

Roller Coaster Activity Sheet



As you ride the roller coaster, conduct the experiment as if you are the experiment, and consider the questions below:

1. How does the size of the hills change during the ride? _____
2. Do you move faster or slower when you are at the top of the hill? _____
3. Do you move faster or slower when you are at the bottom of the hill? _____
4. As you go up a hill, do you gain or lose speed? _____
5. As you go down a hill, do you gain or lose speed? _____
6. As you go up a hill, do you feel heavier, lighter, or the same? _____
7. As you go down a hill, do you feel heavier, lighter, or the same? _____
8. When the ride makes a turn, are you pushed into the turn or away from it? _____
9. Which way are the curves banked? (Sloped toward the inside or outside of the turn?) _____
 - a. Why? _____
10. Where is the kinetic energy greatest during the ride? _____
11. Where is the potential energy greatest during the ride? _____
12. List any simple machines involved in the operation of this ride: _____
13. Identify 3 sources of friction. _____
14. Make a diagram on the back of this sheet of the roller coaster track layout. Label the following: Minimum potential energy, G; maximum potential energy, X; minimum kinetic energy, K; maximum kinetic energy, M; weightless sensation, W; heavy sensation, H.

Name: _____

Teacher: _____

Date: _____

Ferris Wheel Activity Sheet



Problems:

1. When the Ferris wheel is turning at the fastest rate, do you feel lighter or heavier at the bottom of the circle? _____
2. How do you feel at the top of the circle? _____
3. Do the forces get stronger or weaker as the speed increases? _____

Name: _____

Teacher: _____

Date: _____

Merry-Go-Round Activity Sheet



Problems:

1. As the ride turns, is your body thrown slightly to the inside or outside? _____
 2. Do all the animals go up and down at the same time? _____
 3. Does the animal next to you move up and down as you do? _____
 4. Do you feel slightly lighter or heavier when your horse is going up? _____
 5. What about when it's going down? _____
 6. Do you feel differently when riding a horse on the outside vs. the inside of the ride?

- a. If so, how? _____

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Rotating Platform (Rainbow)



1. When the ride is going full speed, do you feel lighter or heavier at the bottom of the circle?

2. How do you feel at the top of the circle? _____
3. What happens when the ride is halfway down? _____
4. What happens when the ride is halfway up? _____
5. What forces do you feel at the top of the circle? _____
6. Does it make a difference if you sit on the left or the right side of the car? _____
 - a. How? _____

Name: _____

Teacher: _____

Date: _____

Rotating Swing Chairs



1. How do you feel when the ride is moving, but not tilted? _____
2. How do you feel when the ride is going down when tilted? _____
3. How do you feel when the ride is going up when tilted? _____
4. Which goes higher----an empty swing or one with someone in it? _____
5. What do you feel as the speed increases? _____
6. What happens to the seats as the speed increases? _____
7. What keeps the riders on the inside from swinging out and colliding with a rider on the outside?

Roller Coaster Type Rides Sample Activity Sheet

People in your group.

Sketch: Make a sketch of the ride with all the appropriate labels.

Data: Record the data you acquired from your instruments and observations.

Problems: Calculations should be done on another sheet and attached it to this sheet.

1. Why is the second hill shorter than the first? _____
2. Assuming no friction how much potential energy was stored on the first climb? _____
3. Determine the gravitational potential energy on the second hill. _____
4. Label the sections on your sketch that represent the greatest kinetic energy.
5. Determine the average and the maximum velocity of the ride.
 - a. Average velocity: _____
 - b. Maximum velocity: _____
6. Where does the maximum and minimum acceleration occur?
 - a. Maximum acceleration: _____
 - b. Minimum acceleration: _____
7. Compare the calculated acceleration with the acceleration you measured with an accelerometer.

Name: _____

Teacher: _____

Date: _____

Rotational Type Rides Sample Activity Sheet

People in your group: _____

Sketch: Make a sketch of the ride with all the appropriate labels.

Data: Record the data you acquired from your instruments and observations.

Problems: Calculations should be done on another sheet and attached to this sheet.

1. Determine the maximum speed of the ride. _____
2. Where does the maximum and minimum acceleration occur?
 - a. Maximum acceleration: _____
 - b. Minimum acceleration: _____
3. What is the average linear and angular speed of the ride?
 - a. Average Linear: _____
 - b. Angular Speed: _____
4. Calculate the frequency and period of rotation.
5. Compare the calculated acceleration with the acceleration you measured with an accelerometer.
6. Calculate the centripetal acceleration and force on a 70 kg person.
7. What prevented you from falling off the ride?