

Urban Innovators Program Overview

The table below provides an overview of the *Urban Innovators* program. With the theme of connecting sustainability, STEM (science, technology, engineering, and math), and one’s community, this program is divided into five topic areas:

- Waste Reduction (two sessions)
- Water Quality (two sessions)
- Solar Energy (one session)
- Community Design (three sessions, can reduce to two to leave more time for the challenge)
- Sustainable Innovation Challenge (two sessions, can increase to three if desired)

Each topic area follows the *Do-Learn-Do-Invent* format described on the last page. Most topics span two days. Days are assumed to be ~ 45 min (60-min block with 5–10 min of welcome/cleanup time on either end). Each day is typically structured as Do-Learn-Do or Do-Learn-Invent.

| Topic | Day | Short description |
|-----------------|-------|---|
| Waste Reduction | 1 | <p>Waste Not, Want Not</p> <p>This fun, straightforward design challenge helps students visualize how small choices can have big impacts.</p> <p>In this challenge, the goal is to make the longest paper chain possible. Each link must match the size of the chain link in the template. But there is a twist. Before students begin cutting out the pieces of the chain, they must cut out and build a house using the other pieces of the template and the construction paper. How they arrange the house template pieces on the paper will determine the amount and shape of the paper they have left to build their chain.</p> |
| | 2 | <p>Separation Strategies</p> <p>Today’s focus is on recycling. The first step in every recycling process is separation.</p> <p>Students are given a mixed bag of objects and a specific set of tools. Students then have about 10 minutes to see if they can separate the materials into individual piles. The only rule is that they CAN NOT use their hands directly to move the objects. They MUST use the tools.</p> <p><i>Invent: Stacy and Evrnu</i></p> |
| Water Quality | 3 & 4 | <p>Water Washers</p> <p>Students will construct their own multilevel filter during this investigation and evaluate how well it removes various contaminants. The general steps for the investigation include:</p> <ol style="list-style-type: none"> 1. Preparing contaminated water 2. Preparing the water filters 3. Filtering the water, observing the results, and designing a new filter set up based on what was observed. <p><i>Invent: Serg, Ian and ecoSPEARS</i></p> |
| Solar Energy | 5 | <p>Multicolor Mystery</p> <p>Students will design a small “creation” for this investigation using UV-sensitive and regular beads. Materials to make necklaces, bracelets, or keychain charms are provided. Creations will then be partially covered with various light-blocking materials, and students will investigate the impact of different types of light on the beads.</p> <p><i>Invent: Young Solar Inventors (Deepika, Bishop, Xóchil)</i></p> |

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| | A young person’s neighborhood is a big part of their life. The following three sessions honor that importance and work to show students how they can use STEM to help their community. | |
| Community Design | 6 | <p>Too Many Chores!</p> <p>Neighborhoods are more than just a collection of homes, streets, and sidewalks. They are also filled with meeting places, shopping places, schools, and restaurants. The easier people can get what they need within their neighborhood, the more time they have for other things like spending time with their family or helping out friends.</p> <p>In this challenge, students learn about the importance of neighborhood design by figuring out a way to get a list of chores done as fast as possible:</p> <ol style="list-style-type: none"> 1. Pick up milk and vegetables at the grocery store. 2. Pick up school supplies at the drugstore or department store. 3. Return a book to the library. <p>The student notebook contains two maps of real US neighborhoods. Students must figure out the fastest route to do their chores. During the following discussion, students start thinking about what types of places they would choose to put in a neighborhood of their design.</p> <p><i>Invent: The Radix Center</i></p> |
| | 7 | <p>Neighborhood Design Practice</p> <p>Designing an entire neighborhood can be a challenge. There is a lot to keep track of, and it can get overwhelming quickly. Before diving into the big design activity, this smaller practice activity enables students to become familiar with “building” and tracking homes, people, food supplies, and community resources.</p> <p><i>Invent: June Grant</i></p> |
| | 8 | <p>Neighborhood Design Challenge</p> <p>The goal is to plan a neighborhood that accomplishes the following things:</p> <ol style="list-style-type: none"> 1. Has a place for everyone to live. 2. Can supply enough food and water for everyone who lives there without producing too much extra food or water. 3. Has buildings and spaces that help create the feeling of community. Each neighborhood must have at least a school, a hospital, and a community place (like a park or community center). 4. Can be built within the budget (\$300,000). Keep in mind responsible city leaders spend as much of their budget as possible (without going over) to create a great city. |
| Sustainable Innovation Challenge | 9 & 10 | <p>Innovation Challenge:</p> <p>Day 9: Brainstorm and Idea Selection Day 10: Produce Design and Presentation (optional)</p> <p>Over the past weeks, students have had a chance to learn about various STEM topics (renewable energy, recycling, and healthy neighborhood design) and various STEM innovators and entrepreneurs (Stacy, Serg, June, and more). Now it’s time for their ideas and solutions, to take center stage!</p> <p>Working either alone or in small groups, students will have two sessions to design an innovation to solve one of the following challenge questions:</p> <ul style="list-style-type: none"> • This would help us recycle... • This would make it easier for people or companies to clean or use less water... • We could use solar energy to... • My city would have the greatest downtown if we had... • This would make my neighborhood or city more sustainable... <p><i>Invent: Albert, Aya, and program participants</i></p> |

Do-Learn-Do-Invent Format

To support this educational philosophy, CreositySpace programs typically follow a *Do-Learn-Do-Invent* format. For a workshop or camp, this takes on the following general structure:

1. **Do** – Each day or topic begins with an introductory activity to engage students, get the conversation going, and allow the facilitator to assess students’ interests and abilities.
2. **Learn** – After the introductory activity, the session leader guides students through a more organized discussion and/or lesson about the relevant topic area. This “lesson” should connect student experiences (from the introductory activity and everyday life) to the topic area and future investigations. This portion can be a mixture of direct instruction, videos, and group discussion.
3. **Do** – Depending on your specific program format, the second “Do” session can include a larger investigation or simply be a continuation of the introductory activity in a way that allows for deeper exploration. In addition to the hands-on portions of the investigation, students are encouraged to discuss their initial hypothesis (or what they expect to see) before they begin the experiment and then reflect on the relevance and greater impact of what they have observed upon its conclusion.
4. **Invent** – The final step of the cycle encourages students to combine what they have learned with their natural creativity to create an original invention or innovation. This section introduces a relatable real-world entrepreneur—their story, innovation, and business—to help provide the students with inspiration and confidence. Students then have an opportunity to work on an open-ended innovation prompt. This prompt is connected to the overarching topic of the session but is still flexible enough to give students a chance to explore their ideas. After having some time to work on their inventions, students are encouraged to share and discuss their ideas with the group. This can happen daily or during a dedicated session(s) at the end of the program.