FUNTOWN IN LEARNING MIDDLE SCHOOL

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WELCOME TO FUNTOWN IN LEARNING MIDDLE SCHOOL

This program was designed to show how you could apply concepts taught in the classroom at your favorite amusement park, Funtown Splashtown USA.

On the following pages are some questions designed to bring you a little closer to the world of physics while enjoying yourself. You will be asked about the direction of forces, where energy losses occur, and why rides feel like they do. Try to concentrate on your own senses and get an idea on what is actually happening around you and to you. This is one of the best ways to get a grasp of the concepts of physics.

Feel free to approach these problems in groups or individually. Look over the booklet and get familiar with it, as this will prepare you for the problems that ask you to make observations while you are on the rides. Write down any questions or comments you may have and discuss them with others. Do not be discouraged if you cannot finish all of the problems at the park; many of them may require some thought after you leave. You can work through each ride's set of problems in any order. Consult your instructor should you have any questions before your visit to Funtown Splashtown USA.

One important note; please be safe while observing and riding the rides. All of the usual park rules still apply; no running, stay seated while a ride is in motion, etc. – all common sense rules.

The staff at Funtown Splashtown USA looks forward to having you at the park. If you were not able to get all of your questions answered before you leave, write to the park.
Thanks and have fun!

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Dragon's Descent

Dragon's Descent, is 68 meters (220 feet) tall. It carries 12 passengers at one time. This amazing attraction is not just an exciting ride up the tower, but the incredible accelerated drop that is a "beyond free fall" that provides passengers with a negative gravity experience they had no idea was coming. It is a sudden downward rush that is totally unexpected.

Dragon's Descent is a vertical ascent and rapid descent ride where passengers are raised at a lower speed straight upward, paused at the top for several terrifying seconds, and then blasted downward in an instantaneous, negative-gravity plummet toward the ground. The Dragon allows passengers to enjoy several air-cushioned "bounces" up and down the tower. Dragon's Descent's emphasis is on the sudden blast downward from the top.

It is best to take a few time measurements while you are waiting in line – trying to time anything while you are on the ride is somewhere between difficult and impossible.

1. How long does it take the ride to go up to the top? _____

2. How long does it take to descend from the top to the point where the cart turns around? _____

3. While you are on the ride, try to sense what forces are being applied to you at various times. For each of these times, record what force is pushing you, in what direction, and how hard. If there is more than one force, compare their magnitudes.

    a. At rest, waiting at the top

    b. The first few moments of the descent

    c. While you are slowing down approaching the bottom

    d. At the very bottom, about to be flung back up

4. What is your velocity going up if the first ascent is 53m (170 feet)? (Velocity = distance / time)

5. What is your velocity going down if the first descent is 39m (125 feet)? (Velocity = distance / time)

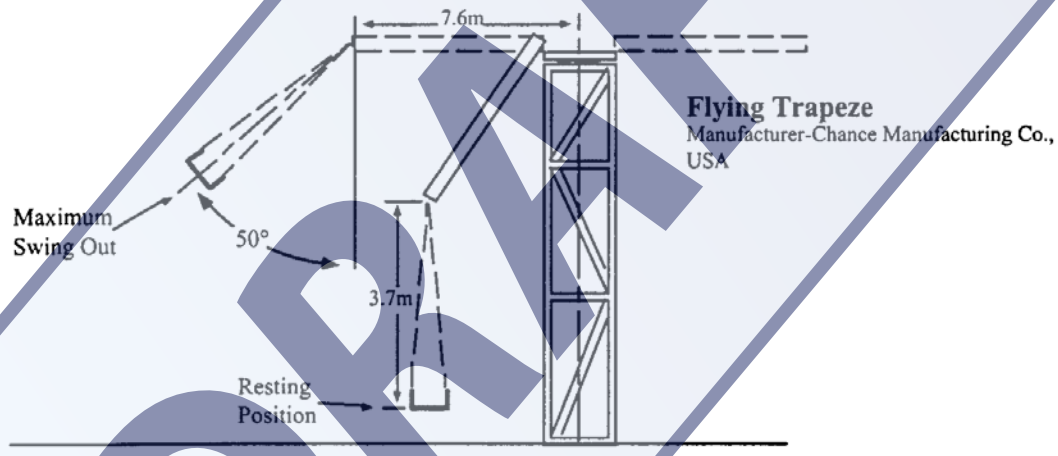
Flying Trapeze

1. Measure the time it takes for 2 complete rotations when the ride is at maximum speed.

   a. Time for 2 rotations? _____ sec.
   b. Average time for each rotation? _____ sec.

2. If the distance around is 40m (131 ft), what is the velocity?
   Velocity = distance / time

3. On the diagram below, draw all of the energies on the swing when it is at it highest point.



4. What is the kinetic energy if your mass is 60kg?
   Kinetic Energy = ½ x mass x velocity x velocity

THUNDER FALLS LOG FLUME

1. Examine how the concepts of energy conservation can be applied to the Thunder Falls Log Flume ride. At each of the following points (see diagram below), describe what form(s) of energy are present and what increased or decreased from the previous point.

   B.

   C.

   D.

   E.

2. Now, what about A? If energy is conserved, the total energy at A should be the same. Where does the energy come from that raises the boat from point A to point B?