

HS-EHS-5 Respiratory System

90 min
classes

Respiratory System Unit Pacing Guide

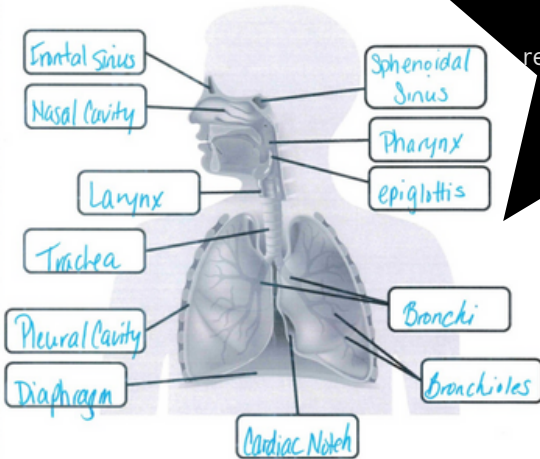
	Day	Intro	Instruct	Assess	Homework
Anatomy of the Respiratory System	1	Students add to prefix/suffix flashcards: • rhin-/naso-, oro-, lingua-	<ul style="list-style-type: none"> Respiratory System PPT- Section 1 & Section 2 Cornell Notes (Upper Respiratory Tract Parts 1 & 2) 	<ul style="list-style-type: none"> Cornell Notes summaries Informal discussion and questions 	
	2	Prefix/suffix flashcards: • pneumo-, spir-	<ul style="list-style-type: none"> Vocal Cord Lab Respiratory System PPT- Section 3 Cornell Notes (Lower Respiratory Tract) Materials: Binders, boxes, or textbooks Pack of large rubber bands, Pencils (2 for each lab pair)	<ul style="list-style-type: none"> Collect Vocal Cord Lab Informal questioning during lab activity Cornell Notes summaries Informal discussion and questions 	
Breathing	3	Prefix/suffix flashcards: • pulmon-, -itis, -alveol-	<ul style="list-style-type: none"> Respiratory System PPT- Section 4 Cornell Notes (Breathing) Lung Capacity Lab Materials: Round balloon for each student, metric rulers- 1 per pair, calculators	<ul style="list-style-type: none"> Cornell Notes summaries Informal discussion and questions Collect Lung Capacity Lab Informal questioning during lab activity 	<u>Honors:</u> Lab Extension: Respiratory Disease & Lung Capacity
	4	Prefix/suffix flashcards: • hyper-, hypo-, -pnea	<ul style="list-style-type: none"> Respiratory System PPT- Section 5 Cornell Notes (Ventilation Control) Respiratory Homeostasis 	<ul style="list-style-type: none"> Cornell Notes summaries Informal discussion and questions 	Study for Respiratory System Quiz <u>Honors:</u> Digging Deeper: Gas Exchanges
Review	5	Review prefix/suffix flashcards	<ul style="list-style-type: none"> Respiratory Online Quiz (need computers) Trachea and Lung Microscopy Lab Materials: trachea slide, lung/alveoli slide and microscopes or virtual slide	<ul style="list-style-type: none"> Informal check microscopy lab for accuracy/completion 	<u>Honors:</u> Data Analysis: Hemoglobin
Respiratory Disease	6	Review prefix/suffix flashcards	<ul style="list-style-type: none"> Digging Deeper: Vaping Disease Poster (need computers) 	<ul style="list-style-type: none"> Informal discussion and questions Rubric for Respiratory Disease Poster 	Study for test
Review	7	Review prefix/suffix flashcards	Task Card Review	<ul style="list-style-type: none"> Observe student progress during task cards Informal questioning, if necessary 	Study for test
	8	Review notes for test	<ul style="list-style-type: none"> Go over Task Card Review making sure students have correct answers to study for test Respiratory System Diagram Anatomy of the Larynx Diagram 	<ul style="list-style-type: none"> Assess student understanding based on task card answers Information questioning Informal check of diagram accuracy 	Study for test
	9	Review notes for test	Respiratory System Test	<ul style="list-style-type: none"> Formal assessment 	

Standards document in Unit Planning Folder

Using this Pacing Guide as is? You can print all the student pages in order from the "Student Pages" folder.

This icon is found on the top right corner of Honors pages for easy identification.

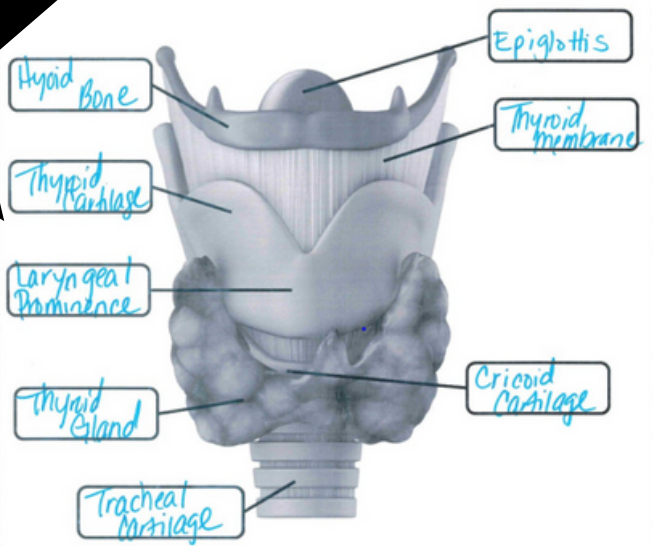
Respiratory System



Word bank: larynx, epiglottis, bronchioles, frontal sinus, pleural cavity, sphenoidal sinus, nasal cavity, pharynx, cardiac notch, trachea, bronchi, diaphragm

