Teacher's name: Flosi Katia	**Teacher's name:** Giulia Pacini
Title : Let's make a town in miniature!	**Time** : 90 minutes
Subjects : *Social Studies*	
Aims: - develop students' creativity and problem-solving skills through the construction of a miniature town model. - apply computational thinking principles to plan, design, and build the town.	
Key CS elements: Decomposition; Pattern Recognition; Abstraction; Algorithm Design.	
Age group : 8-10 years old	
Learning situations: classroom, white smart board.	**Activity type :**group work, cooperative learning, frontal lesson
Materials: ● Rulers, pencils, and other measuring tools ● Poster board or large paper for planning	**Resources :** ● Cardboard boxes or foam boards ● Craft supplies (markers, paints, glue, scissors, etc.) ● Small toy cars, figurines, and other miniature objects
Learning development:	
Problem Definition How can we design and construct a miniature town that effectively represents real-world urban planning principles, while fostering creativity, collaboration, and computational thinking skills among students? **Introduction (20 minutes)** This lesson plan focuses on building a miniature town. It combines creativity, problem-solving, and computational thinking. Students will break down the task into smaller steps, recognize patterns in town planning, abstract key concepts, and design algorithms for construction. The goal is to develop their understanding of computational thinking and apply it to a real-world project, fostering collaboration and critical thinking skills.	
Pre - Assessment Test (optional):	
1.DECOMPOSITION (20 minutes) Break down the task of creating a miniature town into smaller, manageable components. ● Discuss the different elements that need to be included in the town, such as residential areas, commercial buildings, public spaces, and transportation infrastructure.	

2. PATTERN RECOGNITION (20 minutes)

Guide students in recognizing patterns and common features of towns, such as:

- The layout of streets, types of buildings, and placement of landmarks;
- Encourage students to identify recurring themes or architectural styles that they can incorporate into their miniature town.

3. ABSTRACTION (20 minutes)

Abstract the key concepts of town planning by focusing on:

- The essential elements needed to create a functional and visually appealing miniature town;
- Discuss the importance of scale, proportion, and balance in designing the town layout and architecture,
- Emphasize the need for creativity and imagination in representing real-world features in miniature form.

4. ALGORITHM DESIGN (30 minutes)

Algorithm for Constructing a Miniature Town:

- Distribute the materials and allow students to start building their miniature towns.
- Provide assistance and guidance as needed, encouraging students to work collaboratively and problem-solve any challenges they encounter.

Step 1: Plan the Layout

- Draw the outline of the town on a large piece of paper or poster board, considering factors like available space and desired features.
- Designate areas for streets, parks, residential zones, commercial districts, and landmarks.

Step 2: Create the Infrastructure

- Begin by drawing the main streets and avenues on the layout, ensuring they connect different parts of the town.
- Add smaller streets and alleys branching off from the main roads to create a grid-like pattern or other suitable layout.

Step 3: Establish Public Spaces

- Designate spaces for parks, playgrounds, and green areas within the town layout.
- Determine the locations of public buildings such as schools, libraries, and community centers.

Step 4: Place Residential Zones

- Decide where to place houses and residential buildings within the town.
- Consider factors like proximity to amenities, access to transportation, and neighborhood cohesion.

Step 5: Design Commercial Areas

- Identify areas for shops, restaurants, and other commercial establishments.

- Ensure that commercial zones are strategically located to attract visitors and serve the needs of residents.

Step 6: Incorporate Landmarks and Points of Interest

- Choose prominent landmarks or iconic structures to include in the town, such as churches, monuments, or historic buildings.
- Place points of interest like fountains, statues, or scenic viewpoints to enhance the town's appeal.

Step 7: Integrate Transportation Systems

- Add roads, sidewalks, and pathways to facilitate movement throughout the town.
- Consider including bridges, tunnels, or other features to connect different parts of the town and overcome natural obstacles.

Step 8: Enhance with Eco-Friendly Elements

- Incorporate eco-friendly features such as bike lanes, public transit stops, and electric vehicle charging stations.
- Integrate green spaces, trees, and sustainable landscaping practices to promote environmental sustainability.

Step 9: Detail and Decorate

- Add details and decorative elements to enhance the town's visual appeal, such as streetlights, benches, signage, and street art.
- Use craft materials like paint, markers, and modeling clay to add color and texture to the miniature town.

Step 10: Review and Revise

- Review the completed town layout to ensure it meets the desired design principles and eco-friendly objectives.

6. Conclusion:

- Have students present their completed miniature towns to the class, explaining their design choices and pointing out notable features.
- Facilitate a discussion about the process of creating the miniature towns and how computational thinking principles were applied.
- Encourage students to reflect on what they learned and how they can use computational thinking in future projects.

Assessment:

1. Group Project Rubric:

- **Creativity:** How imaginative and original was the group's design?
- **Collaboration:** How well did the group members work together and share responsibilities?
- **Construction Skills:** How well did the group use the materials to build their structures?
- **Presentation Skills:** How clearly and effectively did the group present their work?

2. Individual Reflection Journal:

- Students will write about their experience in the project, including:
    - Their role in the group
    - Challenges they faced and how they overcame them
    - What they learned about town planning and construction
    - What they would do differently next time

3. Teacher Observation:

- **Participation and Engagement:** How actively did the student participate in group discussions and activities?
- **Problem-Solving Skills:** How well did the student identify and solve problems?
- **Creativity and Imagination:** How creative were the student's ideas and contributions to the project?
- **Attention to Detail:** How carefully did the student complete their tasks?

4. Self-Assessment:

- Students will rate themselves on a scale of 1-5 for each of the following:
    - Creativity
    - Teamwork
    - Problem-solving
    - Effort

Post - Assessment Test (optional):

Expected results:

By the end of this lesson, students are expected to:

- Develop their creativity and imagination: Students will have the opportunity to design and build their own miniature town, expressing their unique ideas and artistic abilities.
- Enhance their problem-solving skills: They will encounter challenges during the construction process, such as scaling, proportion, and material limitations. They will need to think critically and find creative solutions to overcome these obstacles.
- Improve their collaboration skills: Working in groups, students will learn to cooperate, share ideas, and compromise to achieve a common goal.

- Apply computational thinking principles: They will break down the task of creating a town into smaller steps, recognize patterns in urban planning, abstract key concepts, and design algorithms for construction.
- Gain a deeper understanding of urban planning and architecture: They will learn about the different components of a town, such as residential, commercial, and public spaces. They will also explore concepts like zoning, infrastructure, and sustainability.
- Develop fine motor skills and dexterity: Constructing miniature buildings and structures requires precision and attention to detail, which will help improve students' hand-eye coordination and manual skills.
- Foster a sense of pride and accomplishment: Completing a complex project like a miniature town can boost students' self-esteem and confidence in their abilities.

Note: Extension Activities:

- **Virtual Town Planning:** Use digital tools like Minecraft or SketchUp to design and build virtual towns. This can introduce students to digital design and 3D modeling.
- **Community Outreach:** Invite local architects or urban planners to speak to the class about their work. This can provide real-world context and inspire students.
- **Research Project:** Assign students to research a specific aspect of urban planning, such as transportation, housing, or environmental sustainability. They can then present their findings to the class.