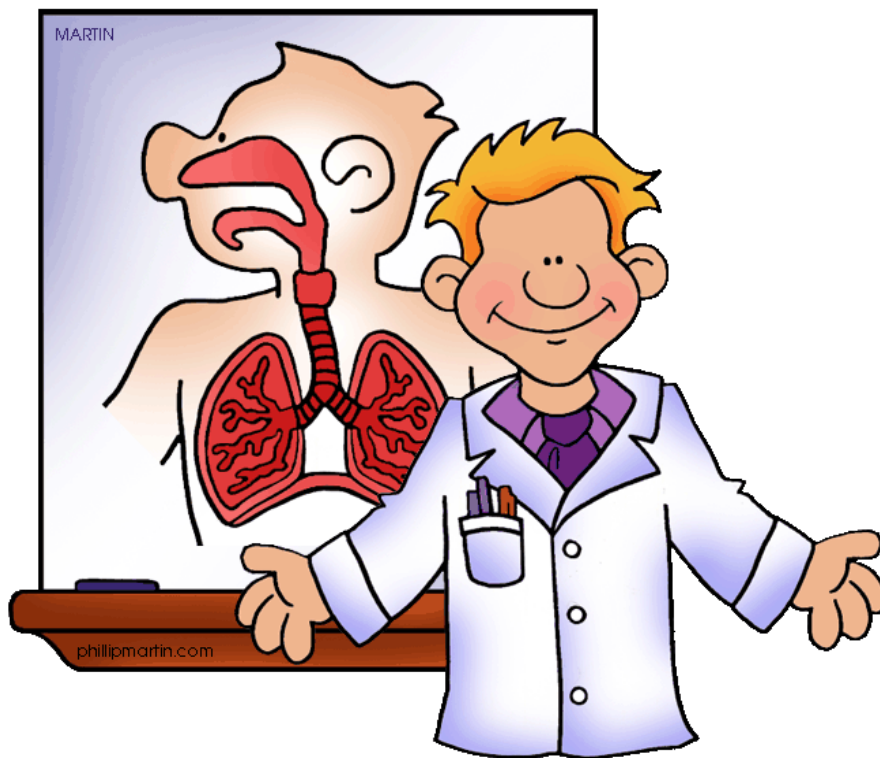


Respiratory System Unit

An integrative unit including lessons in Science, Art, Math,
Health, and Literature

3rd Grade
Anatomy



Introduction:

The respiratory system allows the human body to take in oxygen and expel carbon dioxide. The lungs are the main organ in the respiratory system that carry out the exchange of gasses as we breathe. Oxygen is exchanged for carbon dioxide and then is carried into our lungs where it is removed and then exhaled. Other body parts that make up the respiratory system are: nasal cavity, pharynx, larynx, trachea, bronchi, alveoli, and the diaphragm.

Unit Summary:

During this unit, students will learn about the respiratory system, its parts, and how it functions. This will be done through lab experiments in which students construct a pair of lungs themselves and demonstrate the process of turning oxygen into carbon dioxide.

Minnesota Standards Addressed:

3.4.3.2.2 Give examples of differences among individuals that can sometimes give an individual an advantage in survival and reproduction.

3.4.1.1.1 Compare how the different structures of plants and animals serve various functions of growth, survival and reproduction. For example: Skeletons in animals and stems in plants provide strength and stability.

Overall Objectives:

Cognitive:

- Students will discover the respiratory system and it's parts
- Students will discover smoking and how it is bad for our lungs
- Students will discover how much air our lungs can take in
- Students will discover the gas exchange that occurs in the respiratory system

Affective:

- Students will appreciate the ability of their bodies to convert oxygen into carbon dioxide
- Students will examine their values as to what they put in their bodies in regards to smoking.

Psychomotor:

- Students will create the respiratory system through food and other objects
- Students will collaborate with their peers
- Students will write results and opinions that occur throughout the unit

Vocabulary:

- Respiratory System - set of organs that allows a person to breathe and exchange oxygen and carbon dioxide throughout the body.
 - Nasal Cavity - large air filled space above and behind the nose in the middle of the face.
 - Nostril- external opening of the nasal cavity that admit air to the lungs
 - Oral Cavity - part of the mouth behind the gums and teeth that is bounded above by the hard and soft palates and below by the tongue and by the mucous membrane.

