Online Roller Coaster Lab

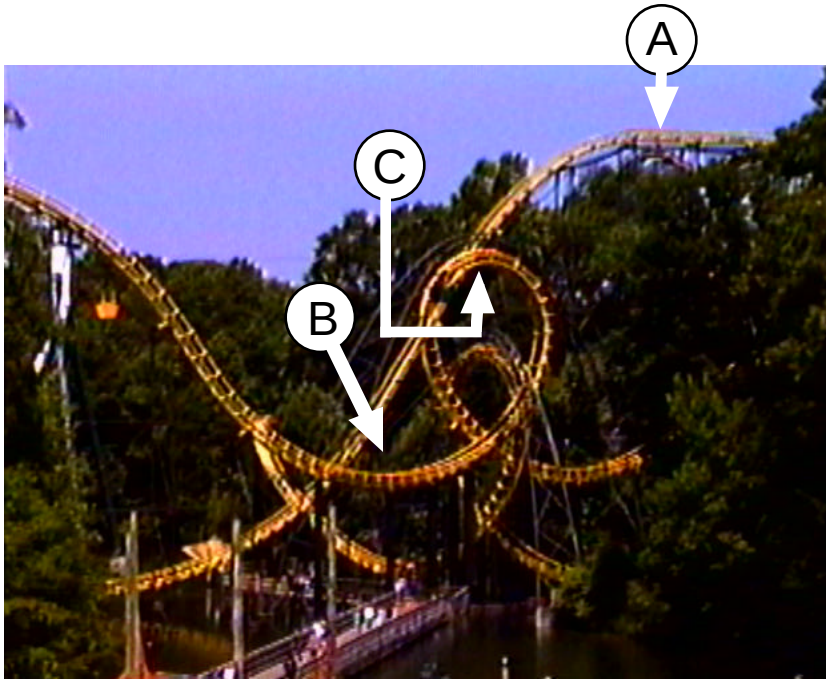
"Lochness Monster" roller coaster at Busch Gardens, Williamsburg, Virginia

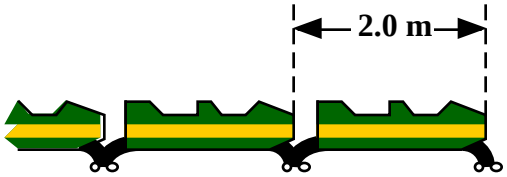
Materials

- Computer with access to the coaster QuickTime movies.
- Stopwatch

If needed review the velocity measurement methods on the web site. This lab uses method one.

The measurements revolve around the three locations shown below. You will need to decide which locations can be used to answer the appropriate question.





Coaster car's dimensions.

These are not the train's real dimensions. You will have to go to Busch Gardens to get those.

Show your work for all answers. Ignore all frictional forces.

1 What is the train of car's total length?

ANSWER:

2 Location "**A**" is close to the exit of the loading station. What is the speed of the train at location "**A**?"

ANSWER:

3 By the time the train reaches location "**B**" it has already traveled past one drop, up a hill and is coming down in to the first loop. What is the speed of the coaster at location "**B**?"

ANSWER:

4 What is the difference in height between locations "**A**" and "**B**" assuming no energy is added or removed from the ride between these locations?

ANSWER:

5 If a rider feels a force factor of 2.2 g's at location "**B**," then what is the radius of curvature at location "**B**?"

ANSWER:

6 Location "**C**" is the top of the first loop. What is the speed as location "**C**?"

ANSWER:

7 What is the difference in height between locations "**A**" and "**C**" assuming no energy is added or removed from the ride between these locations?

ANSWER:

8 What is the difference in height between locations "**B**" and "**C**" assuming no energy is added or removed from the ride between these locations?

ANSWER:

9 If the radius of curvature is 7.0 meters at the top of the first loop, location "**C**," then what is the centripetal acceleration a this location?

ANSWER:

10 How many g's of acceleration does a rider <u>feel</u> at location "**C**" ?

ANSWER: