

"The Commotion About Motion At Quassy" Physics Project Worksheet

(This educational project was developed with the cooperation of Project Explore students at Rochambeau Middle School in Southbury, Conn.)



1. Newton's Third Law Of Motion states:

How might it apply on the bumper cars?

2. The "Wooden Warrior" uses what types of energy?

If the second hill on the coaster was higher than the first, could the car make it to the top of the second hill?

3. Definition of centrifugal force. Do most amusement rides which spin in a circle generate centrifugal force? Name other rides in the park which might unleash centrifugal force.

4. Experiment #1 - What will happen to the bucket of water on the "Paratrooper" ride once it is placed in the seat and the ride starts?

5. Experiment #2 - RPMs. Pick a seat on the "Paratrooper." Count how many times that seat makes a complete revolution during one minute. (RPMs - Revolutions Per Minute).

6. Hydraulics. Definition. Experiment #3 - Use your "Yo-Yo" swing ride sheet. What other rides use hydraulics? Find at least two in the park and name them here:

7. Friction. A force that appears when two things rub against each other. Rub your hands together quickly. Experiment #4 - Will friction stop the train on the Little Dipper?

The Power Of Hydraulics

We're putting the pressure on (oil pressure that is) and we want you to figure out the following at the "Yo-Yo."



The "Yo-Yo" Super Swing at Quassy is powered by hydraulics. In fact, three hydraulic mechanisms put this huge ride through the paces as riders swing high above the park. Each YELLOW & RED arm on the "Yo-Yo" is lifted into the air by a hydraulic cylinder in the center of the ride. Here's a math puzzle for you:

There are _____ yellow/red arms on the ride. Each arm weighs 600 pounds.

There are _____ seats on the ride. For this math puzzle, we will say **each** seat and passenger weigh 100 pounds combined. Now do the math.

The total weight the center hydraulic cylinder is lifting = _____ pounds, or _____ tons. **Now that's what we call "Power Lifting," thanks to hydraulics!**

Watching the ride from the safety fence, you can see TWO other hydraulic mechanisms on the "Yo-Yo" as it operates. Name them:

(1) _____

(2) _____

Roller Coaster Physics!

You Do The Math!



Little Dipper Roller Coaster track length is 280 feet

Wooden Warrior roller coaster track length is 1,250 feet

Time BOTH roller coasters from start to finish (leaving the station and returning - coming to a complete stop in the brakes; NOTE: For Wooden Warrior the brake run is outside of the station - that will be stopping point for this experiment).

AVERAGE SPEED OF LITTLE DIPPER IS: _____ mph

AVERAGE SPEED OF Warrior IS: _____ mph

Formula: Average speed = distance % time _____ feet per second.

(60 MPH = 88 feet per second)

Take the average speed - feet per second - multiply by 60 (seconds);

divided by 88 = _____ mph for each roller coaster