Name _____

Ready, Set, Escape!!

You have been taken prisoner in a foreign country. You are going to try to escape from the prison. In order to escape, you must time the movements of the guards exactly! You have to design a method of timing 3 minutes – the time it takes the guards to change posts – so you can make your break. You will be able to use a timing device to check the accuracy of the device. No clock/watch may be used in the device itself. You will be graded on how close you come to the 3 minutes. Good Luck!

Materials List:

Stop watch – accuracy and final testing purposed only
String (shoelaces)
Paper
Cardboard
Paperclips
Bar of soap
Glue
Coins
Paper cups
Plastic soda bottles
(Students may bring in up to 3 additional simple items – no clock, watches, or any other device that has a pre-made timer.)

Procedure:

1. In groups, brainstorm ideas to complete the task (record all ideas).
2. Make a list of 3 materials you would like to bring from home (this cannot include a timing device)
3. Choose the best solution.
4. Get approval from your teacher on additional materials being brought in.
5. Explain why that solution was chosen.
6. Sketch solution.
7. Build prototype
8. Test prototype (record time)
9. Redesign to get a more accurate time.

Brainstorming Ideas (at least 4) – Be specific! (10 points)

Chosen Solution

Why was this solution chosen over your other design ideas? (5 points)

Amount over or under the 3 minutes achieved during testing _____ seconds

Conclusion Questions: (5 points each)

1. When did your system have potential energy? Kinetic energy?

2. Were you able to observe conservation of energy in your system? If not, explain how it was conserved.

3. Did your device follow simple harmonic motion? Explain.

4. Accuracy of your device time trials:

   a. _____
   b. _____
   c. _____
   d. _____
   e. _____

5. Redesign your device. What did you do to make your device more accurate?