

## 2<sup>nd</sup> Grade - Lesson 1.4

### Using the Properties of Materials to Improve a Model Boat Teacher Background

In Lesson 1.4, students apply what they have learned about the properties of materials to the problem of improving the design of a paper boat.

The lesson can be viewed as an engineering challenge to design and test a solution to the problem: How can a paper boat be made to hold more pennies without sinking?

For the purpose of this lesson, starting with a paper boat that fails is necessary because it gives students an opportunity to think about how the paper boat can be improved by using materials they have tested.

This allows students to engage in an engineering practice of thinking about possible solutions and testing them. You may need to remind students about the properties of the materials they have tested. You can encourage them to think about which materials might be best for keeping water from absorbing into the paper boat. Students should suggest using aluminum foil and plastic on the outside of the boat to test whether inhibiting absorption will enable the boat to hold more weight.

You may want students to try to optimize their design by allowing them to change the design of the boat itself and by using multiple layers of non-absorbent material.

