Co-funded by the European Union

3D STEAM

Project title: ***Accelerating STEAM-related Knowledge and Skills via 3D Modelling and 3D Printing*** *(reg. no. 2023-1-CZ01-KA220-HED-000160664)*

Programme: Erasmus+ KA220-HE - Cooperation partnerships in higher education

Teacher visualisation

TEMPLATE

Available in: **English**

(2025)

Leading organization: University of Jyväskylä (FIN)

Partner organization: Johannes Kepler University Linz (AT)

University of Ostrava (CZ)

University of Luxembourg (LUX)

Comenius University Bratislava (SK)

OSTRAVSKÁ UNIVERZITA

JOHANNES KEPLER UNIVERSITÄT LINZ

UNIVERSITY OF JYVÄSKYLÄ
FINNISH INSTITUTE FOR EDUCATIONAL RESEARCH

UNIVERSITÉ DU LUXEMBOURG

COMENIUS UNIVERSITY BRATISLAVA

Co-funded by the European Union

3D STEAM

Project: Accelerating STEAM-related Knowledge and Skills via 3D Modelling and 3D Printing
Reg. no. 2023-1-CZ01-KA220-HED-000160664

Didactic Use of 3D Technologies – Visualisation of Teaching Content (Demonstration Aids)

Template for planning a lesson or series of lessons where 3D models and 3D printing are primarily used to provide a clear, tangible, and accurate visualisation of curriculum content.

Basic Information

SUBJECT	
YEAR	
NUMBER OF LESSONS	
DIDACTIC OBJECTIVES	
SPECIFIC OBJECTIVES	

Didactic Purpose

☑ 3D printing / 3D models as a tool for visualising content

Brief justification: Why focus on visualisation? What misconceptions or learning difficulties are being addressed? Why is it necessary to print a 3D model, etc.?

Learning Objectives

- Identify and explain the goals and implementation methods of the activity involving a printed 3D model
- Describe the content of the activity, the lesson plan, and how the 3D model will be used

Selection and Preparation of 3D Models

- Model source: original design, open source (CC BY / CC BY-SA), school repository, generated using AI
- Didactic adaptations by the teacher

Syllabus of Cross-Curricular Links

SUBJECTS	AREA OF LEARNING	CONTENT STANDARD	PERFORMANCE STANDARD

Co-funded by the European Union

3D STEAM

Project: Accelerating STEAM-related Knowledge and Skills via 3D Modelling and 3D Printing
Reg. no. 2023-1-CZ01-KA220-HED-000160664

Teaching Planning Tool – 3D Modelling and 3D Printing (STEAM)

Template (2 parts: Conceptual Planning + Lesson Plan). Replace the square brackets with your own content.
3D printing and modelling as a tool for the creative development of students' knowledge and skills (original designs, iterations)

PART 1: Conceptual Planning (General Information)

Title of the Thematic (STEAM) Unit

[Title of the Unit]

Authors (Names / School / Country): [Name, Institution]

SUBJECT	
YEAR	
NUMBER OF LESSONS	
DIDACTIC OBJECTIVES	
SPECIFIC OBJECTIVES	

THEMATISATION AND PROBLEMATISATION

Why is the topic meaningful, and what problem does it address?
Key questions and didactic strategy (e.g. PBL, constructionism, EUR method).

STUDENTS' ENTRY SKILLS

☐ Basics of TinkerCAD

☐ Experience with GeoGebra3D

☐ Working with STL/OBJ files

☐ Basic slicing (PrusaSlicer / Cura / Bambu Studio)

☐ Experience with other software (please specify): …

☐ 3D printing safety

3D TOOLS AND SOFTWARE

• Modelling software: [TinkerCAD, Fusion, Blender, GeoGebra 3D, …]

• Slicer: [PrusaSlicer, Bambu Studio, …]

• Viewer/AR: [iPhone – AR viewer / USDZ]

Co-funded by the European Union

3D STEAM

Project: Accelerating STEAM-related Knowledge and Skills via 3D Modelling and 3D Printing
Reg. no. 2023-1-CZ01-KA220-HED-000160664

3D PRINTING

Equipment required for the activity:

Learning objectives related to 3D modelling and printing

Main objective:

Secondary objectives:

STEAM Elements

STEAM ELEMENT	CHARACTERISTICS OF THE ELEMENT IN THE ACTIVITY
SCIENCE	
TECHNOLOGY	
ENGINEERING	
ARTS	
MATHEMATICS	

Syllabus of Cross-Curricular Links

SUBJECTS	AREA OF LEARNING	CONTENT STANDARD	PERFORMANCE STANDARD

Co-funded by the European Union

3D STEAM

Project: Accelerating STEAM-related Knowledge and Skills via 3D Modelling and 3D Printing
Reg. no. 2023-1-CZ01-KA220-HED-000160664

PART 2: Specific Planning – Lesson Plan

Title of the Lesson: [Title]

Lesson Objectives: [Objectives]

Expected Student Outcomes: [List of specific outcomes]

.

Lesson Plan (Phased Description)

Typical phases: Introduction – motivation, objectives, criteria. Student Learning – knowledge processing, planning. 3D Modelling – CAD work. 3D Printing – slicing and printing.

Assessment – Overview

Reflection / Evaluation – Feedback

Assessment of 3D Modelling and 3D Printing (Detailed)

1) Does the student understand / know …? – Method: [mind map]

2) Has the student created …? – Method: [product evaluation]

3) Can the student present …? – Method: [presentation, peer review]

4) Does the student implement / improve …? – Method: [prototype revision]

5) Teamwork …? – Method: [observation, self-assessment]

Additional Information (Optional)

Notes: [...]

Teaching Resources / Support Materials: [...]

Evaluation Resources / Materials: [...]

Other Resources / Materials: [...]