

□ The Challenge

Consider a problem your city or town currently faces in its infrastructure (e.g. transportation, water, sewer, power, or internet). Using the 3Doodler and plastic strands, design, prototype and propose a new and improved solution to this problem.

3Doodler EDU

Challenge Tip Look at your city or town's plans for updating services, integrating renewable energy or improving public transportation for inspiration.





How do cities and towns address the ever-changing needs of growth, new technology and crumbling infrastructure? It is estimated that Americans lose thirty-eight hours per year just sitting in traffic and 19% of the household budget is spent on transportation. Renewable energy and high speed internet also face similar issues of integration into an over 100-year-old electrical grid system. In countries like India, rolling brownouts or blackouts are such a frequent occurrence, millions are left without electricity on a daily basis. Solutions need to be created to work with old, inadequate or hard to reach areas all over the world.

① Before You Start Doodling

We recommend using a DoodlePad or clear tape placed over paper as a foundation to keep your Doodles in place and so that you can peel them off with ease.













- A. 3Doodler Pens and Plastic Strands
- **B.** Tools (from your 3Doodler box) plus needle-nose pliers or scissors for snipping plastic ends
- C. Map of city's transit, power grid or sewer system
- **D.** Clear plastic tape or DoodlePad for Doodling foundation
- E. Paper for Doodling foundation and extra sketching/note-taking space
- **F.** Drawing utensils (markers, pens or pencils)
- G. Camera or video recording device to document the Challenge and results

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■ Challenge Organization

© Challenge Documentation

Take photos & videos of your process using a camera. Document what to do and what not to do. Share your experience with the online community using #3DoodlerEDU! The Challenge is organized into 50-minute classes. Start with a map of your city or town and consider things that could be improved. Don't try to solve several problems at once. Select one area such as transit, sewer, roads, renewable energy or internet to give your solution focus.

☐ Class 1: Investigate

Total Time: 50 min.

QInvestigate (⊕50 min.)

Step 1: In teams, investigate one form of public infrastructure to analyze in your city or town, such as: public transit, walking and bicycling routes, parks, sewer, trash collection, internet or cell phone coverage, power, renewable energy or roads.

Step 2: Observe how your location could benefit from an improvement in one of these areas. Walk outside and see how your public infrastructure connects to your home, school or business. Draw a map locating where it connects and draw or take pictures of what it looks like now and what you see is a problem to solve.

Step 3: Jot down 10 quick ideas to fix the problem. No idea is too crazy, or too big!

☐ Class 2: Design & Build ☐ Class 3: Design & Build ☐ Class 4: Design & Build ☐ Class 4: Design & Build ☐ Class 5: Design & Build ☐ Class 6: Desig

Total Time: 50 min.

Design & Build (⊕ 50 min.)

We recommend pliers or scissors for snipping plastic ends. Make sure to keep your plastic ends clean to prevent clogs and jams. Snip plastic after removing it from the 3Doodler pen to make sure it's clean for the next time.

Step 1: Based on the research and the ideas generated, pick a solution that will improve your chosen part of the infrastructure to design. A solution can be anything from a new way to manage power services at the pole, building a better bus stop or improving signage. Draw and plan how you can quickly show this solution using the materials and tools on hand.

Step 2: Using only the 3Doodler pen and plastic strands, build a quick prototype of your solution based on your initial design.

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☐ Class 3: Build (Cont'd), Present & Reflect

Total Time: 50 min.

Build (Cont'd) (⊙15 min.)

Spend 15 more minutes to finish Doodling your solution.

& Present & Reflect (⊚35min.)

Step 1: Spend 15 minutes developing your presentation for the group.

Make sure your presentation covers the following items:

- · What type of infrastructure are you addressing?
- What is the problem you are trying to solve?
- · How does your solution address or fix the problem?
- · What would you need to do next to improve it?

Step 2: Spend the remaining time presenting and providing feedback to other groups. Use the "I Like, I Wish, I Wonder" model to help others improve their projects.



For further information about integration of bicycles into the transit systems, visit:

http://safety.fhwa.dot.gov/ped_bike/docs/bike_bus.pdf

For further information about State of America's infrastructure system, visit:

· https://goo.gl/ahY9Mf

For further information about Department of Energy's guide on renewable energy integration, visit:

http://goo.gl/Z7ECVm

For further information about integrating free WiFi, visit:

- http://goo.gl/7C2J6Z
- http://www.strixsystems.com/csmetrowidewifi.aspx

For further information and inspiration about the "I Like, I Wish, I Wonder" model and the power of feedback, visit:

http://goo.gl/RBxUxX