



## ***The human body- the lungs and the respiratory system – VEGA Teaching Scenario***

**Topic:** To understand how the respiratory system functions and how the lungs work together with the diaphragm. To understand the importance of taking good care of the lungs and maintaining a good physical condition.

**Subject(s):** Biology/Social studies/health education/English

**Age / Grade:** 11+ / grade 5+

**Short description of the VR game in this scenario:**

- [Share Care YOU](#) is a real-time simulation of the human body that allows anyone to freely navigate and explore an anatomically accurate, 3D model of the human body, its organs, and their natural function. Customize physiology and simulate disease. Personalizes the human body to represent YOU. Sharecare YOU is an immersive, photorealistic simulation of the human body, enabling anyone to explore its astonishing details in 360 degrees. Travel inside systems and organs, dissect them, visualize their natural and disease states, and even personalize the human body to be a virtual YOU!

## **Introduction to the scenario**

In this scenario students learn how the respiratory system and the lungs functions and how the diaphragm works to enable it all. The students will learn to reflect on what they already know about the subject and set up goals for what they want to learn. In this way they will start feeling responsible for their own learning and stay motivated throughout the assignment. They will also see the connection between good healthy habits, clean air and healthy lungs. By using Share Care YOU app and Human body app from Tinybop the students will get a possibility to gain a visual perception of how everything is working together and they will be able to stay motivated. This assignment can easily be adjusted to all students.

## **Learning outcomes:**

The students are able to:

- to reflect on what they already know about their lungs and the respiratory system and set up goals for what they will know when the assignment is finished
- to understand how the respiratory system and the lungs work together
- to see the connection between cause and effect, to see the connection between a healthy lifestyle and a good lung capacity
- to gain an increased sense of responsibility towards the sustaining of a clean environmentally friendly environment as the student understand how it will affect their lungs
- name important concepts and parts in the respiratory system in both Swedish and English
- present their learned knowledge in a clear way in digital mind maps (Simple Mind) and in Google documents with included hyperlinks to educational videos and photos together with hand-drawn illustrations (scanned and included in the documents)

## **A selection of learning outcomes from the Finnish Curriculum**

- M1 arouse and maintain the student's interest in the environment and the teaching of environmental science and help the student to realize that all subject areas in environmental science are important for him
- M2 guide and encourage the student to set goals for their studies and to work long-term to achieve them and to analyze their knowledge in environmental science
- M3 support the student to develop environmental awareness and to act and influence in their immediate environment and in different contexts to promote sustainable development and to appreciate the importance of sustainable development for themselves and the world
- M4 encourage the student to formulate questions on different subject areas and to use them as a starting point for investigations and other activities
- M5 help the student to plan and carry out small investigations, make observations and measurements in diverse learning environments with the help of different senses and investigation and measurement tools
- M6 help the student to see the connection between cause and effect, draw conclusions based on the results and per center their results and research in different ways
- M13 guide the student to understand, use and create different models with the help of which one can interpret and explain man, the environment and related phenomena
- M15 guide the student to investigate nature , identify organisms and habitats, think ecologically and help the student to understand human structure, life functions and development
- M19 guide the student to understand the areas of health, the importance of healthy habits and the course of life, the individual growth and development in childhood and adolescence and encourage the student to practice and apply their knowledge on health in everyday life

## **Formative assessment**

**Number of students: Duration (estimated time/number of lessons):**

- 20 students (4 students/group)
- 6 lessons á 45 min

**Prerequisites (necessary materials and online resources):**

- Computers with internet connection and Share Care YOU demo version downloaded on a STEAM account
- [Human body app](#) from Tinybop downloaded on I pads
- VR glasses with the application installed on a gaming computer (Valve Index, Oculus Rift or some other VR Goggles connected to STEAM)
- Check that the internet is working
- Information about the topic to mediate to the students (videos, pictures, Educational tools etc.)

**Before the program begins (preparatory work for teacher):**

- Search and collect information and material about the topic
- get properly acquainted with the VR app Share care YOU and the demo version on computer
- Watch the video [Share Care YOU demo](#), [Share Care YOU 3D VR](#) and [The work of the Diaphragm](#) (change the playback speed to 0,75)
- Watch the video about how the Human body app from [Tinybop](#) works. Try it yourself on the Ipad.
- prepare a [glossary](#) with important terms as the app is only in English

- Prepare and collect all things needed for the scenario
- Learn how basic functions work and how you use the controllers (make a manual for the controllers if the students haven't used them before)
- Create an assignment in Google classroom with project description and goals (the same task for three lessons)

All material the students need is included in the assignment

- Divide students into groups of maximum four /book one Ipad/student

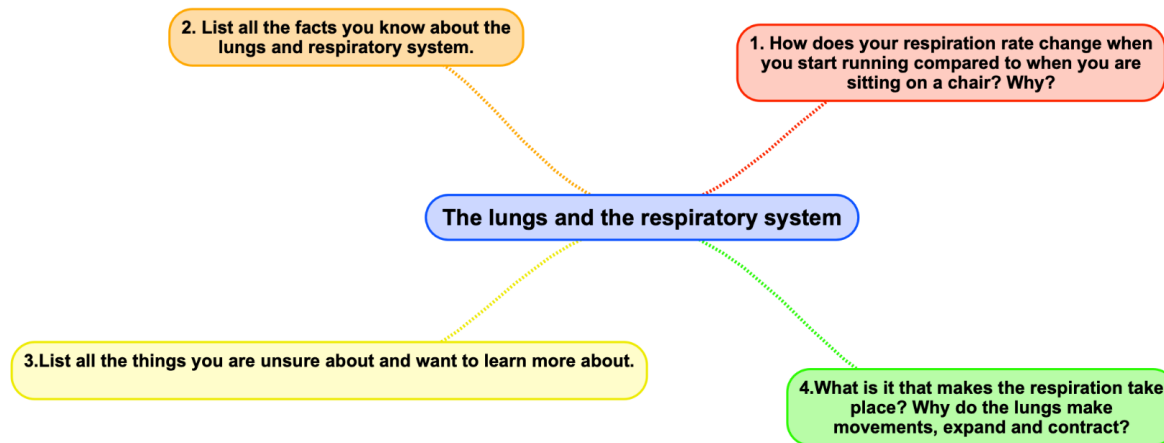
**NOTE! Before use, check if any of your students are sensitive to blood. The experience can be intense and there may be a risk of fainting if the student is sensitive. Recommended to use SharecareYou in a sitting position.**

**The main part of the scenario (number of lessons):**

**Part one (one lesson 1 x 45 min)**

**Lesson 1**

- The teacher divides the students into groups and every student gets an Ipad and log in on their Classroom account where they find their assignment and the template for a digital mind map in Simple Mind
- Teacher presents and explains the assignment to the students by starting with this question:



**1. How does your respiration rate change when you start running compared to when you are sitting on a chair? Why? The teacher encourages the students to carry out small investigations by making observations while sitting and running on the spot.**

- The groups start discussing, testing and trying to come up with answers as the teacher walks around. The teacher sums up all answers. The students take notes in their own digital mind map (or if the teacher prefer in their analog notebooks)
- The students start **listing all the facts they think they know about the lungs and respiratory system** in the digital Mind Map (Simple Mind) Assignment 1 in Google Classroom
- Then they **list all the things they are unsure about and want to learn more about** In the same assignment they need to answer this important question:

### **What is it that makes the respiration take place? Why do the lungs make movements, expand and contract?**

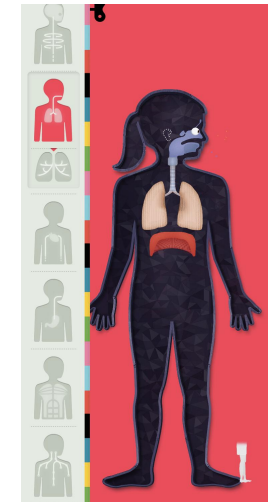
- The teacher summarizes students' thoughts on the white board
- The teacher shows this [video](#) (45 s in the video) that shows how the diaphragm works. Let the students watch it a couple of times and ask them what they see and have observed.
- Then it is time to summarize the knowledge the students have gained by taking notes and drawing pictures in their digital mind maps

**When you breathe in, or inhale, your diaphragm contracts and moves downward. This increases the space in your chest cavity, and your lungs expand into it. The muscles between your ribs also help enlarge the chest cavity. They contract to pull your rib cage both upward and outward when you inhale.**

- The teacher introduces the Human body app from Tinybop to the students and they can play with it for the rest of the lesson while they finish their digital mind maps.

### **Debrief with students in the end of the first lesson**

- What did you learn today that you didn't know before?



- Are you ready to travel into the human body with VR Goggles next lesson?
- How does the cooperation in your group work?

**Home assignment (that is included in Google Classroom assignment):**

- Watch [this](#) video at home and practice the words in [this](#) Glossary





# The human body- the lungs and the respiratory system - Assignment 1

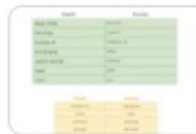


- **Open Simple Mind and create a new mind map with the title: The lungs and the respiratory system**
- **Write down every question and answer them according to your teacher's instructions**

1. How does your respiration rate change when you start running compared to when you are sitting on a chair? Why?
2. List all the facts you think you know about the lungs and respiratory system.
3. List all the things you are unsure about and want to learn more about
4. What is it that makes the respiration take place? Why do the lungs make movements, expand and contract?

