Saving the Egg: a study in vectors

Explanation: The concept of vectors has an important role in subjects such as geometry and trigonometry, but it also plays an important role in physics. Vectors are used to describe and model force, velocity, and acceleration, for example.

The definition of a vector states that a vector is a quantity that has magnitude and direction. Since a vector is graphically represented by a ray, we know also that a vector has an initial point (called a starting point) and a terminal point (called an end point).

Purpose: For this experiment, we will be studying gravity as a vector. In the experiment, we will be dropping an egg from a specified height, and we must construct a container or holder for the egg that will prevent the egg from cracking when it is dropped.

Materials: Each student will be provided one egg. The student will be responsible for building/making/creating the container the egg will be dropped in. The container must be free-falling, i.e. no strings to lower, no pulleys, &c.

Procedure: From the specified height, the student will release the container. Once the container has reached the ground, the egg will be examined for cracks/breaks/leaks/yolk, &c.

The grade will be determined based solely on whether the egg is intact (no cracks, leaks, or spills), or not.

Exercises: Please answer the following questions:

1. What forces are you working against in making sure the egg does not break?

2. What materials do you think might work best in making the egg’s landing softer?