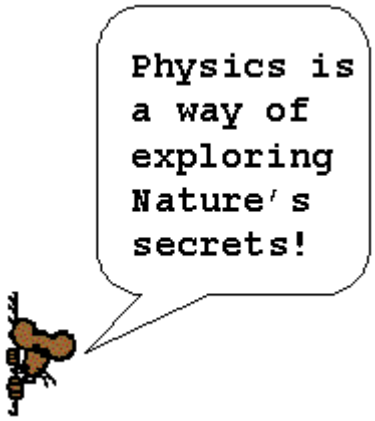
C.E. Physics 1010 Outline & Lesson Plans

Quarter #3



- Day #46
  C: Kinematics I
  E: In Time You Will See The Moving Plot: How can you use a graph to analyze and describe a common motion? (Friction car, tape timer, meter stick, graph paper)
  D: CBL motion of a student overhead (Making Displacement and Velocity Tracks)
  T: Color
  P: Sailcar Proposal assigned

  Day #47
  C: Kinematics II
  E: Kinematics Of A Student: How would you walk to represent constant velocity graphically? How would you walk to maintain a constant acceleration for 30 m? (Stopwatches, meter tapes, and a long hallway)
  E: Connecting Displacement and Velocity Tracks: How are displacement vs time graphs related? (CBL Motion detectors)
  H: Textbook: Read Motion Chapter and do R.Q.
  T: Diffraction & Polarization

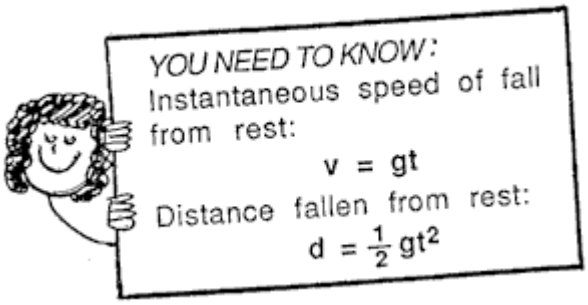
  

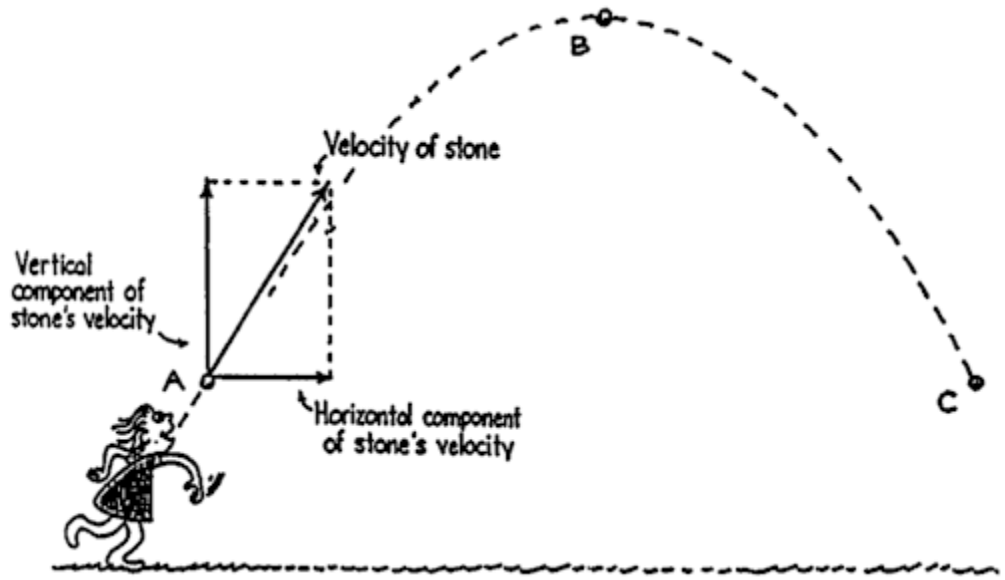
  Day #48:
  C: Acceleration I
  E: Getting on Track: How is the relationship between displacement and velocity applied when the graphs are not linear? (CBL & Motion detectors)
  E: Change Your Tracks: How can you describe changing velocity? (CBL & motion detector)

