Biology 12 Name: _____

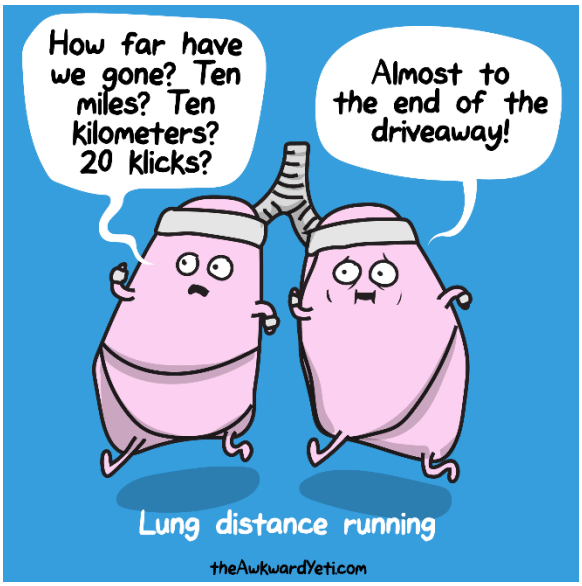
Respiratory System Per: _____ Date: _____

Chapter 11 – The Respiratory System

Complete using BC Biology 12, page 342 - 371

11.1 The Respiratory System pages 346 - 350

1. Distinguish between…
   A. ventilation: _____
   _____
   B. external respiration: _____
   _____
   C. internal respiration: _____
   _____
   D. cellular respiration: _____
   _____
2. As air moves in along the airways, it is filtered, warmed, and moistened.
   How are each of these accomplished?
   A. filtered: _____
   _____
   B. warmed: _____
   _____
   C. moistened: _____
   _____
3. What happens to air as it moves out during expiration? _____
   _____
4. What is the **glottis**? _____
5. Why are the cartilage rings that hold the trachea open C-shaped? _____
   _____
   _____



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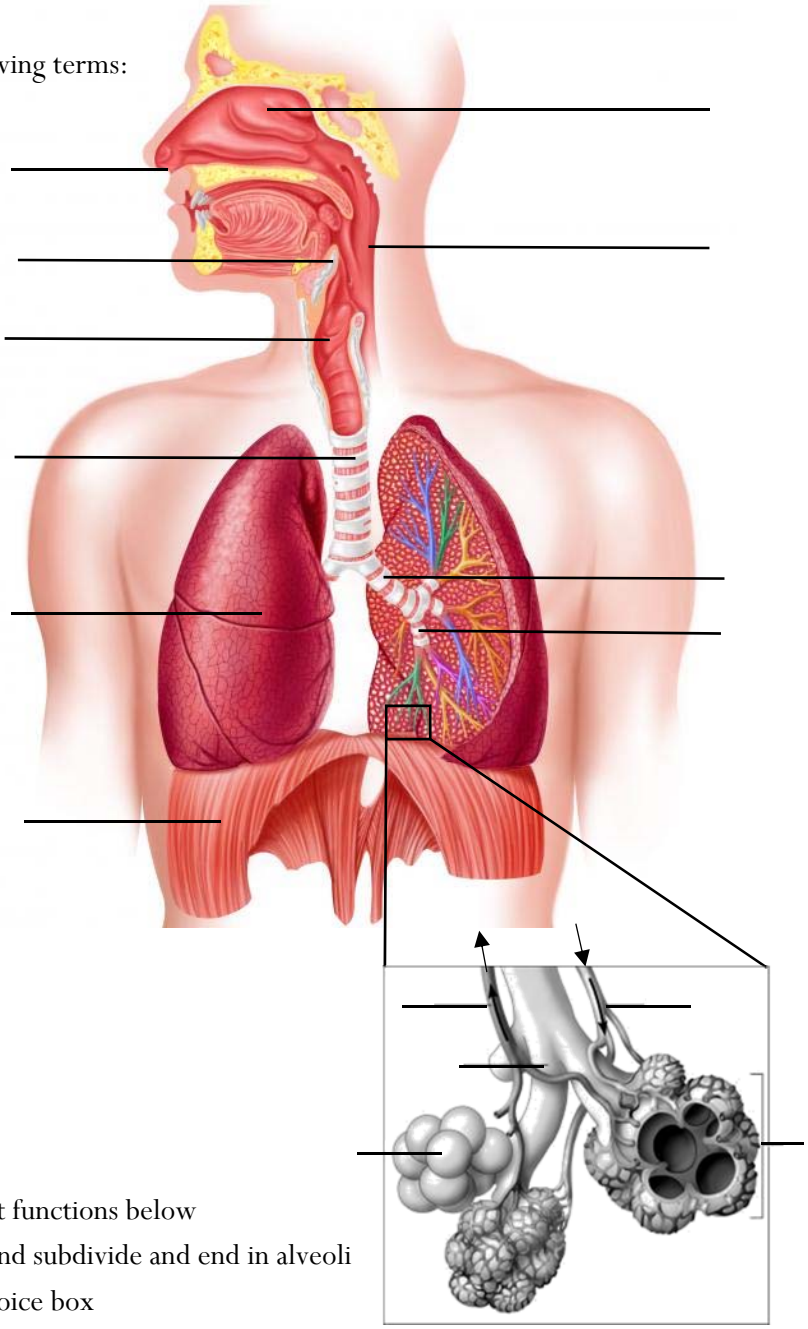
6. Complete the diagram with the following terms:

