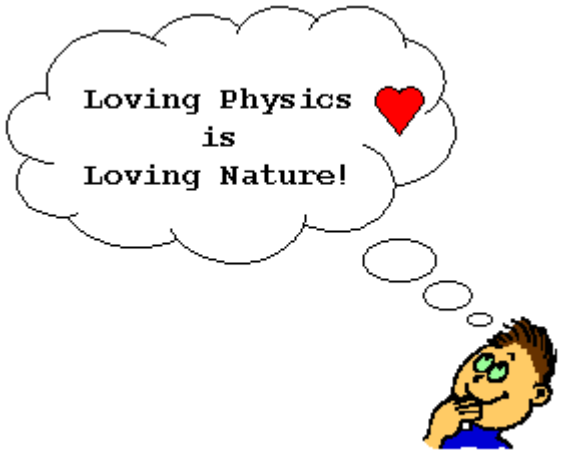
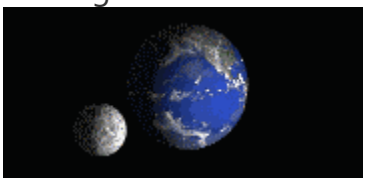
C.E. Physics 1010 Outline & Lesson Plans

Quarter #4



- Day 66
  C: Satellite Motion
  H: Gravitational Interaction & Satellite Motion W.S.
  H: Read & Outline Elliptical Orbit Chapter
  E: Elliptical Orbits: (String, pins, paper)
  V: Mechanical Universe: Navigating in Space
  P: Assign Bottle Rocket Proposal



Day 67
C: Center of Mass
E: Where Is Your Center of Gravity? (Bathroom Scale, Board, 2 triangular files, scrap wood, meter sticks)
D: Teeter Tarter with masses
D: Center of Gravity Toys
T: Gravitation
H: Read Chapter on Center of Gravity and do the R.Q. Day 68
C: Torque
H: Read Chapter on Rotational Motion and do the T.E.
E: Lab With a Twist: What is the relationship between the force applied to a balance and the position of the force to establish equilibrium. (Hook masses, fulcrum, & meter stick)

Day 69
C: Rotational Motion (Rotational Inertia, Angular Momentum, etc)
D: Spinning bicycle wheel
D: Spinning Person
D: Gyroscope & top
V: Mech. Univ.: Cons. of Angular Mom.
T: Circular Motion
H: Torque W.S.

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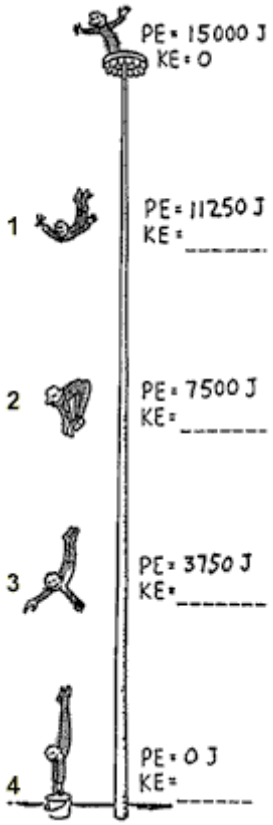
- Day #70
  C: Work
  E: It's All Uphill: What relationship exists between force and distance when moving an object up an incline?
  H: Work and Energy W.S.
  V: Eureka: Work
  D: I-beam
  D: Bridge work
  T: Center of Gravity

  Day 71
  C: Potential Energy
  E: All Work and No Play: How can you determine the amount of work done when a force acts through a distance? (Cart, inclined plane w/ slot cut in the middle, spring scale, ring stand, right angle clamp, support rod, meter stick, & masses)
  H: Read Energy Chapter and do the R.Q.

