

Designing a Community

Description:

Students will plan, design, and test the infrastructure of a hypothetical community.

Objective(s):

1. Students will design the infrastructure of a city while considering the needs of a community.
2. Students will draw on real world examples of planned communities. Both of the past and present.

ISTE/NGSS Standards:

4a: Students know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.

4c: Students develop, test and refine prototypes as part of a cyclical design process.

5c: Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.

MS-ETS-1.1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS-1.2: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

Teq Lesson Plan Activity

Essential Question(s):

1. What is considered when planning a community?
2. What are the logistical challenges of densely populated areas?

Materials:

- Poster Paper
- Ozobot Markers
- Ozobots
- Engineering Design Challenge Graphic Organizer

<https://docs.google.com/document/d/1UYqqzT3aMgdNVb6-zog02Q4mY686WuM-2iHSEfsyLps/edit>

Do Now:

What is needed for a community to be functional?

Lesson:

1. Students will read one, or both articles on city planning. One is about the planning and construction of [Brasilia](#) and another is on city planning in [Ancient Greece](#).
2. Students will design a city with a commercial, residential, and industrial zones. The students will also include police departments, fire departments, and hospitals.
3. Students will need to connect services to areas of need, which can be decided by the teacher.
4. Students will use ozobots to time how long it takes each service to reach areas of need along optimal routes.
5. Students will test multiple routes and designs as needed.

IF TIME: Students will create and test multiple versions of the city while actively engaging in the Engineering Design Process.

TeqTM Lesson Plan Activity

Closure:

1. Students will clean up their space and put all materials back where they belong.
2. Students will complete and submit their reflections.

Extension:

Students can design a subway system for their city based on residential and commercial areas.