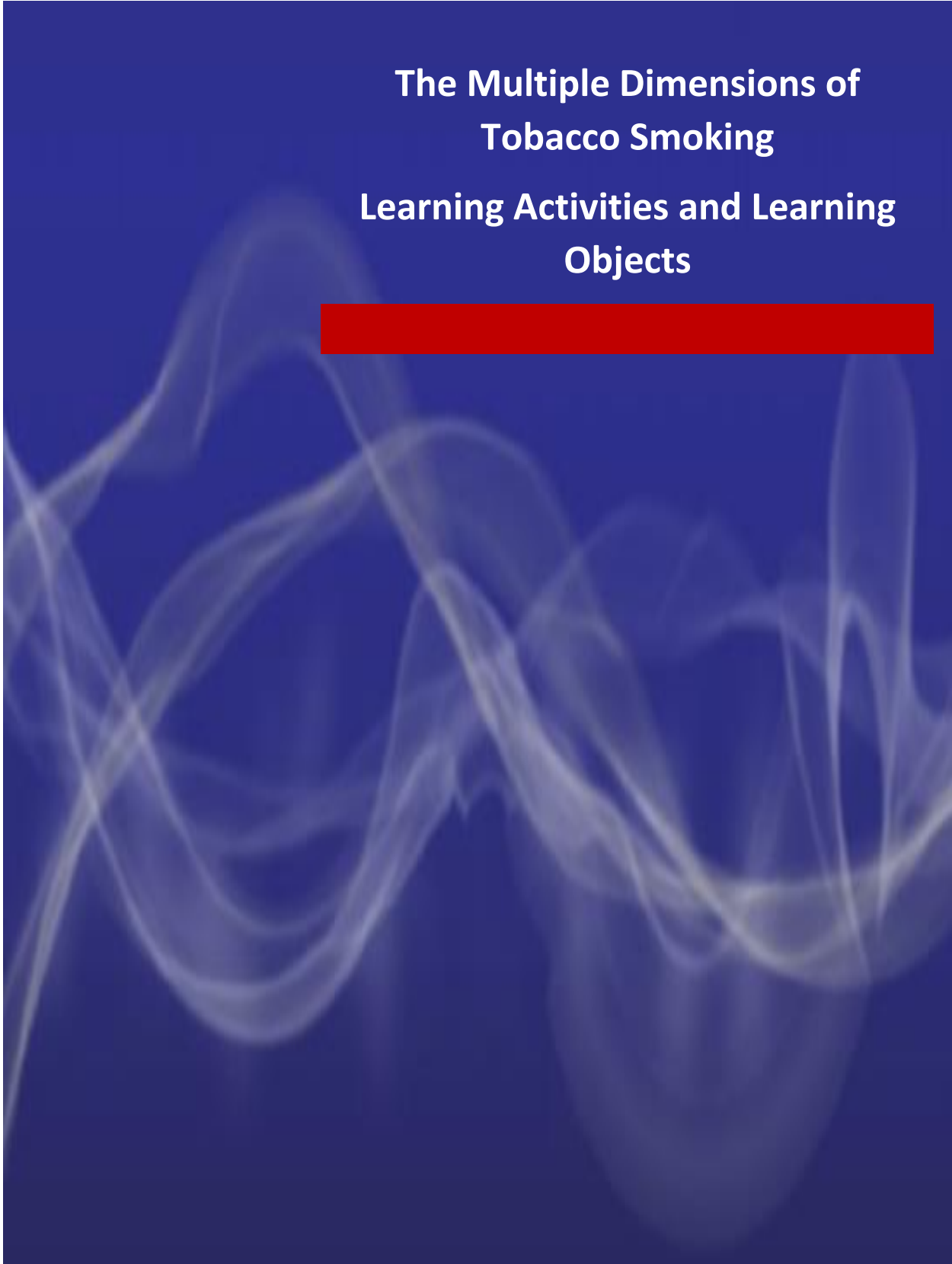


**The Multiple Dimensions of
Tobacco Smoking
Learning Activities and Learning
Objects**





Project Number: 101006468

Project Acronym: PAFSE

Project title: Partnerships for Science Education

**FINAL VERSIONS OF LEARNING ACTIVITIES
AND
LEARNING OBJECTS**

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Learning Activities and Learning Objects:

Subject: Biology (possible contribution of Computer Science, Home Economics, Art, English teachers, etc.)

Grade: 9th grade (+/- 14-16 years old students)

Estimated duration for scenario implementation:

- 5 periods of 40-45 minutes to promote conceptual and epistemological understanding related to the PAFSE topic: *Looking after myself and others - Substance Tobacco.*

- 4 periods of 40-45 minutes to conduct the research project entitled: *The Multiple Dimensions of Tobacco Smoking*

- Open Schooling Event.

Classroom organisation:

Lessons 1-5: Students are organised in groups of 4-5 students. Use of individual and cooperative learning, discussion, and reflection in the whole class.

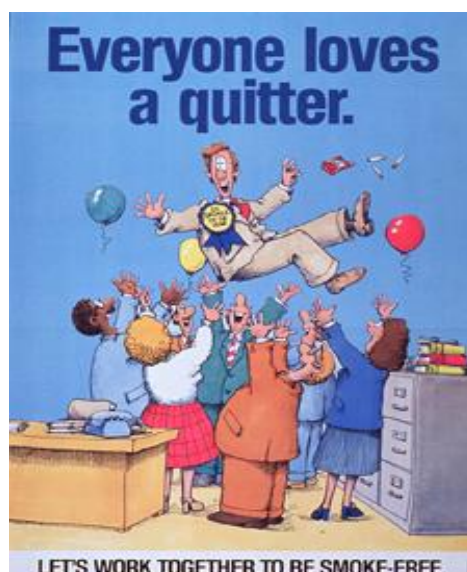
Lessons 5-8: Organising students into groups of 4-5 students. Use of cooperative and individualized learning and use of the jigsaw technique. Discussion and reflection in the whole class.

0. Introduction: A social and cultural history of tobacco use and public health

(Lesson 1)

01. Socio-scientific issue

Read the text below related to the history of tobacco use, and then try to do the posed activities.



Tobacco has been growing wild in the Americas for nearly 8000 years. Around 2,000 years ago tobacco began to be chewed and smoked during cultural or religious ceremonies and events.

The first European to discover smoking was Christopher Columbus. In 1531 tobacco was cultivated for the first time in Europe. By 1600 tobacco use had spread across Europe and by the 1700s smoking had become more widespread and a tobacco industry had developed.

Cigarette making machines were developed in the latter half of the 1800s. The first such machines produced about 200 cigarettes per minute (today's machines produce about 9,000 per minute). Cheap mass production and the use of cigarette advertising allowed tobacco companies to expand their markets during this period.

The prevalence of cigarette smoking continued to grow in the early 20th Century.

Smoking increased dramatically during the world wars, mainly due to the policy of providing free cigarettes to allied troops as a 'morale boosting' exercise.

Later in the twentieth century, smoking became less popular. According to different researchers, tobacco smoking has been implicated as the cause of various diseases. In addition, it has been estimated that thousands of people die each year due to exposure to passive tobacco smoking.

Over the last few months, it has been observed that many students in your school smoke a lot, even though they are aware of the biological consequences of smoking. Parents and teachers at your school are very worried about this increase of smoking.



02. Students' Mission

Your mission is to investigate the following primary research questions:

1. What are the biological, social, economic, cultural, and ethical dimensions of tobacco smoking?
2. What are the main reasons 9th grade students in our school give for tobacco smoking?
3. What are the main reasons people of the local community where you live give for tobacco smoking among students in our school?

To answer the research questions of this socio-scientific issue, you are asked to formulate specific questions and hypotheses, to collect data from a variety of inquiry-based sources (e.g., such as texts, articles, pictures and videos, tables and diagrams and scientific measurements, questionnaires, interviews, etc.) analyse, make inferences, synthesize, and draw conclusions.

During this process, you will also experience how scientists usually work, as scientific work does not only include conducting experiments but also includes searching for data and evaluating sources or making scientific models, collecting data using questionnaires, interviews, etc. In addition, you will obtain a basic conceptual understanding on the structure and function of the human respiratory system and the health effects of tobacco smoking. Additionally, you will investigate the biological, social, economic, cultural, and ethical dimensions of tobacco smoking and explain possible reasons 9th grade students, parents and other people of local community give for students' tobacco smoking.

Finally, through these procedures, you will be able to create a poster and a brochure and hold a forum entitled *Biological, social, economic, cultural, and ethical dimensions of tobacco smoking, and make suggestions for tackling tobacco smoking*. The public event will be organised and coordinated by you, in cooperation with your teachers and the principal of your school.

03. Prior knowledge: Answer the following questions.

03.1. Why is it important to learn about human respiratory system to be able to understand the problem of tobacco smoking and effectively communicate the results of your investigation?

