

## Lesson Plan Plastic Model

<b>School:</b> IC “Liberio Andreotti”	<b>Teacher:</b> Maltagliati Orietta
<b>Title :</b> Plastic model	<b>Time :</b> 8hours
<b>Subject :</b> English, ICT, Geography, Science	
<b>Aim:</b> Learn how to create a practical-manual product through the Clil theme of knowledge, skills; Understanding using computational thinking in following the different phases of the Project; Create a plastic model.	
<b>Key CS elements:</b> decomposition, pattern recognition, abstraction, practicing algorithms	
<b>Age group:</b> 7th grade 12-13 years old students	
<b>Learning situations:</b> students classroom, Art classroom, computer room.	<b>Activity type:</b> pairs/group work; cooperative learning, problem solving
<b>Resources:</b> Google Workspace, videos, whiteboard, IWB, computers, laptops, specialized articles and websites	
<b>Learning development:</b>	
<ol style="list-style-type: none"><li>1. <b>DECOMPOSITION</b> (breaking a problem down into a smaller part)<ul style="list-style-type: none"><li>• Begin by breaking down the task into smaller, manageable steps. For example, separate the process into stages like sketching, modeling, texturing, and rendering.</li><li>• Divide the students into groups and assign specific tasks to each group to ensure collaboration.</li></ul></li></ol>	

**2. PATTERN RECOGNITION** (looking for similarity and trend within a problem)

- Help students recognize patterns and commonalities in the shapes and structures of trees or animals. Encourage them to identify recurring features such as branches, leaves, or fur patterns.
- Provide examples of different types of trees and animals to analyze and compare.

**3 . ABSTRACTION** (focusing on the important part of a problem, filtering out unnecessary details)

- Guide students in abstracting essential characteristics and details of the chosen tree or animal. This might involve simplifying complex shapes or focusing on distinctive features.
- Emphasize the importance of understanding the core attributes that make a tree or animal recognizable.

**4. ALGORITHM DESIGN** (create a step by step sequence of instruction to solve the problem)

Texturing and coloring the model.

Rendering the final 3D image.

Encourage students to plan and write down their modeling process as a set of instructions or algorithms.

Here's a simplified step-by-step algorithm design for creating a 3D model of a tree or animal:

**Step 1:** Sketching

Start by sketching the tree or animal on paper, focusing on its major features and proportions.

**Step 2:** Basic 3D Shape

Begin modeling by creating a basic 3D shape that represents the core structure of the tree or animal. For example, a cylinder for a tree trunk or a sphere for an animal's body.

**Step 3:** Adding Details

Gradually add details to the 3D model, such as branches, leaves, or fur. Use tools in the modeling software to sculpt and refine these features.

**Step 4: Texturing**

Apply textures and colors to the model to make it visually appealing and realistic. Ensure the textures match the characteristics of the tree or animal.

**Step 5: Rendering**

Render the final 3D model to generate a realistic image or animation.

Adjust lighting, camera angles, and other settings to enhance the presentation.

**Step 6: Presentation and Reflection**

Have students present their 3D models to the class, explaining their design choices and the computational thinking principles they applied.

Reflect on the challenges faced, problem-solving strategies used, and what they learned about computational thinking through the process.

**Assessment:** The assessment of learning can take place through the production of the students:

- Developing of key competences: Functional alphabetical competence, Digital competence, Personal, social and learning-learning skills.
- Promoting and facilitating the socialization and the building of relationships with the peers and adults of the school in a structured, small group environment.
- Promoting positive relationships between pupils in the class through structured interactions in small groups.
- Consolidating and strengthening the learnings related to the disciplines involved for the entire class.
- Developing of key competences: functional alphabetical competence, practical and digital competence,
- Learning by doing, Peer Tutoring.
- Deduce and compare information, make conclusions; give reason.
- Learn to use technological devices and tools.
- Cooperate with peers.

**Expected results:**

- Realization of a practical-manual product (a plastic model) for Art in which the following elements are present: mountain, hill, plain, river, lake, sea for Geography; some vertebrate animals and invertebrates in a representation of plants and flowers for science.
- Apply computational thinking while engaging in creative 3D modeling, helping them develop problem-solving skills and a deeper understanding of the modeling process

**Notes:** This project starts from the idea to develop students' skills in using technological devices and tools by the realization of a plastic model, in particular the basic skills: turning on, switching off and accessing to the student's account, searching for images and information on the internet as well as Improvement in communication and cooperative learning skills.