



## Dot Tower Challenge

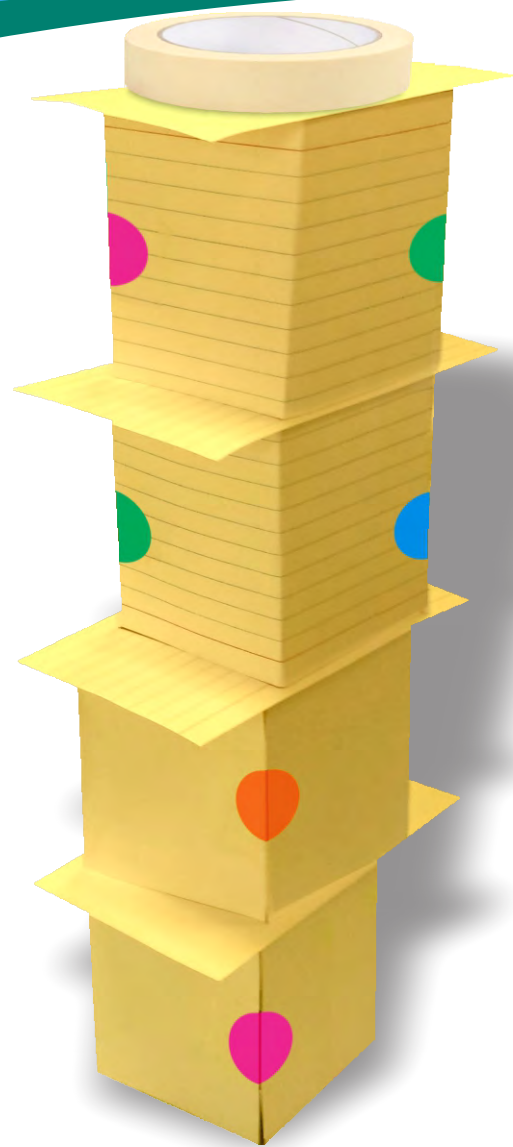
In this fun but challenging activity, kids become engineers, using critical thinking, problem-solving, and creativity to plan, design, build and improve an index card tower.

### Fun Facts/Information:

- Towers technically are defined as structures that usually are taller than they are wide.
- Towers generally are distinguished from masts by their lack of guy-wires (a tensioned cable designed to add stability to a free-standing structure), and commonly are built to take advantage of their height.
- Towers also can stand alone on the ground or as part of a larger structure or device, such as a fortified building or an integral part of a bridge.
- Having existed since primitive times, towers have served as structures that support bridges, and even prisons (think of the classic fairy tale, Rapunzel).
- The Tokyo Skytree, completed in 2012, is the tallest tower in the world at 634 meters (2,080 feet). It is the world's second tallest structure after Burji Khalifa, a 2,716.5-foot skyscraper located in the United Arab Emirates.
- The Stratosphere Tower in Las Vegas, Nevada is the 19th tallest observation tower in the world, standing 350.2 meters (1,149 feet) tall, and was constructed in 1996.

### Objective:

- Challenge children to be engineers and build the tallest dot tower out of index cards and sticker dots.
- Reinforce that engineers are problem solvers who invent, design, analyze, build and test machines, computer systems, structures, gadgets and materials to fulfill functional objects and requirements. This all is done while considering the limitations imposed by practicality, regulation, safety and cost.
- Engineers use this engineering design process:
  1. PLAN: Draw a diagram and gather your materials.
  2. CREATE: Follow your plan and test it out.
  3. IMPROVE: How can you make it better? Did it work? Do you need to add more or less?





### Materials:

- Sheet of plain paper
- 30 3-inch by 5-inch index cards (white or multicolored)
- 4 sheets of sticker dots
- Roll of tape (masking tape works best)
- 10-pack of markers or a box of cereal
- 1 meter stick or tape measure

### Procedure:

The dot tower must be built according to the following limitations:

- The tower should have a minimum height of 30 centimeters.
- The only building materials that may be used are index cards and sticker dots.
- Materials must not be taped to anything for support. This must be a free-standing structure.
- Build the tower on a table or desk.
- The tower must be able to hold the weight of a 10-pack of markers, a roll of masking tape or a box of cereal at its highest point.

### Directions:

1. Sketch the dot tower design on plain paper.
2. Next, assemble index cards in any desired way, taping with the sticker dots where it is necessary to keep the tower together.
3. Begin to build a base with the above materials.
4. Continue to add to the dot tower with index cards.
5. Remember to build the dot tower so that it is a minimum height of 30 centimeters.
6. Once the dot tower is built to 30 centimeters tall or taller, place the 10-pack of markers, the roll of masking tape or the box of cereal securely at the highest point of the dot tower.
7. Hopefully, the dot tower is strong enough to hold the weight of one of the items at its highest point!

### Extensions:

- Follow this additional index card challenge:
- Use only 12 index cards.
- Each level of cards is considered a story or floor.
- Give yourself a timeframe in which to build the tallest structure.
- Fold, bend, cut, curl, and/or tear the index cards into X, W or M shapes, prisms, etc.
- Test the resulting structure by placing a book on top of it. If the structure remains intact, then you have built a sturdy structure!