Home assignment:

- Watch the video YOU by Sharecare and practice the words in [the Glossary](#). Next time we will experience the app with 3D Goggles!



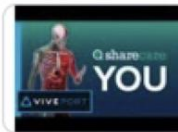
**Glossary Share Care YOU**  
Google Dokument



**The Human Body by Tinybop**  
YouTube-video 0 minuter



**Mind map example**  
Google Teckningar



**YOU by Sharecare | Sharecare**  
YouTube-video 0 minuter

## **Part two (two lessons 2 x 45min)**

**Questions that need to be answered after these two lessons (in their mind maps):**

- 1. What are the main tasks for the lungs and the respiratory system?**
- 2. Which are the main parts in the lungs and the respiratory system?**
- 3. What outer circumstances can affect the respiratory system in a bad way?**
- 4. What can you do to improve your respiratory system and keep your lungs vital and healthy?**

### **Teacher preparation:**

- Bring the VR glasses and check that they are charged
- Cast the VR Glasses to a computer and the projector
- check that the demo version of Share Care you works on at least on computer/group even better two computers/group
- book the Ipads, one Ipad/student (if you are not making digital mind maps the students can draw mind maps in their notebooks)

## **Lesson 2 & 3**

**The main idea is: one group at a time works with the Goggles and the others work with the demo app and Google**

**Classroom tasks (digital mind maps answering questions, drawing pictures of the respiratory system, practising the English words)**

- Introduce VR glasses to one group at a time while the other groups are working with the demo app on computers
- Students get to know how the glasses and controllers work
- The teacher can demo while the students watch on the screen (cast the Goggles to a screen)
- When the students have an idea about how the basic functions work they start exploring the lungs and the respiratory system, in turns. When one student explores, the others follow the work on the computer and try to answer the questions that need to be answered
- While working they will figure out a lot of functions and the teacher guides them while working. When everyone in the group has finished exploring the app (15-20 minutes) the students document learned aspects in their mind maps.
- Then it is time for the next group to try the app.

## **Debrief with students after lesson three and four**

- How is the assignment going?
- How does cooperation work?
- Do you have questions about functions or problems with Share care YOU?

### **Part three (two lesson a 45 min)**

#### **Teacher preparation:**

- Have access to network, computer and projector for students' presentations
- Be prepared with a tick list to evaluate students' assignments. (Teacher evaluate: Student's participation and cooperation skills, Prepare an evaluation survey for the students in Google Forms.

### **Lesson 4 and 5 (2x 45 min)**

#### **Lesson 4**

**The main goal is that the students in their groups verbally practice describing what they have learned based on their mind maps. They also prepare questions to ask the rest of the class. Meanwhile one group at a time uses Sharecare You with Goggles and investigate how a healthy lung looks and function compared to a astmathic lung. They also have the time to explore other organs and systems to make them curious and eager to learn more about the human body.**

## **Lesson 5 (45 min)**

**The main goal is that the students in groups verbally teach the rest of the class what they learned. By repeating the same facts it will make all students remember and understand the content better.**

- The students make a verbal presentation together with one of the group members' mindmap (they can draw lots for who to choose) to the rest of the class
- every group does the same
- When all groups have finished their presentations the students evaluate the assignment, their mind maps, their work and group cooperation in the evaluation survey in Google Forms. The teacher can also ask some specific questions in the evaluation that show how much the students have learned about the topic. The evaluation survey is included in the assignment.

**The presentation must state:**

- answers to all the questions in the assignment
- a personal reflection about what they think of their lungs now compared to before the assignment
- their personal reflection on the app Share Care YOU

**Summative assessment:**

Grades 5-10	5	6	7	8	9	10
Activity and engagement	The student has had challenges to get the task finished. The student hasn't shown signs of engagement neither at school nor at home.	The student has only occasionally shown interest in the work and has had difficulty finding motivation.	The student has mostly shown interest in the work both at home and at school.	The student has shown interest and commitment to the work both at home and at school.	The student has shown great interest and commitment both in lessons and at home.	The student has shown great interest, responsibility and commitment both in lessons and at home.
The overall picture of the work when completed.	The student misses several parts of his work and several points are not checked in the list.	The student lacks several parts of the checklist in his work.	The student lacks certain parts of the checklist, but it is largely complete.	The student has done all the parts on the checklist.	The student has done all the parts on the checklist and you can see that the student has made an effort to include all the parts.	The student has done every single part on the checklist and it can be seen that the student has processed the content.