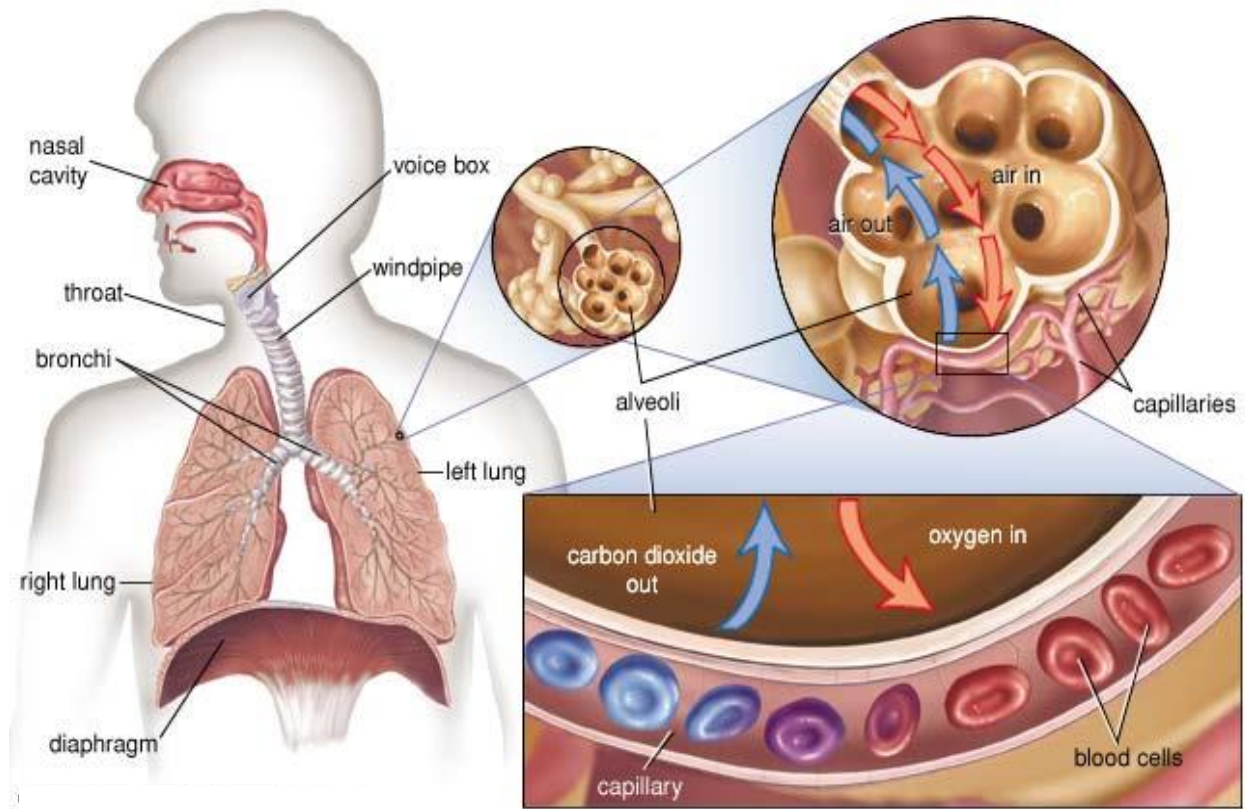
Write down three (3) reasons.

(a).....
.....

(b).....
.....

(c).....
.....
.....

03.2. Observe the following infographic and try to think about the posed questions:



Think about.....

What is the primary function of our respiratory system?

What organs make up the human respiratory system?

.....

Which human organ system works closely with the respiratory system?

.....

How does cigarette smoking affect the human respiratory and circulatory system?

.....



It does not matter if you do not know exactly the answers of these questions. The main objective of doing this activity is reorganizing your initial ideas about the human respiratory system and the relationship with tobacco smoking until now.

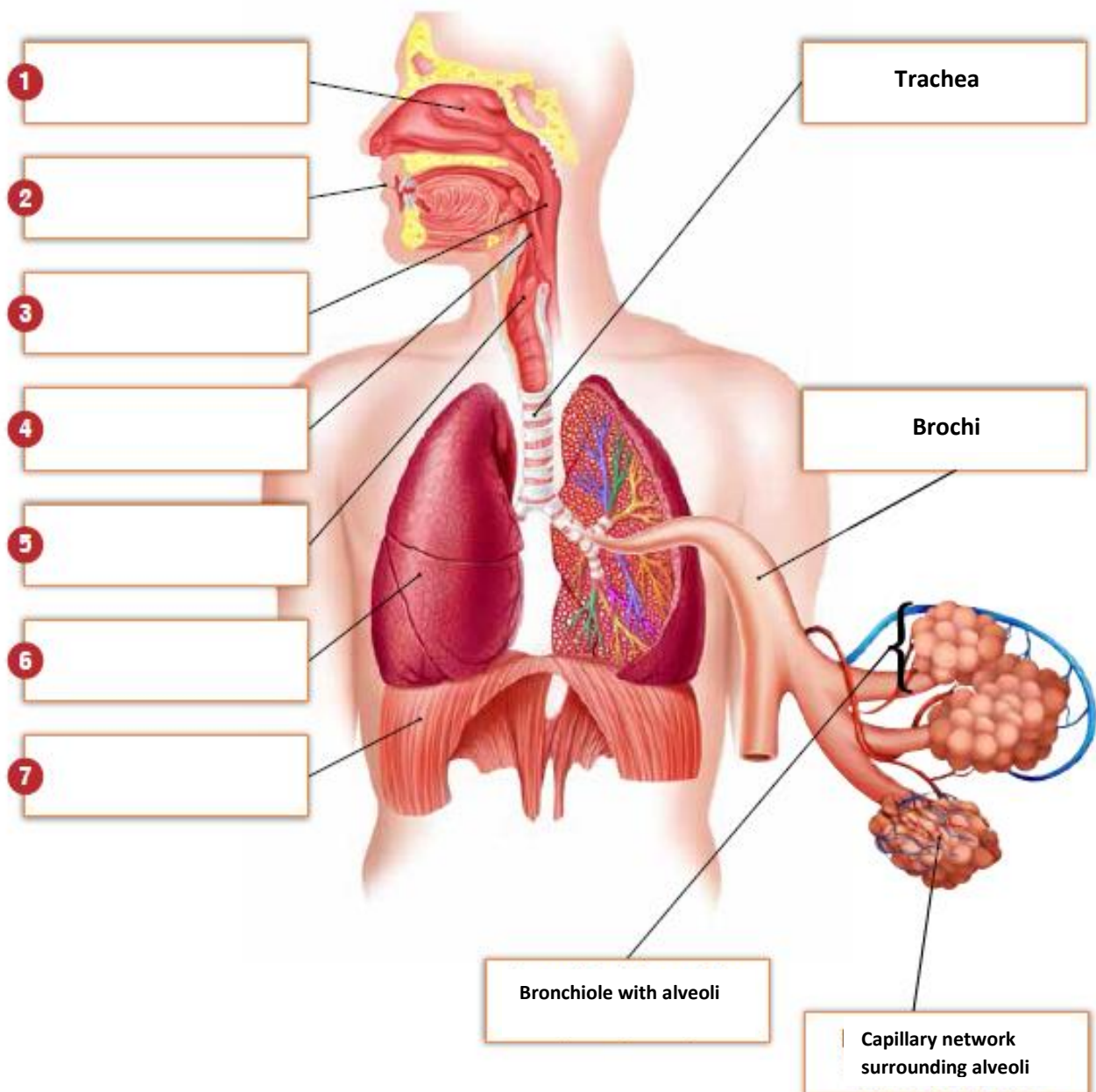
In the next activities 1 & 2 you will learn more about human respiratory system.

Activity 1: Structure and Function of the Human Respiratory System

(Lessons 2 & 3)

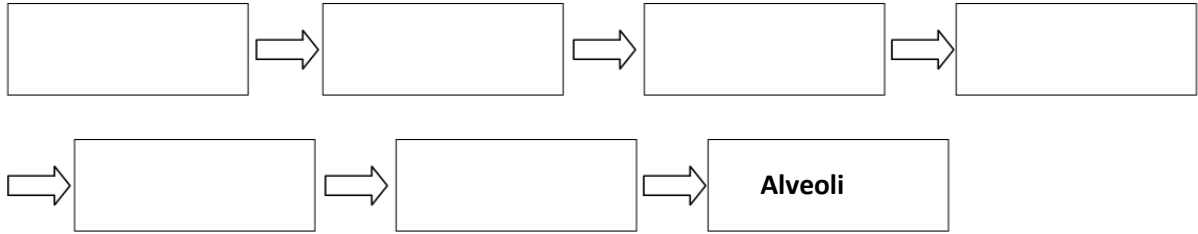
1.1. The diagram below illustrates the organs of the human respiratory system. Watch the video *Human respiratory system* at <https://youtu.be/cL0mP3IfmHE> and then complete a labelled diagram, using the following terms (given in alphabetical order): **diaphragm**, **epiglottis**, **larynx**, **lung**, **nasal cavity**, **mouth**, **pharynx** (Baytelman et al., 2018 in greek).

https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf

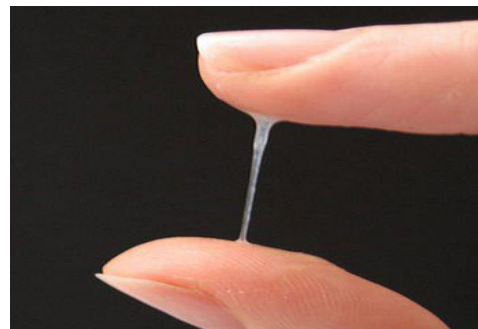
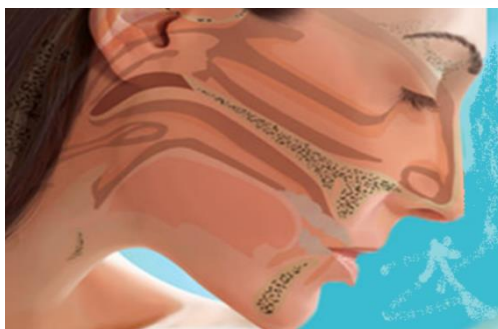
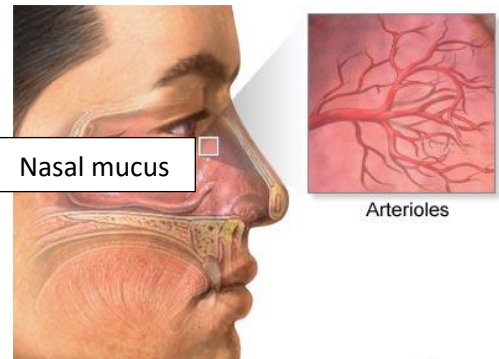


1.2. What is the pathway air follows as it passes through your respiratory system?

Based on the diagram of the human respiratory system above, discuss with your group the pathway air follows as it passes through our respiratory system, and then write it in the following diagram.



