I. Purpose and strategies of respiration
   A. Purpose: Acquire oxygen and eliminate carbon dioxide
   B. Strategy and mechanism of gas exchange
      1. Components of air
         a) Nitrogen: 78% (by volume)
         b) Oxygen: 21%
         c) Argon and other gases: 0.97%
         d) Carbon dioxide: 0.03%
      2. Air moves by bulk flow into and out of lungs
         a) Referred to as pulmonary ventilation
      3. In lungs, oxygen diffuses (from high to low) from alveoli (little lung sacs), through
         interstitial fluid, and into the blood capillaries - carbon dioxide diffuses in the opposite
         direction
      4. Hemoglobin facilitates oxygen transport; carbonic anhydrase facilitates CO₂ transport -
         regulating factors include:

         Hemo-O₂  ⇌ Hemo + O₂ (released)
         decreased pH

         [High O₂ in blood]  ⇌ transport to tissues  ⇌ [low O₂ in blood]

         CO₂ + H₂O  ⇌ H₂CO₃  ⇌ HCO⁻ + H⁺

   a) Concentrations of oxygen and carbon dioxide
   b) pH
   c) Temperature

II. Components of the respiratory system
   A. Nasal cavities (nose) - entrance for air
   B. Pharynx (throat) - entrance to respiratory & digestive tract
      1. Larynx (contains vocal cords - open area = glottis) leads to the lungs; esophagus leads to
         the stomach
      2. Epiglottis - covers the larynx during swallowing of food
   C. Trachea (wind pipe) - entrance just before lungs
   D. Two bronchi - entrances for lungs
   E. Bronchioles - branching of bronchi
   F. Alveoli - outpouchings of bronchioles
      1. Gas exchange between air and blood occurs across alveoli walls
         a) From alveolus, through interstitial fluid (space between cells), into capillaries,
            and into red blood cells, to hemoglobin

III. Story time: The Heimlich Maneuver
   A. Used to force food out of trachea (diaphragm is forcibly elevated to push food out)
   B. More than 10 years ago - - -
      1. Heimlich approached American Red Cross and American Medical Society to get rid of
         backslap
      2. Dr. Edward Patrick did work at Purdue University to look at potential energy
         Questionnaire sent out to paramedics, etc. (1200 answers)
      3. Results published in Emergency Magazine
      4. Helped to justify The Heimlich Maneuver