**Vernier Labquest Extension Investigation**

**Grade 7 Kit: FOSS (Life Raft drop and gravity) Investigation # 6 & 7**

**Grade 7 Kit: SEPUP (Force, Acceleration, & Mass) Investigation # 78**

**Title of investigation:** Free Fall (Acceleration due to Gravity)

**Guiding Questions:** How does gravity affect the acceleration of a falling object?

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**Summary of activity:** Students use a photogate and “picket fence” to determine the acceleration due to gravity (approximate).

**Science Standards:** 7.1.5, 7.1.6, 7.1.7 Force, gravity, speed, and acceleration

**Equipment used:**

Per group: Vernier Labquest with photogate sensor, “picket fence” (plastic piece), ring stand and clamp

Consumable: none

**Description of Procedures, notes (teacher manual):**

Each group drops a “picket fence” (piece of plastic with alternating black and clear stripes, 5 cm in width) through the photogate. Students do several runs, being careful to drop the picket fence through the photogate sensor without touching the sensor. Any runs that do hit the sensor or miss altogether are thrown out. Students choose a section of the data, choose Curve Fit from the analyze menu, then choose velocity and select Linear as the Fit Equation. Record the slope of linear curve fit in the data table.

**Scientific questions:**

How fast do things fall?

What makes them fall?

Do different things fall at different rates?

Do things fall at different rates at different places on the earth’s surface (e.g. at sea level; the top of Mount Everest, etc)

Do things fall faster or slower at the moon’s surface? Can you explain your answer?

**Connections:** a force acting on an object changes its motion. Objects accelerate as they fall. This is due to the force of gravity. On Earth, this acceleration is ~9.8 m/s2.