- Pharynx- the membrane-lined cavity behind the nose and mouth, connecting them to the esophagus.
 - Larynx - the hollow muscular organ forming an air passage to the lungs and holding the vocal cords in humans; voice box
 - Trachea - a large membranous tube reinforced by rings of cartilage, extending from the larynx to the bronchial tubes and conveying air to and from the lungs; windpipe
 - Right and Left Main Bronchus - primary division of the tracheobronchial tree
 - Right and Left Lung - each of the pair of organs situated within the rib cage, consisting of elastic sacs with branching passages in which air is drawn, so that oxygen can pass into the blood and carbon dioxide be removed.
 - Diaphragm- a dome-shaped, muscular partition separating the thorax from the abdomen.
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- Pollution - the presence in or introduction into the environment of a substance or thing that has harmful or poisonous effects.
 - Cigarettes - a thin cylinder of finely cut tobacco rolled in paper for smoking
 - Exhaust - waste gases or air expelled from an engine, turbine, or other machine in the course of its operation
 - Smoke - a visible suspension of carbon or other particles in air, typically one emitted from a burning substance
 - Circumference - the enclosing boundary of a curved geometric figure, especially a circle
 - Capacity - the maximum amount that something can contain

- Estimate - roughly calculate or judge the value, number, quantity, or extent of
- Dispel - make disappear
- Create - bring something into existence

Materials:

- Clear plastic bottle
- Large balloon
- 2 Small balloons
- Play dough
- Plastic straw
- 2 Rubber bands
- Pollution Outside the Body
- Pollution Inside the Body
- Cigarette
- Tissue
- Candle
- Magazine
- Newspaper
- String cut to 24 inches long (for each pair of students)
- Balloons
- Rulers
- Recording sheet with space for several attempts in both “Estimate of Circumference” and “Actual Circumference” -they will create this in their notebooks.

- Pencil
- Journal
- Smart board for “Tony’s Respiratory System”
- Laffy Taffy
- Life Saver Gummies
- Licorice
- Rice Krispies
- Parchment paper
- Worksheet

Daily Overview

Day One - The Breathing Machine - Science

Objectives:

Cognitive: Using the model in class students created in class lab, students will accurately the gas exchange process.

Affective: Students will become aware that air is made up of gases.

Psychomotor: Students will construct lungs using the materials given.

Procedure:

This lesson will begin with lecture, then lead into a lab activity. Students will learn through lecture the parts of the respiratory system and discuss what it does in the body. Then the students will construct a pair of lungs that will demonstrate the gas exchange that takes place.

1. I will begin the lesson by showing the students a labeled picture of the respiratory system.
As we go through each part of the system, I will have them point to the same part on themselves.
2. We will then discuss how the respiratory system takes in oxygen and dispels carbon dioxide.

3. I will then model the lab experiment for the students and break them into groups to construct their own lungs.
 - a. Cut the bottom off of the bottle, leaving a portion of the bottom edge on.
 - b. Cut the top part of a large balloon and discard. Tie the stem of the balloon in a knot and slip the open end over the bottom of the bottle.
 - c. Attach the small balloons to the straw with a rubber band and insert the straw, balloon-side down into the bottle.
 - d. Seal the top around the straw with clay or play dough.
 - e. . Let the children experiment by pulling down on the knotted balloon. The small balloons will inflate the same as when you expand your chest and
 - f. inhale air through the nose.
4. When they are done, I will have each group verbally explain the process of how the respiratory system turns oxygen into carbon dioxide to their peers. They will use their “breathing machine” to utilize in their explanations.