1.3. Air enters the respiratory system through the nose or the mouth. If it goes in the nostrils, the air is warmed and humidified. Study the provided images and then try to explain how the nose warms and humidifies the air that is breathed in. Then, explain why nose breathing is more beneficial than mouth breathing. Discuss with your group your answers. Explain your reasoning.



.....

.....

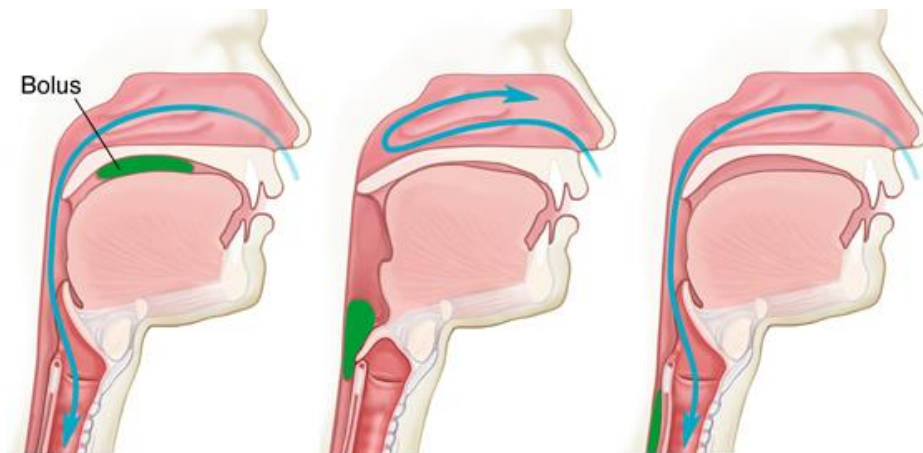
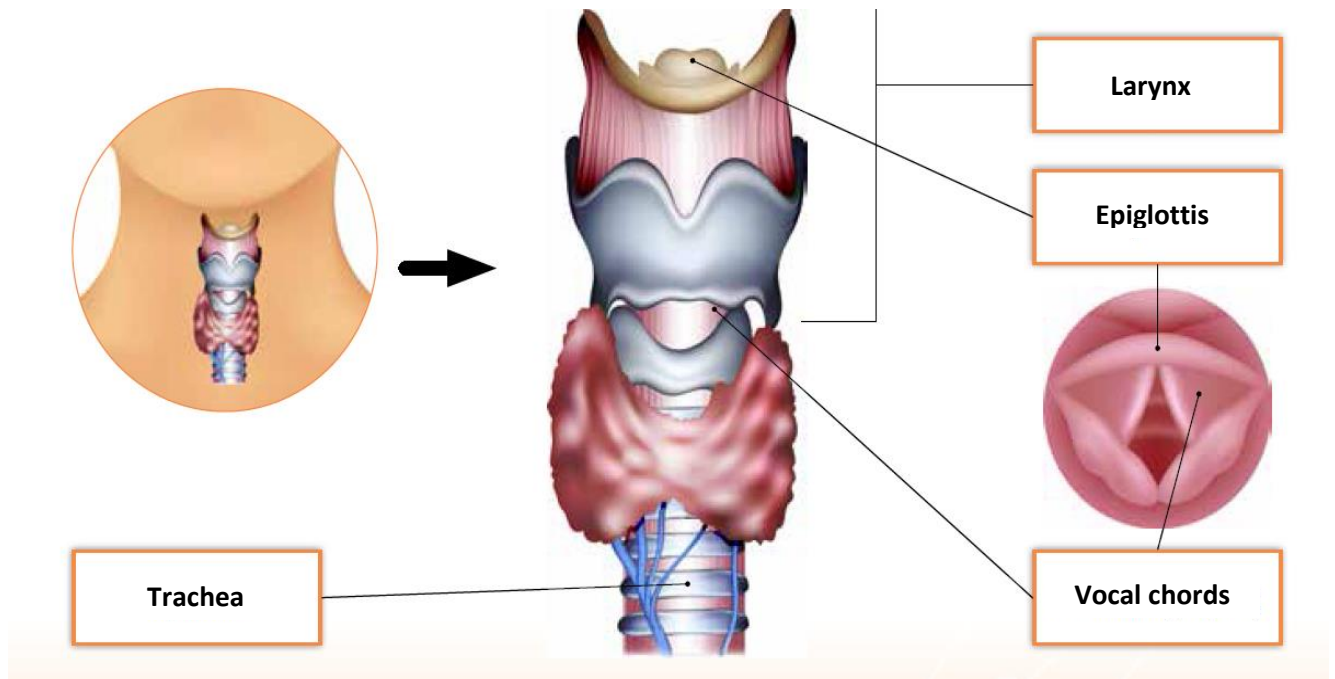
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.....

1.4. Study the provided pictures, and then try to answer the posed questions.

1.4.1 Predict the role of epiglottis in breathing and swallowing?

1.4.2. The larynx plays an essential role in human speech. How do you think larynx affects speech? https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf



Swallowing

1.4.1.....

.....

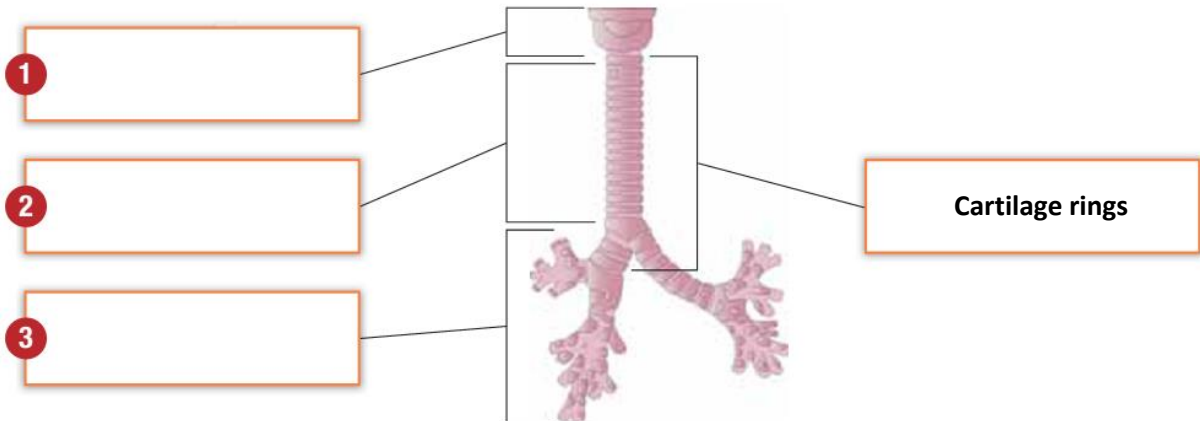
1.4.2.....

.....

.....

1.5. The trachea, or windpipe, is the widest passageway in the respiratory tract. It is about 2.5 cm wide and 10-15 cm long. It is formed by rings of tough cartilage. The back part of each ring is made of muscle and connective tissue. Moist, smooth tissue called mucosa lines the inside of the trachea. The trachea widens and lengthens slightly with each breath in, returning to its resting size with each breath out. Complete a labelled diagram and try to explain, what functions the specific structure of the trachea serves.

Discuss with your group which answers you would give to the question. Explain your reasoning.



1.6. We know that breathing is a complex process of the respiratory system where air travels into and out of the lungs. The table below shows the percentages of gases in inhaled and exhaled air. Let's put a \checkmark in the appropriate box of the table below referring to changes of the composition of exhaled air with respect to the inhaled. Then, try to answer the posed questions:

| Components of atmospheric air | Inhaled air | Exhaled air | Increase | Decrease | No change |
|-------------------------------------|-------------|-------------|----------|----------|-----------|
| Oxygen | 21,00% | 17% | | | |
| Carbon dioxide | 0,03% | 4,03% | | | |
| Nitrogen | 78% | 78% | | | |
| Other gases (vapors, hydrogen etc.) | 0,97% | 0,97% | | | |

Which gas is decreased during the breathing process?

Which gas is increased during the breathing process?

Predict what happens to the part of oxygen that is not exhaled?

.....

Predict why carbone dioxide is increased by exhalation?

.....

Discuss with your group your answers, explaining your reasoning.

1.7. The lungs are the primary organs of the respiratory system in humans. The two lungs together weigh approximately 1.3 kilograms. The surface area of both lungs is roughly the same size as a tennis court and the total length of the airways running through them is 1,500 miles.

Study the provided pictures, complete a labelled diagram of lungs, and try to explain the size of the surface area of the lungs (Baytelman et al., 2018 in greek).

https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf

Human Lungs

1

2

3

4

Alveoli

1.8. Match the organs of the human respiratory system of column 1 and the sentences of column 2 to understand better the structure and function of the human respiratory system.

| No | COLUMN 1 | COLUMN 2 | No |
|-----|---------------------|---|----------|
| 1. | Bronchi | The primary and preferred entrance of outside air into the respiratory system. The walls of the nasal cavity are covered with hair, or cilia. During inspiration, well-vascularized mucous membranes inside the nose release moisture. The cilia trap dust and harmful particles to purify the inhaled air. Nose hair moisturizes and warms the air to the approximate temperature and moisture within the lungs. | A |
| 2. | Bronchiole | The passage that collects outside air from the nose and mouth and moves it down toward the windpipe (trachea). | B |
| 3. | Diaphragm | A strong wall of muscle that, when moved downward, creates suction in the chest that draws in air and expands the lungs. The diaphragm separates the chest cavity from the abdominal cavity. It contracts and flattens when someone inhales. This creates a vacuum effect that pulls air into the lungs. When someone exhales, the diaphragm relaxes, and the air is pushed out of lungs. | C |
| 4. | Epiglottis | Part of human respiratory system. It's a hollow tube that lets air pass from pharynx to trachea on the way to lungs. It also contains and is essential to human speech, so it's often called the voice box. | D |
| 5. | Larynx | They are located in the thoracic cavity of the chest near the backbone and on either side of the heart. They are the pair of large, spongy organs mainly involved in the exchange of gases between the blood and the air. | E |
| 6. | Lungs | A tissue flap at the entrance to the windpipe (trachea) that closes during swallowing, preventing food or drink (destined for the esophagus and stomach) from entering the lower respiratory tract. | F |
| 7. | Nasal cavity | The mouth, also known as the oral cavity, is the secondary external opening for the respiratory tract. Most normal breathing takes place through the nasal cavity, but the oral cavity can be used to supplement or replace the nasal cavity's functions when needed. | G |
| 8. | Oral cavity | When the windpipe (trachea) reaches the lungs, it splits into two main tubes, one to each lung. The tubes divide again into each lobe of the lung, and then continue to divide even further. | H |
| 9. | Trachea, | The smallest subdivision in the bronchial tubes. At the end of the bronchioles are air sacs, called alveoli. | I |
| 10. | Pharynx | A long tube that connects larynx to bronchi. Bronchi send air to lungs. Trachea is a key part of respiratory system. The trachea is made of rings of cartilage. It is lined with cells that produce mucus. | J |

Activity 2: Creating a Model: “How do lungs work?”