5.1 Analyze structures of respiratory system

Anatomy of the Larynx



Word bank: hyoid bone, laryngeal prominence, epiglottis, tracheal cartilage, cricoid cartilage, thyrohyoid membrane, thyroid cartilage, thyroid gland

Digging Deeper: Vaping

Background:

The use of e-cigarettes, commonly called vaping, has seen a dramatic rise in popularity. Unlike traditional cigarettes which burn tobacco to create smoke, vape pens or e-cigarettes heat up a liquid which vaporizes and is then inhaled. They have been touted as the safer alternative to cigarettes because they don't contain the toxic additives traditionally found in cigarettes. However, these devices have only been available for a few years so the long-term effects of vaping are still largely unknown.

Medical professionals do have some idea of the short-term effects of vaping on the respiratory system, though. E-cigarettes are used to deliver nicotine, which is highly addictive and can harm the developing brains of teens and children. Additionally, the additives used to vaporize the oily liquids bathe the lungs in chemicals. The immune system often attacks these chemicals causing an inflammatory response which can permanently destroy lung tissue. One of these chemicals, diacetyl, is also used as a food additive to simulate butter flavor in popcorn. Diacetyl is safe when eaten, but a harmful irritant to the lungs when inhaled. The inflammation and scarring of the lungs caused by this chemical is commonly known as "popcorn lung". There is no treatment for the permanent scarring that occurs from this disease.

Another common result from vaping is a primary spontaneous pneumothorax (collapsed lung). A lung collapses when a tiny blister or tear in the lung ruptures, disrupting the pressure balance. Some teens are more susceptible to these blisters because of rapid growth spurts during adolescence. Although the blisters would otherwise be asymptomatic, vaping can cause them to burst.

Vaping hasn't been around long enough to know whether it causes lung cancer, but the addition of tiny particles into lung tissues always carries a carcinogenic risk. Because of the vast number of risk factors involved in e-cigarette use, they continue to be heavily regulated in many states and are completely banned in some countries.

Discussion Questions:

1. Have you seen e-cigarette ads or products? In what ways do you think these products are being marketed towards minors?

Appealing looks / smells that are sweet

2. Name 3 health risks associated with e-cigarettes and vaping.

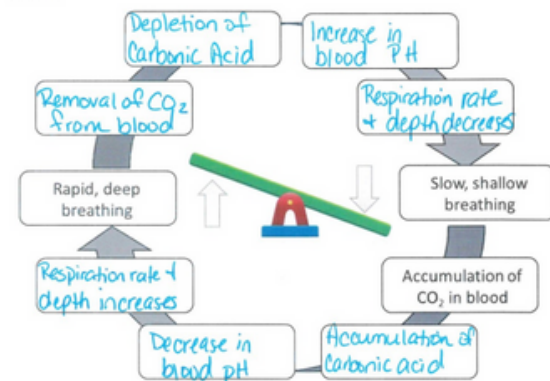
- ① Highly addictive
- ② Lung Inflammation/scarring
- ③ Lungs can collapse from inhaled irritants.



Respiratory Homeostasis

Acid-Base Balance

The respiratory system contributes to one of the greatest homeostatic regulations in the body. The amounts of oxygen and carbon dioxide in the body can change quickly. When carbon dioxide builds up, it reacts with water in the blood to form carbonic acid. Carbonic acid causes a drop in the pH of the blood, which the body recognizes and regulates by increasing the rate of respiration to remove the excess carbon dioxide.



Discussion Questions:

1. Fill in the following statements on the cycle above: increase in blood pH, decrease in blood pH, accumulation of carbonic acid, depletion of carbonic acid, removal of CO₂ from blood, respiration rate and depth increases, respiration rate and depth decreases, rapid & deep breathing

2. The other reason respiratory rate can change is due to oxygen levels. In an individual experiencing hypoxia, how would you expect the respiratory rate to change?

↓ Hypoxia is low → hypoxia is low oxygen levels. You would expect someone to breathe faster and deeper for more oxygen.

3. You try to hold your breath, but after a few minutes you have to let it go. What is happening in your body/lungs that causes your brain stem to override this conscious decision? Lungs fill with carbon dioxide; if not exhaled blood pH are low. Brain overloads lungs and forces you to breath out CO₂.

5.2, 5.3, 5.5 5.6 Diseases, physiology, and process of respiratory system

RESPIRATORY System Test

Multiple Choice

Select the best answer for each question below.