Vocabulary:

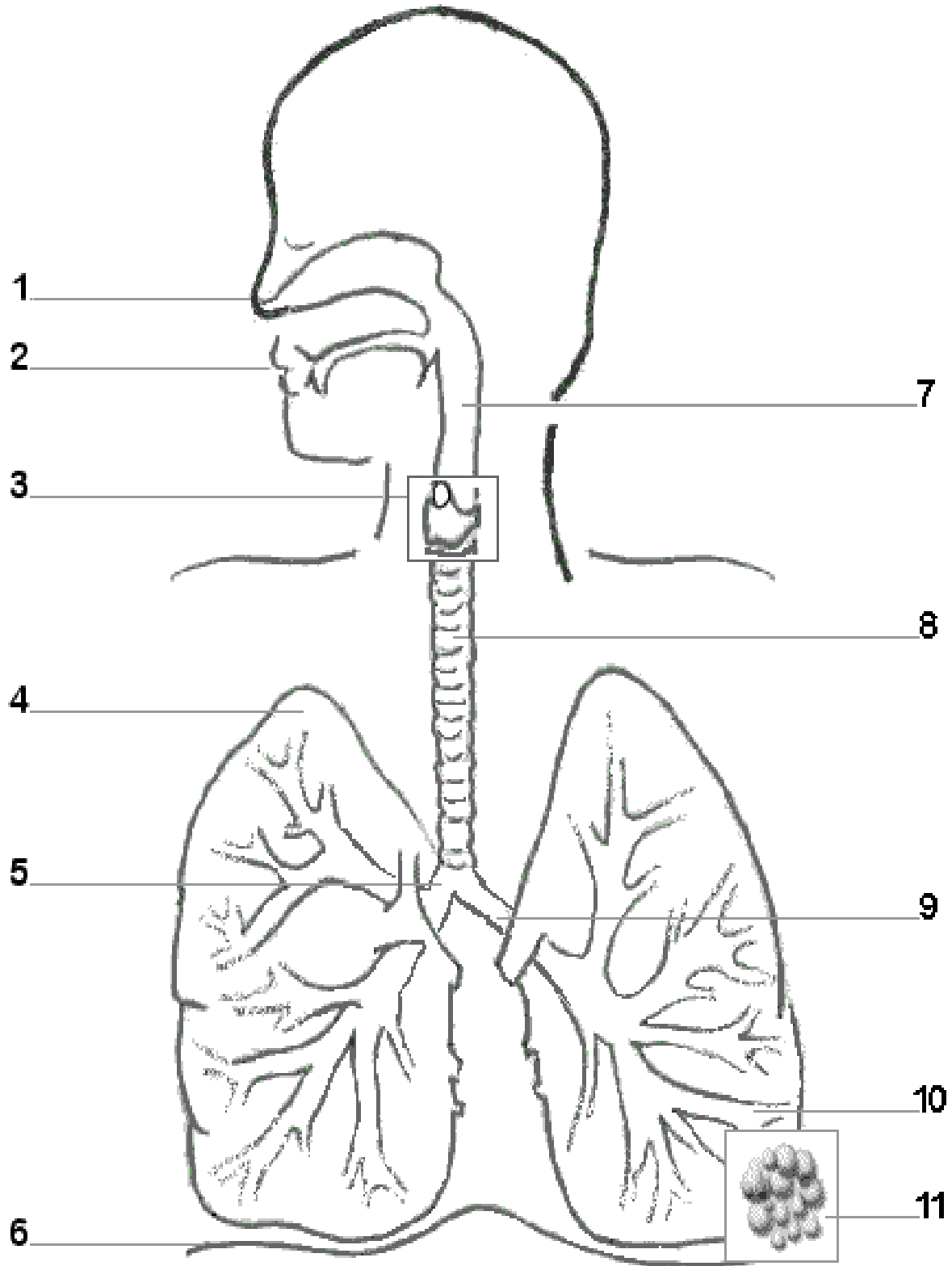
- Respiratory System
 - Nasal Cavity
 - Nostril
 - Oral Cavity
 - Pharynx
 - Larynx

