

## Let's Build a City: Crash Course Kids #48.1

You and I, we've been engineering for a while now. At this point, you all deserve your own hard hats because you guys are pros. That tree house we designed, I've been spending a ton of time in there. I've got beanbags, bookshelves, and stacks of snacks, it is paradise. Thanks for helping me build it, and remember if you had another idea for a space to hang out in, send it my way. I totally wanna see what you came up with. But this time, we've got bigger projects to think about. Key word here: BIG. How big? As big as your home town, because this time, we don't wanna just design an invention, or a building, we want to design an entire city.

It's a massive challenge that only the very best and brightest can take on, and I'm enlisting you. How can we use engineering to design a city that is safe, healthy, sustainable and fun to live in? This kind of engineering, called urban planning, requires a lot of complicated interlocking variables. It's a huge project! So, where do we start? Say it with me: the engineering process.

Let's define our problem. We need a place to put people. We need that space to fulfill their needs, things like food, water, shelter, and also just places to have fun. And we need the space to respect the natural environment where it exists. Sounds simple enough, but when you're planning a city, there are lots of things to think about. How will people move around the city? Where will they go to have each of their different needs met?

Next, we have to consider solutions. Since a city is such a massive project there are a ridiculously large number of problems and an even ridiculously larger number of solutions. So I want you to build and test your own prototype for a city. Think through the trials you might run and the variables you need to test and then start designing. Where do you start?

First, think about the things that you like about where you live. Maybe your city has a park that you really like, or there's a public pool with a super cool slide. Then, think about some things about your city that you don't like. Do you wish you could walk or bike to get to school instead of riding a bus. This is a great way to start thinking about

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planning, the job of a city planner is to create places for people to live in that make them happy. Now, let's get to specifics.

As city planners, we want to plan our city, somewhere. Decide where yours will be. On a mountain? Near a river? By the beach? How does its location affect its resources? For instance, if your city is in a desert you'll need to pump in water from somewhere else.

A city planner needs to plan for the future too. Consider what you'd do if lots of people moved to your city. Will you build lots of small buildings for them each on its own plot of land cutting into the nature around you? Or would you build buildings higher or even go underground?

Next, think about how you'll divide up your city. Cities have neighborhoods so people can get what they need without having to go too far. Once you've divided your city decide where you'll put things like grocery stores, schools, airports, train stations, doctor's offices, post offices, and parks.

And then think about how people will get there. Will they take a bus? If so you'll need lots of roads. Will they take a subway? Better put it in the plan. Maybe they can bike? Then put in some bike paths too. And hey, don't forget sidewalks.

Now take a look at the city you've created. Will your residents be happy and healthy? Will they be able to shop for groceries, mail their mail, and go to work in this space? Is your city good for the environment too by respecting the surrounding nature? Cities are really complicated feats of engineering. There's so much to consider but I trust you to do a great job. You've had a ton of training and you've rocked it so far.

So do me a favor, please send us a picture of the city you've created and let us know how you used the engineering process to create it. Building a hang glider to get across a gorge, that's one thing. A flying robot, pretty awesome. A tree house, better still. But a city, with this project you'll have really earned your hard hat for sure.