A. alveolus
B. bronchiole (x2)
C. bronchus
D. diaphragm
E. epiglottis
F. larynx
G. lobule
H. lung
I. nasal cavity
J. nostril
K. pharynx
L. pulmonary arteriole
M. pulmonary venule
N. trachea



7. Match the above parts to their correct functions below

_____ smaller airways that divide and subdivide and end in alveoli
_____ houses the vocal cords and voice box
_____ entrance to the respiratory system
_____ dome shaped muscle that separates the thoracic cavity and abdominal cavity
_____ carry deoxygenated blood to the alveoli
_____ thin walled microscopic air sacs; site of gas exchange between air and blood
_____ main organs of the respiratory system
_____ carry oxygenated blood away from alveoli
_____ two main airways that branch off the trachea and head to each lung
_____ chamber for passage of air and food; contains lymphocytes to protect against inhaled antigens
_____ grouping of alveoli
_____ commonly called the windpipe; held open by C-shaped cartilaginous rings
_____ flap of tissue that prevents food from passing into the larynx

_____ composed of two canals separated by a septum; also contains chemoreceptors

5. Describe the function of the mucus and cilia in the trachea. _____

_____

_____

6. Trace the path of air from the human nose to the alveoli. _____

_____

_____

7. The right lung has _____ lobes and the left lung has _____ lobes, allowing room for the _____ whose apex points left. A lobe is further divided into _____, and each one has a _____ serving many _____. The apex of the lung is narrow, while the base is broad and curves to fit the dome-shaped _____, the muscle that separates the _____ cavity from the _____ cavity.
8. Describe the *pleura*, including both structure and function. _____

_____

_____

_____

9. Why do alveoli not collapse, even during exhalation? _____

_____

    a. What is *infant respiratory distress syndrome*? _____

_____

11. 2 Mechanisms of Breathing pages 351 - 353

10. To understand ventilation, the following facts should be remembered:
    a. Normally, there is a _____ from the pharynx to the alveoli in the lungs.
    b. The lungs lie within the _____ cavity. The rib cage, consisting of ribs joined to the _____ posteriorly and to the _____ anteriorly, forms the top and sides of the cavity. The _____ and _____ _____ form the floor.
    c. The lungs adhere to the thoracic wall by way of the _____. Normally, any space between the two layers is minimal due to the _____ of the fluid between them.
11. Complete the table