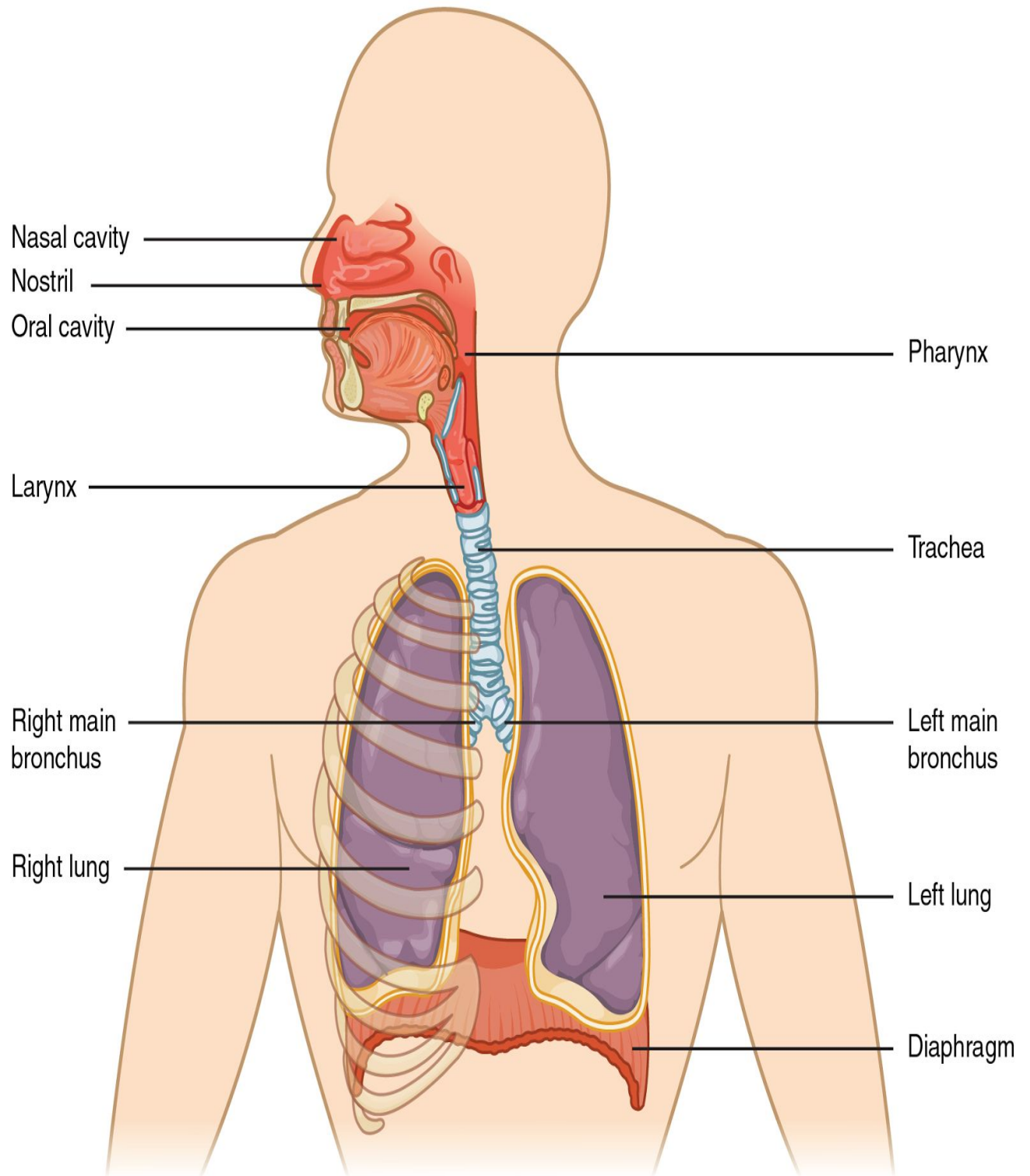
- Trachea
- Right and Left Main Bronchus
- Right and Left Lung
- Diaphragm

Materials:

- Clear plastic bottle
- Large balloon
- 2 Small balloons
- Play dough
- Plastic straw
- 2 Rubber bands

Assessment: Students will complete a worksheet of the respiratory system and label all of the parts.





Day Two - Smoking - Health

Objectives:

Cognitive: Using the worksheets and knowledge from the demonstration students will be able to identify some of the harmful effects of smoking cigarettes

Affective: Students will improve decision-making ability in regards to what is bad to put into their bodies. They will also evaluate their personal values and attitudes towards smoking.

Psychomotor: Students will find pictures in magazines, write answers on worksheets, walk outside to see a demonstration, and draw a poster.

