

Magnetic Tower: Within and Between-Team Collaboration Experiential Exercise

Magnetic Building Block Set Information

Magnetic building block sets are common, and sets vary in size and quantity of pieces. We have found that sets with magnetic sticks two to three inches long are ideal for the exercise. Further, sets should have at least 240 magnetic sticks and 100 magnetic balls to have enough building materials for the exercise.

Instructions

1. This is the detailed building instructions.

You have now been divided into a product development team of seven individuals, who each possess different strengths and weaknesses. The overall team goal is to build a three-tiered tower out of differently colored magnetic pieces in the allotted 45 minutes. Each section contains an overview of the tier you are building, a performance goal, instructions that detail how to build each tier, and pictures to guide you. You are free to reference the instruction sheet as many times as you would like. Good luck.

Tier 1 Overview

Construct the foundation of the tower by building four separate “legs” of the following colors:

- Blue
- Red
- Orange
- Green

Each leg leans in a certain direction. One potential solution is to begin by creating the foundation using two equilateral triangles, so it looks like a rhombus with a diameter or a skewed square with a piece through the middle. The entire leg should have three “levels”. Triangular

pieces can then be used to build upwards to a secondary rhombus, and so on to the third one.

Each leg should use no more than 40 magnetic pieces and no more than 15 magnetic balls. Only connect magnetic pieces with magnetic balls. Connecting one magnetic piece to another magnetic piece will not be stable enough.

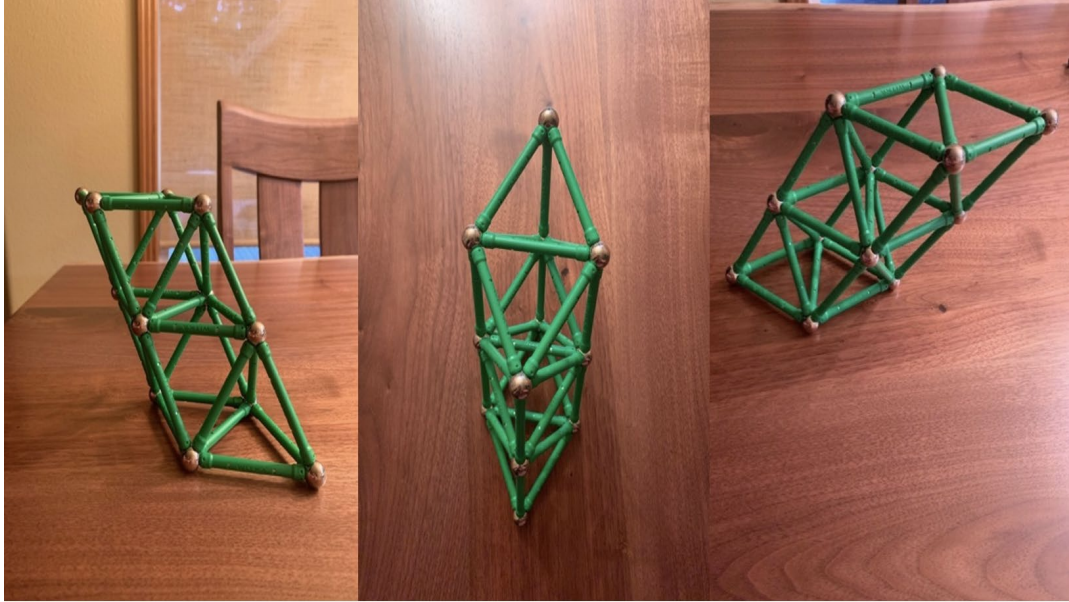
Performance Goal: Build four individual legs that stand on their own and slightly lean in one direction. Each leg should end up having a rhombus at the foundation, middle, and top, that represent three “levels”.

