



1. Your weight doesn't change while riding The Joker, but your *sensation* of weight does change while on the ride. What force is responsible for your *sensation* of weight?
  
2. Describe your sensation of weight for each position:
  - a. at rest
  
  - b. moving through the lowest point
  
  - c. at the highest point
  
3. To feel the lightest, you should sit (closer to) (farther from) the center of the gondola. Explain your response.
  
4. Determine the period of the ride by timing one back and forth swing:
  - a. for a small initial oscillation  $T = \underline{\hspace{2cm}}$  seconds.
  - b. for a large maximum oscillation  $T = \underline{\hspace{2cm}}$  seconds.

c. Was the period affected by the size of the oscillations? Explain.

5. At what point during the swing of the ride is greatest gravitational potential energy the largest and at what point of the swing is the kinetic energy the largest?

6. How do the points of greatest gravitational potential energy compare to: (the same) or (different than)

- a. points of lowest accelerometer readings \_\_\_\_\_
- b. points of maximum accelerometer readings \_\_\_\_\_
- c. points of minimum velocity \_\_\_\_\_
- d. points of maximum velocity \_\_\_\_\_

7. How do the points of greatest kinetic energy compare to: (the same) or (different than)

- a. points of lowest accelerometer readings \_\_\_\_\_
- b. points of maximum accelerometer readings \_\_\_\_\_
- c. points of minimum velocity \_\_\_\_\_
- d. points of maximum velocity \_\_\_\_\_

8. Align your Force Factor meter **head-to-toe** and record the maximum swing readings:

- a. moving forward through the lowest point \_\_\_\_\_
- b. at the highest point \_\_\_\_\_

9. Align your Force Factor meter **front-to-back** and record the maximum swing readings:

- a. moving forward through the lowest point \_\_\_\_\_
- b. at the highest point \_\_\_\_\_

Name:

Partner:

Teacher:

**The Joker**

10. Where did the maximum Force Factor occur? Is this point the same for every seat? Explain!

11. Are the maximum and minimum Force Factor readings the same for every seat? Explain!

12. Use your Force Factor measurements to make quantitative free body diagrams for a 60 kg rider:

a. at rest

b. moving forward through  
the lowest point

c. at the highest point