Below you will find the I can, warm up, and exit ticket question for physics. Enjoy!

9/2/15
ACT Vocab Word: Alternative A choice limited to one of two possibilities
I can follow the procedure for this class
WU: What is due on Friday?
ET: List some materials that you need to be successful in this class

9/3/15
I can follow the lab safety rules
WU: What resources can be found on Mr. Venne's website?
ET: What are the 3 fundamental units of the metric system?

**************** WU/ET TURN IN *****************

9/8/15
ACT Vocab Word: Articulate – *made clear, distinct, and precise in relation to other parts.*
I can measure with accuracy and precision
WU: How many significant digits are in 3.10 ?
ET: The speed of light is 300,000,000 m/s (wow!). Write this number in scientific notation.

9/9/15
ACT Vocab Word: Articulate – *made clear, distinct, and precise in relation to other parts.*
I can solve dimensional analysis problems
WU: The moon is 250,000 miles away. How many inches is it from Earth?
ET: A family pool holds 10,000 gallons of water. How many cubic meters is this?

9/10/15
ACT Vocab Word: Articulate – *made clear, distinct, and precise in relation to other parts.*
I can create graphs on google
WU: On a graph where does the independent and dependent variable go?
ET: A bean plant grows 2.5 cm over 5 days. What is the average growth of the planet per day?

**************** WU/ET TURN IN *****************

9/14/15

I can use SOH, CAH, TOA

WU: What type of graph has both the X and Y axis increasing?

ET: NO ET

9/15/15

I can use SOH, CAH, TOA

WU: Rearrange the equation below for q_1

$$F = kq_1q_2/d^2$$

ET: NO ET

9/16/15

I can tell the difference between scalars and vectors

WU: What is the difference between scalars and vectors?

ET: List all the vectors you can think of.

9/17/15

I can calculate speed

WU: List all the scalars you can think of.

ET: Draw a ticker tape diagram of a car moving at a constant speed, then slowing down, and finally coming to a stop.

***************************WU/ET TURN IN *************************

9/21/15

I can calculate speed

WU: What is the acceleration of a car that maintains a constant velocity of 55 mph for 30 seconds?

ET: None

9/22/15

I can solve the invocation challenge!

WU: Determine the distance in meters of an object that moves in a straight line for 15 seconds at a speed of 8.30 m/s.

ET: NONE

9/23/15

I can create a position vs time graph

WU: In a 4-kilometer race, a runner completes the first kilometer in 5.9 minutes, the second kilometer in 6.2 minutes, the third kilometer in 6.3 minutes, and the final kilometer in 6 minutes. The average speed of the runner for the race is…..?

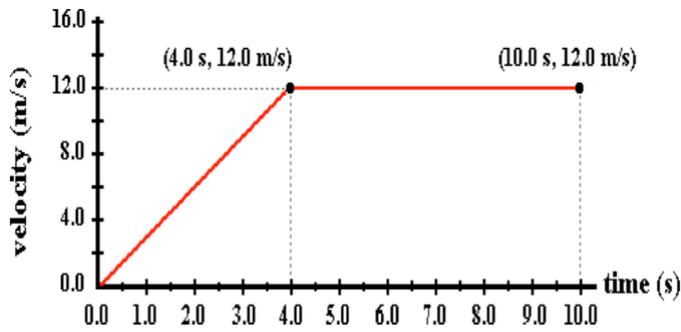**ET:** On a position-time graph, the magnitude of the slope is representative of an object's _____.

a. rate

b. speed

c. direction

d. acceleration

9/24/15

I can create a velocity vs time graph

WU: What does the slope of a velocity time graph tell you?