Procedure:

1. I would begin the lesson by asking the children to define the word pollution, then give them a definition from the textbook.
2. The students would find pictures of examples of pollution using magazines and newspapers. These could include factory smoke, car exhaust, rocket launches, and cigarette smoke.
3. Students will then complete the "Pollution Outside the Body" worksheet.
4. Through looking at these we would talk about how these pollutants in the air come into our respiratory system. Explain how these are bad for our bodies and can damage them. While doing this we would look at a picture of the respiratory system and review how it works.
5. I would then go outside with the class with a cigarette and a tissue. Then I, the teacher, would light the cigarette and blow smoke through the tissue. The tissue

will show the particles left behind in the tissue. Explain that the tissue represents our lungs and the cigarette smoke can leave all of the bad particles in our lungs.

6. Take the students back inside and use a light a candle. Ask a child to stand a reasonable distance from the candle. Instruct the child to take a deep breath, and then blow out the candle. Relight the candle. Ask the child to stand at the same distance from the candle. Instruct the child to take a deep breath and blow out at least half of the breath before attempting to blow out the candle. With the breath that is left, ask the child to blow out the candle. What happened? They have a harder time blowing out the candle. This is because the lungs cannot exert as much air because of the cigarette smoke.
7. Students will then look at the “Pollution Inside the Body” worksheet.
8. We will then talk about how else the body is effected from smoking.
 - a. Smokers make the air around them smell and themselves
 - b. Smoking stains the teeth
 - c. Smoking costs a lot of money because of buying cigarettes.
9. Lastly, the students will create an informative poster about smoking.

Vocabulary:

- Pollution
- Cigarettes
- Exhaust
- Smoke

Materials:

- Pollution Outside the Body

- Pollution Inside the Body
- Cigarette
- Tissue
- Candle
- Magazine
- Newspaper

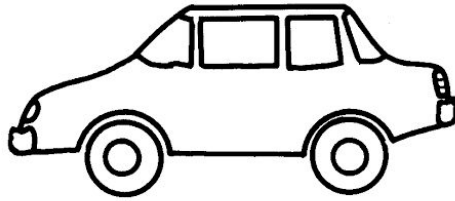
Assessment: The formative assessment I will have is the poster that the students create.

Name _____

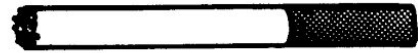
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Pollution Outside the Body

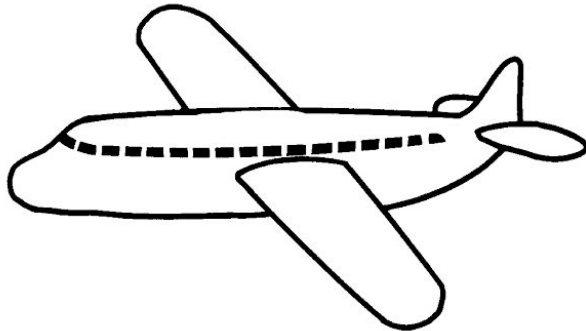
Fill in the missing letters of the things that dirty the air around us.