1. The rhombus based foundation should use five pieces and four balls, which should end up looking like two equilateral triangles that share the same base.
 - 1.1 Consider the two magnetic balls that are furthest from each other as “points”, while the other two magnetic balls are “sides”.
 - 1.2 Pick one of the two equilateral triangles and attach one magnetic piece to each of the magnetic balls, then connect those three pieces with a magnetic ball so you have built a pyramid over the original equilateral triangle. This is the first “point”, of the second level rhombus.
 - 1.3 Then attach two magnetic pieces to the point of the rhombus that has been unused thus far. Each of these pieces should stick upwards and towards the other sides of the foundational rhombus.
 - 1.4 Then attach one magnetic piece to each of the two sides of the rhombus, and connect each of those pieces with the two pieces from step 1.4 using two separate magnetic balls. This should create two new equilateral triangles that extend vertically. Each of the magnetic balls will represent the second and third “sides” of the second-level rhombus.

- 1.5 Connect the three magnetic balls you have now used with magnetic pieces that lay horizontally.
- 1.6 Attach a third magnetic piece to the point of the foundational rhombus in step 1.4 that juts out at about a 45-degree angle. Add a magnetic ball to the piece, then attach two horizontal magnetic pieces to the other two magnetic balls so you've created the second "level" rhombus.
- 1.7 Repeat steps 1.1 through 1.7 on top of your original build until you have created four legs with three levels.
- 1.8 Once completed, arrange them so you can connect each point (the magnetic ball that juts out due to the leg "leaning") using four magnetic pieces. Once connected, it should look like the legs are connected by a square.
- 1.9 Then use two additional magnetic pieces to connect one side of each leg with the leg opposite it, to provide more support.

Pictures of how each leg should be constructed are below in figure 2 (remember, each leg should be a different color):

Figure 2: Foundation Leg Multiple Angles



Pictures of how each leg should be connected are below in figure 3:

Figure 3: Foundation Leg Orientation



Tier 2 Overview

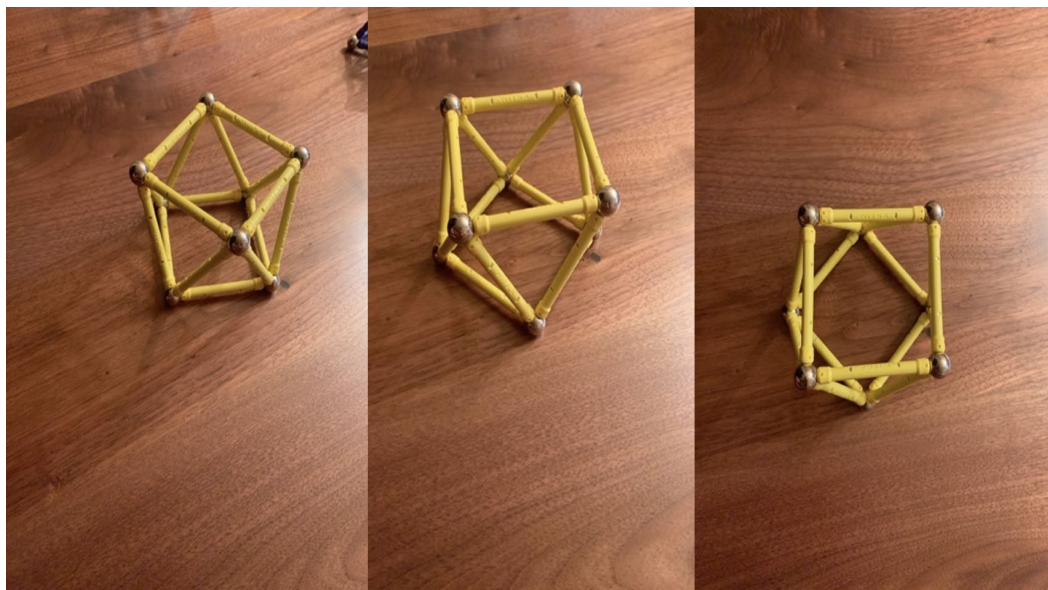
Build a transition platform that connects the four legs to the tower. This platform should consist of no more than 40 yellow magnetic pieces and 20 magnetic balls.

Performance Goal: Create a modular transition platform that can stand entirely on its own without being connected to the rest of the project.

- 2.1 Begin with a singular square.
- 2.2 From each magnetic ball of the square, two pieces should extend upward, creating four triangles that are connected by metal balls.
- 2.3 From the balls of those four triangles, a new square can be constructed by connecting each magnetic ball with a magnetic piece placed horizontally.

