

Siege Machine Lesson Plan



Name: Christine Robbins	Subject/Grade: Math II/6-8	Date: 2012
Content/Skills Connection: ___ English Language Arts ___XX_Math ___XX_Science ___ Social Studies ___ Arts ___ Phys. Ed/Health ___ Social/Emotional Learning ___XX_STEM		
MA Curriculum Framework Standard(s): Tech/Eng Grades 6-8: 2.1, 2.2, 2.3,2.4,2.5. and 2.6		
Student Grouping: ___ Whole group ___ Small group ___XX_Partner ___ Individual		
Materials: PITSCO Education Catapult and Trebuchet kit, woodworking glue, toothpicks, one or two facial tissues, piece of waxed paper (about 15 inches long), pencil, large bucket, small hobby knife, internet access (for for viewing of trebuchet and catapult videos), computer or DVD player for instructional video, rulers or tape measuring for activity, flip camera, and safety glasses		
Accommodations/Sheltered English Adjustments: Small group instruction		
<p>Goal: Students will incorporate the Engineering Design Process through a hands-on activity that involves math and science. The students will construct a medieval machine and perform experiments with distance and mass. This activity is planned for four (4) class periods, each approximately 60 minutes each.</p> <p>Objectives and Assessments</p> <p>Objective 1: Introduce Medieval Siege Machines and assembly terms (mortise and tenon, face glue, edge glue). Assessment 1: Pretest 1 from PITSCO Siege Machine Teachers Guide</p> <p>Objective 2: Construction of the catapult kit Assessment 2: Observation of student work, documentation with flip camera</p> <p>Objective 3: Distance and Mass Activity Assessment 3: Completed student activity worksheet</p> <p>Objective 4: Wrap-up discussion and writing activity. Assessment 3: Journal Activity: describe the construction used by groups, and activity results in student journals.</p>		

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Procedures

Anticipatory Set: Discussion on medieval siege machines and PBIS pumpkin catapult activity

Lesson Progression 1. Teacher distributes Pretest; have students complete on paper and later enter in student ASSISTment account. 2. Have student volunteers read aloud pages 3-6 from the *Siege Machines* book. 3. Whole class discussion on the information. 4. Have students watch the Catapult or Trebuchet video (provided in PITSCO kit) and then “real-life” siege machines in action via YouTube videos. 5. Have students put four desks together and partner up. 6. Show students kit packages, tools and materials needed for activity. 7. Students will follow the instructions provided in the kits to complete construction of their siege machine. (Remind students to put their initials on all parts of the basswood pieces for future reference.) 8. Complete the Student Activity using Klean Klay as launch material. Remind students to use safety glasses and stay out of the range of the target area (constantly remind them) 9. Teacher will lead discussion about successes and failures (if any) during the activities. 10. Students will date and title the next page in their math journal and answer the writing prompt provided by the Teacher. Note: Students will be encouraged to use the flip camera to document their progress/project during the class periods.

Extensions/Practice: Brainstorm some ideas on future activities with the completed siege machines. activities to use the machines in future activities or experiments. Ask about improvements or adjustments to future classes completing this assignment.

Resources used in planning: The Medieval Trebuchet <http://www.youtube.com/watch?v=L1EAA7pkEJ4>, PITSCO Medieval Machines Scope and Sequence

Reflection: The students absolutely LOVED this activity. The sixth and seventh graders completed the catapults and eight graders the trebuchets. Eight graders were chosen for trebuchet activity because of number of kits available and size of classes, as well as use of hobby knife. It would have been better if we had more kits available and the groups of the students were smaller. At times some of the students were better observers than participants. It was great to have an empty hallway that the students could take the buckets out into, and have lots of space to “fire” the catapults. The eight grade students were fortunate to use the technology classroom for their construction and activities. The technology classroom has long flat tables, as opposed to the slanted desk tops in the other classrooms.

For school connections, the PBIS team held an event the previous year launching pumpkins with a trebuchet constructed by the Tech and Art teachers. We will use the students’ machines at Math Night in the Spring.

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Distance and Mass Activity

1. Make three balls out of the Klean Klay, one each weighing 1.5 grams, 3 grams, and 6 grams. Before you weigh the balls estimate the weight and circumference each. How close was the actual measurement to your estimate?

2. Move the desks in the classroom to allow for a space about 15 feet long, if possible. Estimate the distance using a point of reference before actually measuring the distance. (An average middle school student is about 60 inches tall. 60 inches equals how many feet?????)

3. Roll out the white paper (wax paper) and place the catapult or trebuchet on one end of the paper, marking where it is located. You want your machine at this spot for each test.

4. You will measure the distance for each test as you go, launching the three balls at least two times. Make sure your classmates are out of firing range before you start. (Remember to announce: "Fire in the hole") Mark the spot where the clay ball lands; it should leave a mark on the paper.

5. Use the table below to record your measurements:

Clay ball size	1 st Distance traveled	2 nd Distance traveled
1.5 grams		
3 grams		
6 grams		

6. What did you notice about the distance each clay ball traveled? Did it travel as you expected?

7. Now that you have completed your experiment, take one of the blue buckets and try to get the clay balls to land into it. What distance do you think would be best for each weight? Have some fun with this!