U78KUTZTOWN UNIVERSITY

ELEMENTARY EDUCATION DEPARTMENT

LESSON PLAN FORMAT

Teacher Candidate: Colleen Bagonyi & Taylor Della-Croce Date: 10/1/14

Cooperating Teacher: N/A Coop. Initials N/A

Group Size: 25 Allotted Time 1 hour Grade Level Third Grade

Subject or Topic: Simple Machines Section N/A

**STANDARD:** 3.2.3.B1. Explain how movement can be described in many ways.

1. Performance Objectives (Learning Outcomes):
   1. The third grade students will define and create a simple machine by using classroom materials to create their own simple machines.
2. Instructional Materials
   1. Brain Pop Jr. Video “Inclined Plane”
   2. Access to computers
   3. 3 large books (such as dictionaries)
   4. A load/weight (this should be something you can tie to a piece of string around so you can attach it to the spring scale)
   5. String/yarn
   6. Spring scale
   7. Copies of 2 different triangles: one 3 inches high/4 inches long, the other 3 inches high/6 inches long (1 copy of each per student) \Markers or highlighters
   8. Pencils (2 per student)
   9. Tape
   10. Power point
3. Subject Matter/Content (prerequisite skills, key vocabulary, big idea, outline of additional content)
   1. Prerequisite skills
      1. Fine motor skills
      2. Knowledge of a venn diagram
      3. Knowledge of force gained in previous lessons
      4. Gross motor skills
   2. Key Vocabulary
      1. Simple machine – a tool that makes work easier
      2. Force - a push or pull that changes the motion or shape of an object.
      3. Energy is the ability to do work.
      4. Work is the result of force moving an object.
      5. Gravity is the force that constantly pulls objects toward Earth.
      6. Inclined Plan – a slanted surface to make lifting easier
      7. Screw – an inclined plane wrapped around a pole or shaft that is used to hold materials together or drill holes.
   3. Big Idea
4. How does an inclined plane and screw make work require less effort.
   1. Additional content
5. Implementation
   1. Introduction
      1. The teacher will put a box filled with books on your desk or on the floor at the front of the class. Ask a couple of students to come up and try to nudge the box. You don’t want them to try to actually lift it because it will be heavy and they could hurt themselves. You just want to prove that the box is fairly heavy. f
      2. The teacher will begin a short discussion with the class using the following questions and statements:
         1. You could probably lift this box, but not easily. What if you had to put it on a shelf that was as high as the ceiling? How would you get it up there?  
            (Write this and all of the following answers on the board. You are not quite ready to introduce the simple machines so use whatever language your students use. You will revisit these ideas somewhat immediately.)
         2. What if you had to carry the box home?   
            (If students do not get beyond just carrying the box and taking rests add to the question and ask: Are there any devices that could help you? It may be that students are coming up with “things” that incorporate one of the simple machines, like a cart or a dolly. If so, this is a great lead in to the lesson.)
   2. Development
      1. Introduce simple machines as machines with few or no moving parts, that make work easier and briefly discuss the 6 simple machines using the teacher created power point. The six simple machines are inclined plane, screw, wedge, lever, pulley and wheel and axle. Today, we will be learning about 2 of these--the inclined plane and the screw.
      2. To further explain what an inclined plain and screw are the teacher will show the Brain Pop video entitled “Inclined Planes.”
      3. The teacher will demonstrate how an inclined plane makes work easier:
      4. The teacher will use the spring scale to weigh the item you are using as a load.
      5. The teacher will create an inclined plane by stacking 2 of the large books in a pile.
      6. The teacher will lean the third book against the 2 stacked books to create a ramp.
      7. The teacher will keep the load attached to the spring scale, slowly slide the load up the inclined plane. As the teacher is sliding, she will have students read the weight of the load.
      8. The teacher will ask “how does the inclined plane make work easier?”
      9. The teacher will discuss the relationship between the inclined plane and the screw--the screw is simply an inclined plane wrapped around a center pole, with a wedge at the tip.
      10. The students will use the 2 triangles to make models of screws.
      11. The students will have students use a marker or highlighter to highlight the longest side of each triangle.
      12. The students will cut out both triangles.
      13. The teacher will point out that these are inclined planes.
      14. The teacher asks the students:
          1. If these were mountains, which would you rather climb? Why? (You would want to climb up the longer one--although it would take longer, the work is also more spread out).
      15. The students will create a "screw" from the smaller triangle.
      16. The students will tape the triangle/inclined plane to the pencil (like a sail). Then, wrap the inclined plane around the pencil, ensuring that the highlighted side faces out. Tape the tip so that it stays wrapped. The highlighting along the longest side of the inclined plane represents the threads of the screw.
      17. The students will do the same with the longer inclined plane. This screw should have "threads" that are closer together.
      18. The teacher will ask the students:
          1. “If you were building something, which of these do you think would be easier to turn? Why?” (The screw with the threads closer together would be easier to turn; however you would have to turn it a greater number of times.)
          2. How are a screw and an inclined plane alike? How are they different?
      19. The students will draw a picture of the plane and screw and complete a Venn Diagram in their science journal.
   3. Closure
      1. The teacher will administer the inclined plane quiz
      2. The students will hand in the quiz and the answers will be discussed later in the week.
   4. Accommodations/Differentiation
      1. For S.D. with emotional behavior disorder I would have him sit near the door if he would need a break from the class to accommodate his emotional behavior. H would have all of the notes and procedures written out to help him focus on the task without getting frustrated.
   5. Assessment/Evaluation Plan
      1. Formative
         1. The teacher will administer the inclined plane quiz to see the students understanding of the material.
         2. The teacher will collect the science journal.
      2. Summative
         1. There is no summative assessment.
6. Reflective Response
7. Report of Student Performance in Terms of Stated Objectives (Reflection on student performance written after lesson is taught, includes remediation for students who fail to meet acceptable level of achievement)