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1) Which of the following structures connects the nose to the throat?
 a. nasopharynx
 b. oropharynx
 c. larynx
 d. laryngopharynx

2) Boys have high pitched voices when they are young, but their voices deepen as they age. What causes this?
 a. They are able to push more air through the larynx as they get older.
 b. Their lungs grow as they get older.
 c. Their mouths and sinus cavities grow, causing sound to vibrate more deeply.
 d. Their vocal cords grow longer as they get older.

3) What is the purpose of the cartilaginous rings that surround the trachea?
 a. To prevent food from entering the trachea accidentally.
 b. To prevent the trachea from collapsing between breaths.
 c. To collect foreign particles and prevent them from entering the lungs.
 d. To produce sound as air passes through them.

4) Which of the following describes the path of carbon dioxide through the respiratory system?
 a. alveoli, bronchi, bronchioles, trachea, larynx, pharynx
 b. mouth/nose, pharynx, larynx, trachea, bronchi, bronchioles
 c. mouth/nose, pharynx, larynx, bronchioles, trachea
 d. alveoli, bronchioles, bronchi, trachea, larynx, pharynx

5) You are sitting calmly while you work on this test. The air that passes through your lungs during this time is called the
 a. residual volume.
 b. vital capacity.
 c. total lung capacity.
 d. tidal volume.

6) Your doctor told you that you have an upper respiratory infection. Which of the following would NOT be affected by this infection?
 a. tonsils
 b. pharynx
 c. larynx
 d. nose

7) Your friend had her larynx removed. What will she be unable to do?
 a. cough
 b. swallow
 c. breathe
 d. speak

8) The ciliated cells within the respiratory mucosa propel foreign particles and mucus from the trachea.
 a. inferiorly, superiorly
 b. superiorly, inferiorly
 c. laterally, medially
 d. medially, laterally

9) You go for a morning run. Your respiratory rate will increase because
 a. you are consciously controlling it.
 b. your cells are building up more carbon dioxide.
 c. the pH of your blood is rising.
 d. both B and C are correct.

Match.

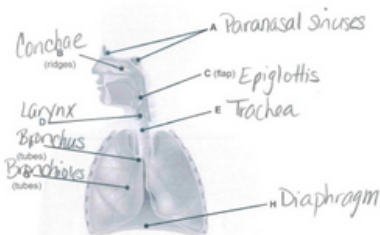
Match the following structure to the correct description.

- | | |
|--------------------|--|
| *G 1) Concha | a) responsible for moving foreign particles towards the throat |
| 2) Cilia | b) surrounded by cartilage |
| *F D 3) Epiglottis | c) found above the nasal cavity |
| C 4) Sinuses | d) involved in both respiratory and digestive systems |
| E 5) Vocal cords | e) produce sound when air passes over them |
| B 6) Trachea | f) found in the respiratory zone |
| *A 7) Alveoli | g) increase air turbulence in the nasal cavity |

Terms: Based on the prefixes and suffixes you've learned, provide a probable definition for the following words:

- 1) hyperpnea: 4 respirations
 2) pleuritis: Inflammation of the lung lining.

Label: Label A - H in the diagram below:



Free Response.

Answer 5 of the questions below. Use full sentences.

- Name 2 differences between the left and right lungs.
 - List the three portions of the pharynx from most superior to most inferior.
- 1) Right lung has 3 lobes and the left has 2. The left has a notch for the heart.
- 2) Nasopharynx, oropharynx, larynx

9) Which of the following is NOT a function of the paranasal sinuses?
 a. produce mucus
 b. resonate speech
 c. keep airways open
 d. lighten the skull

10) Tonsils and alveolar macrophages are found within the respiratory system, but function as part of the
 a. digestive system.
 b. lymphatic system.
 c. muscular system.
 d. nervous system.

11) In the trachea, the cartilaginous rings are U-shaped. They are open on one side to allow movement of
 a. the larynx.
 b. the esophagus.
 c. the diaphragm.
 d. the lungs.

12) The largest cartilaginous portion of the larynx that is prominent in men and commonly called the

- ad cartilage.
- il cords.

itory zone?

lungs _____ causing pressure in the lungs to

es, decrease.
 ses, increase.

lung capacities. Which is not part of vital lung capacity?
 tidal volume
 residual volume

ndles on your cake this year. Which lung volume

tidal volume
 residual volume

sory information and control regular, quiet breathing are

- Explain how the vocal cords can change the pitch of someone's voice.
- Explain how gas exchange can alter the pH of the blood.
- Explain the difference between internal and external ventilation.
- Why is breathing through your nose preferable to breathing through your mouth?
- Which muscles are involved in breathing?
- Explain the difference between an obstructive respiratory disease and a restrictive respiratory disease.
- The girl below has a model of lungs made of a straw and plastic bags. Explain why this model is inaccurate.



- External intercostal muscles and diaphragm.
- COPD prevents full exhalation + restrictive airway prevents full inhalation.

Test over Respiratory System-
 Summative Evaluation
 HS-EHS-5.1, 5.2, 5.3, 5.4, 5.5, 5.6,
 5.7