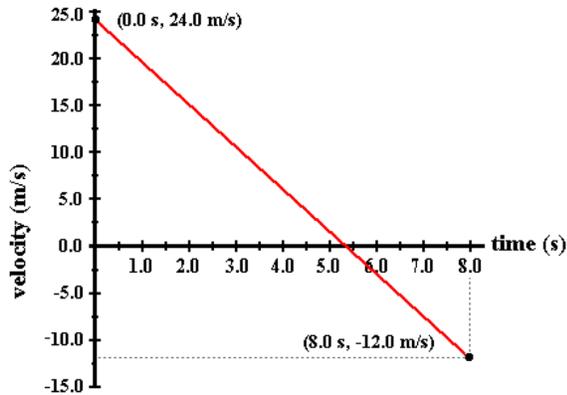**ET:** Determine the acceleration of the object from 0-4 seconds

******************** WARM UP TURN IN ********************
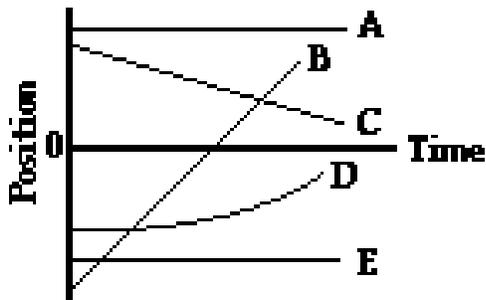
9/28/15

I can interpret graphs

ACT Vocab Word*:* **Ethical** *– being in accord with the rules or standards for right conduct*

WU: Describe this objects motion

ET: Which objects are at rest? Which is moving fastest?

9/29/15

I can solve free fall problems

ACT Vocab Word*:* **Ethical** *– being in accord with the rules or standards for right conduct*

WU: A stone is dropped from rest into a 45-meter deep well. It hits the water after approximately 3.0 seconds. The rock's **acceleration** has a magnitude of approximately _____ m/s/s.

ET: Mr. Venne drops an egg off of Eagle Tower (~23 meters tall). How long will it take to hit the ground?

9/30/15

WU: An object moving at a speed of 20 meters per second accelerates uniformly for 5.0 seconds to a final speed of 50 meters per second. What is the acceleration of the object?

ET: A race car traveling at 10 meters per second accelerates at 1.5 meters per second^2 while traveling a distance of 600 meters. The final speed of the race car is?
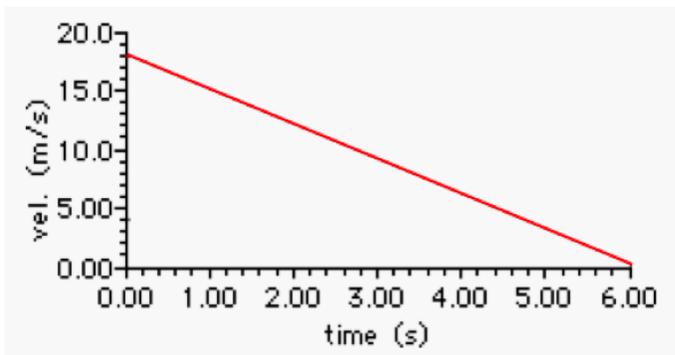
10/1/15

I can use the kinematic equations

ACT Vocab Word: <u>**Ethical**</u> – *being in accord with the rules or standards for right conduct*

WU: Robert Pershing Wadlow is the tallest man on record. He is 2.72 meters tall (8 feet, 11 inches). Determine the speed that a quarter would have reached before contact with the ground if dropped from rest from the top of his head.

ET:

  Use the graph to determine...

a. ...the acceleration of car.

b**.** ...the distance traveled during the last 6.0 seconds of motion.

******************** WARM UP TURN IN ************************

10/5/15

I can describe Newton's 1st Law

ACT Vocab Word: <u>**Plausible**</u> – *having an appearance of truth or reason*

WU: Forces, when unbalanced, always cause objects to _____.

ET: A 6-kg object is moving to the right with a **constant velocity** of 4 m/s. The net force encountered by the object is _____.

10/6/15

I can describe Newton's 1st Law

ACT Vocab Word: **Plausible** – *having an appearance of truth or reason*

WU: An object experiences a rightward force of 8 N, a leftward force of 8 N, an upward force of 10 N and a downward force of 10 N. What can be said about this objects motion?

ET: Which two of the following statements about inertia are true?

  a. Inertia is the force that keeps a moving object in motion.

  b. Inertia is the force that keeps a stationary object at rest.

  c. Inertia is the natural tendency of a stationary object to resist motion.

