

Unit 1: Newton's Laws of Motion

Reading Assignments

Coordinated Science for the 21st Century

Chpt. 1, Activities 1, 2, 5 (pgs. 6-27, 47-51)

Supplementary Reading

9 “Snowboard Superstar”, *Science World* (21 Jan 2002) Due: _____

Homework/Activities

9 **Activity 1: A Running Start/Frames of Reference** Due: _____

Think: *What Do You Think?*

Activity: *Separate handout*

Read: *For You To Read (Inertia, Running Starts, Frames of Reference)*

Apply: *Physics To Go #1-2, 6-9, 11*

9 Worksheet: Speed/Velocity Due: _____

9 **Activity 2: Push or Pull – Adding Vectors** Due: _____

Think: *What Do You Think?*

Activity: *Separate handout*

Read: *For You To Read (Weight and Newton's Second Law, Where There's Acceleration, There Must Be an Unbalanced Force)*

Apply: *Physics To Go #1, 3, 4, 6, 10-11, 15*

9 Worksheet: Force, Mass, and Acceleration Due: _____

9 **Activity 5: Run and Jump** Due: _____

Think: *What Do You Think?*

Activity: *Separate handout*

Read: *none*

Apply: *Textbook - Physics To Go #2, 4*

Additional Question(s): 1) Describe what happens (in terms of forces) when a ball bounces on the ground.

Concepts/Topics

9 Distance, speed and velocity p.90-91

9 Frames of reference p.11-13

9 Law of Inertia (Newton's 1st Law) p.11

9 Acceleration (vs. velocity), deceleration p.122

9 $F = ma$ (Newton's 2nd Law) p.20

9 Weight, gravity (weight vs. mass) p.21

9 Newton's 3rd Law p.49

Target Outline

A Running Start and Frames of Reference

- ...calculate the *average velocity* of a moving object, given the object's change in position with respect to time
- ...explain the difference between speed and velocity
- ...be able to explain the consequences of balanced or unbalanced forces on an object in motion or an object at rest

Push or Pull – Adding Vectors

- ...calculate the *average acceleration* of a moving object, given the object's change in velocity with respect to time
- ...explain how an object moving at a constant speed can be undergoing acceleration
- ...be able to add together vectors along a straight line
- ...*predict* how objects of different *masses* will accelerate when subject to the same *force*
- ...calculate the *acceleration* of an object, given the object's *mass* and the net *force* on the object
- ...calculate the weight of an object, given the object's mass and the acceleration due to gravity
- ...explain the difference between mass and weight

Run and Jump

- ...Illustrate with everyday examples that for every action there is an equal and opposite reaction

Web Resources

Physics4Kids: Newton's Laws

http://www.physics4kids.com/files/motion_laws.html

Physics4Kids: Velocity/Acceleration

http://www.physics4kids.com/files/motion_velocity.html

Newton's First Law

http://mechanical-physics.suite101.com/article.cfm/newtons_laws_for_kids_first_law

Newton's Second Law

http://mechanical-physics.suite101.com/article.cfm/newtons_laws_for_kids_2nd_law

Newton's Third Law

http://mechanical-physics.suite101.com/article.cfm/newtons_laws_for_kids_third_law

Exploratorium: Sport Science

<http://www.exploratorium.edu/sport/index.html>