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| http://compsci.appstate.edu/sites/compsci.appstate.edu/files/imagecache/slideshow/slideshow/ASU_compsci_logo.png  **The CS4ALL NSF Supported Program** | https://encrypted-tbn3.gstatic.com/images?q=tbn:ANd9GcQGzOU-XT8XZWIBUwiPs2jjgixLO3CvrEyNq90lu1dbXJ0BQume  [**https://cs.appstate.edu/cs4all/**](https://cs.appstate.edu/cs4all/) |

**Subject Area(s):** Object-based Programming, Physics

**Computer Science Tools:** SNAP

**Activity Title:** Modeling Projectile Motion in SNAP

**Grade Level:** 11+

**Time Required:** 1 hour

**Recommended Group Size:** 1

**Summary:** Students are required to take an existing shell program and fill in the blanks to make a complete program. The program itself models the projectile motion of a basketball player dunking the ball. An understanding of programming and physics is necessary to successfully complete this task.

**Computer Science Connection:** Programming and logic

**Keywords:** SNAP, object oriented, programming, logic, physics, projectile motion

**Pre-Requisite Knowledge:** Kinematic Equations, Programming Logic, Familiarity with SNAP

**Materials List:**

* SNAP available at <https://snap.berkeley.edu/snap/snap.html>
* “PMwithSNAP-Shell.xml” (An incomplete SNAP project.)

Teacher Only

* “PMwithSNAP-CompleteKey.xml” (Offers one of many possible solutions.) Student answers will vary but their programs should behave similarly.

**Introduction/Motivation:** This module is designed to introduce students to some of the more robust applications of SNAP. It requires the student to not only “know” the math behind the kinematic equations, but to really understand the iterative process used in calculating position and velocity at every point of a projectile’s flight. This module will help solidify physics ideas while improving on a student’s programming skills.

**Assessment (Results/Conclusions)**

* + Build a full working program upon an existing (but incomplete) SNAP framework.
  + Be able to successfully score a “slam dunk” by using physics.