

Physics 10: Discussion Lab 1

HOVER PUCK

Activity

- 1) Get to know the hover puck.
 - a. Slide it along the floor with the fan off. What happens?
 - b. Now turn on the fan but don't push it.
 - c. Now give it a push. What happens? Why?
 - d. What do you need to do to get the hover puck to travel at a constant velocity? Make a prediction first and write it here, then try it:

 - e. Now predict what would happen if you push it with a constant force (first write it here, then try it):

- 2) The figure depicts a hover puck sliding with constant speed v in a straight line from point "a" to point "b" on a frictionless horizontal surface. Forces exerted by the air are negligible. You are looking down on the puck. Predict and **sketch** what will happen to the puck if you were to give it a brief push in the direction of the heavy print arrow at point "b".



- 3) Now experimentally test your hypothesis. Discuss your findings vs. your predictions with your group members.
- 4) Make the puck perform circular motion (i.e. move along in a circular path). What do you have to do?

LEVEL PLANE WITH CARS

Questions

- 1) If you were to briefly push two frictionless cars, "car a" with 2 times the mass of "car b", with equal force, then:
 - a. "car a" will reach the finish line first.
 - b. "car b" will reach the finish line first.
 - c. both cars will reach the finish line at the same time.
- 2) Where is the acceleration greatest?
- 3) Where is the velocity greatest?
- 4) What could you do to ensure that they both reach the finish line at the same time? (Try to be roughly quantitative.)
- 5) How would your answers to the previous questions change if "car a" were 4 times as heavy? Or 6 times as heavy?
- 6) Assume that "car a" is the same mass as "car b" but "car a" is placed at the beginning of the plane while "car b" is placed at the midpoint of the plane. If you were to apply a force to "car a" and then were to apply an equal force to "car b" right as "car a" reaches "car b", then:
 - a. "car a" will reach the finish line first.
 - b. "car b" will reach the finish line first.
 - c. both cars will reach the finish line at the same time.

Experiment

Experimentally test your answers. Come to a consensus as a group and be able to provide a reason for your findings.

INCLINED PLANE WITH CARS

Questions

- 1) If “car a” is 2 times as massive as “car b” and both are released from rest, will:
 - a. “car a” reach the finish line first.
 - b. “car b” reach the finish line first.
 - c. both cars reach the finish line at the same time.
- 2) Where is the acceleration greatest?
- 3) Where is the velocity greatest?
- 4) Assume that “car a” is the same mass as “car b” but “car a” is placed at the beginning of the plane while “car b” is placed at the midpoint of the plane. If you were to release “car a” and then were to release “car b” right as “car a” reaches “car b”, then:
 - a. “car a” will reach the finish line first.
 - b. “car b” will reach the finish line first.
 - c. both cars will reach the finish line at the same time.

Experiment

Experimentally test your answers. Come to a consensus as a group and be able to provide a reason for your findings.