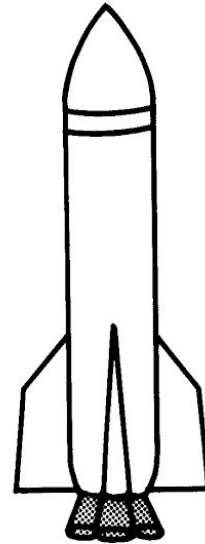
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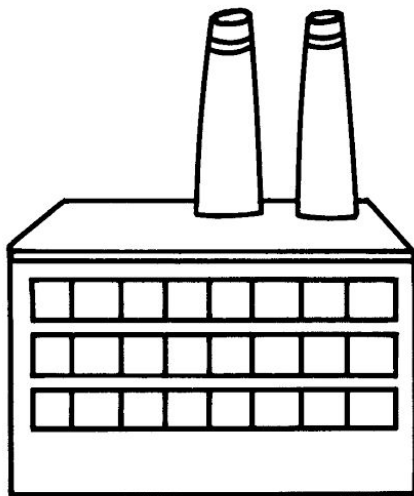
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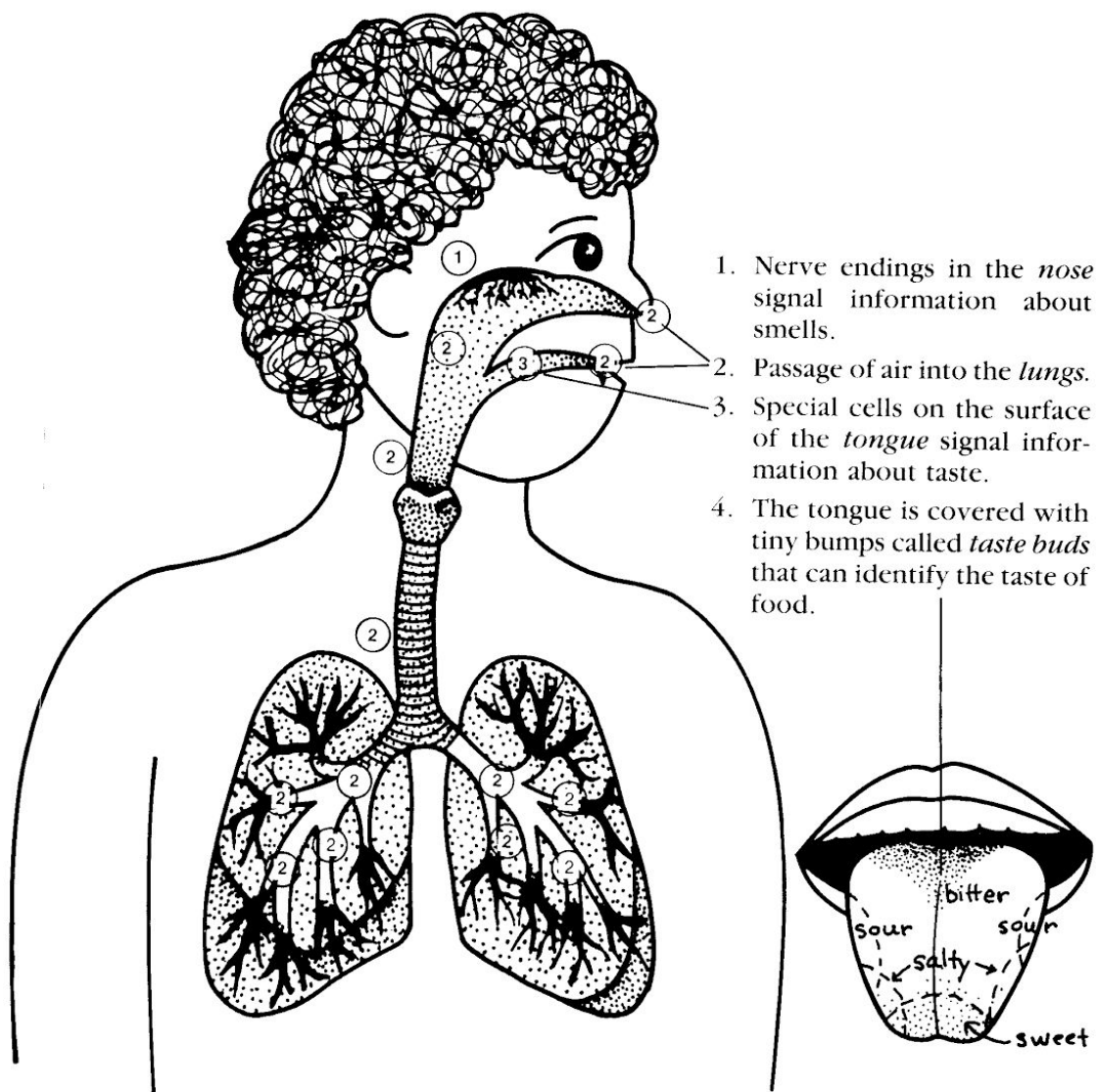
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Date _____

Pollution Inside the Body



Smoking cigarettes deadens the nerve-endings for smell and taste. People who smoke cannot smell or taste as well as nonsmokers.