Remediation Plan

1. Personal Reflection (Questions written before lesson is taught. Reflective answers to question recorded after lesson is taught)
   * 1. Where the students engaged during the activity?
     2. Was the chart an quiz way to assess knowledge? Was it too easy? Was it too hard?
     3. Were the students able to make their own connections while doing this experiment?
2. Resources (in APA format)

Simple Machines. (n.d.). Retrieved November 25, 2014, from http://www.brainpopjr.com/science/forces/simplemachines/

Inclined Plane. (n.d.). Retrieved November 25, 2014, from <https://www.brainpop.com/technology/simplemachines/inclinedplane/quiz/>

Move It! With Simple Machines. (n.d.). Retrieved November 25, 2014, from <http://sciencenetlinks.com/lessons/move-it-with-simple-machines/>

BrainPOP | Inclined Plane. (n.d.). Retrieved November 25, 2014, from https://www.brainpop.com/technology/simplemachines/inclinedplane/

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

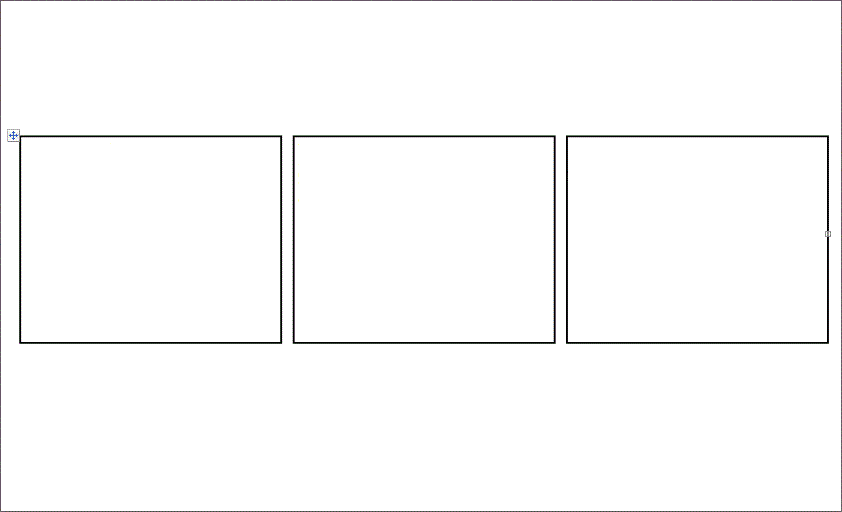
Incline Plane Quiz

1. An inclined plane is an example of:
   1. Simple machine
   2. Complex machine
   3. Effort machine
   4. Time-saving machine
2. On what amusement park ride might you see an inclined plane?
   1. Bumper cars
   2. Roller coaster
   3. Merry-go-round
   4. Spinning teacups
3. Which of the following is a true statement?
   1. An inclined plane reduces the amount of work one needs to do
   2. An inclined plane increases the amount of work one needs to do
   3. An incline plane makes work require more effort
   4. An inclined plane makes work require less effort
4. In physics, what is work?
   1. The effort exerted over a certain amount of time
   2. The force required to make an object accelerate
   3. The effort exerted over a certain distance
   4. The force required to make a moving object stop
5. What Olympic event features an inclined plane?
   1. The 100-meter dash
   2. Swimming
   3. Ice skating
   4. Downhill skiing
6. Which of these activities would require the least amount of effort?
   1. Walking up a short ramp with a steep incline
   2. Walking up a long ramp with a steep incline
   3. Walking up a long ramp with a slight incline
   4. Bypassing the ramp and jumping directly on the platform
7. When you carry a heavy box up a ramp, instead of lifting it directly on the platform:
   1. The amount of work you have to do increases slightly
   2. The amount of work you have to do decreases slightly
   3. The amount of work you have to do decreases significantly
   4. The amount of work you have to do stays the same
8. Which of the following devices makes use of an inclined plane?
   1. A can
   2. A funnel
   3. A bottle
   4. A bucket
9. Which of the following is an example of an inclined plane you might find in your house?
   1. The doorknob on the bedroom door
   2. The bed that you sleep in
   3. The blades of the fan used to cool your room
   4. The wheels on your desk chair
10. What is a plane?
    1. Another word for “ramp”
    2. Another word for “flat surface”
    3. Another word for “machine”
    4. Another word for “gravity”

Incline Plane Quiz Answer Key

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**Inclined plane**

**screw**