



MSTEM

LESSON PLAN: HUMAN ANATOMY

METaverse-BASED STEM EDUCATION FOR A
SUSTAINABLE AND RESILIENT FUTURE

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Purpose of the lesson

The aim of this class is to help our students understand the complex phenomenon of digestion, through knowledge of the anatomy and physiology of the digestive system.

In addition, concepts such as the different types of nutrients will be reviewed and the requirements of a balanced diet will be taken into account.

Description of the lesson

Students will learn about the anatomy and physiology of the digestive system through the journey of a bite of a ham and tomato sandwich, with an emphasis on the parts where digestion of different nutrients occurs.

Lesson teaching method

- **Learning based on thinking:**

The main thing is to teach how to work with and make the most of the information received. It teaches to contextualise, relate, analyse, put in common, argue... You teach, therefore, to think.

- **Virtual and augmented reality in training**

Virtual reality (VR) and augmented reality (AR) offer immersive environments that facilitate more dynamic and engaging learning.

Simulations created through virtual reality provide learners with the opportunity to experience practical situations in a safe environment.

- **Flipped classroom**

Students will work at home on the parts of the digestive system to acquire the necessary basis for understanding the physiology of the digestive system, and to be able to spend more time on the practical side

- **Cooperative learning**

Improves attention, increases involvement and enhances knowledge acquisition. Each member has an assigned role and specific functions to be achieved successfully. Interacting and working in coordination is essential to achieve the common goal.



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Lesson objectives

By the end of this lesson, students will be able to:

- Know the anatomy of the digestive system.
- Know how the process of digestion works, differentiating between what happens in each of the parts.
- Differentiate between mechanical and chemical digestion, and know where the digestion of each of the nutrients occurs.
- Recognise pseudoscientific hoaxes related to food, and be able to 'debunk' them using reliable sources of information.

Lesson plan

1.- Introduction (less than 5 min):

- Engage students by telling them that in this part of the syllabus we are going to poop.

2.- Main lesson: (35-40 min)

- The digestive process: Explanation of the physiology of the digestive system, using a bite of our ham and tomato sandwich. We will look at all the parts it goes through, and what process occurs in each part.

3.- Metaverse activity: Practical exercise (25-30 min)

- Review of the process through a virtual journey through the digestive system. Students will have to solve the questions posed to them in order to progress and complete the digestion process in the best possible way (Alternative: Laboratory practice).

4.- Conclusion (10-15 min)

- Review of the most important points of the topic
- Explanation of the task



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Lesson table

Lesson plan	
Introduction: Engaging approach	1- 5 min
Main lesson: The digestive process: Anatomy and physiology of the digestive system.	35-40 min
Metaverse activity: Practical exercise - Virtual journey through the digestive system. Students will have to solve the questions posed and complete the digestive process, fulfilling the objective set: Pooping. (Alternative: Laboratory practice).	25-30 min
Conclusion - Review of the most important points of the topic - Explanation of the task	10-15 min



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Lesson resources

- Presentation slides on the thematic of the lesson
- Access to a VR platform for the Metaverse activity. Alternative: Access to the Laboratory

Resources used to create the lesson:

- García López, M. (2022). *Biology and Geology 3, Secondary*. Fanfest Edelvives.
- Ballarín, P. L. (n.d.). 2.8. *Mutations. Relationships with evolution*. Biologia-geologia.com. Retrieved April 16, 2025, from https://biologia-geologia.com/BG4/28_mutaciones_relaciones_con_la_evolucion.html
- Instituto de Enseñanzas a Distancia de Andalucía (IEDA). (n.d.). 1.1. *Physiology of the digestive process*. Junta de Andalucía. Retrieved April 16, 2025, from https://edea.juntadeandalucia.es/bancorecursos/file/025c9dfd-df1f-4147-91e1-79f591546c5b/1/es-an_2021062112_9201048.zip/11_fisiologa_del_proceso_digestivo.html?temp.hn=true&temp.hb=true

Work and homework

Individual work:

- Work 1: Exercises applying the content seen to be able to complete the challenge of the journey of the morsel in the digestive tract.

Homework:

- Homework 1: In pairs, you will have to look for pseudoscientific myths or hoaxes related to the effects of certain foods or habits on the digestive process and record Reel-type videos, debunking these myths.



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Evaluation and indicators

Assessment Methods:

- Practical exercise: Students will be assessed on their ability to relate anatomy and physiology of the digestive system in order to be able to recreate the entire digestive process, recognising what happens in each part of it.
- Homework: The quality of the final product will be assessed on the basis of its final presentation, editing and editing of the video, quality of the information given, and oral expression.
- Teamwork and participation: Each student will evaluate the work of his/her partner, as well as his/her own work. In addition, the interaction between the two will be assessed, penalising those who divide up the work and then put it together without any kind of connection.

Success Indicators:

- The student knows the parts of the digestive system
- The student is able to relate these parts to the function they perform.
- The student is able to recognise the enzymes involved in the digestive process, where they are found, and which nutrient they digest.
- Pupils work well in groups
- The student produces good group work, with information appropriate to the level required, and with an attractive final product.



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EVALUATION AND SPECIFIC INDICATORS	
WHAT IS BEING ASSESSED?	INDICATORS
Practical exercises	• Ability to relate anatomy and physiology of the digestive system
Homework	• Final presentation of the video • Quality of the information given • Oral expression. • Team work



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Overview of the lesson

With this lesson, the student will acquire a complete knowledge of how the digestive process works, from the moment we ingest a food until we defecate, through a practical example, in which they will have to relate the different nutrients they have consumed with the parts of the digestive tract in which digestion takes place, and also with the enzyme that carries out the process.

In addition, we will learn to recognise false information, and to contrast it with reliable sources of information.



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