Names Brennan S. C Date

Marble Run—Part 1

Materials
- Three half pieces of copper pipe insulation (gray, spongy); each piece 1.83 meters or 6 feet
- Masking tape
- One marble
- Stopwatch
- Meter stick

Task
To work as a group to build a roller coaster and to diagram the forces of motion and energy transformations that apply to the track.

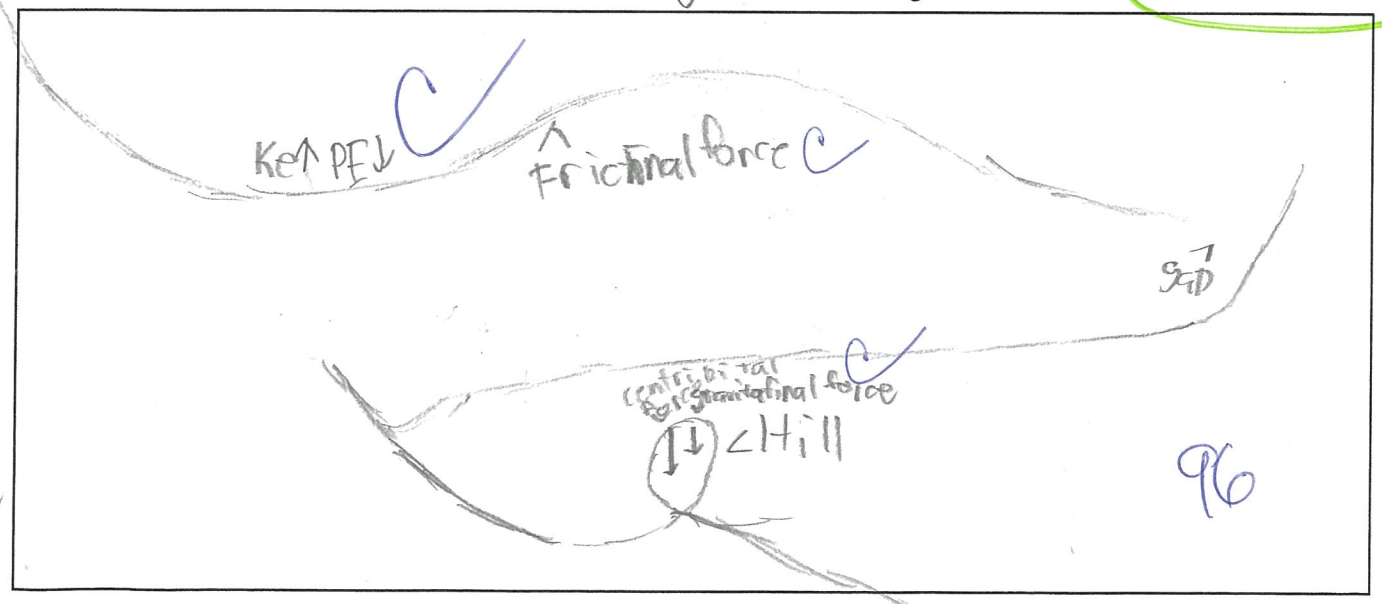
Parameters
1. Use 5.49 meters (18 feet) of copper pipe insulation for the track.
2. Select any type of marble, but only one marble. You will be able to make one switch if you want to change marble type.
3. Avoid putting tape on the surface of the track on which the marble rides.
4. This is not a race, so take time to enjoy it.

Don't forget to label!

Procedure
1. As a group, build a roller coaster that has
   - An initial hill and one additional hill
   - A complete loop
   - A gap where two pieces of track do not touch each other
   - A run that a marble can roll the entire distance of the track (except at the gap)
2. Time five complete marble runs.
3. Sketch the shape of the coaster below.
4. Label the forces that are present during the marble run (include gravitational, centripetal, and frictional).
5. Label energy transformations in your diagram where the potential energy and kinetic energy increases or decreases.

Roller Coaster Diagram

Average time for 5 trials _____



forces → motion

1. gravitational force – Pushes down ↓
2. frictional force – up ↑
3. centripital force – circle ⟲

Energy transportation

KE → PE
PE → KE

Law of conservation of Energy

energy can't be created or destroyed but can be transferd.