Day 72
C: Power
E: Work That Body: How much work can the human body do when performing various tasks? (Meter stick, weight machine, climbing ropes, free weights, stairs, etc.)
E: How Fast Can You Work? How can you determine the amount of work you can do in a specific amount of time? (Cylindrical objects w/ various diameters, heavy nylon cord, masses, meter stick, stopwatches, spring scales).
T: Rotational Motion
H: Power Production W.S.
P: Bottle Rocket Proposal Due



Day 73:
C: Energy
D: How Powerful is Wind: Sail Cart on an Incline
E: The Power of Music: (Party Horn, stopwatch, meter stick, 4 meter of clear plastic tube, 10% bleach solution, clear plastic gallon jug, larger container, 200 ml beaker, wet erase marker)
V: Eureka: Pot. & kin. Energy
H: Cons. of Energy W.S.
P: Assign groups for Water Rocket

Day 74
C: Conservation of Energy I
D: Pendulum
D: Spring Energy & toys
D: Perpetual Energy Toys
E: Phooling Around In Physics: What observations, predictions and hypothesis can you make related to the motions and energies associated with movement along a Hot Wheels track? (Hot Wheels track with ramps, cars, assortments of metal spheres, tape)

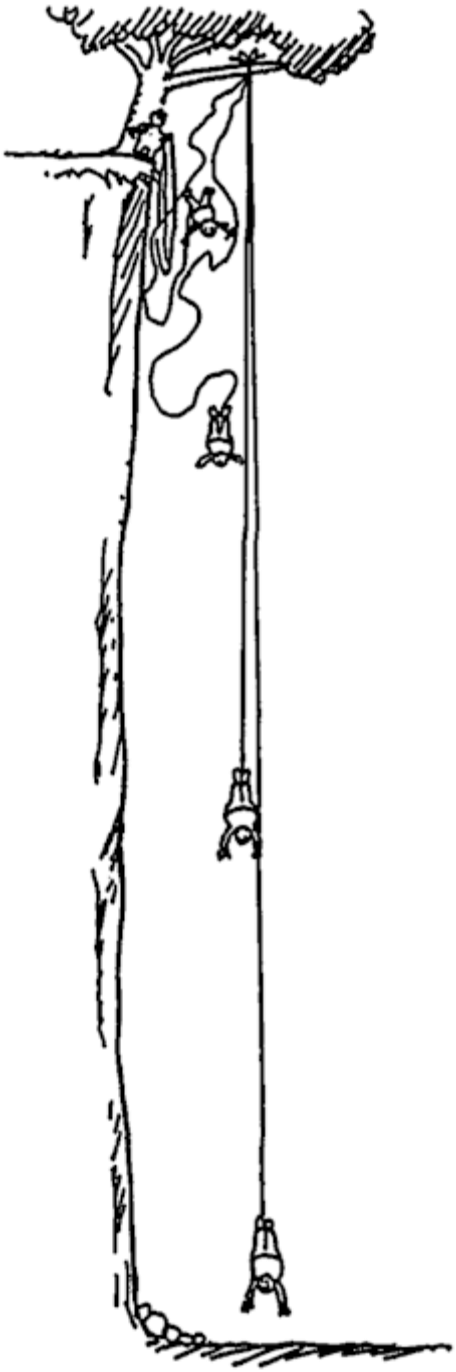
D: Rolling ball Tracks
D: Roller Coaster

Day 75
E: Bottle Rocket
V: Mech. Univ.: Conservation of Energy

Day 76
C: Conservation of Energy II
E: Kinetic Energy On a Hot Wheels Track: How can you find the kinetic energy of a Hot Wheels car as it leaves the launcher?
E: How Hot are Your Hot Wheels? (Hot wheels set with loop-the-loop and ramp, small car, meter stick & timing device)
H: Simple Machine W.S.
V: Eureka: Simple Machines
D: Simple Machines

- Day 77
  C: Impulse I
  E: The All-American Egg Drop: How can you protect an egg form breaking on impact of a fall? (Fresh egg, 1m of masking tape, 5 sheets of paper)
  V: Sport Science: Football
  H: Textbook: Read the Momentum Chapter and do T.E.
  D: Egg and Sheet

