🌉 The Flexible Bridge Challenge

Week 4 — Wednesday | Flexibility Investigation

📖 Building Bridges

Engineers need to understand flexibility to build good bridges. A bridge must be **rigid** enough to hold weight without collapsing. But it also needs to be **flexible** enough to handle wind, temperature changes, and vibrations. If a bridge is too rigid, it might crack or break during an earthquake. If it is too flexible, it might bend too much and become unsafe.

Engineers test materials by building **models** — small versions of the real thing. Today you will be an engineer and build a bridge model. You will test how much weight your bridge can hold and observe how the material behaves.

Remember the steps of the **engineering design process**: 1) Ask the question, 2) Imagine solutions, 3) Plan your design, 4) Build your model, 5) Test it, and 6) Improve your design.

📋 Bridge Design Plan

My bridge materials:

_____

My bridge design (draw it below):

I think my bridge will be mostly: *Flexible / Rigid / Both*

🔬 Bridge Test Results

Test	What Happened?	Drew a Picture
Did the bridge hold weight?	_____	
Did the bridge bend?	_____	
Did the bridge break?	_____	

📊 Bend Test Lab

Test these items: bend each one and record what happens.

Material	Bends Easily?	Bends a Little?	Does Not Bend?	Broke?
Straw				
Paper				
Rubber Band				
Stick/Twig				
Aluminum Foil				
Pipe Cleaner				
Coin				

🌿 Nature Flexibility Hunt

Go outside and find flexible and rigid natural objects.

Flexible in Nature	Rigid in Nature
_____	_____
_____	_____
_____	_____

🎨 Improve Your Bridge

Based on your test, how would you make your bridge better? Draw your improved design.

✏️ Thinking Questions

1. What was the most flexible material you tested? Why do you think it was so flexible?

2. What would happen if a real bridge was made of rubber? Explain.