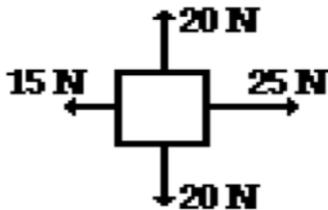 d. Inertia is the natural tendency of a moving object to resist a change in its velocity.

10/7/15

I can draw free body diagrams

ACT Vocab Word: **Plausible** – *having an appearance of truth or reason*

WU: Draw a free body diagram of a box being pulled by a rope to the right at constant speed with friction.

ET: What is the net force of this free body diagram?

10/8/15

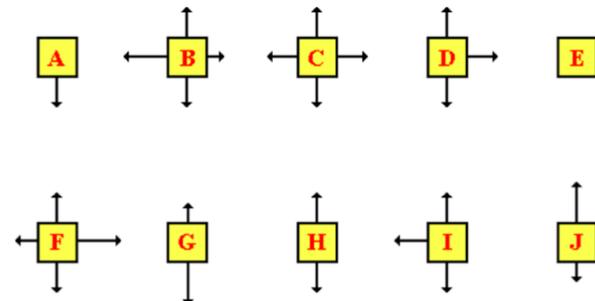**I can describe the force of friction**

ACT Vocab Word: **Plausible** – *having an appearance of truth or reason*

WU: List all the forces acting upon the situation below:

A sign is suspended by two cables and hangs at rest

ET: Which one would be most consistent for the following scenario?

A rightward moving car is skidding to a stop; the wheels of the car are locked.

************** WARM UP/ET TURN IN ******************

10/12/15

I can design a lab using friction

ACT Vocab Word*:* **Ambiguous** *– open to or having several possible meanings*

WU: Draw a FBD of the situation:

A block is being pushed across the top of a table. Consider only the forces acting upon the block.

ET: A bucket of water, attached by a rope, is being pulled out of a well.   What forces are acting upon the bucket? Ignore air resistance

10/13/15

I can use Newton's 2nd Law

ACT Vocab Word*:* **Ambiguous** *– open to or having several possible meanings*

WU: *What is the formula for Newton's 2nd law?*

ET: Which of the following can be explained using Newton's second law of motion?
  a. It explains why a stationary object remains stationary.
  b. It explains why every force is accompanied by a reaction force.
  c. It explains why an object accelerates with a particular acceleration value.

10/14/15

I can use Newton's 2nd Law

ACT Vocab Word*:* **Ambiguous** *– open to or having several possible meanings*

WU: *What is the mass of an object that requires 100N of force in order to accelerate it at $10m/s^2$?*

ET: What is the acceleration of a 10kg mass pushed by a 5N force?

**************** WARM UP TURN IN *****************

10/19/15

I can see how mass and net force relate to acceleration

ACT Vocab Word*:* **Arbitrary** *– Subject to individual will or judgement without restriction*

WU: *At the end of the Giant Drop, riders experience a large upward normal force to bring their falling bodies to a stop. Determine the normal force value required to accelerate a 52.1-kg physics student with an upward acceleration of 27.4 m/s^2.*

ET: NONE

10/20/15

I can solve "harder" newton 2nd law problems

ACT Vocab Word: *Arbitrary* – *Subject to individual will or judgement without restriction*

WU: A 1250-kg small aircraft decelerates along the runway from 36.6 m/s to 6.80 m/s in 5.10 seconds. Determine the average resistive force acting upon the plane.

ET: What is the acceleration of the sky diver?