H: Accelerated and Non-Accelerated Motion W.S.
V: Sports Science: Track
P: Sailcar Proposal due

Day #49:
C: Acceleration II
E: Measuring Tracks: How can you measure the rate at which velocity changes? (CBL, motion detector, long ramp, cart or ball)
E: Tracks to Trails: How do you find acceleration when velocity is changing? (CBL, motion detector, pendulum or slinky)
H: Free-Fall & Dropped-From-Rest W.S.
P: Sailcar groups assigned
v: Mechanical Universe: Falling Bodies

- Day #50
C: Relative 2D Motion
D: Is Motion Relative? How fast are you going? Relative to whom? (Hallway, stopwatch, meter tape)
E: My Point of View Is True! How does the reference frame affect the velocity of a moving object? (2 Battery operated cars, 2 Poster boards, adding machine tape, stopwatch, paper punch, self stick notes, meter tapes & string)
E: Point of View? It's Up To You! How do the graphs of displacement vs. time and velocity vs. time vary when both a motion detector and an object move? (CBL, motion detector, a battery operated car, hall way, meter tapes, stopwatches)
H: Vectors, Components and Resultants W.S.



- 

  Day #51
  C: Projectile Motion
  E: Flick The Pennies: What happens to a falling object if it is given an initial horizontal "kick"? (Ruler, pennies, other coins, tables)
  D: Frictionless carts and Ball Drop
  D: Frictionless carts and Ball Pop
  D: Monkey shoot
  V: Mechanical Universe: Inertia
  E: Target: Can you predict the landing point of a projectile? (Marble, ramp, stopwatch, meter stick, carbon paper, paper, sketch pad paper, markers)
  H: Projectile Motion W.S.
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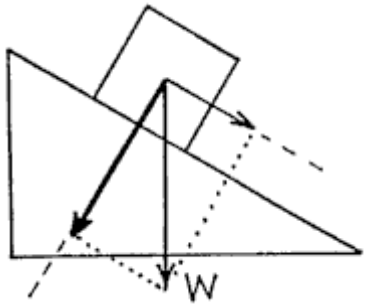
  Day #52
  C: Force Vectors revised
  E: Rafter Physics: How do roof rafters and walls in a building support a load? (Two 1"x2" boards of equal length connected by a hinge, string, set of masses, spring scale, two dynamic carts, protractor)
  T: Motion
  H: Sailboat & Force Resultant W.S.
  V: Sport Science: Snowboarding

Day #53
C: Inertia
D: Ball and String
D: Green felt and Pool balls
D: Bottle and Hoop
H: Textbook: Read Vector/Projectile Chapter do T.E.
P: Sailcart Test



Day #54
C: Newton's 2nd Law I
E: Carts With a Spring Balance: What relationship can you discover between mass, force, and acceleration? (Human dynamics carts, & skates)
T: Vectors & Projectiles
H: Textbook: Read Inertia Chapter & do R.Q.
P: Assign report on judging the Science Fair

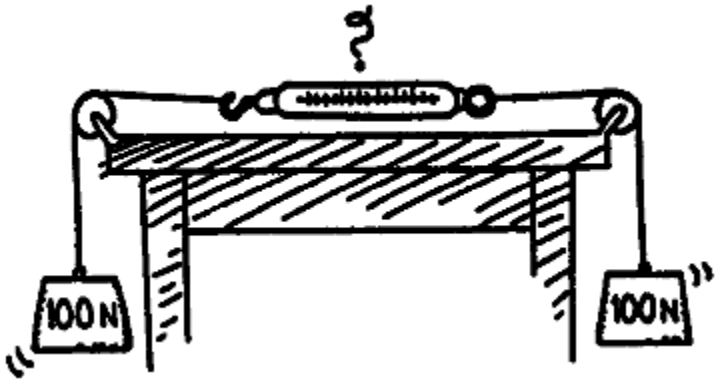
Day #55
C: Newton's 2nd Law II
E: Can You Change Your Motion? What factors do you think might affect the acceleration of an object? (Dynamics cart, bricks, stop watch, string, spring scales)
D: Who Pushed That Speeding Car? (Pick up truck)
H: Textbook: Read Newton's 2nd Law Chapter and do the T.E. and Plug & Chug.