<p>The mindmap: Text structure, spelling and layout of text.</p>	<p>The mind map lacks important parts and lacks headings. The student uses a limited number of words and the variation is poor. The student needs a lot of support to complete the task in view of the digital skills required. The task is full of spelling and language errors.</p>	<p>The student has challenges with the content in the mindmap and lacks headings. The student uses a limited number of words and the variation is not great. The student needs support to complete the task in view of the digital skills required. The task is full of spelling and language errors.</p>	<p>The student's mind map includes the basic things but lacks some important facts . In most places, the student has a heading where the task so requires. The student has certain shortcomings in the digital skills that the task requires. The student has several places of negligence and not corrected spelling errors.</p>	<p>The student's mind map includes the most important things. The student uses headings and can reflect on his word choices. The student has the digital skills that school work requires, knows the standards for basic spelling and the structures of written language and can use them in text production.</p>	<p>The content of the mind map is complete. The student has creative headings and can reflect on their word choices in many ways. The student has the digital skills that the task requires. The student knows the norms of basic spelling and the structures of written language and can use them in a versatile way in their mind map.</p>	<p>The mind map has all the content that is requested and is structured in a way that shows that the student masters the subject. The text is put together in a versatile way. The student uses a versatile language and varies his words. The student knows the norms of basic spelling and the structures of written language and can use them in a versatile way in text production.</p>
<p>Images and captions</p>	<p>The student lacks pictures.</p>	<p>The student has few pictures and no captions.</p>	<p>The student has pictures but no captions.</p>	<p>The student has pictures with accompanying text.</p>	<p>The student has several pictures and descriptive captions.</p>	<p>The student has versatile pictures and descriptive and explanatory text.</p>

<p>Showing responsibility for the completion of the work. Cooperation and peer response</p>	<p>The student had difficulty cooperating with his group and did not listen to his classmates. The student did not give a peer response and did not take into account what the group gave in response.</p>	<p>The student had some difficulties in cooperating with his group and listening to his classmates. The student gave peer feedback without following the instructions. The student did not take into account the response given by the group.</p>	<p>The student mostly cooperated well with his group. The student received and gave feedback from his group almost always according to the instructions. The response was mostly constructive.</p>	<p>The student showed responsibility and mostly a good ability for cooperation. The student received and gave feedback from his group. The response was constructive.</p>	<p>The student showed evidence of good responsibility and a good ability for cooperation. The student gave a versatile response and took the response he / she received from his / her group into account.</p>	<p>The student showed evidence of excellent responsibility and an excellent ability for cooperation. The student made an effort to formulate himself in a constructive and valuable way for the task in order to help his group further in his work. The student received a response from his group and took it into account in his own work.</p>
<p>Skills</p>	<p>The student shows obvious shortcomings in the understanding of the subject.</p>	<p>The student shows some shortcomings in the understanding of the subject.</p>	<p>The student shows evidence of a certain understanding and some learned knowledge of the subject. .</p>	<p>The student shows evidence of a good understanding and has assimilated the most important content in the subject.</p>	<p>The student shows of an excellent understanding and has assimilated the most important content in the subject but lacks some knowledge.</p>	<p>The student shows evidence of an excellent understanding and fully masters the content.</p>



Language learning/English	The student has big difficulties in learning the English words.	The student struggles with and has some challenges with the English words.	The student knows the most important concepts and words in English.	The student shows evidence of understanding most parts In English.	The student has a good understanding and has learned most of the concepts and knows all the words in English.	The student masters all concepts and words in English.
The VR part and the app use	The student presents obvious difficulties in understanding how Sharecare YOU and the Human Body app work. Shows a lack of interest and is careless in the use of equipment needed.	The student presents some difficulties in understanding how Sharecare YOU and the Human Body app work. Trying to do according to the instructions, but can not keep the interest up all the time. The student is sometimes careless in the use of equipment needed.	The student understands the main features of how Sharecare YOU and the Human Body app work. Mostly follows the instructions, but sometimes lacks perseverance. Is usually careful with the equipment.	The student shows a good understanding of how Sharecare YOU and the Human Body app work. The student always follows the teacher's instructions and is careful with equipment.	The student shows an excellent understanding of how Sharecare YOU and the Human Body app work. Always follow the teacher's instructions and is very careful with the equipment.	The student masters the use of Sharecare YOU and the Human Body app. Always follow the teacher's instructions and help their classmates. Always be careful with technology.

