L. Sigh

Let's Fly

Kindergarten (Option 4)

Introduction: This lesson is part of a "Let's Fly" unit, in which students use mathematical concepts to learn the essentials of designing, building and flying paper planes. In this lesson student are engaged in learning the role that thrust and weight have on a flying model. This is a 45 minute lesson which will take place outside in an open field.

Explore (45 minutes)

Engaging Context: This lesson engages students in solving measurable math and engineering problems with a model. Primary students enjoy representing real life situations using actions, objects, words, and numbers. In this lesson, students will use a spinning model to represent the relationship between thrust and weight. Students will used a tape measure to compare and document data on a chart entitled "Forces of Thrust Applied and Distance Traveled". Kindergarten Common Core requires that students make observations and gathering information as they think about problems (K-2-ETS1-1).

Teacher will use information from NASA site to show the speed space vehicles travel. The students and teacher will discussed how weight and thrust are used in aviation to propel vehicles into space. Teacher will also discuss the role that weight and thrust have on a paper plane.

Objectives:

- To use a spinning object, and weights, to represent the effect of thrust and weight on a moving flying object.
- To describe what happens to a flying model when a greater or lesser thrust is applied.

Materials: spinner, small objects attached to spinner, chart to organize data, measuring tape.

Essential Question: How will thrust and weight affect the lift and distance of a spinning object?

Evidence Collected: Teacher used interviews to assess students understanding of the concept. Teacher used questions to check reasoning skills:

- How can a spinning model represent thrust and weight?
- How did the design of the spinner enhance its lift into the air?
- How can weight and thrust affect a paper plane?

This lesson is aligned with Next Generation Science Standards (NGSS) and Math Common Core Practice for Kindergarten.

NGSS Kindergarten

- Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull (K.PS2-2)
- Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object (K.PS2)

Common Core and Math

- Asking questions, making observations, and gathering information are helpful in thinking about problems (K-2-ETS1-1)
- Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object (K.MD.A.1)

Force of Thrust Applied and Distance Traveled		
Thrust with Weights	Thrust without Weights	Distance traveled
	Great	27 feet
Less		5 feet
Great		10 feet