F_{air} = 200 N

F_{grav} = 900 N

a = _____ m/s/s
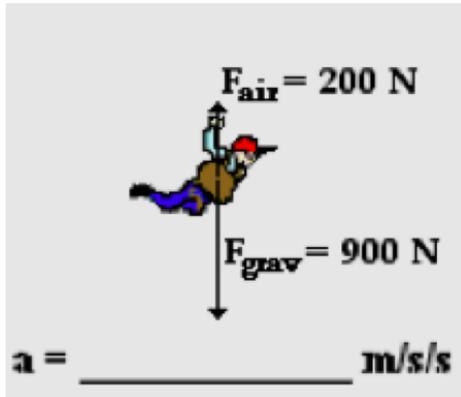
10/21/15

I can explain Newton's 3rd Law

ACT Vocab Word: *Arbitrary* – *Subject to individual will or judgement without restriction*

WU: *A skydiver is accelerating in the downward direction at 3.29 m/s². The mass of the skydiver is 67.2 kg. Determine the air resistance force on the skydiver.*

ET: Shirley Bored sits in her seat in English class. The Earth pulls down on Shirley's body with a gravitational force of 600 N. Describe the reaction force acting upon the Earth.
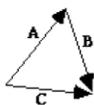
******************* WARM UP TURN IN ************************

10/26/15

I can add vectors

ACT Vocab Word: *Attribute* – *to consider a quality or characteristic of the person thing or group*

WU: *Coach DeBaker walks 26 yards to the north along the sideline, pauses, and sprints 15 yards east towards the ref due to a bad call. What is the magnitude of his displacement?*

ET: Which one of the following vector addition equations is shown in the diagram?

  a. A + B = C   b. B + A = C

  c. A + C = B   d. C + A = B

  e. B + C = A   f. C + B = A

10/27/15

I can resolve vectors

WU: A springboard diver jumps with a velocity of 12 m/s at an angle of 80° to the horizontal. The v_x and v_y components are _____ m/s and _____ m/s respectively.

ET: NONE

10/28/15

I can use vectors like a boss!

WU: An ant walked: 2 m, West; 14.0 m, South; 25.0 m, East; 11.0 m, North; and 2 m, West. The direction and magnitude of the resultant displacement is _____.

ET: Which one of the following combinations would result in the projection of this vector onto the usual x- and y-axis?
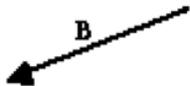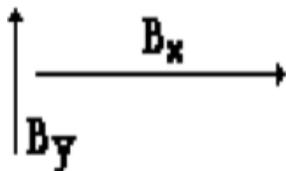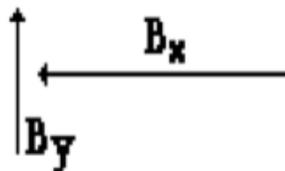

Diagram A	Diagram B	Diagram C	Diagram D
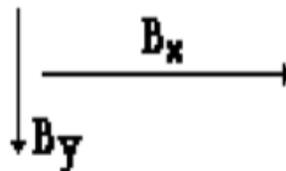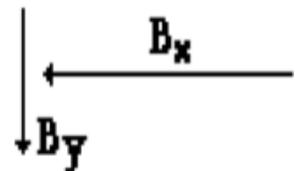
10/29/15

I can DOMINATE vectors!

WU: *A projectile is launched with a speed of 21.8 m/s at an angle of 35.0-degrees above the horizontal.   Determine Vx and Vy.*

ET: An airplane moves at 141 km/h toward the northeast (45 degrees). What is its component of velocity in the northward direction?

******************** WARM UP TURN IN ************************

11/2/15

I can solve vectors in my sleep

ACT Vocab Word: ***Conceive*** – *to form*

WU: A hiker's motion can be described by the following three displacement vectors.

 22.0 km, 45 degrees + 16.0 km, 135 degrees + 12.0 km, 270 degrees

Determine the hikers overall displace*ment*

ET: In a grocery store, a shopper walks 36.7 feet down an aisle. She then turns left and walks 17.0 feet straight ahead. Finally, she turns right and walks 8.2 feet to a final destination. What is the direction of her displacement in degrees?

11/3/15

I can solve river boat problems

ACT Vocab Word: ***Conceive*** – *to form*

WU: A 5-ton airplane normally flies at 200 km/hr. If it experiences a 50 km/hr tailwind (i.e., a wind from behind), then its resultant velocity will be ____ km/hr.

ET: A boat begins at point A and heads straight across a 90.0-meter wide river with a speed of 4.0 m/s (relative to the water). The river water flows north at a speed of 3.0 m/s (relative to the shore).   How long will it take to get to the other side?

