Newton’s Laws Lesson Plan

1. **Grade/Age Level:** Third Grade (Age 8-9)

2. **Subject Area:** Science

3. **Time allotted for the lesson:** Three 45 minute class periods

4. **Short description of lesson:** In this lesson, the learners will perform different experiments to learn about Newton’s Three Laws of Motion.

5. **State Curriculum Standards met in this lesson:**
   a. Utah Third Grade Science Standard 3: Students will understand the relationship between the force applied to an object and resulting motion of the object.

6. **Instructional Objectives (Each instructional objective [learning outcome] for this lesson):**
   a. Students will be able to explain each of Newton’s Three Laws of Motion with 100% accuracy and with proper science vocabulary.
   b. Students will be able to predict what will happen to an object when different forces are applied to it with 80% accuracy.

7. **Instructional Procedures**
   a. **Lesson Set**

   b. **Techniques and activities**
      i. **Newton’s First Law of Motion**
         1. Give students a piece of clay and ask them to move it without touching it. Discuss why they can’t make it move by summarizing Newton’s First Law of Motion: An object at rest stays at rest and an object in motion stays in motion until acted upon by another force.
         2. Use the “Move It, Sir Isaac” worksheet from uen.org to guide students in experimenting with the effect of small and large pushes on objects.
      ii. **Newton’s Second Law of Motion**
         1. Discuss Newton’s Second Law of Motion, which states the greater the mass, the greater, the force required to move an object.
         2. Have students make balloon rockets by taping a straw to a balloon. Also use three pieces of string to attach a small paper cup to the bottom of the balloon.
         3. Thread the balloon rocket on a string attached to the floor and the ceiling.
         4. Inflate the balloon and time how long it takes to get the balloon to the top of the string.
5. Weigh several coins and add them to the cup. Have students predict what will happen when you inflate the balloon the same amount and release it. Discuss how the balloon doesn’t go as high with more weight.

6. Have students record their observations on the “Balloon Rocket” worksheet from uen.org.

iii. Newton’s Third Law of Motion

1. Explain that Newton’s Third Law of Motion states that every action has an equal but opposite reaction.

2. Have students make balloon propellers by taping a balloon over the end of a straw. Use a small pin to secure the straw to the eraser of a pencil. Put the pin at the point where the straw with the balloon taped on it balances.

3. Have students inflate their balloons and observe what direction the balloon spins and what direction the air is coming out of the balloon.

4. Discuss how the two actions are opposite of each other, which causes the propeller to move.

   c. Lesson Closure
      i. Have students complete an exit card describing what each of the three laws of motion state.

8. Adaptations for special learners

   a. All experiments can be conducted either individually or in groups, depending on the abilities of the learners. For example, students who have a difficult time with small motor skills can work with other classmates in constructing the balloon rockets and balloon propellers.

9. Supplemental Activities: Extension and remediation

   a. Remediation
      i. Have students explore the Push and Pull activity at http://www.bbc.co.uk/schools/scienceclips/ages/5_6/pushes_pulls_fs.shtml
      ii. Have students explore the Forces and Movement activity at http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement_fs.shtml

   b. Extension
      i. Have students do the Hot Wheels Lab activities located at http://teachertech.rice.edu/Participants/louviere/Newton/index.html

10. Assessment/Evaluation

   a. Students will submit their observation sheets for the teacher to review.
   b. During experiments, the teacher will also be able to conduct informal assessments as students discuss with each other and as a class what is going on during the experiments.
   c. The exit card will assess individual student understanding of the three laws of motion.

11. Learner Products

   a. Experiment logs
   b. Exit Card
   c. Completed balloon rockets and balloon propellers

* Note for learners: This lesson plan template is adapted from the model that is recommended in the book Preparing to Use Technology: A Practical Guide for Technology Integration.