

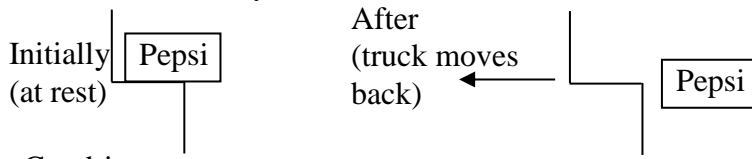
Physics 20 - Lesson 14
Forces & Dynamics – Conceptual Change – Answer Key

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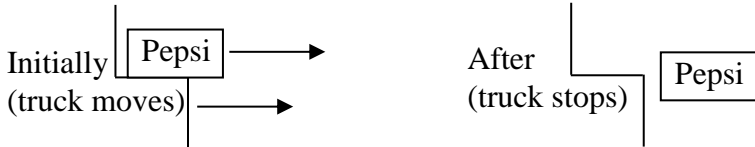
1) Initially the child and the wagon are stationary. When the wagon is pulled forward, the child tends to maintain his/her motion (stationary). The child appears to fall backwards
 /2

2) Inertia is the mass of an object. The more mass that an object has, the more force is required to accelerate the object. A massive object like a train requires a very large force to accelerate it.
 /3

3) Truck drivers story



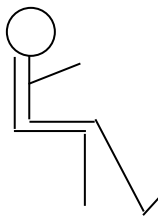
/4 Car drivers story



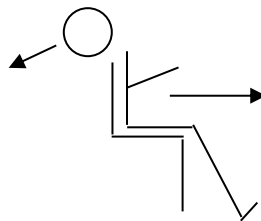
Both cases lead to the same result. Cannot tell who is at fault from the evidence.

4) The china and glasses maintain their motion (at rest) while the cloth is pulled out from underneath them. Principle → Law of Inertia
 /2

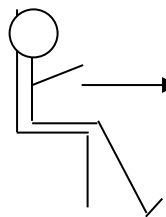
5) Before (at rest)
Without headrest



After impact



/4 With headrest



The victim's head remains in one place while the body moves underneath it.

6) For highway drivers a steady force is necessary to overcome the forces of wind resistance and road friction. For city driving, the car is being accelerated constantly which requires greater forces and more energy (gasoline).
/3

7) It takes more force to accelerate from rest to a constant velocity than it does to maintain the speed.
/2

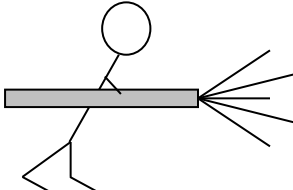
8) **Action** – bag on groceries; **Reaction** – groceries on bag
The groceries exert the reaction force and the bag feels it. The force acts down.
/3

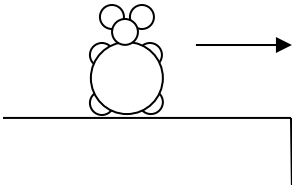
9)  You apply the force on the log; the reaction is the log's force on you.
/2

10) Because the reaction force is the rock kicking you back.
/1

- 11) a) Northward force of ball on foot
b) Forward force of ground on shoe
/5
c) Upward force of desk on book
d) Forward force of gases on jet engines
e) Forward push of water on swimmer's hand

12) The fault is that each force of a force pair acts on a different object, not the same object.
/2

13)  He leans forward to overcome the reaction force of the water on the hose
/2

14)  The squirrel can throw the nuts toward the edge; the reaction forces of the nuts on the squirrel will slow it down.
/2