11/4/15

I can describe a projectile

ACT Vocab Word: ***Conceive*** – *to form*

WU: *A riverboat heads east on a river that flows north. The riverboat is moving at 5.1 m/s with respect to the water. The water moves north with respect to the shore at a speed of 3.6 m/s.*

 A) Determine the resultant velocity of the riverboat (velocity with respect to the shore).

 B) If the river is 71.0 m wide, then determine the time required for the boat to cross the river.

 C)   Determine the distance that the boat will travel downstream.

ET: Draw a free body diagram for a projectile launched at an angle when it:

A)rises towards its peak   B)at its peak   C)as it is falls from its peak.

11/5/15

I can solve projectile problems

ACT Vocab Word: **_Conceive_** – _to form_

WU: A 2-kg object is launched upwards and rightwards and subsequently experiences projectile motion. Just prior to reaching the peak of its trajectory, the net force on the 2-kg object is _____.

ET: NONE

************* WARM UP TURN IN ******************************

11/9/15

I can solve projectile problems

ACT Vocab Word: **_Discrete_** – _apart or detached from others_

WU: The magnitude of the **vertical** velocity of a projectile is ALWAYS _____. List all that apply.

a. constant   b. Changing   c. Increasing   d. 9.8 m/s   e. zero

ET: The magnitude of the **horizontal** velocity of a projectile is _____. List all that apply.

a.constant   b. changing

c.Increasing   d. 9.8 m/s

e. zero

11/10/15

I can solve projectile problems

ACT Vocab Word: **_Discrete_** – _apart or detached from others_

WU: _A ball is launched horizontally from the top of a cliff with an initial velocity of 20 m/s. If the ball strikes the ground after 4 seconds, how high was the cliff?_

ET: _A ball is launched horizontally from the top of a cliff with an initial velocity of 20 m/s. If the ball strikes the ground after 4 seconds, how far did the ball travel horizontally?_

11/11/15

I can solve projectile problems

ACT Vocab Word: **_Discrete_** – _apart or detached from others_

WU: A physics student is driving his pick-up truck down Washington Avenue. The pick-up is equipped with a projectile launcher that imparts a vertical velocity to a water-filled rubber projectile. While traveling 20.0 m/s in an eastward direction, the projectile is launched vertically with a velocity of 58.8 m/s.

Determine the height of the projectile after 3 seconds

ET: _Same question as above, but this time what is the horizontal displacement after 3 seconds?_
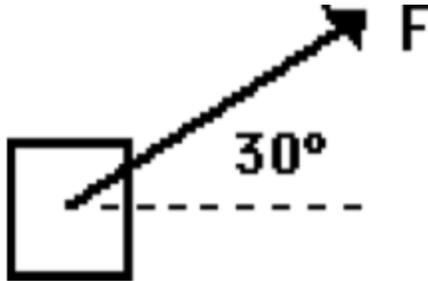
**************************** WARM UP CHECK ************************

11/16/15

I can solve two dimensional force problems

ACT Vocab Word: **_explicitly_** – *fully and clearly expressed or demonstrated*

WU: *A 50-N force is applied at an angle of 30 degrees north of east. This would be the same as applying two forces at _____ .*

F

30°

ET: A sign that weighs 40 N is supported symmetrically by two cables that make an angle of 60.5 degrees with the horizontal. A single cable will pull <u>upward</u> on the sign with a force of _____ Newton.
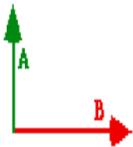
11/17/15

I can solve two dimensional force problems

ACT Vocab Word: **_explicitly_** – *fully and clearly expressed or demonstrated*

WU: Consider the diagram below. Force **A** has a magnitude of 32.1 Newton. Force **B** has a magnitude of 56.6 Newton.
What magnitude must a third force (force **C**) have in order bring the object to equilibrium?

A

B

ET: A student slides a 1390 N crate across the floor by pulling with a force of 804 N at an angle of 32.0 degrees above the horizontal. If the crate moves at a **constant speed**, find the frictional force.

