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| **Lesson Title:** Float Your Boat! |  |
| **Grade Level:** Kindergarten | **Quarter: 3** |
| **Standards:** **SKP1a** Compare and sort materials of different composition**SKP1b** use senses to classify common materials**SKCS2a**. Use whole numbers for counting, identifying, and describing things and experiences. **SKCS3b**. Make something that can actually be used to perform a task, using paper, cardboard, wood, plastic, metal, or existing objects. (For example: paper plate day and night sky models) **Math**[**MCC.K.4a**](http://www.corestandards.org/Math/Content/K/CC/B/4/a/)When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.**[MCC.K.4b](http://www.corestandards.org/Math/Content/K/CC/B/4/b/)**Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted. |
| **Lesson Essential Question:** Why do some objects sink and others float?How do I determine the amount of objects that I have? | **Vocabulary:**Sink, buoyancy, flexibility, density, float, weight |
| **Lesson Materials**Foil, Styrofoam, packing peanuts, plastic bubble wrap, wooden popsicle sticks, cotton ball, paper, large tubs, and counting bears, tape, other materials that may not make a good boat (fabric scraps, tissue, etc. for investigative purposes)*Captain Kidd’s Crew-Experiments with Sinking and Floating,* by Mark Weakland or other sink/float book | **Lesson Assessment:** Student journalTeacher observationFloat Your Boat data sheet- attached  |
| **STEM Challenge Overview:**  Students will build a boat that will carry as many passengers as possible to the main land using only the supplies available. |
| **Teacher/Student Background:**We have studied that there many different materials in our world. We know that these materials can be used in a variety of ways to help us make things that can make our lives easier. We are going to making a boat using a material that your group will choose.  |
| **INSTRUCTION** |
| 1. **Ask/Engage**
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| * BrainPOP Jr. Sink or Float and BrainPOP’s [Buoyancy](http://www.brainpop.com/science/motionsforcesandtime/buoyancy/) movie
* After watching brainstorm ideas of “what makes some objects float in water and other objects sink?” Write down students ideas.
* Read the book, *Captain Kidd’s Crew-Experiments with Sinking and Floating,* by Mark Weakland or a similar book on sink/float.
* Refer back to student list when reading
* Discuss density-demonstrate with 2 objects that are the same size, but one has a higher density (1 object that sinks and one that floats, such as a ping pong ball and a golf ball) Show the students what happens when they are put in water.
* Have students test materials they could use to construct a boat-foil, Styrofoam peanuts, bubble wrap, popsicle sticks, cotton ball, paper
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| 1. **Imagine/Brainstorm**
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| * **Challenge:**

Some “beary” special passengers were stranded on an island when their boat sank. They need your help! You need to build a boat that will carry as many passengers as possible to the main land using only the supplies available.* Students will work in student journal to design a boat to hold 10 or more passengers (plastic teddy bears)
* Before beginning construction, each team must tell you the supplies they need.
* Every team gets 12” of masking tape
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| 1. **Plan/Design**
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| * Each student presents ideas to team
* Teams collaborate to come up with final design plan
* Draw final plan in student journal
* Draw or list materials chosen for boat
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| 1. **Create / Test**
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| * Students get materials needed
* Create boat collaboratively
* Make team prediction on class sheet—how many bears will our boat hold?
* Have students look at other designs and compare designs.
* Test boats in water-add one bear at a time-counting as they add each one
* Record final number on class sheet
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| 1. **Evaluate/Improve –** and repeat Steps 1-5
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| * In student journal fill in part 4 Create/Test and 5 Evaluate/Improve
* Using student data, construct a simple graph
* Compare designs/data to see which design was the most successful
* If time allows repeat process, students may change materials or improve original design
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**NOTES:**

\*This lesson works fine with individuals, pairs, or small groups. I know it says “each team”, but you can decide how to organize it based on the needs of individual students.

\*Please make sure you have enough materials for each student to try this activity at least twice, with different materials each time if they choose. We don’t want to stifle the improvement process due to lack of materials.

\*If you don’t get all of the requested materials, no big deal. Just work with what you have. Not getting any bubble wrap is not really a problem as long as you have a variety of other item available.

\*The lesson calls for counting bears. If you don’t have those, any little item of comparable weight will work. See McNaughton to look through the Rhymes & Times items for ideas.

\*While the goal is for the students to build their boat independently, if you see a student struggling it is always a good idea to help guide their thinking. What’s going wrong? What are you trying to do? What might help fix this problem?

\*Before they test their boat, ask the student if they see any spots that might cause a problem (hole, low side, etc.). If the student can identify a possible problem, allow them to try to fix it before testing.

\*The improvement step is very important to the STEM process. It is the step that teaches students to stick with it, “if at first you don’t succeed…” and all that. If their boat worked great the first time, this step pushes them into a higher level of thinking about their invention (can you make it carry more passengers? Can you keep all the bears dry?). If their boat sank the first time, this step teaches them to continue thinking, evaluate their own work, and possibly change strategies (Can you tell me WHERE the problem was on your boat? Which material didn’t work so well? What can you try to make it better?). This is what we are trying to get to transfer over to their academics.

\*Student journal pages are attached to this lesson. Feel free to alter them to suit your needs, create brand new ones (send me a copy if you do so we can share the resource) or add other resources (video clips, KWL, etc).

\*Your team may decide on another “hook” or “wrap up”. Video clips, introductory activities, closing activities, etc. Totally up to you and your team. Study the lesson to decide how to break up your day.

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