

Inertia

Check Questions: Answer all questions briefly but completely.

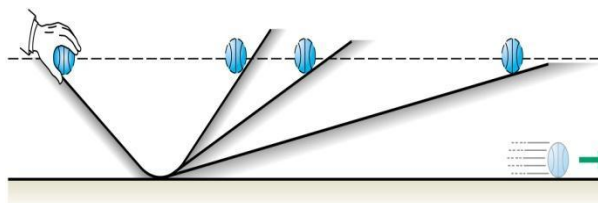
1. What is inertia?

The tendency for an object to continue in its state of motion

2. What is the law of inertia?

Newton's First Law- An object in motion stays in motion, an object at rest stays at rest, unless acted on by an outside force.

3. When a ball rolls down an incline, how high will it roll back up another incline?



Same height it was release from.

4. If a ball was to roll down an incline, and there were no obstructions for it to run into, how far would it roll?

For ever.

5. How does the famous table cloth trick work? This is when someone pulls the table cloth out from object sitting on the table cloth without the object moving?

An object at rest stays at rest!

6. When you are in your car and you hit the gas why do you feel like your body is being pushed into the seat?

Your body stays at rest.

7. What do seatbelts have to do with Newton's 1st law when you hit the brakes on your car?

Your body is in motion. The seatbelts bring you to rest.

8. Why is it dangerous to hit the brakes on your car when you have a tractor trailer following very closely on the interstate?

The tractor trailer has a lot of inertia.

9. (Hewitt p.57, #27) A Suppose you place a ball in the middle of a wagon that is at rest and then abruptly pull the wagon forward. Describe the motion the ball makes relative to the wagon? To the ground?

The ball stays at rest.

10. When a junk car is compacted into a cube, does its mass change?

NO

11. (Hewitt p.57, #29) If an elephant were chasing you, its enormous mass and its great velocity would be very threatening. But, if you zigzag as you run away from the elephant, the elephants mass would be to your advantage. Why?

ZIG ZAG

12. When space ships are flying through space, why don't their engines need be constantly be on like in your car?

NO, an object in motion stays in motion.

13. Which has more inertia, a car traveling 15m/s or a bicycle traveling 20 m/s?

The car.

14. Explain what happens to a puck on an air table when it is pushed?

An object in motion stays in motion.

15. A truck is equipped with a cannon that points straight up. The truck is moving at a constant velocity when the cannon are fired. Neglecting air resistance, where will the cannon ball strike when it returns?

Back into the cannon.

16. Using Newton's First Law, explain the following situations.

- a. The use of a seat belt, air bag, and head rest in a car.

Help stop you from moving.

- b. The best way to get ketchup out of a nearly empty bottle.

Jerk it.

- c. Why you will hurt your hand if you hit it against a wall while carrying a heavy load. (and, why it won't hurt that much if you aren't carrying anything...)

Less inertia.

- d. Twirling a bucket full of water vertically around in a circle – and not getting wet.

Inertia

- e. Laying a book on four Styrofoam cups and not having them break, and then *dropping* the book on the cups and squishing them.

Inertia

- f. A skateboard you are riding on strikes a curb (what happens to you!)

You keep moving.