11/18/15

I can solve static equilibrium problems

WU: _Mr. Venne has purchased a sign for his physics cafe. He hangs the sign with two cables that make an angle of 34.5° with the horizontal. He measures the tension in each cable to be 373 N._

Determine weight of the sign.

ET: A box is being accelerated across a level surface. A force is being applied to the box in an upward and rightward direction. In this situation, the normal force is ____ the force of gravity.

a. less than   b. greater than   c. equal to
d. It is impossible to tell without any actual numbers.

11/19/15

**I can solve static equilibrium problems**

ACT Vocab Word: **_explicitly_** – _fully and clearly expressed or demonstrated_

WU: _Three moms are fighting over a life size tickle me Elmo on Black Friday. A top view of the magnitude and direction of the three forces is shown in the diagram to the right._
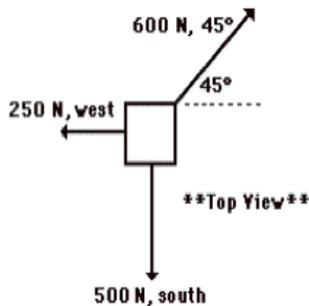
a. _Determine the net force acting upon the dress._
b. _Determine the acceleration on the 50 kg Elmo_

ET: Solve for the blanks below

$F_{norm} =$ _____

$F_{tens} = 60$ N

$F_{frict} =$ _____

30°

$\mu = 0.50$

$F_{grav} =$ _____
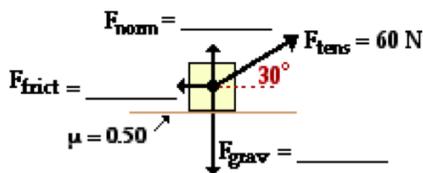
$m = 8$ kg

$a =$ _____ m/s/s, right

$\Sigma F =$ _____

***************** **WARM UP CHECK** *******************

11/23/15

I can ACE this test

WU: *A 43.1-Newton force is applied at a 32-degree angle to the horizontal to accelerate a 8.8-kg box across a rough surface (coefficient of friction = 0.35).*
Determine the net force and acceleration of the box
ET: *NONE*

11/24/15

I can describe circular motion

WU: *The largest community rolled ball of twine can be found ins Cawker, Kansas. It has a diameter of 2.46 meters. What is the circumference of this twine ball?*
ET: *An object is moving along a circular path. Which one of the following adjectives describes the direction of the velocity vector?*
  a. It is directed tangent to the circular path.
  b. It is directed towards the center of the circle.
  c. It is directed away from the center of the circle.
  d. It is directed in the opposite direction that the object is moving.

11/25/15

I can find one million things to be thankful for

WU: *R*ank the following objects from slowest to fastest. Their radius and period has been provided:
Object A Object B Object C Object D
R = 2.0 m   R = 1.0 m R = 1.0 m R = 1.0 m
T = 0.5 s   T = 0.5 s   T = 1.0 s T = 2.0 s
ET: Four objects are attached to a 1-meter long string at various locations. The string is held at one end and twirled in a circle. The object that moves with the greatest speed is object ___.
  a. A
  b. B
  c. C
  d. D
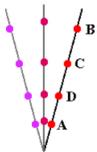
************** **WARM UP TURN IN** *******************

11/30/15

I can describe centripetal acceleration

WU: Young Mr. Venne was on a romantic date and decided to ride the Ferris wheel. In an effort to impress his date he decided to calculate the rotational speed of the Ferris wheel. The Ferris wheel had a diameter of 75 meters and takes approximately 10 minutes to make a full circle. Determine the speed of the Ferris wheel in m/s.

ET: *A merry-go-round takes riders on a spin at 8.0 m/s. The radius of the circle about which the outside riders move is 7.4 m. How long does it take the riders to make one complete circle?*

A. 2.9 s

B.5.8 s

C.6.5 s

D.4.7 s

12/1/15

I can identify the net force of an object undergoing UCM

WU: An object is moving along a circular path. Which one of the following adjectives describes the direction of the **acceleration** vector?

  a. It is directed tangent to the circular path.

  b. It is directed towards the center of the circle.

  c. It is directed away from the center of the circle.

  d. It is directed in the opposite direction that the object is moving.

