



# Newton's 3rd Law of Motion

Action and  
Reaction

Forces

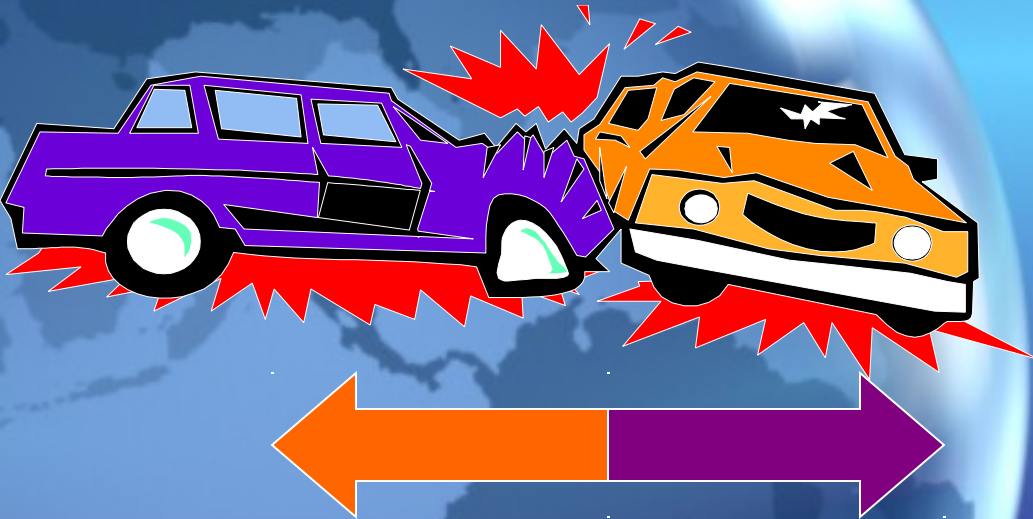
How do Newton's Laws of Motion allow us to make predictions and draw conclusions regarding the motion of an object?

# The third law of motion in space

- Watch the short video clip regarding Newton's 3rd Law of Motion.
- Based on what you read in chapter 4, write a brief paragraph describing why Newton's 3rd Law of Motion makes it difficult for astronauts to work in outerspace.
- <http://www.teachersdomain.org/resources/phy03/sci/phys/mfw/asrnt/index.html>

# Newton's Third Law of Motion

- A force is part of a mutual action, or interaction, between two things.



# Newton's Third Law of Motion

- Whenever one object exerts a force on a second object, the second object exerts a force back on the first object.
- These forces are equal in strength and opposite in direction.



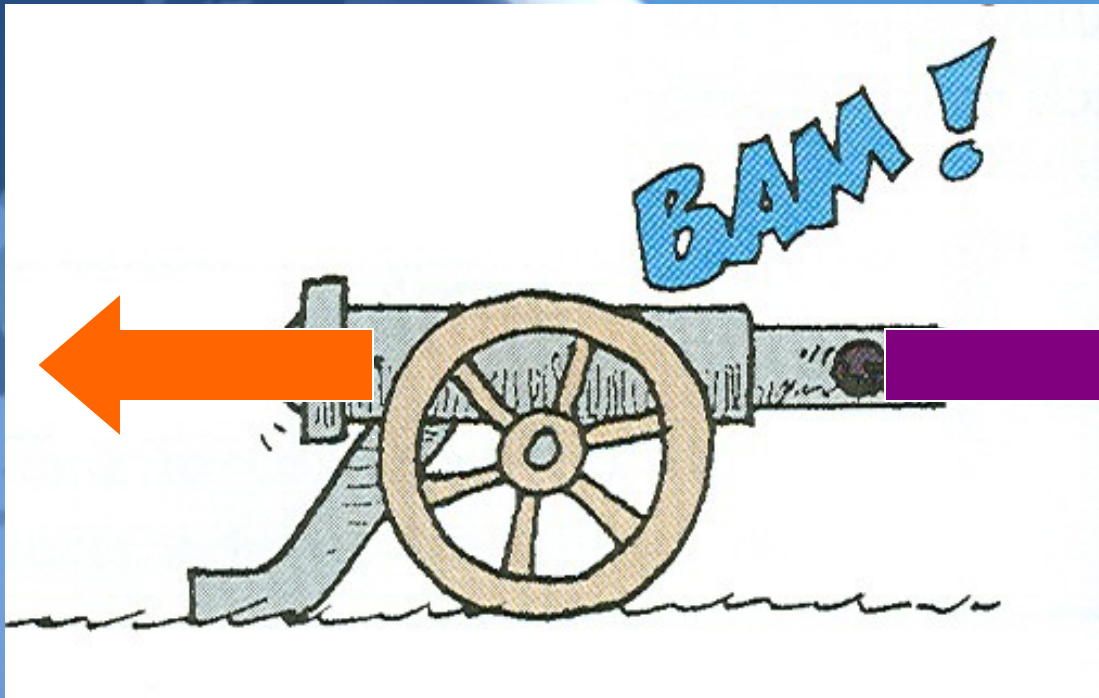
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- Another familiar way of stating it is:
- For every *action force*, there is an equal and opposite *reaction force*.
- Neither of these forces can exist without the other.

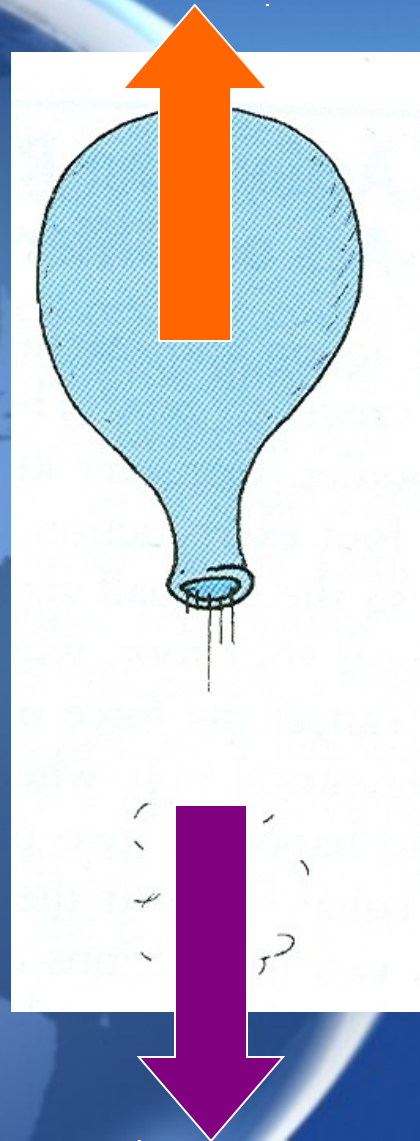
Examples of Newton's Third Law:



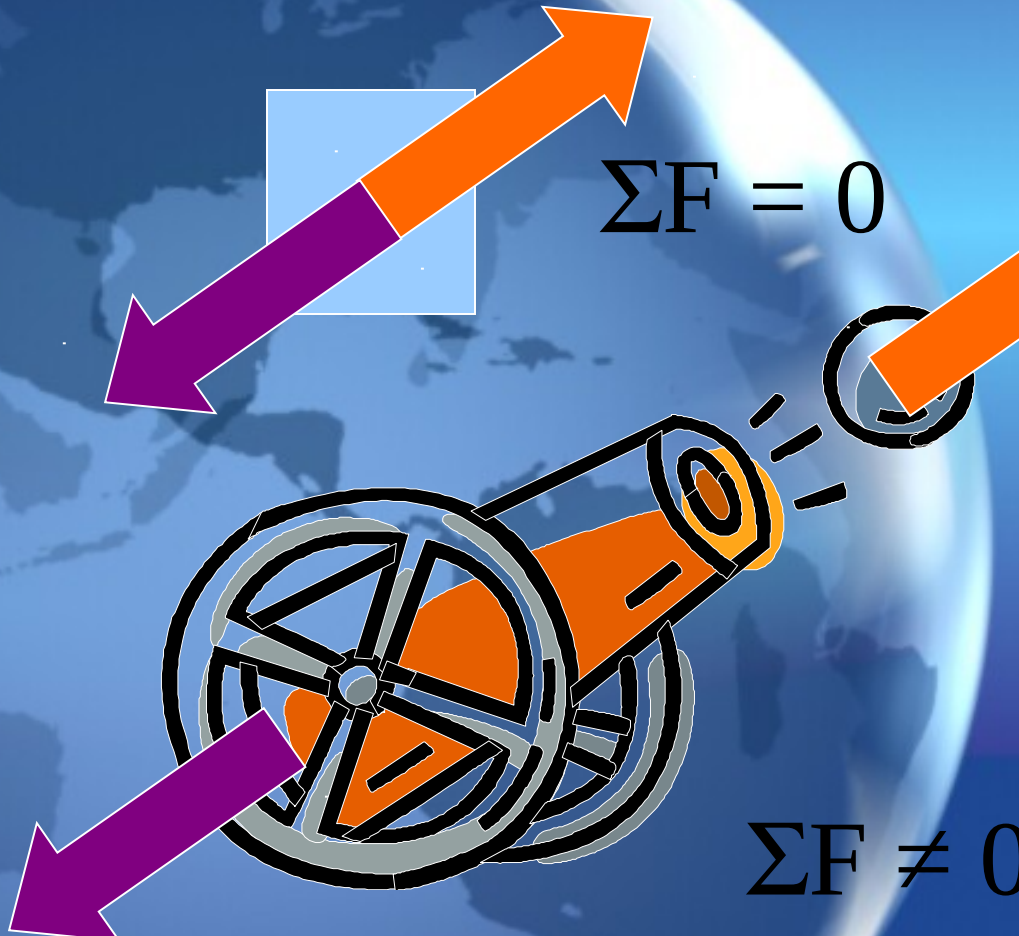
# Newton's Third Law of Motion



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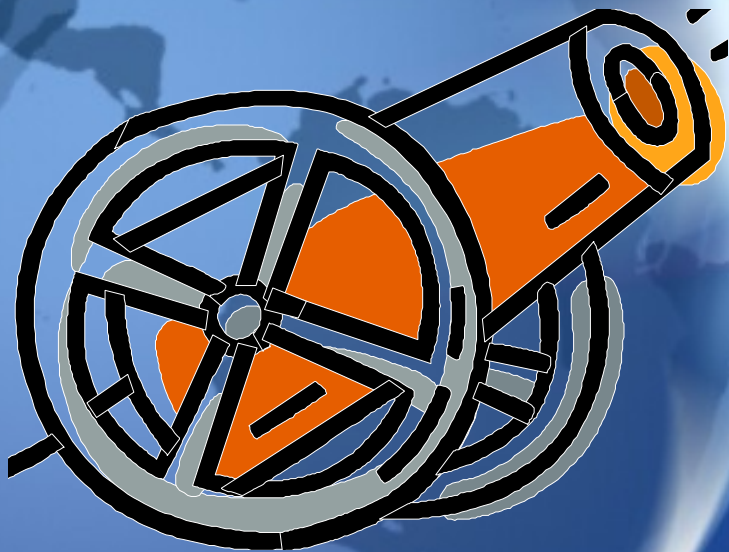


- Why don't these forces cancel out?
- Action forces and Reaction forces act on different objects.



# Newton's Third Law of Motion

- The effect of these forces on each object depends on the object's mass.



$$a = \frac{F}{m}$$

# Newton's Third Law of Motion

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# Newton's 3rd Law

- How does Newton's 2nd Law of motion explain why the acceleration will be greater on the cannonball than the cannon?