

Goal: Using a 3D model as a guide, build a replica of the Willis Tower in Chicago out of gumdrops and toothpicks.

Materials:

- Sturdy toothpicks (50-100)
- Gumdrops (100)

How To:

As the construction manager, you will use different views of the 3D model to make your tower look as close to the model as possible. Your tower should include as many details from the model as possible including:

- The different tiered elevations of the structure (hint: there are four)
- Antenna
- Rooftop mechanical equipment
- Entry way

In order to keep the cost of the project down, you will want to use as few materials (toothpicks and gumdrops) as necessary while still maintaining the overall quality of the project.

The schedule is also tight so you will want to complete this task as quickly as you can!

STEM Explanation:

Structural members (in this case toothpicks and gumdrops) are extremely important when constructing buildings, especially skyscrapers. The Willis Tower is the third tallest building in America, and the twelfth tallest in the world. It uses an innovative design which utilizes the arrangement of different “tubes” to make up the structure. This method allowed for The Willis Tower to be built was built in 1970 and took 3 years to complete. To put that in perspective, it took 20 years to build the pyramids in Egypt!

Construction managers interpret the designs created by architects and engineers to bring their ideas to life. They use plans and models like the ones provided in this exercise to create the buildings we work and live in every day.

Career Connection:

Construction Managers plan, coordinate, and supervise construction projects. This includes everything from schedule, cost, and safety. They use project management techniques to oversee the planning, design, and construction of a project from its beginning to its end. The purpose of construction management is to control a project’s schedule, cost, and quality to make it the best end product for the customer.

STEM Highlight:

Abby Cole is a Project Engineer at DPR Construction. As a child, she loved playing with Legos, helping her parents assemble Ikea furniture, and learning how things are made. After encouragement from her family to pursue a career in science or engineering, she chose to study civil engineering at the University of Texas at Austin. At UT, she was heavily involved in the Women in Engineering Program and served as a mentor for freshman women in the Cockrell School of Engineering.

Through her coursework at UT, Abby developed an interest in construction and the built environment. After graduating, she joined DPR Construction and is on a team building one of the new landmarks in the Austin skyline, the Block 185 skyscraper. Abby is passionate about supporting women in STEM and construction.