Graph Matching Activity

In preparation for your participation in Physics Day at Six Flags, you have been provided with six sets of ride data graphs. Your task is to match the graph with the ride and to justify your match.

The two types of graphs:

Force Factor vs. time graphs show the ratio of the normal force in the direction of measurement to the magnitude of the gravitational force. That ratio, the Force Factor, is a multiplier that can be used to find the normal force on an object. For example, a Force Factor of 2 in the head-to-toe direction means that the normal force is twice as big as the gravitational force and you would feel twice as heavy as usual. A Force Factor of 0.5 in the front-to-back direction means the seat is applying a force to your back equal to half of the gravitational force on you.

The last graph on each page shows altitude vs. time.

The rides:

Use the descriptions and videos to orient yourself to each ride. Once you have determined the graph that matches the ride, write its number in the space provided and explain how you made the match.

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Batman – A steel rollercoaster with a high first hill followed by two vertical loops, a corkscrew and horizontal banks.

Graph corresponding to Batman _____

Describe the graph features that allowed you to match the graph to the ride:

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Highland Fling – A circular motion ride in which riders sit in pods facing tangent to the circle. As the ride speeds up, the pods swing out in a horizontal circle. The arm supporting the center of the wheel of pods raises the wheel into a vertical circle and then returns to the starting position.

Graph corresponding to Highland Fling _____

Describe the graph features that allowed you to match the graph to the ride:

The Joker – A giant pendulum that gradually increases in swing size and then decreases in swing size.

Graph corresponding to The Joker _____
Describe the graph features that allowed you to match the graph to the ride:

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Mr. Freeze – A steel rollercoaster that starts at ground level with an electromagnetic push into the hills and loops of the rollercoaster. It ascends a vertical section, gets a boost, and then goes backward along the same track to the starting point.

Graph corresponding to Mr. Freeze _____
Describe the graph features that allowed you to match the graph to the ride:

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Riverview Racer – A circular motion ride in which swings are supported from a large wheel. As the ride speeds up, the riders swing out, then the wheel tilts slightly so that riders move up and down with each rotation.

Graph corresponding to Riverview Racer _____
Describe the graph features that allowed you to match the graph to the ride:

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Rush Street Flyer – A horizontal seating platform that rotates in a vertical circle. The riders' torsos always remain vertical. The ride begins with side-to-side swings that increase in size until it does full rotations, stops, then reverses rotation direction.

Graph corresponding to Rush Street Flyer _____
Describe the graph features that allowed you to match the graph to the ride: