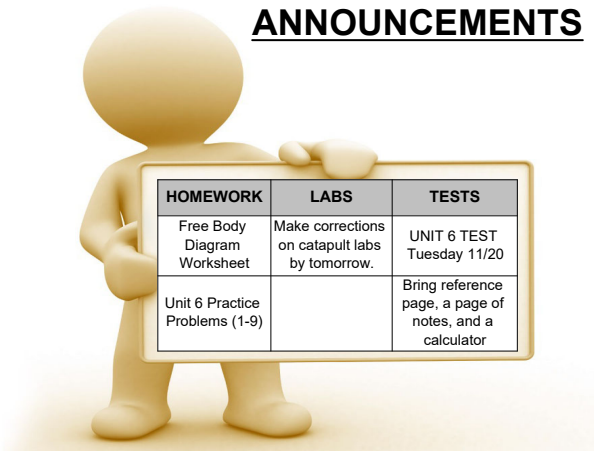
ANNOUNCEMENTS



HOMEWORK	LABS	TESTS
Free Body Diagram Worksheet	Make corrections on catapult labs by tomorrow.	UNIT 6 TEST Tuesday 11/20
Unit 6 Practice Problems (1-9)		Bring reference page, a page of notes, and a calculator

6.4 Newton's Third Law

LEARNING TARGETS

6.3 I can define, explain, and apply Newton's third law to solve problems.

Newton's Laws of Motion

1. Newton's First Law of Motion
   - Every object will continue in a state of rest or with constant speed in a straight line unless acted upon by an external force.
2. **Newton's Second Law of Motion**
   - When a net force act on an object, the object accelerates in the direction of the net force. The acceleration is directly proportional to the net force and inversely proportional to the mass. Thus, $a \sim F/m$ or, $a \propto F/m$
3. Newton's Third Law of Motion
   - Whenever one object exerts a force on a second object, the second object exerts an equal and opposite force on the first.

PHY115 – Sault College – Bazlur slide 2

Mass vs. Weight

Mass	Weight
• a measure of how much matter an object is made of • does not change, regardless of where something or someone is	• the force of gravity on an object • equal to the mass of the body times the local acceleration of gravity

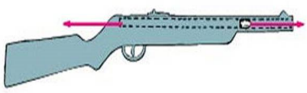
Mass = 59 kg
Weight = 579 N

Why do you think the person's weight is less on the moon?

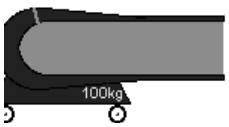
Mass = 59 kg
Weight = 96 N

http://www.exploratorium.edu/ronh/weight/index.html

Recoil

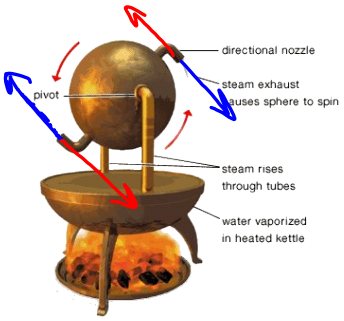


$\sum p = 0$

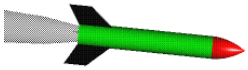


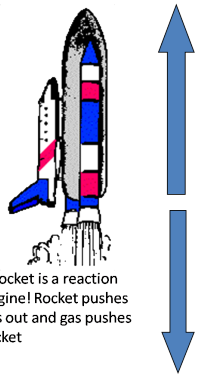
Applications of Newton's 3rd Law

Hero's Engine



Newton's 3rd Law

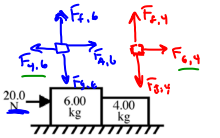




A rocket is a reaction engine! Rocket pushes gas out and gas pushes rocket

Newton's 3rd Law Example

A 6.00-kg block is in contact with a 4.00-kg block on a horizontal frictionless surface as shown in the figure. The 6.00-kg block is being pushed by a horizontal 20.0-N force as shown. What is the magnitude of the contact force between the two boxes?



$F_{N+,4} = F_{6,4}$

$m_4 a = F_{6,4}$

$F_{net,6} = F_{A,6} - F_{4,6}$

$F_{6,4} = 8.0N$

$m_6 a = 20N - m_4 a$

$6a = 20N - 4a$

$+4a \quad +4a$

$10a = 20N$

$a = 2.0\ m/s^2$