

Study Guide #2 - Newton's Laws and Forces Quiz

Physical Science and Technology

Instructions: Answer all problems on a separate piece of paper. Show the Five Steps where indicated.

1. James is standing on top of a truck that is travelling at 10 km/sec. The truck hits a deer and comes to a complete stop. There is no gravity or friction in James's world. According to Newton's 1st Law, what happens to James?
2. Kelly is using an eraser at the end of a pencil to push on Mike's nose. What, according to Newton's Third Law, must also be happening?
3. A curious cat throws a blind mouse straight up in the air in a location where there **is no gravity**. Explain what happens to the blind mouse using Newton's 1st Law.
4. Hannah is using her hands to hold Alyssa in the air above her head. Alyssa is not moving. Alyssa is standing on Hannah's hands. Draw a free-body diagram for Hannah.
5. How much unbalanced force would it take to accelerate Benny the Beaver at a rate of 8.2 m/s^2 if Benny has a mass of 49 kg? Please show the Five Steps.
6. How much mass does Toby the dog have if it takes 409.5 N of unbalanced force to accelerate him at 10.783 m/s^2 ? Please show the Five Steps.
7. What would the acceleration of Susan the skier be if she has a mass of 98 kg and she is being dragged by a snowmobile with a net force of 233 N? Please show the Five Steps.