	Inspiration	Expiration
Rib cage		
Diaphragm		
Pressure difference		

12. Explain why inspiration is considered the active phase of ventilation, and expiration the passive phase.

_____

_____

_____

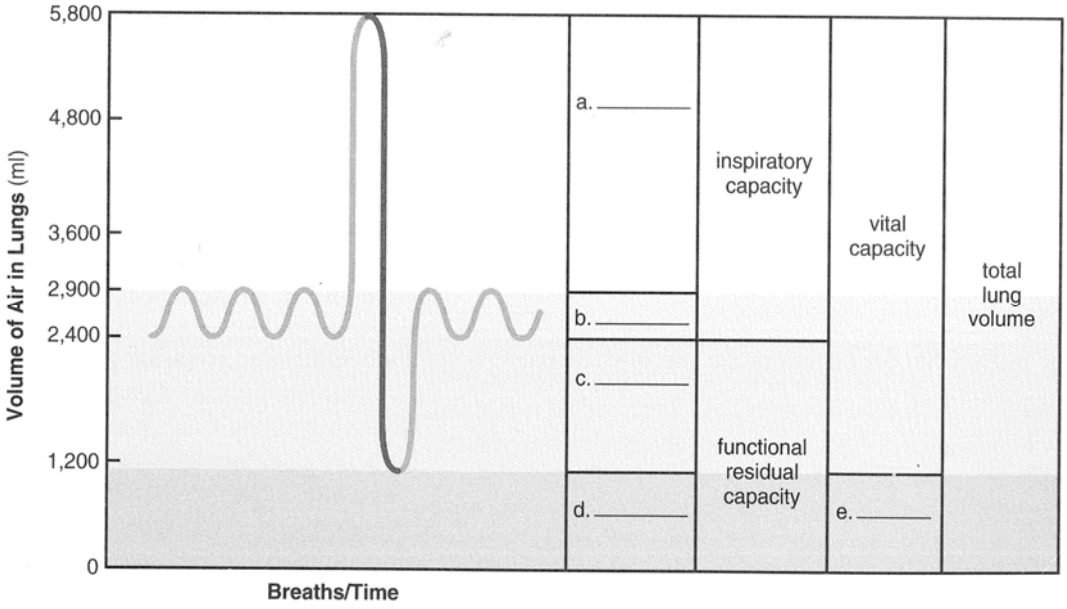
_____

_____

13. The volume of air exchanged normal and deep breathing can be recorded using a _____ and the results can be recorded as a graph like the cone in the next question.

14. Label this diagram, using the following list of terms.

expiratory reserve volume
inspiratory reserve volume
residual volume (used twice)
tidal volume



15. Use the graph above to name the parts of respiration
    a. _____ amount of air exchanged while at rest (~500mL)
    b. _____ maximum inhalation (~3400mL)
    c. _____ maximum exhalation (~1200mL)
    d. _____ air that remains after maximum expiration (~1200mL)

16. Control of Breathing
    a. Resting breathing rate of _____ ventilations per minute
    b. Rhythm controlled by _____ located in the _____
        i. Sends impulses to diaphragm by way of _____ nerve and to the intercostal muscles (between ribs) by way of the _____ nerves
        ii. Following forced inhalation, _____ in the alveoli send inhibitory nerve impulses via the _____ nerve
    c. Chemical input: respiratory center is sensitive to levels of _____ and _____. If either rises, breathing rate and depth is increased. Oxygen levels are monitored by the _____ and _____ bodies.

17. Place the appropriate letter next to each phrase: I for inspiration or E for expiration
    a. _____ lungs expanded
    b. _____ muscles (diaphragm and ribs) relaxed
    c. _____ diaphragm dome-shaped
    d. _____ chest enlarged
    e. _____ less air pressure in lungs than in the environment
18. What is the proper sequence for these statements? Put them in order from 1 – 6.
    _____ Respiratory center stops sending nerve impulse to diaphragm and rib cage
    _____ Respiratory center sends nerve impulse to diaphragm and rib cage
    _____ Diaphragm relaxes and becomes dome-shaped, and rib cage moves down and inward
    _____ Lungs expand as diaphragm lowers and rib cage moves upward and outward
    _____ Air goes rushing out as lungs recoil
    _____ Air comes rushing in as lungs expand

11.3 Gas Exchanges in the Body

pages 354 - 355

19. Match the statements to these terms:
    internal respiration cellular respiration inspiration & expiration external respiration
    A. _____ entrance and exit of air into and out of lungs
    B. _____ exchange of gases between blood and tissue fluid
    C. _____ production of ATP in cells
    D. _____ exchange of gases between lungs and blood
    E. Next, place the terms in the proper sequence
        First _____
        Second _____
        Third _____
        Last _____
20. Give the equation that describes how oxygen is transported in the blood. Label one arrow *lungs* and the reverse arrow *tissues*. (Hint: look at the 2nd and 3rd boxes)