Day 3 - Measuring Your Lung Capacity - Math - Science

Objectives:

Cognitive: Students will be able to explain that lungs hold air when they expand. They will do this through using the new terms capacity and circumference.

Affective: Students will see that healthy lungs can breathe in more air as opposed to a smoker's'. They will also realize that smokers lungs are bad.

Psychomotor: Students will create a physical representation of the amount of air that their lungs can hold at once using balloons. They will also record data according to their results.

Procedure:

1. I would start by dividing students into pairs and have them brainstorm ideas of how they could measure the amount of air out lungs can hold.
2. Explain that the students will be measuring their lung capacity using balloons. To show the size of one person's lung capacity in comparison with another's you will be measuring how big around the balloon gets. This is done through the students blowing the balloons up with a big, single breath.
3. Demonstrate how to measure the circumference of balloon that you've blown up with the string and then how you measure the amount of string used with a ruler.
4. Go over how to create the recording sheet in their notebooks. Explain that they will each get five tries to blow up the balloon. First they will make an estimate and then actually blow the balloon up and measure the circumference. They will then compare their lung capacity with their partners. Who's is bigger?

5. Tie this into the previous lesson by saying that smokers have a bad lung capacity because of the particles contaminating their lungs.

Vocabulary:

- Circumference
- Capacity
- Estimate

Material:

- String cut to 24 inches long (for each pair of students)
- Balloons
- Rulers
- Recording sheet with space for several attempts in both “Estimate of Circumference” and “Actual Circumference” -they will create this in their notebooks.

Assessment: The formative assessment will be the data that they recorded through the lab experiment. I will collect it and evaluate it at the end of class.

Day 4 - Tony's Respiratory System - Literature - Science

Objectives:

Cognitive: Using the book read in class students will be able to accurately describe the process of how the body turns air into carbon dioxide.

Affective: Students will appreciate their bodies ability to breathe and turn oxygen into carbon dioxide.

Psychomotor: Students will write their thoughts in their journals and compare their thoughts with their peers.

Procedure:

1. I would begin by asking students if they could tell me what the pathway was for the air that they breathe in through the respiratory system.
2. Then I would introduce them to Tony (the character in the book), and he is going to tell us how his body takes in air and dispels it as carbon dioxide.
3. We would begin reading the book [Tony's Respiratory System](#) together
 - a. This could be done through volunteer reading
4. We would then discuss how important this process is to our health
 - a. What happens if there were something wrong with our respiratory system?
 - i. Maybe a health problem like Asthma?
 - b. How do you think this process would be performed through a smoker's lungs?
5. After these questions are posed, I would have the students take out their journals and write their answers to these questions.

- a. They will not be penalized for their answers to these questions.
6. Then they will go into their reading groups and discuss their answers with each other.

Vocabulary:

- Dispel

Materials:

- Pencil
- Journal
- Smart board for “Tony’s Respiratory System”

Assessment: The assessment will be through the journalling that they do during the lesson. This will serve as their “exit ticket.” They will write their thoughts and hand it in at the end of class.

Day 5 - Edible Respiratory System - Art - Science

Objectives:

Cognitive: Students will create the respiratory system using food and identifying the parts of the respiratory system.

Affective: Students will use familiar foods to create the respiratory system.

Psychomotor: Students will sculpt a respiratory system out of different candies to identify all of the components of the respiratory system

Procedure:

This lesson will serve as an assessment at the end of the unit. This is also my summative assessment.

1. I will ask the students to review parts that make up the respiratory system
 - a. as they identify them will have them point to it on their own bodies.
2. I will then introduce the activity. They will use the treats to create a respiratory system. I will give them a slip of paper that says what each treat should represent:
 - a. Rice Krispies: Lungs and alveoli
 - b. Licorice: Bronchial tubes and bronchioles
 - c. Gummy Life Savers: Bronchus
 - d. Laffy Taffy: Trachea
3. The students will work independently on this activity. I will give them a blank respiratory system worksheet that they can either build on or reference.

4. When they are finished I will come over to them and they will explain it to me. I also want them to tell me how the respiratory system will work when taking in air.
5. Lastly, they will be able to eat their creation.