ET: *A 1050-kg car is making a turn on a level roadway at 22.5 m/s. The curve resembles the shape of a circle with a radius of 51.9 m. Determine the acceleration (in m/s^2).*

A.9.7 m/s^2

B.3.5 m/s^2

B.14.9 m/s^2

C.21.7 m/s^2

12/2/15

I can calculate centripetal acceleration

WU: A 961-kg car makes a turn at 19.1 m/s. The curve has a radius of 42.8 m. Determine the

acceleration, normal force, gravitational force, force of friction, and the net force.

ET: *A bucket of water is held by a rope and twirled in a vertical circle. At the peak of the circle the tension force acting upon the bucket would decrease to zero if _____ .*
 a. the acceleration decreased to a value of 9.8 m/s^2
 b. the speed decreased to a value of 9.8 m/s
 c. the acceleration was increased to an immeasurably high value

 d. ... nonsense! The tension force cannot be zero if a rope is connected to the bucket!!!

12/3/15
I can calculate centripetal acceleration
ACT Vocab Word*: Facilitate- to make easier or less difficult*
WU: A battery-powered pig is suspended from a string and is flying in a horizontal circle. The 631-gram pig makes a complete circle every 2.15 seconds. The radius of the circle is 0.950 m. Determine the velocity of, acceleration of, and net force acting upon the pig.
ET: *An eraser is tied to a string and whirled in a horizontal circle at a constant speed. Inertia is the natural tendency of the eraser to resist changes in its state of motion. This means that the eraser ____ .*
 a. is experiencing a balance of forces - the inward and the outward force balance each other
 b. would require an unbalanced force in order to leave the circle and continue tangent to it
 c. will continue along its circular path if the forces on it suddenly become balanced
 d. would naturally move tangent to the circle if the string is released

***************** WARM UP TURN IN *********************

12/7/15
I can explain torque

WU: *(*Don't write all this) Suppose that you're at an amusement park and you get on a barrel ride. You stand on a platform with your back to the barrel wall. The barrel spins rapidly in a circle, the platform is suddenly dropped out from under you, and you continue moving in a circle. The type of force that causes you to turn in a circle is the _____.

ET: NONE

12/8/15

I can solve torque problems

ACT Vocab Word: *Feasible- capable of being done*

WU: What is the torque on a bolt produced by a 33 N force exerted perpendicular to a wrench that is 40 cm long?

ET: There are two people, Person A and person B. Person B weighs 500 N, while person A weighs 1000 N. The distance of person A from the center is 1 meter. How far is person B from the center?
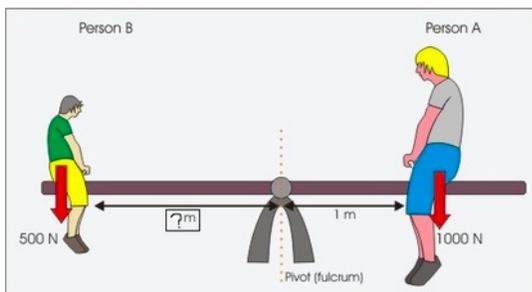
12/9/15

I can explain Newton's Universal Law Of Gravity

ACT Vocab Word: *Feasible- capable of being done*

WU: What do you think each term below means?

$$E_{grav} = \frac{G \cdot m_1 \cdot m_2}{d^2}$$

ET: The force of gravitation between two objects is _____.
 a. usually (but not always) an attractive force
 b. always an attractive force
 c. an attractive force on Earth but neither attractive nor repulsive in space
 d. a force which is attractive for one object and repulsive for the other
 e. an attractive force which is always balanced by a repulsive force to keep the objects from moving towards each other

12/9/15
I can explain Newton's Universal Law Of Gravity
ACT Vocab Word*: Feasible- capable of being done*
WU: Suppose that an object weighs 60 Newton on the surface of the earth (a distance of R from its center). If the same object is located a distance of 2R above the Earth's surface (a distance of 3R from its center), then the force of gravity upon it would be _____ Newton
ET: What is the formula for work?