(Homework)

Every day we breathe about 22,000 times. Our breath, and our lungs, are incredibly fundamental for human body function. Breathing is a symbol of life.

The following activities will help us to establish a model to interpret how lungs work and particularly breathing in (inhalation) and breathing out (exhalation). Then, we will evaluate the predictive power of our model.

2.1. Before, we try to create a model, we will do an exercise involving inhalation and exhalation:

Breathing exercise

- i. Try to feel breathing in (inhalation) and breathing out (exhalation).
- ii. Place your hands on both sides of your rib cage and take several deep breaths.
- iii. Describe what you felt as you breathed in and out.

.....
.....

- iv. Can you explain what the lungs look like?

.....
.....

- v. How big are the lungs?

.....
.....

- vi. Where are the lungs located?

.....
.....

- vii. When you took several deep breaths the lungs got larger and then smaller, can you explain why?

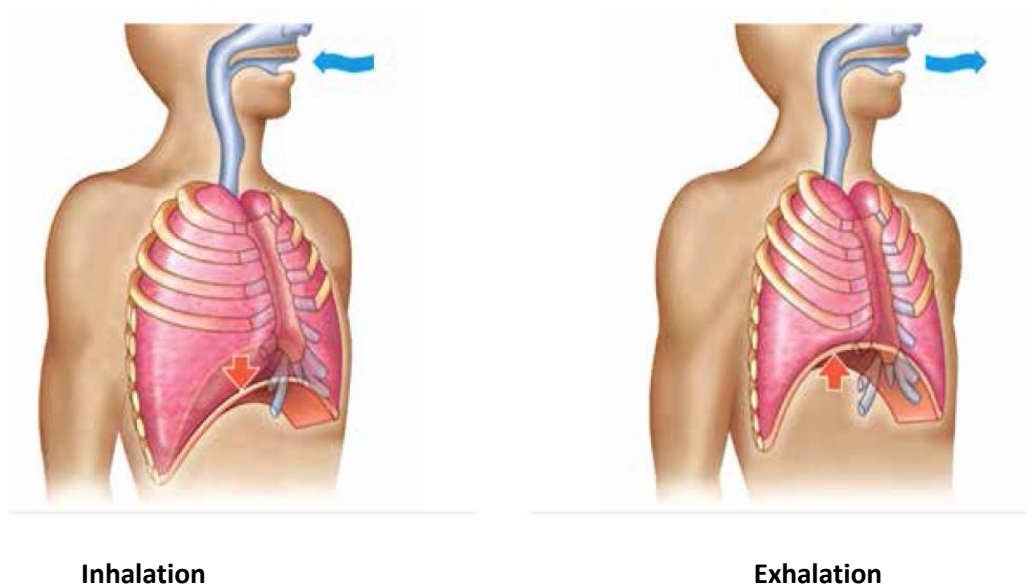
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- viii. What do you conclude from your observations about breathing?

.....
.....

2.2. What is the difference between Inhalation and Exhalation?

According to your observations about breathing, and according to the picture below, complete the following table concerning differences between inhalation and exhalation (Baytelman et al., 2018) https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf



| No | Criteria of comparison | Inhalation | Exhalation |
|----|------------------------|------------|------------|
| 1. | Meaning | | |
| 2. | Process | | |
| 3. | Size of Chest Cavity | | |
| 4. | Role of Diaphragm | | |
| 5. | Volume of Lungs | | |
| 6. | Composition of Air | | |
| 7. | Rib cage movement | | |
| 8. | Air Pressure | | |

2.3. Create a model to explain how lungs work.

What materials would you use to construct your model?

- i. How would you represent the lungs in your model?
.....
- ii. How would you represent a trachea and bronchial tubes (bronchi) in your model?
.....
- iii. How would you represent a diaphragm in your model?
.....
- iv. How would you represent a chest cavity in your model?
.....
- v. Discuss with your group your suggestions and explain your reasoning.

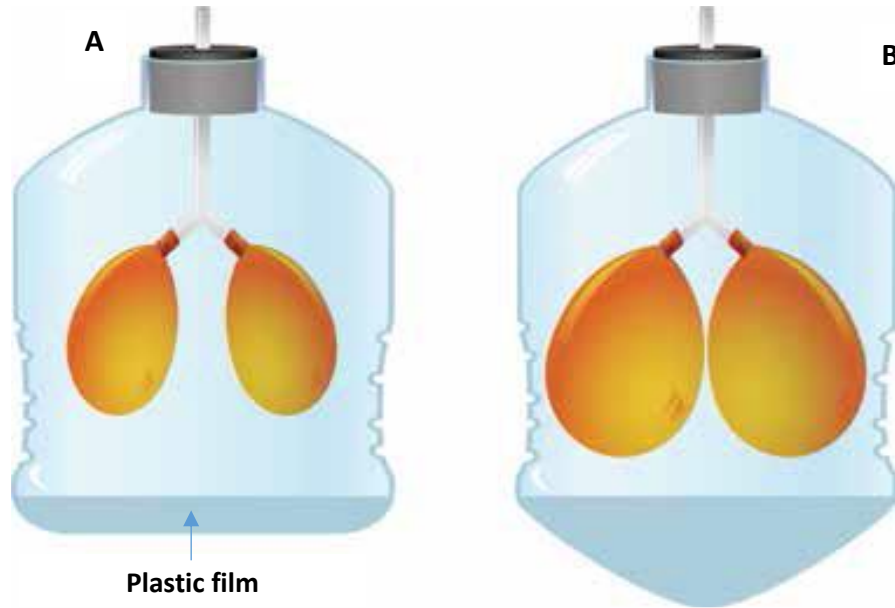
2.4. Discuss with your group how you can use the following materials for the construction of a model to interpret how lungs work and particularly breathing in (inhalation) and breathing out (exhalation). Then, follow the instructions below to construct a model and make observations.

Materials

- Plastic water bottle 1L (cut in half)
- Water balloons (2)
- Small rubber band (2)
- Plastic tube with two outlets
- 15-20 cm balloon or plastic film

Instructions

- i. Put the plastic tube with two outlets in the plastic bottle (See the picture below for reference).
- ii. Put the water balloons onto the end of each tube outlet and secure them with the small elastic.
- iii. Cut the 15-20 cm balloon just where it starts to curve. (See the picture below for reference).
- iv. Have a partner hold the plastic bottle still while you wrap the balloon around the bottom edge of the plastic bottle. Make sure that the balloon is securely around the plastic bottle.
- v. Pull down on the bottom balloon to observe what happens and write your observation.
- vi. Push up to see what happens and write your observation.



2.4. Using your model to interpret how lungs work.

Use your model to explain the mechanism of breathing: Match the parts of your model and the parts of human respiratory system and write down your conclusions.

(a) Matching (https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf)

| No | Parts of Model lung | No | Parts of Human Respiratory System |
|----|--|----|-----------------------------------|
| 1. | Water Balloons | A | chest cavity |
| 2. | Plastic bottle 1L | B | breathing in (inhalation) |
| 3. | 15-20 cm bottom balloon | C | lungs |
| 4. | pull down on the bottom balloon in your model. | D | breathing out (exhalation) |
| 5. | Push up on the bottom balloon in your model. | F | diaphragm |

(b) Conclusions and Limitations of your Model:

From the obtained matching, explain the mechanism of breathing:

.....

