Video Review

Video clip #1: Armageddon

1. What formula summarizes Newton’s Second Law?
2. If the Shuttle has a mass of 2,000,000 kg and the maximum acceleration during the launch is 3 g’s (29.4 m/s2), what is the net force on the Shuttle? (Be sure to include direction - + is up, - is down.) Draw a free-body diagram of the Shuttle and the forces on it.
3. What is Newton’s 3rd Law?
4. How does Newton’s 3rd Law of Motion explain how the rocket gets into space?
5. What is the net force of the Shuttle on the gases? (Be sure to include direction.)
6. What action – reaction force pairs did you see in the clip?

Video clip #2: Bloodsport

1. What is the formula for pressure?
2. In Frank’s hitting technique, what did you notice about how he hit the bricks to cause the greatest amount of pressure?
3. Why do the bricks break when hit but an opponent’s face typically does not?
4. Is Frank’s punch to the bricks similar to a car hitting a tree or hitting a snowbank? Why?
5. A study found martial artists needed 687 pounds of force to break a concrete slab 1.5 inches thick. Use conversion factors to determine the force in units of Newtons. (Remember – 2.2 lbs = 1 kg and 1kg = 10N)
6. If the heel of Frank’s hand measures 10 cm x 5 cm, how much pressure is he applying to the bricks if he uses the amount of force determined in #11?

Video clip #3: Days of Thunder

1. What is the formula for Ffriction?
2. Draw a free body diagram of one of the car’s tires and label the forces on it.
3. Given the following information, find the Fnet, Ffriction, and acceleration of the car:

µ (of rubber and dry asphalt) = 0.65

mass of stock car = 1585 kg

Δ v = 0m/s to 76.4 m/s in 10.4 seconds

1. How much force is being applied TO the road? (Remember direction!)
2. Why would the tires wear down faster when he is driving harder?
3. How would driving like that cost Cruise time?

Video Clip #4: A Christmas Story

1. Do you think Ralphie really gets hit with the pellet? If not, what else could it have been?
2. Draw a free body diagram showing the forces acting on the BB and BB-gun system at the instant it is fired.
3. Why is it safer to get hit with the gun recoil than the bullet?
4. The Red Rider BB gun has a mass of 1.4kg and the bullet has a mass of 5 grams. If the bullet is expelled from rest to a maximum velocity of 380 m/s in 0.1 seconds, what is the acceleration rate of the gun when it hits Ralphie in the face?