of soda, seltzer, or juice - no packaging - just cans
- cardboard (approx. 8.5x11 in.)
- copier paper
- duct tape
- wax paper
- string
- 4 paint stirrers
- 6 rubber bands



Identify the problem

The current way that cans are transported are dangerous to animals/wildlife when they are discarded inappropriately.

Your challenge:

Invent a holder for six cans that's animal-safe, sturdy, convenient, and easy to carry.

You are limited to using only the supplies listed in slide 3.



Identify the problem

The current way that cans are transported are dangerous to animals/wildlife when they are discarded inappropriately.

Your challenge:

Invent a holder for six cans that's animal-safe, sturdy, convenient, and easy to carry.

You are limited to using only the supplies listed in slide 3.



Brainstorm and design

Here are some things to think about when brainstorming:

- The cans in a six-pack are all the same size and shape. Name some other containers that hold objects that are the same size and shape.
- You need to be able to carry the cans easily. What are some different kinds of handles used to pick up objects?
- How can you hold six cans together?
- Should you arrange the cans on end? Stack them?
- How will you remove the cans easily?
- How will you carry the holder?



Test, Evaluate, and Redesign

Take a look at what you have so far.

How well does it solve the problem? If your holder's bending and twisting, that's FORCE at work, pushing and pulling on the parts. You need to reinforce things to resist the force.

What changes can you make to your design to reinforce it?

One strategy to find further enhancements is the SCAMPER technique.



SCAMPER

This acronym can help you find ways to enhance your design.

Substitute - change one part with another

Combine - add parts of the design together

Adapt - change a part of the design to help another part

Modify - optimize part(s) to improve its function

Put to another use - make one part do one or more functions

Eliminate - remove a part

Reverse - change your thinking or the assembly of parts



Questions to reflect on

Which features worked best for holding cans together? Picking them up? Carrying them?

Which design is sturdiest? Lightest? Simplest? Uses the fewest materials? Your design had to withstand bending, twisting, and pushing. How well did your design resist these forces?

What are some ways an improved holder could help the environment?

If an animal were to eat some of the materials you used today, it might still cause problems. How are these problems similar to or different from the problems caused by plastic six-pack holders?



Helpful links

[Design process explained](#)

[Newtons laws of force and motion](#)