Write down limitations of your model:

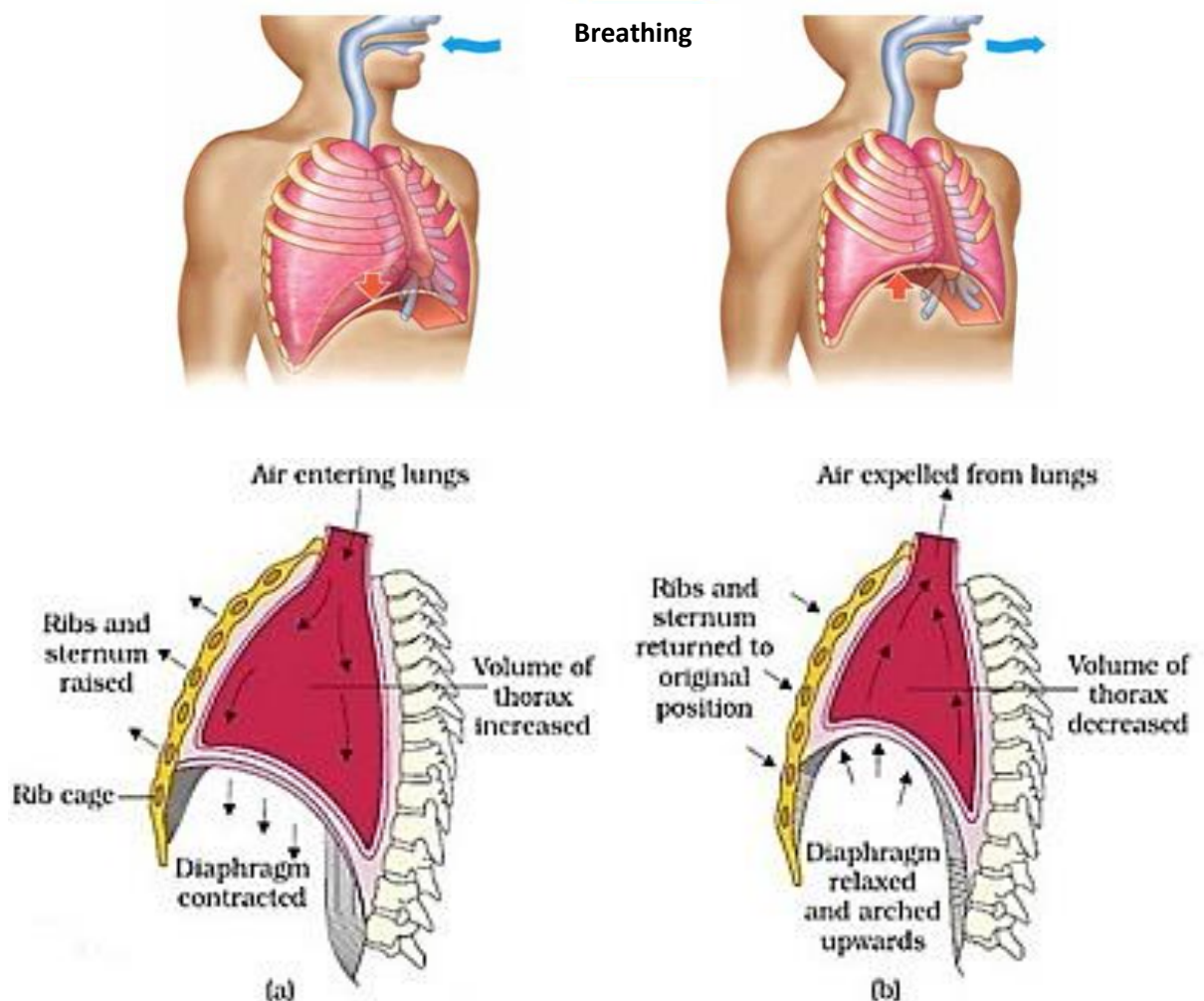
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WHAT DOES SCIENCE TELL US?

Breathing: The action of breathing in and out is due to changes of pressure within the thorax, in comparison with the outside. This action is also known as external respiration. When we inhale the intercostal muscles (between the ribs) and diaphragm contract to expand the chest cavity. The diaphragm flattens and moves downwards, and the intercostal muscles move the rib cage upwards and out.

Inspiration: This increase in size decreases the internal air pressure and so air from the outside (having a higher pressure than that inside the thorax) flows into the lungs to equalise the pressures.

Expiration: When we exhale the diaphragm and intercostal muscles relax and return to their resting positions. This reduces the size of the thoracic cavity, thereby increasing the pressure and forcing air out of the lungs.



Mechanism of Breathing

a. Inspiration

b. Expiration

2.5. Evaluating the predictive power of your model

2.5.1. Models have a representative, interpretive and predictive power. To evaluate the predictive power of your model, investigate the follow questions:

| No | Question | Prediction | Experiment | Observation and Conclusion |
|----|---|------------|---|----------------------------|
| 1. | Having a cold sometimes causes extra mucus to form in the lungs. How does the extra "mucus" affect how much air can be inhaled? | | Add one spoonful of water to the small balloon inside the bottle. Push and pull on the handle and observe what happens. | |
| 2. | (a) How does a dirty air affect breathing? (b) How does tobacco smoking could affect breathing? | | (a) Put some sand in the airway of our model | |
| 3. | How does the size of your lungs affect breathing? | | Put a bigger balloon on our model instead of water balloons? | |

2.5.2. Based on the table above, briefly discuss the similarities and differences between your predictions and your observations.

.....

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.....

.....

.....

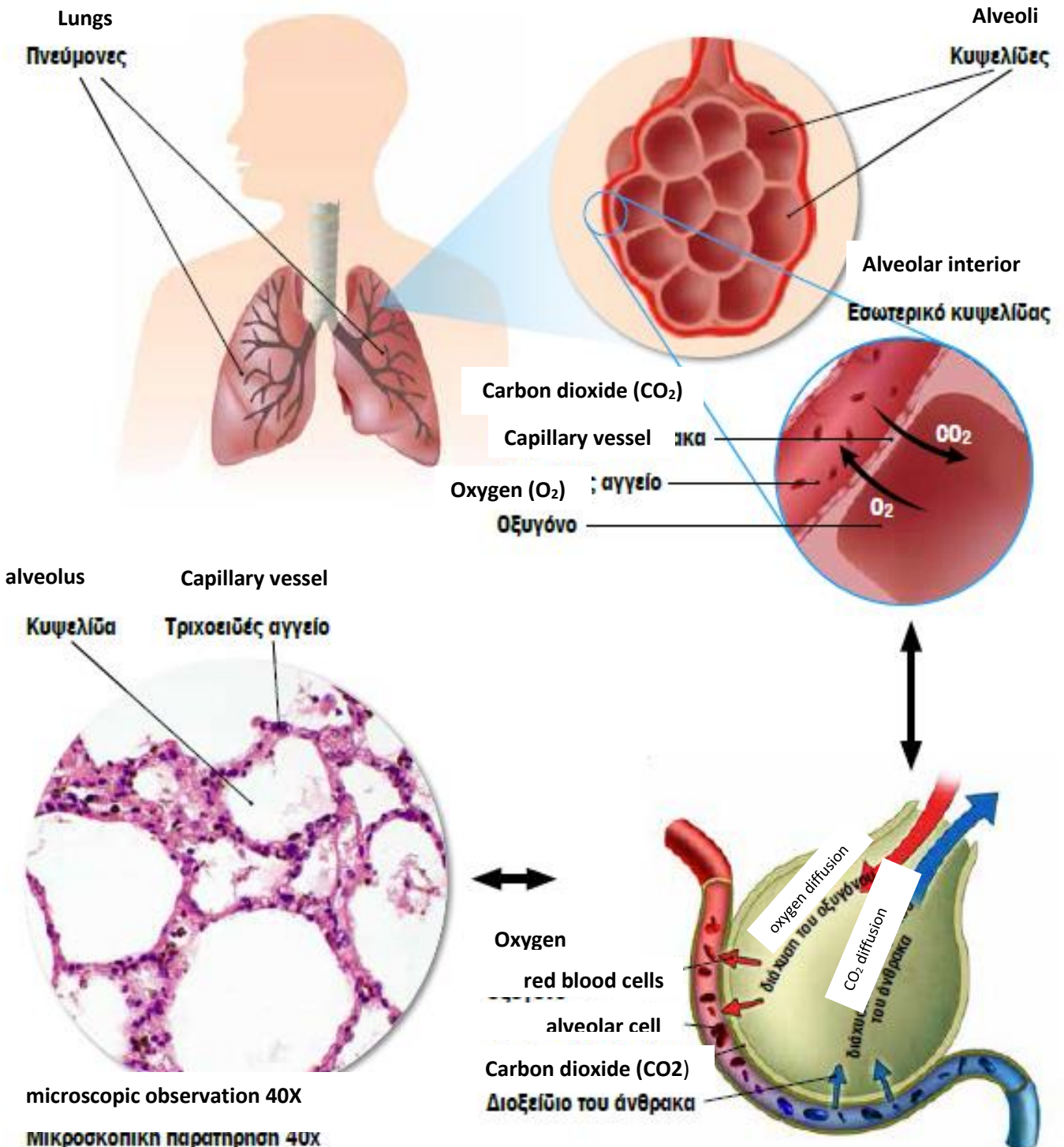
2.5.3. Conclusion

Complete the sentence: The predictive power of our model to interpret how lungs work and particularly breathing in (inhalation) and breathing out (exhalation) is

Activity 3: Gas Exchange and Cellular Respiration (Lessons 4 & 5)

3.1. How does your body use the inhaled oxygen?

3.1.1. Watch the video entitled *How Do Your Lungs Work* at <https://youtu.be/3oYFCQvC-0Q>, observe the following picture and try to answer the posed questions: https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf



WHAT DOES SCIENCE TELL US?

In a process called diffusion, oxygen moves from the alveoli to the blood through the capillaries (tiny blood vessels) lining the alveolar walls. At the same time, carbon dioxide, a waste gas, moves from the blood to the lungs and is exhaled (breathed out). This process, called **gas exchange**.

The walls of the alveoli share a membrane with the capillaries. That's how close they are. This lets oxygen and carbon dioxide diffuse between the respiratory system and the bloodstream. Once in the bloodstream, oxygen gets picked up by the haemoglobin in red blood cells, which travel back to the heart through the pulmonary veins. Then, the heart pumps the blood to the aorta which will distribute the oxygenated blood to all cells of the body.

Body cells use oxygen to transfer energy stored in food to a usable form. This process is called **cellular respiration** and occurs in the mitochondria of the cells.

3.1.2. Watch the video entitled *Gas Exchange in the Lungs* at <https://youtu.be/aPUPfzsqDgs> and then describe, in writing, how the lungs are adapted for gas exchange.

.....

.....

