Challenge: Build a boat from aluminum foil that successfully floats in a tub of water. Then add pumpkins or other small objects to see how many your boat will successfully hold without sinking. Make improvements to your boat so that it can hold the most pumpkins.

Materials:
- A ruler
- tape
- scissors
- Aluminum foil
- Tub of water
- Small items to fill the aluminum boats such as candy pumpkins, math counters, or gram cubes

Procedure:
- Determine what does it look like when something floats or sinks.
- Use the aluminum foil to build a boat that can float.
- Predict how many objects your boat will hold.
- Place pumpkins or other small objects in the boat until it capsizes or sinks.
- Make changes to improve your model and retest for number of objects it will hold.

Teacher Note: To make this more of a challenge for older students, discuss buoyancy. Have them weigh the objects first to determine how many their boat could hold. Their design should be based on how much weight they think their boat can hold. Each group should be prepared to explain the rationale for its boat design before testing the weight it will support. The challenge is met when predictions are correct for students who have tested the fewest times.

Reflection:
- ✓ Draw or take a picture of your boat.
- ✓ Explain why you created your boat the way you did and any changes you made along the way.
- ✓ What were some of the tough parts of your challenge? How did your group work through them?
- ✓ Teachers- Submit a class list of participants to your GST Instructional Support Teacher or to stem@gstboces.org. Be sure to have your name, district and school address.
- ✓ This challenge is Due: 10/30/2019
Pumpkin Challenge Response Sheet

Name: ___________________   Date: _____________
Teacher: ___________________

**Step 1:** Predict how many objects your boat can hold?
Prediction -
My boat can hold ________________ objects.

**Step 2:** Cut a piece of aluminum foil 16 x 18 cm. Use the foil and tape to build your boat. What will be the best way to fold your boat?

**Step 3:** Draw a picture of your boat:

TRY IT!!! (without objects)

My boat: Floats         Sinks

Make changes to improve the design if it does not float.
Step 4: Place your boat in the tub of water. Add the small objects. Keep adding objects until your boat tips or sinks.

Calculation: The boat can hold ________________ objects.

Did your boat meet your prediction? ____yes _____ no

Think about what you have learned. Can you design another boat that might hold more objects?

Pumpkin Boat Challenge

My best designed boat would look like this
(Draw a picture and use labels)
Pumpkin Boat Challenge Primary Response Sheet

Name: ________________________________

Step 1:

Predict: My boat can hold ____________ objects.

Step 2: Use the 16x18 cm aluminum foil and tape to make a boat.

Draw a picture of your boat.

Does your boat float?  
Yes  No  
(circle one)

Do you need to make any changes to your boat so it floats?
Step 3: Calculate

How many objects did your boat hold? _______________

What was your prediction? ____________

Was your prediction more or less than the actual number? (circle one)

Step 4: Draw a picture of your final boat with objects.