

ch. 4 / Conceptual Questions

④ It is Newton's 1st law. The body (if the dog) remains at rest but the water ~~is~~ is brought to motion and it keeps moving.

⑥ The road pushes the car forward. of course, the car must apply a force (in the opposite direction) to the road. That is provided by the car's engine. This causes the tires to apply a force to the ground in the backward direction.

⑨ a) The bathroom scale measures the normal force (against the force of gravity) acting on you. So the assumption is that the gravity is the only force acting on you, and you are at rest.

b) If you are standing on a scale in a moving and accelerating elevator, then the scale's reading is different from your weight.

- ⑪ a) The earth is flattened at the poles and bulged at the equator. Thus you weigh more at poles than at the equator.
- b) for the same reason as (a), you weigh more at the base.
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⑪ They both reach the ground at the same time. In the absence of air resistance, both will acquire the same velocity, because they have the same constant acceleration (assuming zero air resistance).

⑫ The apparent weight could become more than the breaking force on the table. As the elevator accelerates upward, the apparent weight becomes $N = mg + ma = m(g + a)$. If this force is more than the breaking force of the table, the table breaks.