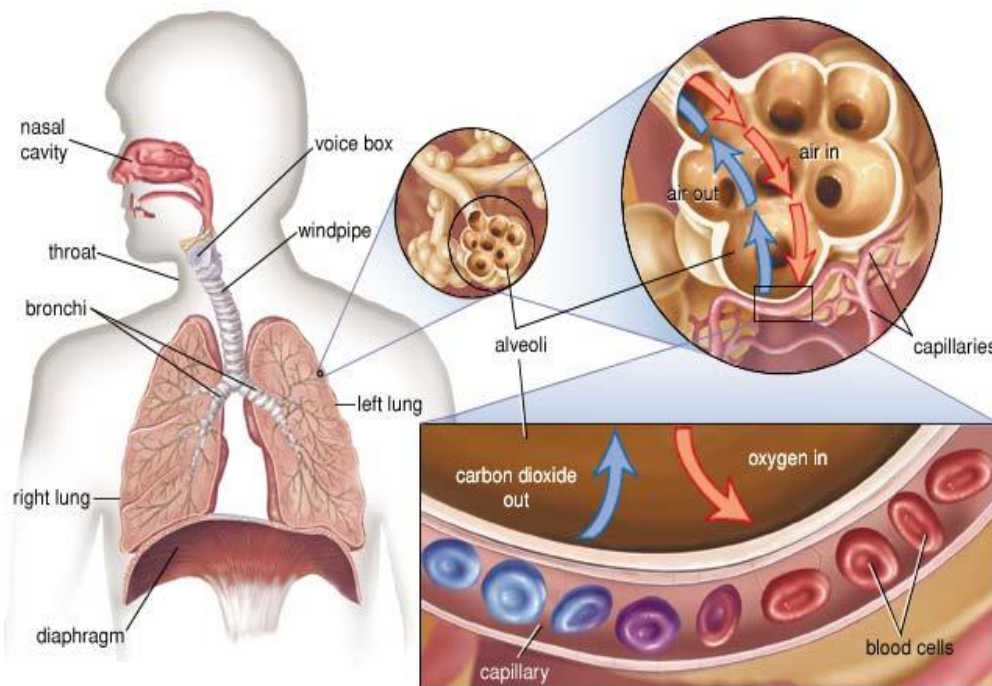
3.1.3. Observe the picture below and explain, in writing.

(a) How does gaseous exchange occur in the alveoli of the lungs?

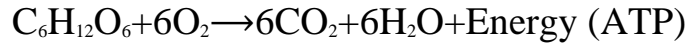
.....

(b) How does gaseous exchange occur in the mitochondria of human cells?

.....



3.1.4. We have learned that cells use oxygen to break down food molecules to get chemical energy for cell functions. This process is called **Cellular Respiration** and occurs in mitochondria. Cellular respiration involves many chemical reactions, but they can all be summed up with the following chemical equation.



(a) What does the equation above show?

.....

.....

.....

(b) Where does the chemical energy in glucose come from?

.....

.....

(c) What type of energy transformation occurs in cellular respiration?

.....

.....

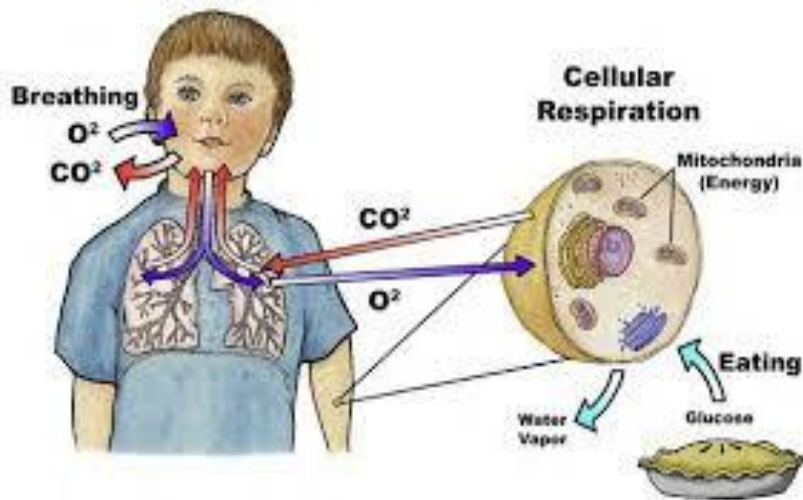
(d) How is breathing related to cellular respiration and how is it different?

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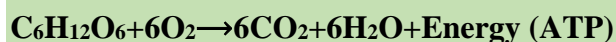
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WHAT DOES SCIENCE TELL US?

Living organisms use oxygen to break down food molecules to get chemical energy for cell functions. This process is called **Cellular Respiration**. Cellular respiration takes place in the cells of animals, plants, and fungi, and in algae and other protists. It is often called **Aerobic Respiration** because the process requires oxygen (the root *aer* comes from the Greek word for “air”).

Cellular respiration or aerobic respiration involves many chemical reactions, but they can all be summed up with the following chemical equation.



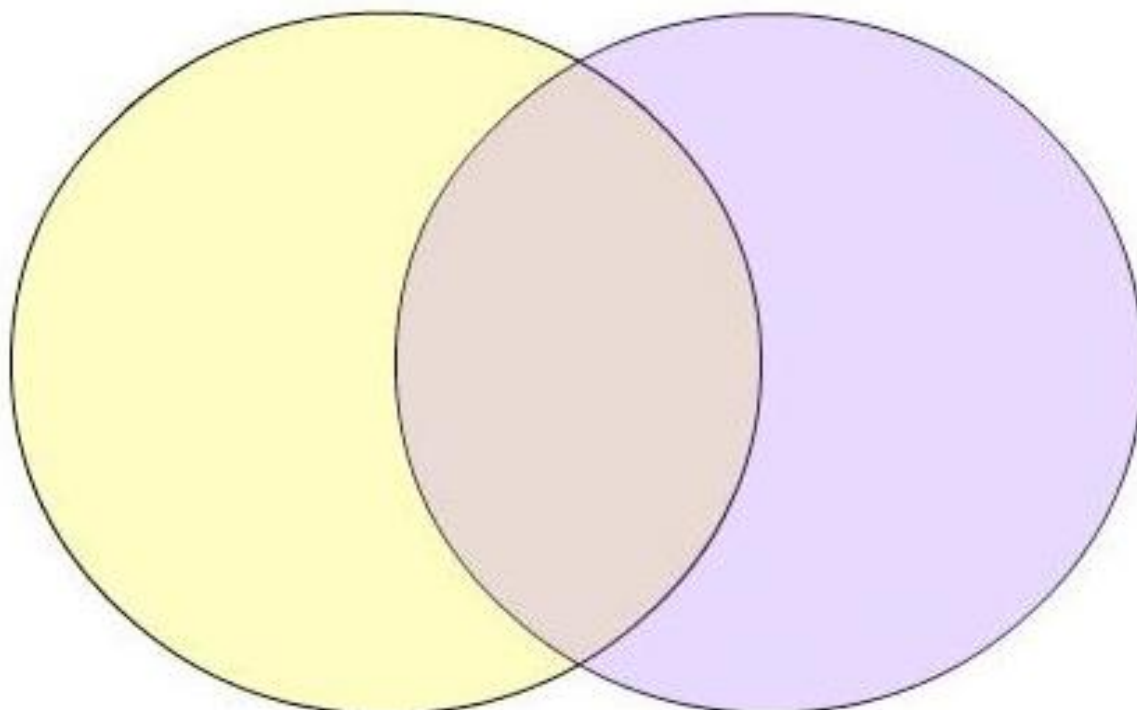
The equation above shows that glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) and oxygen (O_2) react to form carbon dioxide (CO_2) and water H_2O , releasing energy in the process.

In the absence of oxygen, cells can get energy by breaking down food through the process of fermentation, or **Anaerobic Respiration**. Of the two processes, aerobic respiration is more efficient, yielding considerably more energy than that released through fermentation.

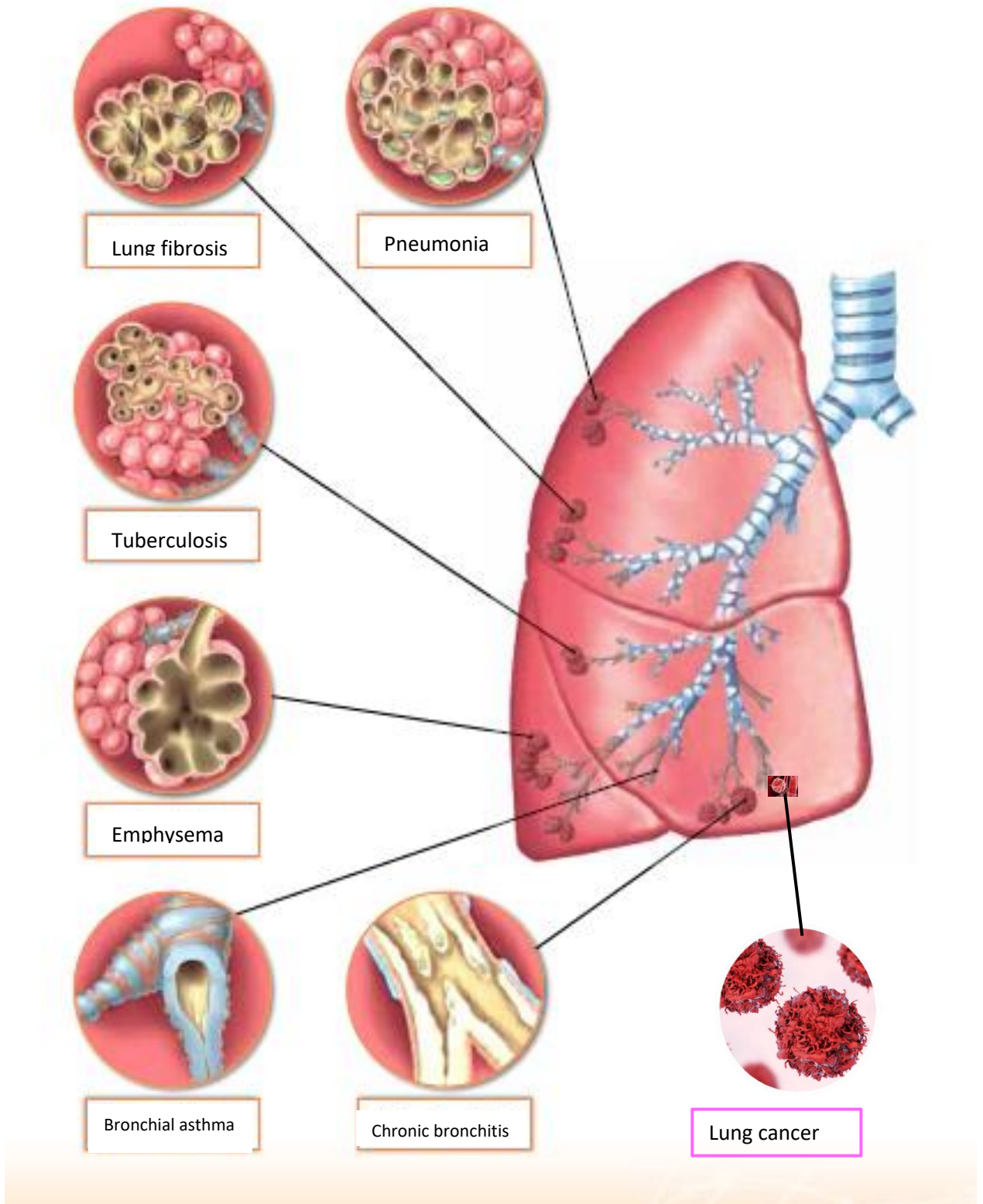
3.2. Watch the video at <https://youtu.be/WsqP1O7388g> concerning Aerobic and Anaerobic Respiration, and then complete the Venn diagram below to show the similarities and differences between aerobic and anaerobic respiration.

