

Quiz.

- Galileo's conclusions about motion helped advance science because they were based on _____.
 - philosophical discussions rather than experiments
 - non-mathematical thinking
 - experiments rather than philosophical discussions
 - Aristotle's theories of motion
- If gravity between the sun and Earth suddenly vanished, Earth would continue moving in a(n) _____.
 - straight-line path
 - curved path
 - outward spiral path
 - inward spiral path
- To say that 1 kg of matter weighs 10 N is to say that 1 kg of matter _____.
 - will weigh 10 N everywhere
 - has ten times less volume than 10 kg of matter
 - is attracted to Earth with 10 N of force
 - has ten times more inertia than 10 kg of matter
- The Earth rotates at 1000 mph. But when you jump upward in front of a wall, the wall doesn't slam into you at 1000 mph. Why?
 - The sun's influence on you is negligible.
 - The air in the room is also moving.
 - The inertia of you and the wall is negligible compared with that of the sun.
 - Both you and the wall are moving at the same speed, before, during, and after your jump.
- Aristotle divided motion into two types. What were they?
 - gravity and forces
 - natural and violent
 - inertia and gravity
 - inertia and forces
- _____ is the amount of matter in an object, and _____ is the force of gravity on an object.
 - Mass, weight
 - Weight, mass
- When you are in a car that slams on its breaks, how does your body react?
 - Your body is pressed into the seat.
 - Your body lurches forward.
 - Your body does not respond.

8. A 5-kg mass is _____ to set into motion and _____ to stop than a 20-kg mass.
- a) more difficult, easier
 - b) more difficult, more difficult
 - c) easier, easier
 - d) easier, more difficult
9. A 2.5-kg object weighs approximately _____ on Earth's surface.
- a) 25 N
 - b) 2.5 N
 - c) 0.25 N
 - d) 250 N

Answer Key.

1. c)

Galileo did not base his views on philosophy or opinion. He conducted various experiments and made conclusions on his measurements.

2. a)

According to the law of inertia, in the absence of forces an object in motion will continue to move at the same speed in the same direction.

3. c)

One kilogram of matter weighs different weights on different planets. On Earth one kilogram weighs approximately ten Newtons, but on the moon it would weigh less. The amount of volume one kilogram of matter displaces depends on the matter's density, and the less matter an object contains the *less* inertia it has.

4. d)

You and the wall are at rest *horizontally* with respect to the ground. The air in the room is moving the same as the wall, on average, so its *net* force on you is approximately zero. The sun's influence on you is not negligible, and the fact that your inertia and that of the wall is negligible compared to that of the sun is irrelevant in this scenario because having less inertia would only make you *easier* to move.

5. b)

Aristotle believed that motion on Earth was different than motion in the heavens, and he divided terrestrial motion into natural motion, which had no observable cause, and violent motion, which had an observable cause.

6. a)

Mass and weight are *not* the same thing.

7. b)

Your body has mass and therefore has inertia. When your body is in motion it continues to move in a straight line. Your seatbelt exerts a net external force to change your motion, but your head continues to fly forward until the tension in your neck pulls it back.

8. c)

The more mass an object contains the more inertia it has, and the more difficult it is to change its motion.

9. a)

Weight on Earth is equal to mass times g , the acceleration due to gravity. Here, one kilogram weighs about ten Newtons.