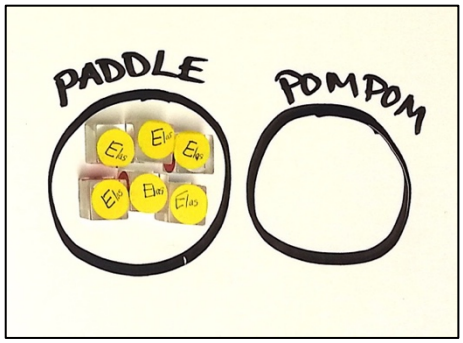
An Introduction to Energy Cubes

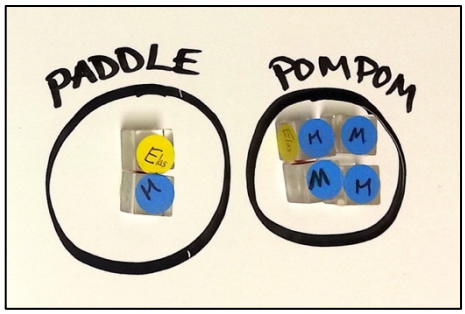
A key *Focus on Energy* representation tool involves energy cubes. Units of energy are represented by small cubes similar to dice. Cube sides are labeled to indicate different energy forms, for example, M for motion energy or Elas for elastic energy.

Working together, groups of students use energy cubes to tell the energy story for a scenario they have explored. Students first identify all of the objects that they think play an important part in the energy story. They draw circles on a whiteboard or large sheet of paper to represent these objects. Students slide the cubes between the circles to represent the transfer of energy from one object to another, and flip cubes to change the symbol facing up to represent a change from one form of energy to another.

Telling an energy story with energy cubes is a dynamic process. The images below capture possible configurations of the cubes for the story of the paint paddle and the pompom at 2 moments in time during that process:



This represents the energy of the springboard system when the paint paddle is latched in the bent position.



This represents the energy of the springboard system immediately after the paint paddle has been unlatched and is still vibrating, and the pompom is flying through the air.

The energy cubes are objects to think with. They provide a way to communicate the energy story that doesn't rely solely on verbal or written communication. Student groups co-construct meaning as they negotiate which components to represent and how to tell the energy story. As they use energy cubes, students learn to hold one another responsible for consistency both with their observations and the rules on their classroom "Model of Energy."

The Energy Cube Rules appear below.

ENERGY CUBE RULES

 Each cube is a unit of energy.

 Regions on a white board or paper represent objects involved in the scenario.

 Each cube indicates its form of energy with a symbol (such as “M” for motion energy) on the side facing up.

 To represent energy transformation, cubes flip so that a different symbol (such as “Elas” for elastic energy) faces up.

 The number of cubes in a region corresponds to the quantity of energy in a physical object.

 The number of cubes showing a particular symbol on the upward side corresponds to the quantity of a particular form.

 To show energy transfer, cubes move from one region to another.

Focus on Energy: Preparing Elementary Teachers to Meet New Science Standards.
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