Aerobic Respiration




Anaerobic Respiration



3.3. The picture below shows some lung diseases. Let's put a ✓ in the appropriate box with the name of a lung disease referring to a disease could be caused by smoking.
https://archeia.moec.gov.cy/sm/41/viologia_c_gymn.pdf



3.4. The following images show microscopic observations of three (3) different samples of three patients. Describe the microscopic observations as shown in samples 1, 2 and 3.

| A/A | IMAGE | OBSERVATIONS | SAMPLES |
|-----|---|--------------|---|
| 1. |  | | <p>Bronchial Mucosa of a non-smoker (Physiological sample)</p> |
| 2. |  | | <p>Bronchial Mucosa of a person who started smoking</p> |
| 3. |  | | <p>Bronchial Mucosa of a smoker</p> |

How has cigarette smoke affected the mucous layer?

.....

What structures of the lungs are affected by smoking?

.....

3.5. What chemicals are in cigarettes?

Experts say that cigarette smoke contains over 4,000 different compounds. Some of the compounds found in tobacco smoke include:

- Nicotine (the addictive drug that produces the effects in the brain that people are looking for)
- Hydrogen cyanide (was used to kill people in the gas chambers)
- Formaldehyde (is a strong-smelling, colourless gas used in making building materials and many household products)
- Arsenic (is commonly used in rat poison)
- Cadmium (is a toxic heavy metal that is used in batteries)
- Ammonia (commonly used in cleaning products and fertilizers)
- Radioactive elements, such as polonium-210
- Benzene
- Carbon monoxide

Knowing the different chemicals in cigarettes can you predict five (5) health risks of tobacco smoking?

i.....

.....

ii.....

.....

iii:

.....

iv.....

.....

v.:

.....



Activity 4: Biological, social, economic, cultural, and ethical dimensions of tobacco smoking

(Lessons 6 – 9)

4.1. To investigate the socio-scientific issue concerning tobacco smoking, first is very useful to prepare a research plan, which will be your research project in miniature.

Use the information below to prepare your research plan to investigate the socio-scientific issue concerning tobacco smoking.

| No | Components of research plan | Explanations for each part of the research project |
|----|--------------------------------|--|
| 1. | Theoretical Background | The theoretical background section should be straightforward. It consists of a few sentences on what the research is about and why it is happening. The theoretical background also includes a problem statement and the primary research questions you're trying to answer. |
| 2. | Objectives | In this part you will explain the specific aims of your research and what you specifically want to find out through this research process based on your primary research questions and for what reasons. |
| 3. | Participants | You must define the type and number of participants you will rely on to get the insights and data you need. |
| 4. | Methodology | In this section, talk briefly about the chosen data collection instruments and the reasons behind why that method was chosen (e.g., Interviews, Questionnaires, scientific texts, articles, pictures, videos, tables, diagrams, simulations, and scientific measurements), as well as the method of data analysis. |
| 5. | Results and Conclusions | In this section, write the results of your investigation and your conclusions concerning your primary research questions. |
| 6. | Approximate Timeline | It is useful to place an approximate timeline in your research plan. (e.g., Research start date, Data Collection, Analysis, Conclusions, Date of Presentation-Open schooling event). |
| 7 | Form of actions | e.g., Organising a public event for discussion, reflection, presentation of research, exhibition of scientific poster. Promote a public debate, distribute an information brochure, etc. |



Evaluate information and consider the source and author of the information used, the purpose of the publication, potential biases of the author or publisher, evidentiary support for the information, and possible missing information.

4.2. Research question 1: What are the biological, social, economic, cultural, and ethical dimensions of tobacco smoking?

To answer the question concerning the biological, social, economic, cultural, and ethical dimensions of tobacco smoking, you should first read the statements below, focusing on different dimensions of smoking.

Vignette: Kent M.

"I have been smoking since I was 20 years old. I really want to quit smoking, but I just can't stop from picking up another cigarette, the urges are just too great and I still can't resist my first cigarette in the morning. I recently tried to quit with the 21 mg patch, but I don't think I was using it correctly and my urges were just too strong."

Vignette: Marta H.

"I have been clean and sober for three weeks now. I want to try and stop smoking too because I can feel how nicotine is ruining my life like the other drugs did. My counselor and sponsor both say it's too soon for me because I have a lot going on. On the other hand, the cigarettes do help me think clearer and maintain my weight. Well, no matter what, I think I WILL try to quit the cigarettes too. I mean if I can cut the alcohol, I can quit smoking."

How does Tobacco Use Disorder develop?

- Dependence does not indicate a long smoking history
- Withdrawal symptoms occur in new and social smokers
- Concern for adolescence
 - Priming Effect: Adolescent brain is more responsive to nicotine's rewarding effects than adults'
 - May report symptoms and assume they are dependent
 - 80% of smokers have their first cigarette before age 18

Ethnic Differences: Social Influences

- Perception of cigarettes and nicotine dependence & role of tobacco use in cultures
 - American Indian cultures: may associate tobacco with medicinal, religious functions
 - Chinese groups may use tobacco as gifts
- Social marketing influences
 - African Americans, Latinos – have been target of intense industry marketing

Vignette: Jerri S.

"I have been smoking since I was 13 years old when lots of my friends started. We all smoke Newport Lights. My partner doesn't smoke anymore but most of my friends and co-workers still do. Every time I try to quit I get irritable and moody, and I always want to smoke when I see a cigarette. I guess it helps that I cannot smoke at work. I want to be able to quit so that I can save money to go to college."

Role of Built Environment

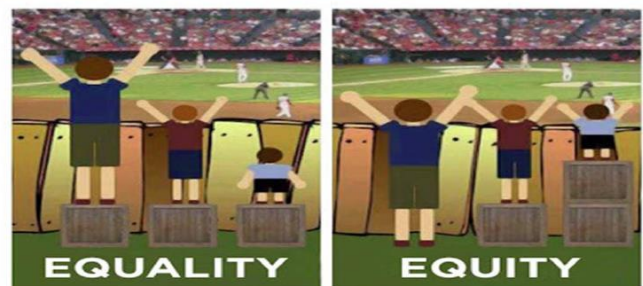
- Absence of Smoke-free Regulations
- Tobacco Marketing
- Tobacco Retailers
 - Are tobacco products nearby?
 - Is the person allowed to smoke anywhere?



Is it easy to find a place to smoke?

Biener L, et al. (2010); Gilpin EA, et al. (1999); Duncan et al., 2014; Yu et al., 2010

Health Equality ≠ Health Equity



↑ Health equity = ↓ Smoking rates among underserved population

Garrett et al., 2015

4.2.1. According to the above statements, write some of the potential factors that prompt people to smoke.

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4.2.2. Formulate some specific questions and hypotheses which should help you to answer the first main question of your investigation: *What are the biological, social, economic, cultural, and ethical dimensions of tobacco smoking?*

Question 1:

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Question 2:

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Question 3:

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Question 4:

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Hypothesis 1:

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Hypothesis 2:

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Hypothesis 3:

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Hypothesis 4:

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4.3. Research question 2: What are the main reasons 9th grade students in our school give for tobacco smoking?

To answer the question concerning the main reasons 9th grade students in school give for tobacco smoking, you should first watch the video entitled Dangers of smoking, at <https://youtu.be/XYL9zCghd8>. Then, read the information below, focusing on World Health Organization (WHO) and Eurostat reports on smoking.

