

FLOAT YOUR BOAT

A 3rd Grade Buoyancy Inquiry

Start with the Standards!

3-PS2-1

Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.

Clarification Statement: Examples could include an unbalanced force on one side of a ball can make it start moving; and, balanced forces pushing on a box from both sides will not produce any motion at all. Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.

3-5-ETS1-1

Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

Fleshed out from the Framework...

3-PS2-1: Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces.

Cause + Effect ←

Draw a model

Every force acting on an object has strength and direction. Objects at rest have forces acting upon them that have a net sum of zero. Forces that do not have a net sum of zero result in motion.

PS2.A Forces + Motion
PS2.B Types of Interactions

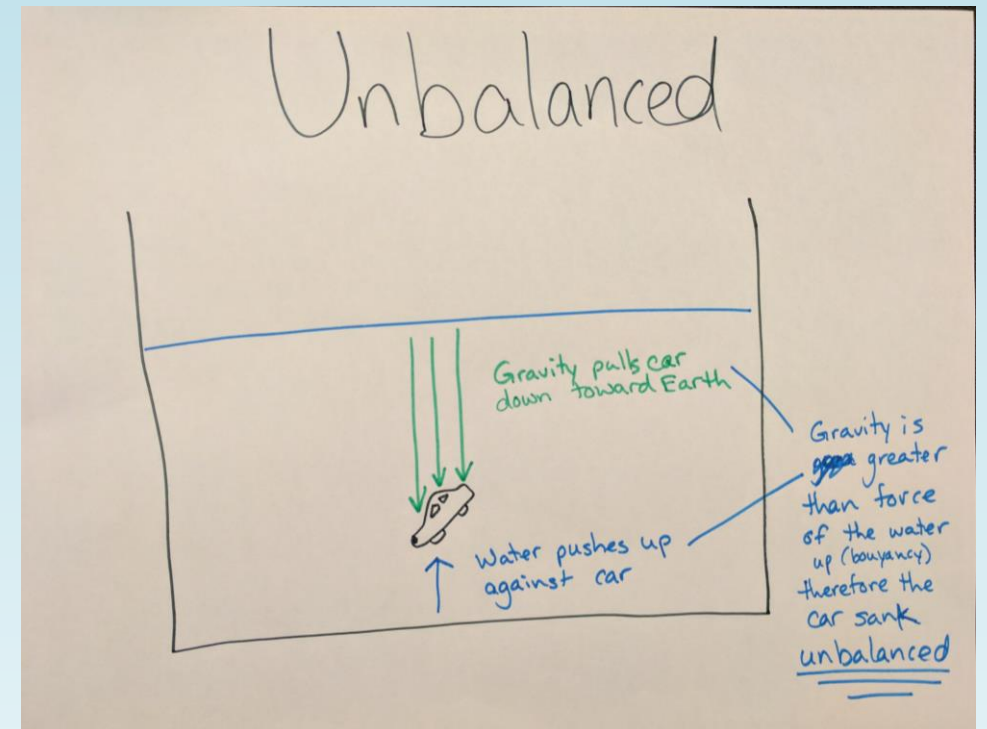
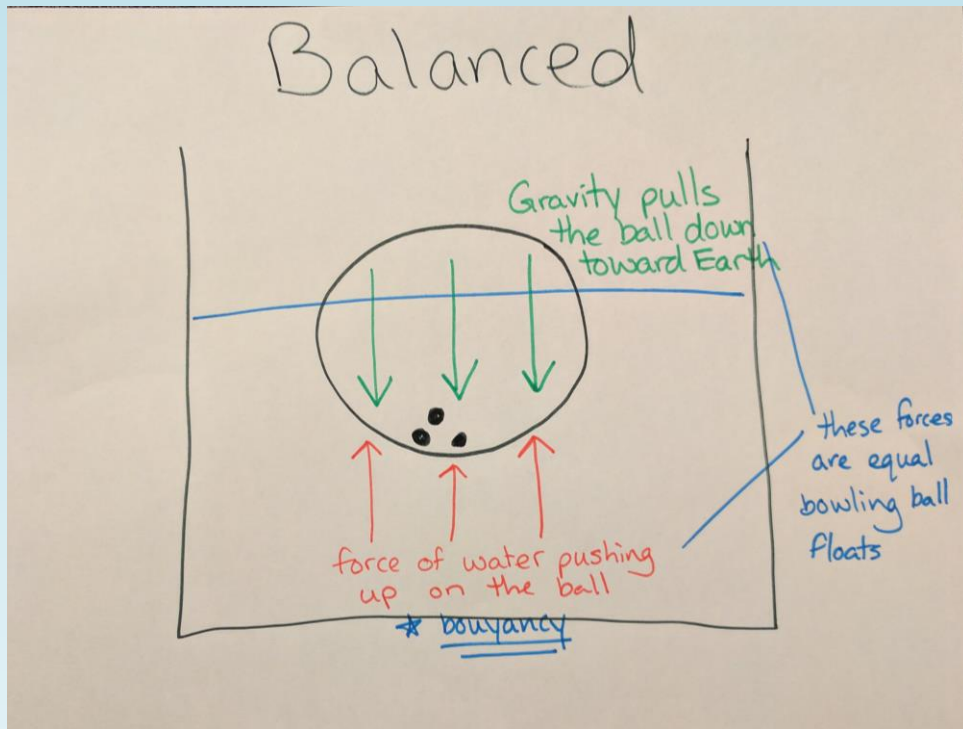
3-5-ETS1-3 Plan + carry out fair tests in which variables are controlled and failure points are considered to id aspects of a model or prototype.

→ ETS1 parts of A, B, + C

3-5-ETS1-1: Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time or cost.

Sink or Float Activity

Draw a model of an example from today's demonstration of an unbalanced force and a balanced force.



Float Your Boat

1. Build a boat out of 1 piece of aluminum foil.
(approximately 30 cm x 30 cm)
2. Your boat must float and hold 5 pennies to be considered a “success.”
3. Draw a model of your first attempt.
4. Did it float? What improvements can you make?
5. Draw a model of your improved boat.
6. Repeat this process until you have “perfected” your design.

Contest!!! Whose boat can hold the most pennies?