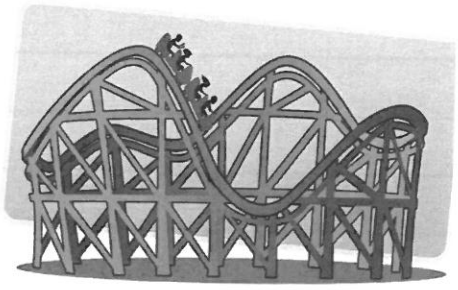
Standards: 4.3S.1, 4.3S.2, 4.3S.3, 4.4D.1, 4.4D.2
3.2S.1, 3.3S.2, 3.3S.3, 3.4D.1

Name: _____



Design and Build a Roller-Coaster

Learning Goal: You will be learning about the scientific method while learning and applying your understanding of energy to design and build a roller coaster.

Your Goal: Design and construct a roller coaster that uses kinetic and potential energy to move. You will need to include at least one loop in the coaster. Remember to consider the impact gravity will have upon your coaster. HAVE FUN!

Scientific Method:

1. **Question:** _____

_____

2. **Background Information:**

- Energy: _____

_____

- Force: _____

_____

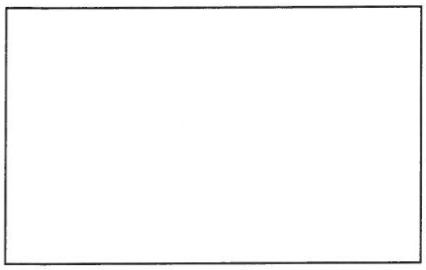
- Gravity: _____

_____

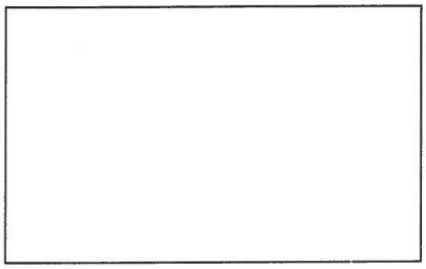
Standards: 4.3S.1, 4.3S.2, 4.3S.3, 4.4D.1, 4.4D.2
3.2S.1, 3.3S.2, 3.3S.3, 3.4D.1

Name: _____

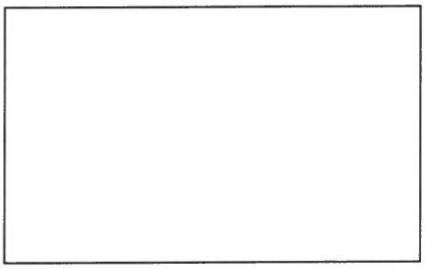
- Kinetic Energy: _____



- Potential Energy: _____



- The Law of Conservation of Energy:



3. **Hypothesis:** _____

I think the best design for a roller coaster would be….(KE- Kinetic Energy, PO-Potential Energy)

Standards: 4.3S.1, 4.3S.2, 4.3S.3, 4.4D.1, 4.4D.2
3.2S.1, 3.3S.2, 3.3S.3, 3.4D.1

Name: _____

4. Materials:

1. Clear plastic lab tubing (bendable)
2. BB pellet
3. Masking tape
4. Desk, table, chairs

5. Procedure

1. Students will design and draw a hypothesis of a roller coaster and label the points where the roller coaster would have kinetic or potential energy.
2. Students will construct the roller coaster design with the plastic lab tubing.
3. Students will test the roller coaster using a BB pellet.
4. Students will record their results and observations.
5. Based on the results, students will create a new design and record the changes and data as follows.
6. The process will continue until they create a successful roller coaster.
7. Write a conclusion reflecting on the process of building a roller coaster.

6. Experiment and Collect Data

#	Roller Coaster Design- Picture	Observations, Changes
Trial # 1		
Trial # 2		

Standards: 4.3S.1, 4.3S.2, 4.3S.3, 4.4D.1, 4.4D.2
3.2S.1, 3.3S.2, 3.3S.3, 3.4D.1

Name: _____

Trial #3		
Trial # 4		
Trial # 5		
Trial # 6		

Standards: 4.3S.1, 4.3S.2, 4.3S.3, 4.4D.1, 4.4D.2
3.2S.1, 3.3S.2, 3.3S.3, 3.4D.1

Name: _____

7. Analyze Data and Conclusion: Make sure to use the vocabulary words: kinetic energy, potential energy, and the law of conservation of energy.

_____

_____

_____

_____

_____

_____

_____

_____

Final Design: Draw your final successful roller coaster and label kinetic and potential energy along the track.