The World Health Organization describes smoking as an

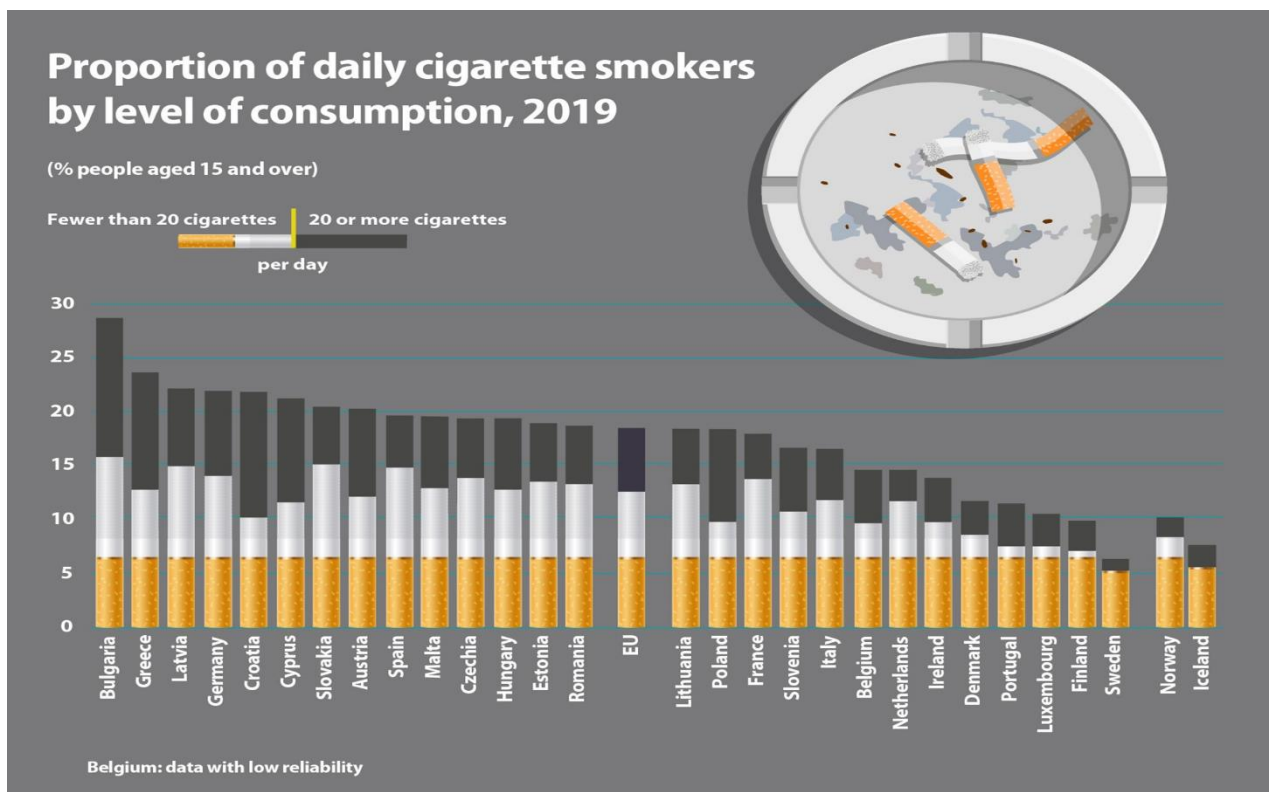
EPIDEMIC

that currently causes nearly **6 million** deaths per year and will lead to **8 million** deaths annually by 2030 if current trends continue

World Health Organization, 2011

Tobacco use is the single most preventable cause of death and disease. Among the WHO regions, **Europe has the highest prevalence of tobacco smoking among adults (28%)** and some of the highest prevalence of tobacco use by adolescents.

WHO / Europe, 2020

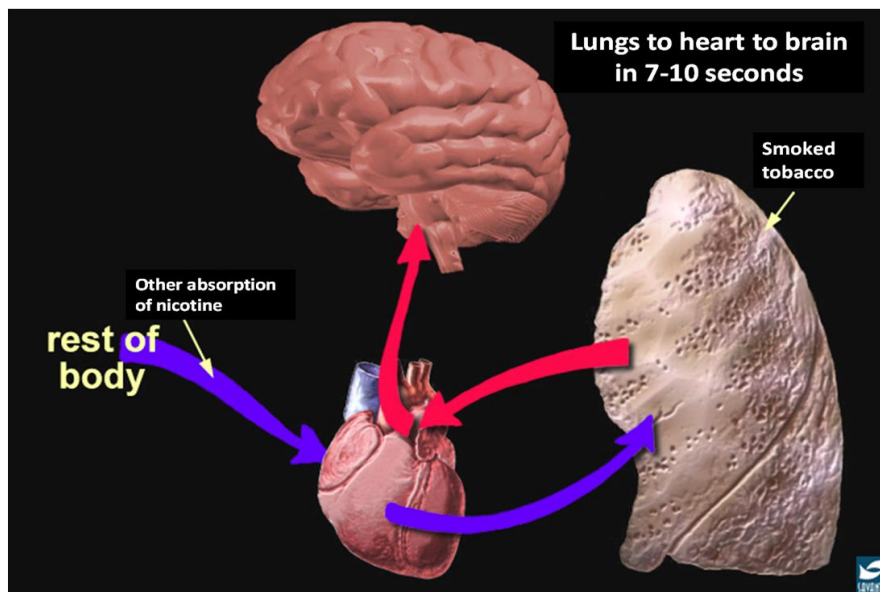


Current Tobacco Smoking in Europe

No room for complacency

| WHO Region | Male prevalence | Female prevalence | Both sexes |
|-----------------------|-----------------|-------------------|------------|
| Europe | 38% | 19% | 28% |
| Western Pacific | 48% | 3% | 26% |
| Eastern Mediterranean | 37% | 3% | 20% |
| America | 22% | 13% | 17% |
| South-East Asia | 32% | 2% | 17% |
| Africa | 25% | 2% | 13% |
| Global | 36% | 7% | 21% |

Source: WHO report on the global tobacco epidemic, 2015: Raising taxes on tobacco.



4.3.1. Young people do not give up smoking even when knowing the biological hazards. Predict the main reasons young people do not give up tobacco smoking?

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4.3.2. Watch a video entitled *Lifestyle and health* at https://youtu.be/H6DrSG_KQjo and then name some questions which you could use to create a questionnaire in order to investigate the main reasons 9th grade students in our school give for tobacco smoking.

Question 1:

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Question 2:

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Question 3:

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Question 4:

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Qualities & some characteristics of a good questionnaire

1. Only relevant questions to the problem under investigation should be added.
2. The questions should be simple, clear, and precise. Its language should be very simple so that informants may easily understand.
3. Questions should be framed with right words. This ensures the validity.
4. Only those questions should be asked which the respondents may reply immediately.
5. Double negatives or more than 1 negative word in question should be avoided – Use of negative word has a psychological effect and can influence the answer.
6. The arrangement of the questions should be such so that no question may slip back. It must involve a logical flow of questions.
7. Precise and simple instructions of filling the questionnaire should be added in the foot note.
8. Every respondent should be ensured that information given by them shall be kept secret.

4.3.3. Discuss with your group about the information and the sources you should use to investigate the main reasons 9th grade students in our school give for tobacco smoking. After searching and evaluating information, discuss with your group the questions you will use to create a questionnaire on Google Forms. Write down your questions.

Investigating the main reasons 9th grade students in our school give for tobacco smoking

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How to create a survey using Google Forms

1. Navigate to <https://docs.google.com/forms/> and click Blank.
2. Name your survey.
3. Tap on Untitled Question and write a question.
4. Click Multiple choice.
5. Select an option for how the question will be answered.
6. Click the side menu icons to add to your survey.

4.3.5. After data collection using your questionnaire, you have to analyse your data, make inferences, synthesize and draw conclusions. Discuss briefly with your group your final conclusions and then write below your main conclusions.

Main reasons 9th grade students in our school give for tobacco smoking

Conclusions

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4.3.6. Based on your investigation and your conclusions, make suggestions for tackling tobacco smoking.

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4.4 Research question 3: What are the main reasons people of the local community where you live give for tobacco smoking among students in our school?

To answer the third research question of your survey, follow the same procedure as for the second research question. That is, collect data using a questionnaire, analyze data, and draw results and conclusions. Write your results and conclusions in the boxes below.

Main reasons parents of the local community where you live give for tobacco smoking among students in our school.

Results

Conclusions

5. Public Event (Open Schooling Event)

5.1. The final activity of this module is the organisation of a public event entitled: *The multiple dimensions of tobacco smoking*.

Based on your research create a **scientific presentation** and **poster** in power point to present in open schooling event. Your poster could be printed and be displayed in a prominent place in our school. The poster will be entitled: *The multiple dimensions of tobacco smoking, and suggestions for tackling tobacco smoking*.

For open schooling event it would be useful to create an **informative flyer** (brochure) promoting non-smoking.

Designing, organizing, and holding a public event (students, teachers, parents, social partners of the local community) is an opportunity for you to present your research project, communicate your knowledge, thoughts and views concerning tobacco smoking and public health. In addition, you will have the opportunity to discuss and debate with the participants the health risks of tobacco smoking and promote a non-smoking.



Rembert the design elements that make up a scientific poster

1. Title and authors' names
2. Text: Posters typically employ around 800 words (and no more than 1000 words) of text. Your text **MUST** be organized into sections and labelled with appropriate section headings so that readers can easily navigate the contents of your poster. The text should clearly describe the objective of your study, the research questions, the methodology used, the results obtained, and any conclusions based on the results presented.
3. Graphics: Graphics must appear in context with the main text. When choosing graphics, always choose high-resolution images (300 dpi or higher), and make sure that these images are large enough such that a person standing one meter away can see them.
4. White space: In general, 30% of your poster should consist of white space, 40% should consist of your title and text, and 30% should consist of graphic images.
5. Add references.
6. Add colour to your poster to define the different sections of your poster.

5.2. To create an **informative flyer** for the public event, you should take in consideration the following:

- Must be appealing and interesting.
- Must include scientific information from valid and accurate resources.
- Must contain ways for addressing the problem.
- Must be understandable and accessible to all ages and people from all socio-economic groups and educational level.

5.3. Prepare and write down the agenda for the public event (students, teachers, parents, social partners of the local community) on the topic: *The multiple dimensions of tobacco smoking, and suggestions for tackling tobacco smoking.*

Agenda

5.4. Prepare and write down the invitation for the public event (students, teachers, parents, social partners of the local community) on the topic: *The multiple dimensions of tobacco smoking, and suggestions for tackling tobacco smoking.*

Invitation

Holding an open schooling event (students, teachers, parents, social partners of the local community) on the topic: *The multiple dimensions of tobacco smoking, and suggestions for tackling tobacco smoking.*

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