1H10.02 Analyze the function of the respiratory system.

A. Cilia – hair in nose that traps dirt and particles
B. Sinuses
   1. Lined with mucous membrane to warm and moisten air
   2. Give resonance to the voice
C. Pharynx
   1. Common passageway for air and food
   2. When food swallowed, epiglottis closes over opening to larynx, preventing food from entering lungs
D. Larynx
   1. Produces sound (voice box)
   2. Made of cartilage fibrous plates
E. Trachea
   1. C-shaped cartilage rings keep trachea open and more rigid
   2. Coughing and expectoration get rid of dust-laden mucous
F. Bronchi and bronchioles – passageway for air from trachea to alveoli in lungs
G. Alveoli
   1. Surfactant – keep alveoli from collapsing
   2. O_2 and CO_2 exchange takes place between alveoli and capillaries
H. Pleura – pleural cavity filled with pleural fluid to prevent friction
I. Pulmonary ventilation (breathing)
   1. Inspiration (inhalation)
      a. Intercostal muscles lift ribs outward
      b. Sternum rises and the diaphragm contracts and moves downward
      c. This increases the volume of the lungs and air rushes in
   2. Expiration (exhalation)
      a. Opposite action from inhalation
      b. Passive process
J. Respiratory movements
   1. 1 inspiration + 1 expiration = 1 respiration
   2. Normal adult = 14 – 20 respirations/min
   3. Increases with exercise, body temperature, certain diseases
   4. Newborn resp = 40 – 60/min
   5. During sleep – resps decrease
   6. Emotion can change rate of respiration
   7. Coughing – deep breath followed by forceful expulsion of air – to clear lower respiratory tract
   8. Hiccups – spasm of the diaphragm and spasmodic closure of the glottis
   9. Sneezing – air forced through nose to clear respiratory tract
   10. Yawning – deep prolonged breath that fills lungs, increases blood O_2
K. Control of breathing
   1. Neural factors
      a. Respiratory center located in medulla oblongata
      b. Increase or decrease of O_2 or CO_2 in the blood will trigger respiratory center
      c. Phrenic nerve – stimulates diaphragm
   2. Chemical factors
      a. Depends on level of blood CO_2
      b. Chemoreceptors in aorta and carotid arteries sensitive to the amount of blood O_2