CYBER FORT CHALLENGE

CYBER DISCOVERY 1.0

100 possible points

SCHEDULE

Wed 3pm:	Challenge Issued
Wed 3:30pm:	Sketchup Workshop
Thurs 2pm:	Sketchup Work session in team time
Thurs 5pm:	Digital upload deadline
Thursday 10pm	Come see your Fort parts laser cut
Friday 1pm	Fort parts delivered for assembly
Sat 10am	Final Boe Bot Challenge

01_INTRODUCTION

Using the 3D virtual modeling software Sketchup your team must digitally design and fabricate a cyber fort that interfaces with your Boe-Bot and its attachments to collect and defend the marbles gathered during the final competition. Basic training in Sketchup will be provided to any interested team members, and, with the help of the instructor you will generate a digital fort design.

The final Sketchup files should include your school's name and be uploaded to the Cyber Discovery Blog no later than **5PM THURSDAY**. On Friday you will be given your laser cut fort parts and an assembly kit containing tape, glue, a utility knife and straight edge.

02_OBJECTIVE

Cyber forts will be evaluated on their functionality as well as aesthetics, poetics and craft of construction. Functionally, the fort must be easily navigated by your Boe-Bot, fitting any unique operability gained in the auction, while defensively and creatively storing your teams collected marbles. Second, your fort should be designed to clearly identify and celebrate your schools identity and/or a central component or theme from your team's storyline. Lastly, each fort should be built with durability and an intentional sense of craft. All of these qualities will be considered in the final ranking of the forts during the competition on Saturday.

03_RULES

1. All forts shells will be made from 1/16"chipboard (provided by the camp), however decoration, painting and modification of the chipboard is allowed and encouraged to improve the aesthetic qualities of each fort
2. The total area of the footprint of your fort may not exceed **1.5 square feet.**
3. The fort Height limit is **5"**
4. All faces of your digital for design must **3 or 4 sides**. Almost any form can be made from triangles and quadrilateral polygons.
5. The marble holding portion of you fort must have a bottom surface. After each round of the final competition camp staff should be able to pick up your fort and pour the collected marbles into a counting jar.

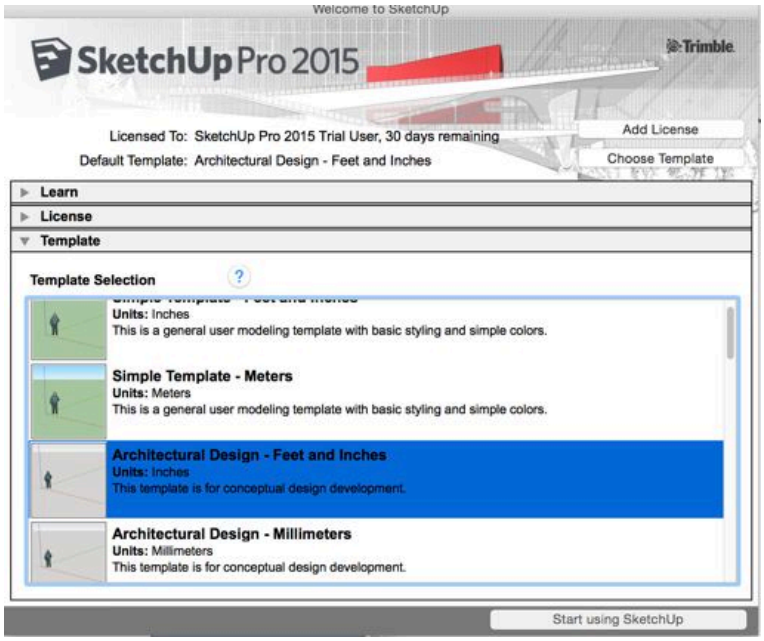
SKETCHUP ORIENTATION

Downlaod the program at Sketchup.com if its not already on your computer
SketchUp Make (the free version) will work just fine for camp purposes.
Download the "Cyber Arena.skp" file located in the cyber fort section of the Blog
Once installed, open this file to explore the program, see example cyberforts and get sketchup Boe-Bot Models.

There are several useful video tutorials on the sketch up.com homepage. If you find yourself having trouble navigating the program, checked them out for some reminders of the content covered in this workshop.

Ready to start learning? Download today, then...
... watch a getting started video.
... learn about SketchUp's tools.
... ask a question in the SketchUp Forums.
Find a 3D model of anything

TEMPLATE: When starting a new sketchup file for your fort sketchup will ask you to select a template. Use the architectural design– feet and inches template. Then click start using sketch up.



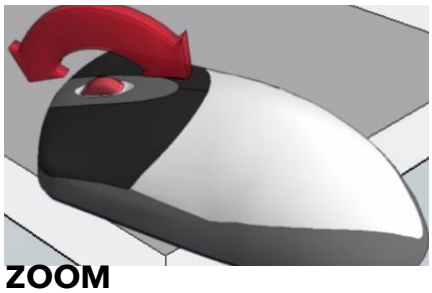
NAVIGATION:
In sketch up all commands are executed via click and release. Rarely is it necessary to click and drag to accomplish the creation of any geometry.

Visual navigation within sketch up is critical to creating a successful and accurate Digital model. Navigation is broken down into three basic commands: Orbit, Pan & Zoom. All of these can be accomplished with an external mouse equipped with a scroll wheel.

ZOOM: Roll the wheel forwards and backwards. SketchUp will always zoom to the point within the model that the cursor is placed, so hover the cursor over the area that you want to take a closer look at when zooming in.