Day #56

C: Newton's 2nd Law III
E: Who Has The Pull Around Here? How can you calculate the applied force and net force needed to accelerate a cart to a given final velocity? How can you determine the forces of friction that act on a cart? (Low friction dynamics carts, three 20 N spring scales, meter stick & two stopwatches)
H: Incline Plane W.S.
P: Report due on Judging Science Fair
T: Inertia

Day #57
C: Newton's 2nd Law IV
E: How Does a Push and Pull Affect the Motion of a Cart? What is the relationship between the magnitude and direction of an applied force and the magnitude and direction of the resulting motion? (Low friction dynamics cart, force sensor /hook, motion detector, 500 g mass, CBL, Balance)

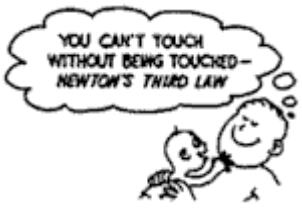
P: Science Fair Judging
H: Force and Acceleration W.S.



Day #58
C: Newton's 2nd Law V
E: How Does a Constant Force Affect The Motion of a Person? (2 metal rods, 2-3 bungee cords of the same length, ruler, large plastic garbage bag, human dynamics cart, motion detector, CBL, basketball & coffee filter)
P: Assign Balloon Rocket Proposal
H: Friction, Falling and Air-Resistance W.S.

Day #59
C: Newton's 2nd Law VI
E: Simple Harmonic Motion: How does Newton's Second Law apply to a mass vibrating on a spring. (Spring, 400 g - 600 g slotted masses, 50 g hanger, ring stand, clamp, wire basket, force sensor, motion detector, CBL, & ruler)
H: Equilibrium & FBD W.S.

- Day #60
C: Newton's 3rd Law I
E: Can You Budge Me: What force does an object exert when a force is applied to it? (Spring Scales, rope, 2 skates, meter tape, rubber bands, paper, string)
D: Hour Glass
D: Fan Cart
P: Balloon Rocket proposal Due
H: Textbook: Read Newton's 3rd Law chapter and do the R.Q.



Day #61
C:Newton's 3rd Law II
E: Probing the Third Law: (CBL, 2 force sencers, 500 gram mass, string, rubber band, 2 dynamics carts)
T: Newton's 2nd Law
D: Carts and Rope
H: Axn/Rxn W.S.
P: Assign Balloon Rocket Groups

Day #62
C: Circular Motion I
E: Pull Me Around: When you are traveling in a circular path, what variables affect the force required for you to continue to follow a circular path. (Spring scale, measuring tape, stop watch, rope & skates)
D: Pail-n-Tray
D: Rotation Toys
H: Textbook: Read Circular Motion Chapter and do T.E./Plug-n-Chug

- Day #63
  C: Circular Motion II
  E: Flying Pig On a String: (Flying Pig Toy, stopwatch, meter stick, mass balance & spring scale)
  H: Centripetal Force and Acceleration W.S.
  V: Mechanical Universe: Circular Motion

T: Newton's 3rd Law

Day #64
C: Universal Gravity
H: Read the Universal Gravity Chapter and do the R.Q.
P: Balloon Rockets

$$F = G\frac{m_1 m_2}{d^2}$$

Day #65
C: Gravitational Interaction
H: Read the Gravitational Interaction Chapter and do T.E.
E: Pulling on Masses: What factors affect the gravitational force on an object? (Hooked masses, triple beam balances, objects, spring scales, graph paper).
T: Circular Motion