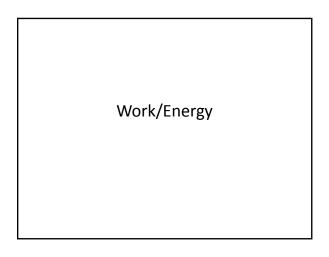
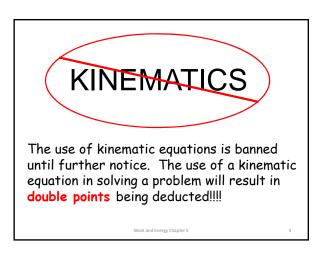
М	Т	W	Th	F
28-Nov A-Day • Notes 6.2 • HW 6.2	29-Nov B-Day • Notes 6.2 • HW 6.2	30-Nov A-Day • Lab 6.3 CoE • Notes 6.3 • HW 6.3	<u>1-Dec</u> B-Day • Lab 6.3 CoE • Notes 6.3 • HW 6.3	2-Dec B-Day • Notes 6.4 • Lab 6.4 • HW 6.4 • T6 Review
5-Dec A-Day • Notes 6.4 • Lab 6.4 • HW 6.4 • T6 Review	<u>6-Dec</u> B-Day • Review	<u>7-Dec</u> A-Day • Review	<u>8-Dec</u> B-Day • TEST 6	<u>9-Dec</u> A-Day • TEST 6
12-Dec A-Day • Correct Tests • Review for Final	13-Dec B-Day • Correct Tests • Review for Final	<u>14-Dec</u> C-Day • ?	<u>15-Dec</u> FINALS	<u>16-Dec</u> FINALS







- Work is done when a force moves an object through a distance against another force.
 - For example, when I lift a book I do work against gravity.
 - If I push the book along the tabletop, I do work against friction.
- Work = Force · distance ("dot product")
- $W = F \cdot d$ W = F || d $W = F d \cos \theta$
 - <u>"Visual Trig"</u>
 - Vector Addition

Work

- W = $\mathbf{F} \cdot \mathbf{d}$
- Since ΣF = ma, we can substitute "ma" into the work equation for "F", giving us
- W = mad

Sample

• It takes 1,875 J of work to move a box 15 meters. How much force was needed?

 $W = F \cdot d$

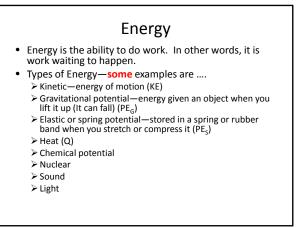
$$1875J = F \cdot 15m$$

F = 125N



 How much work is done if a 1500 kg car accelerates at a rate of 3.0 m/s² for a distance of 100 meters.

$$W = F \cdot d = ma \cdot d$$
$$W = (1500 kg)(3.0m / s^{2}) \cdot 100m$$
$$W = 450,000J$$



Kinetic Energy Gravitational Potential Energy • Kinetic Energy (KE) - the ability of an object to do work because of its motion. $KE = \frac{1}{2}mv^{2}$ Gravitational Potential Energy (PE_G) - the ability of an object to do work because of its position in a gravitational field $PE_{G} = mgh$



• What is the kinetic energy of a 30 kg gazelle running at 20 m/s?

$$KE = \frac{1}{2}mv^{2}$$
$$KE = \frac{1}{2}(30kg)(20m / s)^{2}$$

KE = 6,000J

Sample

• What is the gravitational potential energy of a 30 kg gazelle that is standing at the edge of a 15 meter high cliff?

$$PE = mgh$$

$$PE = (30kg)(9.8m / s^2)(15m)$$

PE = 4410J

Practice

- 1. If it takes 1500 J of work to stop a 50 kg running gazelle, how fast was the gazelle initially running?
- 2. 4500 J of work are done to lift a 10 kg baby gazelle to the top of a cliff. How high is the cliff?