Pictures of how the transition piece should be constructed are below in figure 4:

Figure 4: Tier 2 Angles



Tier 3 Overview

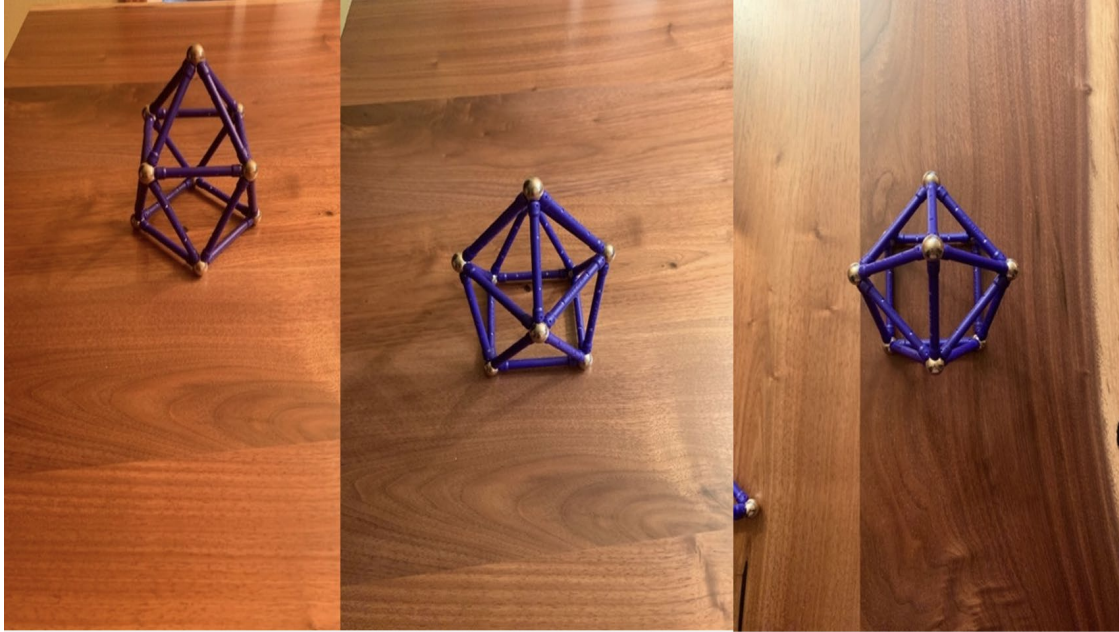
The final tier is an elongated tower with a pointed top. It is built using a square foundation and triangular support pieces, just like the modular transition piece in tier 2. It should be made out of no more than 40 blue magnetic pieces and 20 magnetic balls.

Performance Goal: A light and stable tower that can easily be placed onto the other modular pieces to complete the entire project.

- 3.1 Begin with a singular square.
- 3.2 From each magnetic ball of the square, two pieces should extend upward, creating four triangles that are connected by metal balls.
- 3.3 From the balls of those four triangles, a new square can be constructed by connecting each magnetic ball with a magnetic piece placed horizontally.
- 3.4 Create the “point” of the tower by attaching a magnetic piece to each of the ends of the square, then connecting those four pieces with a magnetic ball.

Pictures of how the final tower piece should be constructed are below in figure 5.

Figure 5: Tier 3 Angles



Combining Each Part

Tiers 2 and 3 are constructed with a base so they can stand on their own as modular pieces to the entire tower. However, when connecting tier 2 to tier 1, and tier 3 to tier 2, keep in mind that the top of each segment will also be the bottom of the next segment. Thus, you will have to actually remove the bottom of each tier before placing it on the tier below it. For example, the four legs are connected by a square, which will be the bottom of Tier 2 once it's connected. So before placing Tier 2 on Tier 1, you must remove the bottom square so Tier 2's magnetic pieces attach to the magnetic balls of Tier 1. You cannot simply stack one modular piece onto another.

Pictures of how each tier should be connected are below in figure 6:

Figure 6: Final Integration Images

