

# Newton's Third Law

Name \_\_\_\_\_

**Concepts: ( use complete sentences and ideas )**

- 1) What is Newton's Third Law of Motion ( clearly list all parts of it )
- 2) How many objects does it involve?
- 3) What quantity must be equal according to the law?
- 4) When can you not use the third law of motion?
- 5) What does the term "interaction" mean?
- 6) What do we mean by "defining a system"?
- 7) According to the third law, how many forces must always be present when two objects interact?

**Implications and applications ( use complete sentences and ideas )**

- 8) The earth pulls ( a force due to gravity ) on the moon, what evidence is there that the moon pulls on the earth?
- 9) You jump off of a desk. What are the two objects, which way do they move and why do you not notice both movements?
- 10) How does a rocket work and how is this different then an airplane?

- 11) A cannonball is fired from a massive cannon. How does the force of the cannon on the cannonball compare to the force of the cannonball on the cannon? How does the acceleration of the cannonball compare to the acceleration of the cannon? Defend your answer.
- 12) Which way do you push to jump up? Why does that work?
- 13) How does swimming work? Explain the objects and the action and reaction forces.
- 14) If you walk on a log that is floating in water, the log will move backwards, why?
- 15) Your standing on the surface of a table. Identify the two objects, the action and reaction forces and directions and give their names. Do these forces cancel out? How do you know?
- 16) A bug and a massive truck collide. Which exerts more force other, the Bug on the truck or the truck on the bug? Which one accelerates more the bug or the truck? Why?
- 17) Your teacher challenges you and a friend to each pull on a pair of scales attached to a horizontal rope in a tug of war fashion, so that each scale has a different reading. Can it be done? Explain.
- 18) You have been separated from your spaceship in space. Explain how you could propel yourself back to the spaceship using Newton's third law of motion.
- 19) Identify the reaction for the following actions:
- |                                |                            |
|--------------------------------|----------------------------|
| action: hand pushes a ball     | reaction: _____            |
| action: sun pulls on the earth | reaction: _____            |
| action: girl holds an apple    | reaction: _____            |
| action: boy drops a pen        | reaction: _____            |
| action: _____                  | reaction: you walk forward |