**************** WARM UP TURN IN *********************
12/14/15
I can explain positive, negative, and no work situations
ACT Vocab Word*: Integral- very important and necessary*
WU: *Two cars - a 1200 kg car and a 2400 kg car - are lifted to the same height at a constant speed in a auto service station. Lifting the more massive car requires _____ work.*
 a. less b. the same c. twice as much
 d. four times as much e. more than 4 times as much
ET: Which requires more work: walking a 50.0 kg crate up a ladder to a vertical height of 2.0 meters or pushing a 25.0 kg crate up a ramp to a vertical height of 4.0 meters?
 a. lifting the 50.0 kg crate up a ladder
   b. pushing the 25.0 kg crate up a ramp
 c. both require the same amount of work
 d. Comparisons cannot be made when the lifting method is different.
12/15/15
I can calculate potential energy

WU: Ned Help is dragging his backpack along an icy sidewalk with a force of 28.7 N at an angle of 42 degrees above the horizontal. He drags the back pack for a total of 87 meters. How much work did Ned do?

ET: Which is the best definition of the term *kinetic energy*?
  a. Kinetic energy is the energy due to motion.
  b. Kinetic energy is the work that an object does.
  c. Kinetic energy is the energy due to temperature.
  d. Kinetic energy is the energy stored in an object due to vertical position (height).

12/16/15

I can discuss TME intelligently

ACT Vocab Word*: Integral- very important and necessary*

WU: *A car is moving along with 3.14 Joules of kinetic energy. If the speed of the car is doubled, then its new kinetic energy will be _____ .*

ET: A force is applied to a root beer float to accelerate it across a level counter-top. Which one of the following statements is true of the mug?
  a. The kinetic energy is constant.
  b. The kinetic energy is decreasing.
  c. The kinetic energy is increasing.
  d. The gravitational potential energy is decreasing.
  e. The gravitational potential energy is increasing.

12/17/15

I can caculate PE and KE

ACT Vocab Word*: Integral- very important and necessary*

WU: Phar Jemper, a famous ski jumper, has a mass of 47.6 kg. He is moving with a speed of 18.4 m/s at a height of 32.2 meters above the ground. Determine the total mechanical energy of Mr. Jemper.

ET: A platform diver weighs 500 N. She steps off a diving board that is elevated to a height of 10 meters above the water. Ignoring the effect of air resistance, the diver will possess ____ Joules of kinetic energy when she hits the water.
a.10   b. 500   c. 510   d. 5000   e. more than 5000

************** WARM UP TURN IN ************

1/4/16

I can calculate work and power

WU: *Using 1000. J of work, a small object is lifted from the ground floor to the third floor of a tall building in 20.0 seconds. What power was required in this task?*
ET: NONE

1/5/16
I can see how energy changes forms
WU: *An arrow is drawn back so that 50 Joules of elastic potential energy is stored in the stretched bow and string. When released, the arrow will have a kinetic energy of _____ Joules. (Assume no energy lost to friction/air resistance)*
ET: Ben Juicin walks a 50.0-kg crate up a ladder to a height of 2.0 meters. In the same amount of time, Will O. Steele pushes a 25.0-kg crate up a ramp to a height of 4.0 meters. The rate at which energy is used (i.e., power) by Ben is _____ as the rate at which energy is used by Will.
 a. twice as much b. half as much
 c. Comparisons cannot be made since Ben is lifting and Will is using a ramp.

1/6/16
I can ACE this quest
WU: The Amazon packaging plant utilizes a motor-powered mechanical arm to exert an average force of 547 N to push large crates of books a distance of 9.5 meters in 22 seconds. Determine the power output required of such a motor.
ET: NONE

1/7/16
I can get me some momentum!
WU: *When you hear the word momentum….what does that mean to you?*

ET: An object that has a lot of momentum can be sure to _____.
 a. have a lot of mass
 b. be moving very fast
 c.   be encountering a large amount of friction
 d. Have a large potential energy
 e. None of these are necessarily true of an object having a lot of momentum.