Roller Coaster Gives Students an Alternate Lab for Physics

By Joan O'Brien
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FARMINGTON — Jason Colby already knew a lot about physics before he and 3,141 other teen-agers descended on Lagoon Friday for the 4th Annual Utah State University Physics Day.

The 14-year-old Logan boy had studied acceleration and kinetic energy. He and classmates from Mount Logan Middle School had built devices called accelerometers to measure G-forces on a wooden roller coaster, the Colossus Fire Dragon, the Centennial Scrambler and the Space Scrambler.

But it was on the Log Flume that he learned a new physics principle.

“I learned that when you put more weight in the log ride you get wetter,” he said. “We loaded it up with guys and we were drenched.”

Lagoon provided the laboratory for students from high schools and junior high schools in Utah, Idaho, Nevada and Wyoming to study fundamental physics concepts.

The idea behind “amusement park physics” is that students will learn better when they’re speeding upside down around the Colossus loop than when they’re sitting behind a desk.

Kinetic energy is not just the energy of a body associated with its motion; it’s why the burly football player’s bumber car moves the petite gymnast’s car farther.

G-force is not just the ratio of the magnitude of acceleration on a body to the acceleration of gravity, it’s gravity that the Colossus seems to defy.

Physics Day is more than rides, however.

Students participated in contests for winnings worth $8,500. The big event was the Physics Bowl, which earned first-place winners a one-year scholar-ship to USU.

Winning scholarships were Viewmont High School students Amy Lindsay, Dave Saetrum, R. Brett Willis.

Second place winners were Ryan Sharp, Owen Winesman and Chris Buck from Box Elder High School. Heber Eastman, Jeff Ferguson and Peter Jones from Viewmont High School came in third.

Jason and Tim Joy participated in the Measurement of G-forces Contest, for which they built their low-tech accelerometers.

Jason built his with a plastic test tube. He hung a fishing weight from an elastic, which was attached to the rubber lid with a paper clip. Then the device was attached to Jason’s arm.

Jason and other contestants measured the largest acceleration force experienced on the Colossus.

See B-2, Column 5
USU Physics Day Teaches Teens in A Roller Coaster

Continued from B-1

They investigated which Lagoon ride provided the maximum vertical acceleration and which ride provided the maximum horizontal acceleration. They also looked for the ride that sustains G-forces of 1.2 for the longest time.

Jason and Tim experienced some technical difficulties, but they measured G-forces of $2\frac{1}{2}$ on the wooden roller coaster.

They also found that the G-forces are greater on the Colossus Fire Dragon than the wooden roller coaster.

Jason found the chances that he’ll get an upset stomach are also greater on the Colossus than on the roller coaster.

In fact, he was unable to measure G-force on the Colossus.

“I was like sick, so I didn’t know.”