  Day 78
  C: Impulse II
  E: Acting On Impulse: How does the length of a straw affect the impulse and the velocity of a cotton swab if the force on the swab is held constant? (Meter stick, 2 cotton swabs, 2 clear plastic straws, masking tape)
  V: Mech. Univ.: Conservation of Momentum
  E: Maxwell's Hammer: How can you determine the impulse force of a hammer acting on a nail? (Meter stick, 1 kg mass, nail, board, hammers for removing nails)
  T: Energy
  H: Momentum W.S.



- Day 79
  C: Conservation of Linear Momentum
  D: Three Stage Human Rocket: (3 human dynamics carts)
  E: Spring Into Action: How does momentum before an "explosion" compare to momentum after it? (Two dynamics carts (one with a spring), stopwatch, balance, meterstick)
  H: Conservation of Momentum W.S.

  Day 80

C: Momentum and Energy
E: Look Out Behind You: How can the conservation of linear momentum be used to find the velocity of a toy car as it leaves a launcher? (2 small toy cars, velcro, launcher, balance, meter stick, stopwatch)
H: Momentum & Enery W.S.
D: Ballistics Pendulum
D: Air Pucks
D: Air Track
V: Auto collisions

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- Day 81
  C: Heat and Temperature
  E: Give and Take: Can you find a rule to predict the equilibrium temperature when materials at different initial temperatures are combined? (Insulated cups, thermometers, graduated cylinders, balance, source of hot water and cold water, metal pieces)
  D: Thermometer
  H: Textbook: Read the Temperature & Heat Chapter & do the R.Q.
  V: Eureka: Temperature

  Day 82
  C: Expansion & Contraction
  E: Hot Stuff: When matter absorbs energy, an increase in temperature may result. What does the increase in temperature depend on? (Calorimeter, immersion heater, thermometer, graduated cylinder, balance, water, other materials)
  D: Ball and Ring
  D: Bimetallic Strip
  V: Eureka: Expansion of Solids, Heat vs. Temp.
  H: Read Expansion & Contraction Chapter and do the T.E.
  T: Momentum

Day 83
C: Heat Transfer
E: The Heat Is On: How can you use the transfer of thermal energy to determine the specific heat capacity of a sold? (Calorimeter, thermometer, water, metal samples, graduated cylinder, balance, ring stand, hot plate, beaker)
H: End-of-Level Review Sheet
D: Convection Chimney
D: Conduction Star
D: Radiation containers

Day 84
End-of-level Exam

Day 85
Physics Day at Lagoon: Amusement Park
E: Hiding Ice: Does ice produce the same temperature change in warm water as does and equal mass of ice cold water? (Calorimeter, stirring rod, thermometer, ice cubes, cold water, warm water, balance)
H: Read the Phase Change Chapter and do R.Q.

Day 86
C: Phase Changes
E: It's Just a Phase: How much energy is involved in a phase change? (Thermometer, CBL, immersion heater, insulated cups, graduated cylinder, ice cubes, water, BB board)
H: Phase Change & Mixture W.S.
E: Hand Textbook in

- Day 87
  C: Thermodynamics I
  E: No Flame--No Gain? How can heat be produced without a flame? (Large rubber band, block of wood, sandpaper, hammer, large nail)
  D: Engine Motors
  E: Down For The Count--Rumford, That is....:In a system where you have an energy transfer, how much of it appears as heat?
  H: Heat exchange & Thermodynamic W.S.
  T: Heat & Temp.

  

  Day 88 (Last Day)
  C: Thermodynamics II
  E: Heat From Electricity: How does the amount of electrical energy compare to the heat that is produced by immersion heater? (Immersion heater, insulated cup, thermometer, water)
  D: We All Scream For Ice Cream...(Ice Cream Maker)

  

  Congratulations.....