ORBIT: You can orbit your model by pressing the scroll wheel and dragging the mouse. Again, the model will orbit around the point where the cursor was when the wheel is pressed.

PAN: To pan simply hold the shift key on your keyboard while pressing the scroll wheel and dragging the mouse. Pan and orbit work seamlessly together.



ZOOM

ORBIT

PAN

CREATING GEOMETRY WITH THE PUSH/PULL TOOL
Use the Push/Pull Tool to push and pull faces to add volume to or subtract volume from your models. You can use push/pull to create volume out of any face type, including circular, rectangular, and abstract faces. Activate the Push/Pull Tool from either the Toolbar or the Tools menu.

Preparing to Use the Push/Pull Tool

1. ClickontheRectangleTool(). The cursor changes to a pencil with a rectangle.

2. Click anywhere in the drawing area to set the first corner point of the rectangle.

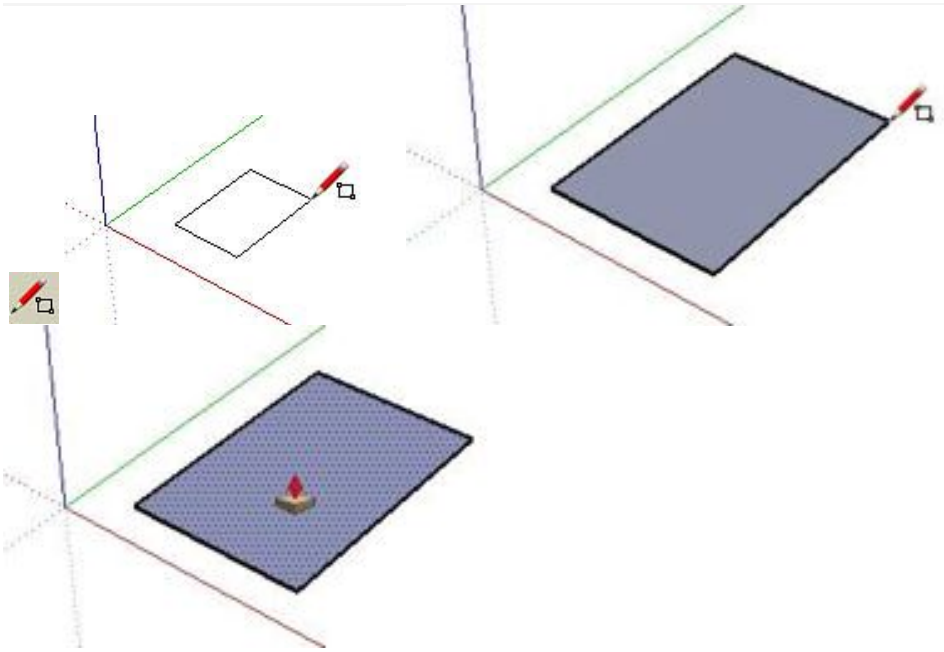
3. Movethecursordiagonally. A rectangle will expand out from the first cornerpoint.

4.Click again to set the second corner of the rectangle. A rectangular face is created bordered by four edges.

Using the Push/Pull Tool To push or pull a face:

1. Click on the Push/PullTool(). The cursor will change to a 3D rectangle with an up arrow().

2. Click on the rectangular face created in the previous exercise.



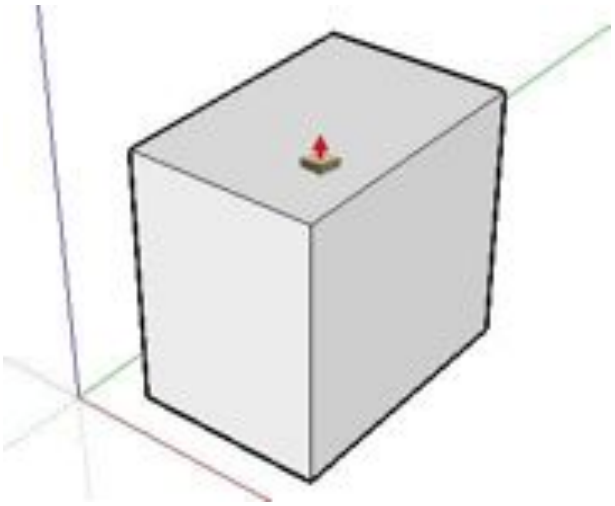
3. Move the cursor to create (or decrease) volume.

Press the Esc key at any point during the operation to start over.

4. Click when the volume has reached the desired size.

You can also press and hold the mouse button, drag the mouse, and release the mouse button to create a volume.

You can use the Push/Pull Tool to create volume from any shape, whether it be an abstract shape drawn using the Freehand Tool or a shape drawn on another piece of 3D geometry. Following are some examples of Push/Pull operations.



EDITING VOLUMES
Once a general volume has been created in sketch up you can edit it by drawing triangles rectangles or polygons on the surfaces of that volume and continuing to push and pull them.

The edges of the resulting volumes can be selected and removed in order to create ramps and sleeping faces for your geometry.

Any time that a set of three or more lines isn't drawn in the same plane sketch up will automatically generate a surface between those Lines. This can be useful for creating triangular faces of ramps and geometric forms in your model.

TIME TO DESIGN
Review the examples in the cyber arena model invited to you on the blog, review how they are constructed and consider the aesthetic and functional strategies shown, and when you are ready, start a new file in which you create your own fort.

Remember, the cyber fort competition is worth 100 points and they will be evaluated on their functionality as well as aesthetics, originality, poetics and the quality of craft in construction.

Good Luck!