

GEOMETRY AND ANATOMY IN 3D MODELING

Exploring geometry through the movements of the Human Body

The movements of rotation and revolution are studied from childhood to school during the hours of science.

Fortunately, there is no lack of educational materials that visually explain the difference between the two, but let's try to imagine if it could be possible to discover it also through the use of our body.

Overview "GEOMETRY AND ANATOMY IN 3D MODELING"

How to recognize the difference between rotation and revolution in everyday life

Context

Everyday life

Cognitive processes

Manage situations
Analyse situations
Processing of information

Target group (incl. necessary prior skills and competences)

Adults and young adults;

Learners are familiar with geometric computation, they are people looking for alternative and comprehensible tools to explain the basic functions of a 3D program.

Dispositions

Flexibility
Curiosity
Collaboration

Contents

Dimension and shape;
Using digital skills

Outcomes and results

Learners will understand the fundamental difference between the two operating commands in a 3D program using dance as an example.



Main information

Content	Geometry; operational calculations; recognition of rotation areas and axes; Foundations of Geometry and 3D Modeling
Target group	Adults and young adults; Learners are familiar with the concept of rotation and revolution and basic function of a 3D program.
Learning intention	Numeracy for higher education or studies
Duration	Aprox. 3 hours
Material and resources	3D modeling software; Exemplary videos
Group size	1-4 students
Problem statement	In science and mathematics, the concepts of rotation and revolution are fundamental movements that describe how objects move around an axis or follow a path around another object. These concepts are often taught through visual aids and models, but what if we could explore them using our own bodies?
Working questions	<ul style="list-style-type: none"> - What is a profile? - What are the concepts of rotation and revolution? - What are the consequences of bringing the rotation axis from inside to exterior to the profile?
Learning outcomes and results	<p>Students will understand the effect of movement and will be able to understand the functional concept.</p> <p>Students will be able to find correlations between physical/anatomical psychomotor operations to translate them into simple actions based on the structuring of algorithms.</p>



Working plan

Time (lessons)	Description of content/activities	Material	Methodical and didactic information
30' +	<p><u>1. Discover</u></p> <p>This activity is conducted initially simply by guiding the discussion with some questions, also to evaluate students' knowledge related to the topic. As a result, the teacher will understand whether or not it is necessary to deepen the concept of anatomy and geometry.</p>	Slides	<p>Discussion</p> <p>[if needed explicit teaching]</p>
60'	<p><u>2. Moving in space</u></p> <p>Students are initially asked how to calculate simple areas and perimeters. A closed profile is identified (starting from a frame of a video). There follows a brief discussion of the proposed ideas and finally, if necessary, practice using an auction or pole.</p> <p>In closing, different situations are submitted to learners and the 3D modeling software is indicated as an ally.</p>	Situations and calculations consistent with the context	<p>Discussion</p> <p>Collaborative learning</p> <p>Explicit teaching</p>
45'	<p><u>3. Evaluate the different proposals</u></p> <p>The teacher provides several Profile proposals and asks students to evaluate the most useful for the purpose of the geometric operation and to discuss together what are the criteria used to make a careful assessment of the matter.</p>	3D modeling practice situations using parametric programs	<p>Collaborative learning</p>



30' +	<p>4. Discussion</p> <p>The Working Groups share the assessments and considerations that emerged during phase 3. a phase of exchange of views followed.</p>		Discussion Feedback
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Appendix

[Wikipedia](#) – Explanation on the concept of profile in descriptive geometry and in topography

In geometria descrittiva sono definiti piani di profilo e rette di profilo i piani e le rette che nello spazio occupano una posizione perpendicolare alla linea di terra.

In topografia si definisce profilo topografico o altimetrico l'andamento della superficie topografica lungo un piano. Il tracciamento avviene in base alle intersezioni del piano considerato con le curve di livello o isoipse: in ascissa vengono riportate le distanze orizzontali tra le curve di livello, in ordinata le quote dei punti di intersezione; talvolta alla scala di rappresentazione delle ordinate si assegna un ordine di grandezza superiore rispetto a quello delle ascisse. Nel progetto di strade, si parla di profilo longitudinali e trasversali, utili a visualizzare volta per volta l'andamento della strada progettata rispetto a quello del terreno naturale.

[link](#). [24.02.2025]

[YouTube](#) POLE DANCE [24.02.2025]



Rotation:



Revolution:

[YouTube 2 Fusion 360](#) [24.02.2025]



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This material was produced in the Erasmusplus project **Numeracy in Practice**, projectnumber 2021-1-NL01-KA220-ADU-000 026 292. In this project, 11 partners in 11 countries worked together in designing, evaluating and improving the materials. All materials can be found on the website (www.cenf.eu).



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