i3 STC Kit Extension Activities

North Carolina

Grade: 5th

Kit Name: Motion and Design Unit

Essential Standard(s): (List number, standard, clarifying objectives where appropriate)
3.P.1 Explain the effects of earth's gravity on the motion of any object on or near the earth.

Unpack the Standard (What does it mean? What is the "Big Idea"?):
Students will understand that the earth pulls on all objects on or near the earth without touching those objects.

What is the Engaging (will get the student interesting) Essential Question that the students will be trying to answer as a result of this Extension?
Why do things fall down instead of up? When we cry, why do our tears go down our face and not up?

Which activities in the kit touch on the Standard(s) and how can they be adjusted to better address the Standard(s)?
Lesson 3 and 4

Kit Activity	Extension Suggestions
Lesson 3: Pulling a Vehicle, Looking at Force	**Objects that Defy Gravity?** Challenge your students to find objects that defy gravity. Take this lesson outside. Encourage each student to bring an object that is non-breakable from the classroom, or from home that they think won't be affected by gravity. Go outside and test them all. The teacher should bring some lighter objects including a feather or a blown up balloon. On a windy day these objects may float. Encourage the class to think of reasons why these objects fall more slowly, in some cases; float (Is air resistance a factor?) Challenge them with questions like, "Birds and airplanes fly, but do they really defy gravity?"
Lesson 3, Lesson 4 : Testing the Motion of Vehicles Carrying a Load	**The Effect Gravity Has on Mass.** The more mass an object has, the stronger the pull of gravity. Divide the class into groups of two. The first partner should hold his arms out straight in front of him with palms facing up. Have pairs talk about what is holding his arms up, and what would happen if he relaxed his arm muscles. The other student should then stack one or more books on his/her partner's outstretched arms. Keep adding books until the partner feels his/her arms being pulled toward the ground. Reverse roles and discuss the effects of mass and gravity.
Lesson 3 and 4	**Hang in There—Does gravity always pull objects toward Earth?** Have the students cut a 12-inch piece of string. Tie one end to a paper clip or washer. Tie the other end to a ruler. Tape the string on the ruler so it does not slide. Hold the ruler parallel to the

	floor. Tilt one end of the ruler. Notice the direction of the clip. Hold the ruler perpendicular to the ground. Notice the direction the clip is hanging. The clip always hangs straight down. Earth's gravity is a force that always pulls an object downward toward Earth.
Lesson 3 and 4	http://sciencenetlinks.com/media/filer/2011/09/27/tf-snl-falling-for-gravity.pdf **Falling For Gravity** This activity helps to test the force of gravity. The instructions for this inquiry-based experiment have been provided in an Adobe PDF format. They are easily followed and can be used in small groups or by individual students. It has been provided by The American Association for the Advancement of Science.

Additional Suggestions (Literature connections; online resources):
http://www.discoveryeducation.com (United Streaming videos, Black line masters and teacher's guides)

http://player.discoveryeducation.com/index.cfm?guidAssetId=6F98A651-9D5D-4C07-BD3C-D423FB20F18A&blnFromSearch=1&productcode=US (Gravity video, 19 minutes)

http://www.newtonsapple.tv/video.php?id=1293 (Short video about gravity, teachers guide)

http://www.escapadedirect.com/plwigr.html (Activities to defy gravity, excellent engaging or introduction activities)