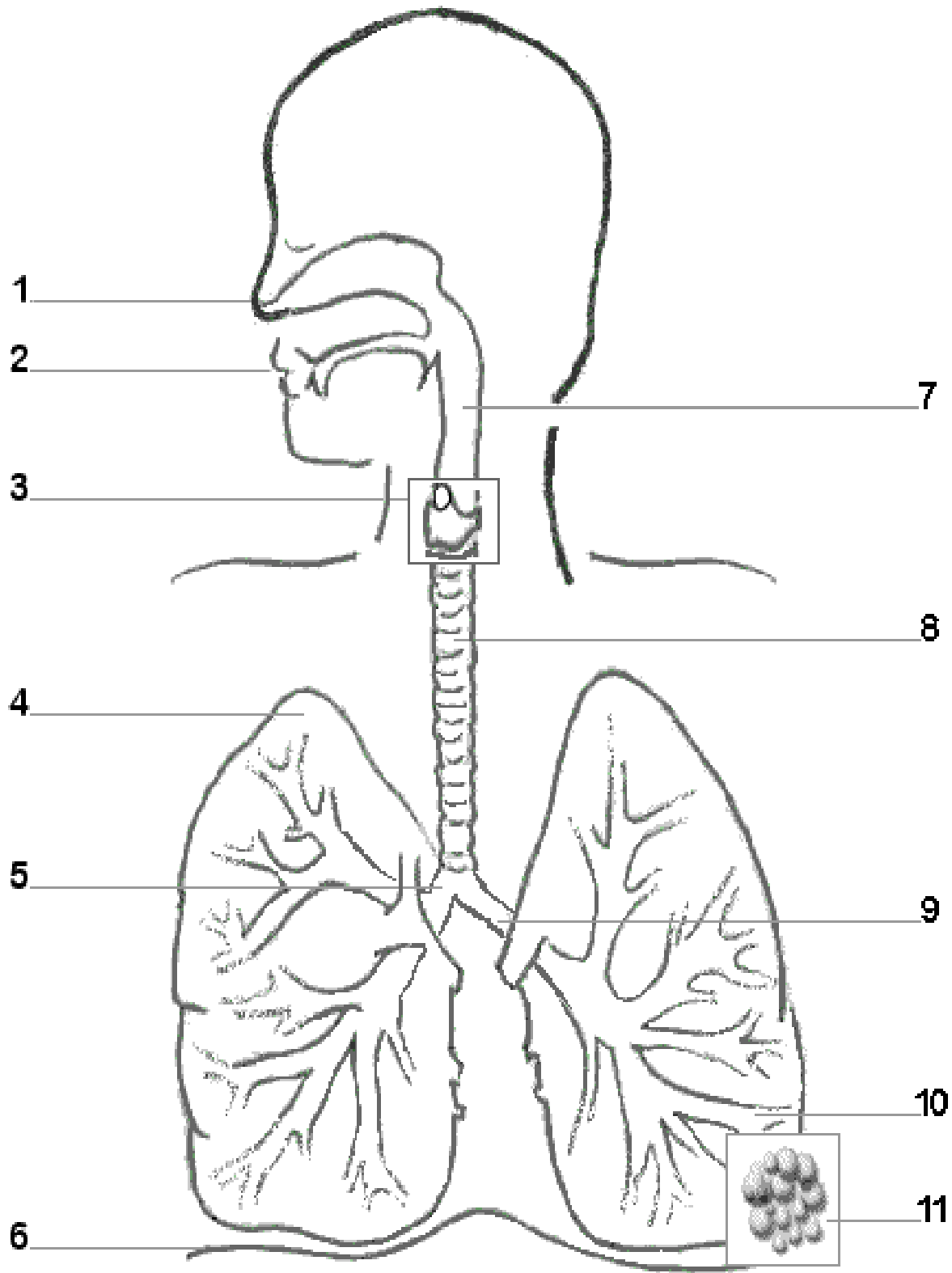
*be sure to not tell the students that this is an assessment because I want to ensure that they will enjoy this activity.

Vocabulary:

- Create

Materials

- Laffy Taffy
- Life Saver Gummies
- Licorice
- Rice Krispies
- Parchment paper
- Worksheet



Respiratory System Edible Model

