

## RE-ENTRY

Waves are disturbances in a medium that transfer energy. An example we witness every day is sound. Sound is a wave traveling through the air as its medium. Lagoon's Rocket Re-Entry is an example of damped simple harmonic motion. If the ride were moving past you horizontally on a cart, it would resemble a wave. While waiting in line, investigate how simple harmonic motion and waves relate through the following activities.



### Ride Facts

Number of riders: 12

Height of ride: 60 meters (approximately 200 feet)

Force initially: 4.5 g

### Questions

1. What are the forces that cause the riders to slow down?
2. Using the iPhone or iPod "Stopwatch Analog+Digital" application or the Android "StopWatch and Timer" application, measure how long it takes to complete the first free-fall.
3. Draw a graph of the riders' position over time. Identify the period,  $T$ , on the graph.
4. What is meant by experiencing 4.5 g's on this ride?
5. Use the "Vernier Video Physics" iPhone or iPod application, stand next to Boomerang and record a group riding Re-Entry from beginning to end. Be sure that you can see the entire ride in the video screen, do not pan the video, and keep the device as steady as possible. Follow the directions in the application and analyze the ride video. In the top right corner, hit the graph icon and compare the distance versus time graphs to your graph. How are they similar and different?