

# Low Cost Field Options

## Introduction

The official field components and game objects used in *VEX Robotics Competition – Tower Takeover* are all available for purchase from [www.vexrobotics.com](http://www.vexrobotics.com) (P/N 276-6090, 276-6091, 276-6092, and 276-6093), however not every team needs the exact objects which will be used at official VEX Robotics Competition tournaments. This section will outline some options for teams wishing to use lower-cost substitutes for field objects.

## Field Perimeter Cost Reduction

*VEX Robotics Competition – Tower Takeover* utilizes the VEX Competition Field Perimeter (278-1501) as the outer edge of the playing area. This custom sheet-metal and lexan frame is robust and designed to be a high-end solution for anyone holding a VEX Robotics Competition. In some cases, however, having a high-end perimeter wall is not important. Some teams may wish to practice with something as simple as a perimeter of tape laid out on the floor. For information on cost reducing the field perimeter and for detailed plans to construct one example of a low-cost perimeter consult the Low-Cost Field Perimeter Guide.

## Field Object Cost Reduction

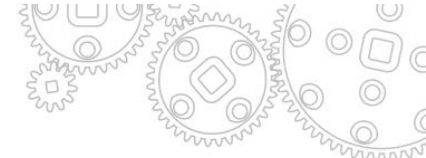
The field elements specific to playing *VEX Robotics Competition – Tower Takeover* are available from [www.vexrobotics.com](http://www.vexrobotics.com). These objects include the *Cubes*, *Towers*, *Scoring Zones*, and hardware.

The key things to think about when cost reducing these field objects are the following two questions:

1. What field functionality do I actually need?
2. How can I achieve this functionality with the minimum effort and cost?

The simplest way to reduce cost is to use less. Does every team need a full set of *Cubes*? Maybe a handful is enough for prototyping and practicing.

There are a variety of reasons to build or purchase field objects, in many of these cases the official “spec” field components are unnecessary. By analyzing the functionality needed for an application, one can build a “stand-in” object which will interact with robots in the same manner as an ‘official’



## ***VEX Robotics Competition Tower Takeover – Appendix A***

component. These “stand-in” objects can be extremely useful during the prototyping phase of the design process.

### **Note:**

These low-cost options are to be used for prototyping and practice purposes only, and are not legal for official qualifying tournament use.





## **VEX Robotics Competition Tower Takeover – Appendix A**

### **Example Prototyping Ideas**

As discussed above, when considering building unofficial field objects, consider the functionality required. Mock-up *Towers* could be as simple as some cardboard and PVC pipes fastened together. It may be possible to build the entire field out of wood and successfully simulate robot functions – it just depends what is being tested.

Detailed specifications for the “official” pieces are included in Appendix A – a team must determine which dimensions are important for their mockups and build them accordingly.

Every Welcome Kit will include one *Cube*. This sample should help teams learn about the nature of the objects, but also to find things they can use to simulate objects. The sample will provide a good benchmark as teams look for “placebo” objects.

.STL files are available on [www.vexrobotics.com](http://www.vexrobotics.com) for the *Cubes*. Teams can use most 3D printers or 3D printing services to create a higher-fidelity prototype game object from these files. Despite coming from an official source, teams should remember that there will be differences between a 3D printed object and the official object.

### **VRC Tower Takeover Practice Kit**

VEX Robotics is happy to offer lower-cost kits to VEX Robotics Competition participants who do not wish to purchase a full field. The Scoring Element Kit includes 1 *Cube*. With two of this kit teams can build enough for their robot to test its scoring abilities.

More information on these kits is available in the *VEX Robotics Competition – Tower Takeover* section of [www.vexrobotics.com](http://www.vexrobotics.com).

### **Further Questions**

For official game manual clarifications, please go to [www.robotevents.com/VRC/2018-2019/QA](http://www.robotevents.com/VRC/2018-2019/QA). The Q&A allows teams to ask for official rulings from the VEX Robotics Competition Game Design Committee. Each question will receive an answer from the GDC. Non-clarification questions should be directed to the VEX Technical Support & Community Forum at [www.vexforum.com](http://www.vexforum.com) where all VEX related questions and discussion is welcome.