21. Give the equation that describes how most of the carbon dioxide is transported in the blood. Label one arrow *lungs* and the reverse arrow *tissues*. (Hint: look at the 1st and 4th boxes)

22. What is the name of the enzyme that speeds up this reaction? _____
23. Carbon dioxide transport produces hydrogen ions. Why does the blood not become acidic? _____

_____

24. By what process does carbon dioxide move from the blood to the alveoli? _____
25. After studying Figure 11.10, fill in the blanks
    a. Where does oxygen enter the blood? _____
    b. Where does oxygen exit the blood? _____
    c. Where does carbon dioxide enter the blood? _____
    d. Where does carbon dioxide exit the blood? _____
    e. Which vessels are rich in oxygen? _____
    f. Which vessels are rich in carbon dioxide? _____
26. Hemoglobin is remarkably suited to the transport of oxygen. Why? _____

_____

27. Why does a person rapidly die from carbon monoxide poisoning? _____

_____

28. How does hemoglobin help with the transport of carbon dioxide? _____

_____

11.4 Disorders of the Respiratory System pages 356 - 359

29. Complete the table. Your knowledge of the disorders will not be tested but rather is provided for interest.

Disorder	Description
Upper Respiratory Tract	
	Characterized by sneezing, a runny nose, and perhaps a mild fever. What is the most common group of viruses that cause colds?
	Inflammation of the throat. Commonly called _____ and is caused by a _____
	Inflammation of the tonsils. Can be removed if breathing is impaired. Why are fewer tonsillectomies performed today than in the past?
	Inflammation of the larynx with accompanying hoarseness. Overused vocal cords may develop benign growths, or _____, on their vocal cords.
	Inflammation of the cranial sinuses. Multiple possible causes.
	Inflammation of the middle ear. Why is this disorder considered in the respiratory section of the book? What is a common treatment for children with chronic ear infections?

Lower Respiratory Tract	
	Obstructed trachea. The _____ maneuver can be performed to dislodge object. If unsuccessful, trained medical personnel may cut the trachea and insert a breathing tube during an operation called a _____
	Inflammation of primary and secondary bronchi.
	Airways are inflamed and filled with mucus. What is the most frequent cause?
	Disease of bronchi and bronchioles that is marked by wheezing, breathlessness, and sometimes a cough. Smooth muscle of bronchioles undergoes spams and restrict breathing pathways. Give the name of the drug that can help control the inflammation and prevent an asthma attack.
Diseases of the Lungs	
	Infection of the lungs. Bronchi or alveoli fill with thick fluid.
	Caused by a bacterium that invades the lung tissue and a "tubercle" is formed to encapsulate the bacteria.
	Chronic and incurable disorder often preceded by chronic bronchitis. Alveoli burst and fuse into enlarged air spaces, reducing surface area available for gas exchange.
	Genetic disease. 1 in 25 Canadians carries the defective gene, but 2 copies must be inherited to have the disease.
	Leading cause of cancer death. More prevalent in men than women. _____% associated with cigarette smoking. Name and describe the only treatment that offers a *possibility* of a cure.

Chapter Questions **pages 366 - 371**

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
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9. _____
10. _____
11. _____
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27. _____
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31. _____
32. _____
33. _____
34. _____
35. _____
36. _____
37. _____
38. _____
39. _____
40. _____
41. _____
42. _____
43. _____

44. Label the parts of the respiratory system and the muscles used in ventilation.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____

46. _____

47. _____

49. Match the descriptions with the corresponding structures.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____
i. _____
j. _____
k. _____
l. _____
m. _____

50. _____

51. Internal respiration: _____

External respiration: _____

56. _____

_____

57. _____

_____

58. _____

_____

63. _____

_____

64. _____

65. _____

_____

71. Place the following in the correct box on the flowchart.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
h. _____
i. _____

73. a. tidal volume = _____ vital capacity = _____

b. breathing rate = _____

c. _____

74. d. _____

_____

78. a. _____ b. _____

Mark the review questions using the answer key on pages 546 - 548