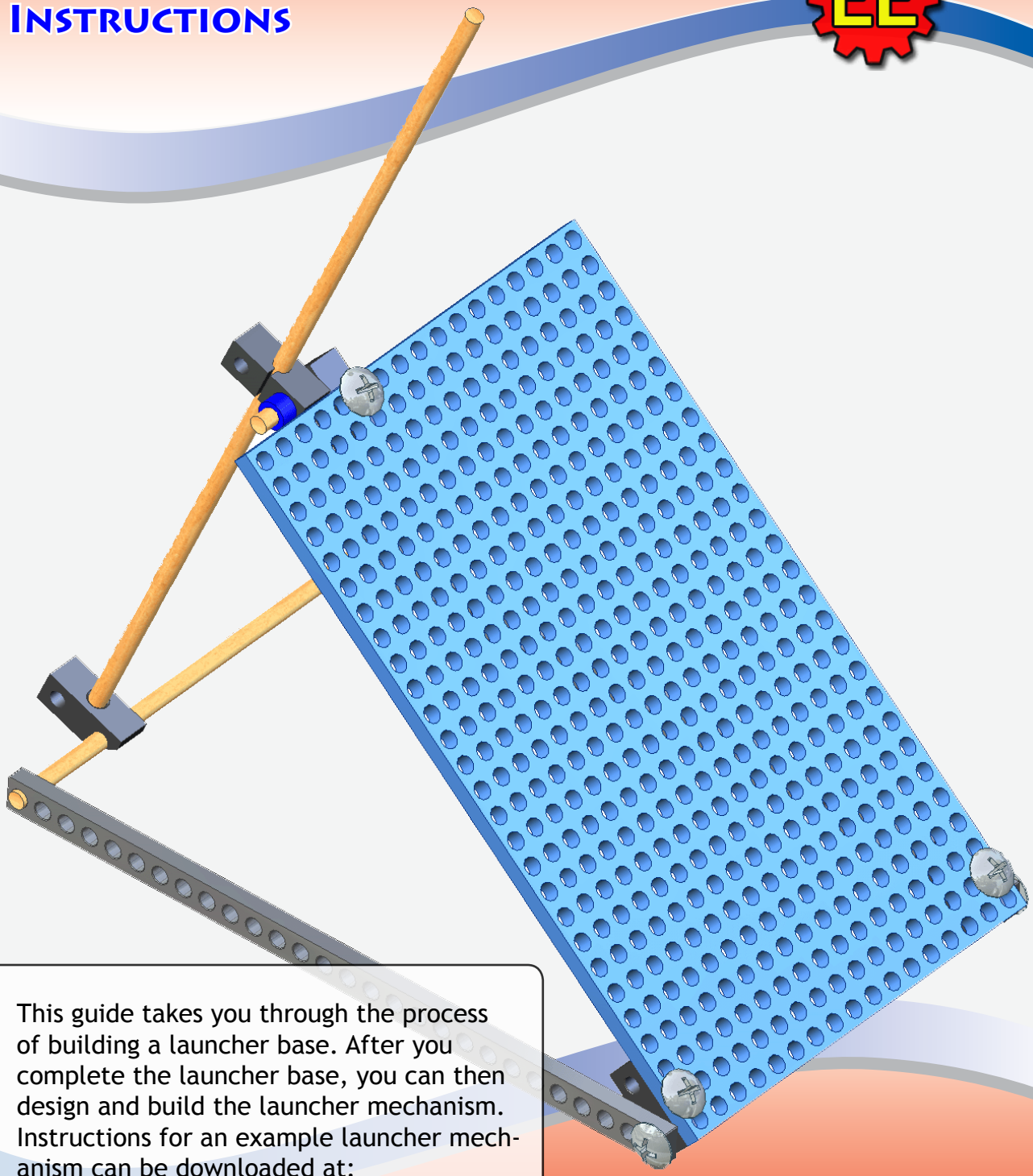
Big Blue Launcher

Part 1: Base Building Instructions



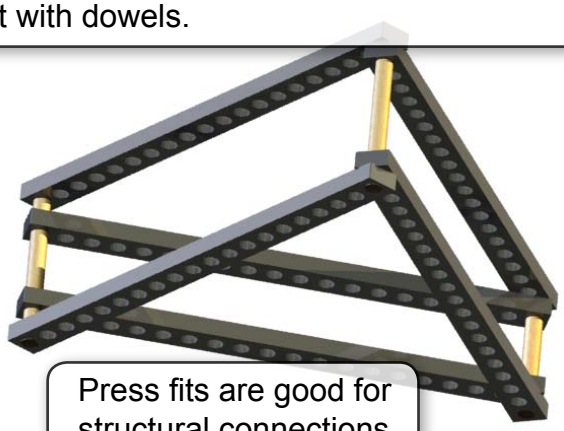
This guide takes you through the process of building a launcher base. After you complete the launcher base, you can then design and build the launcher mechanism. Instructions for an example launcher mechanism can be downloaded at: teachergeek.org/blue_launcher.pdf

TeacherGeek.com

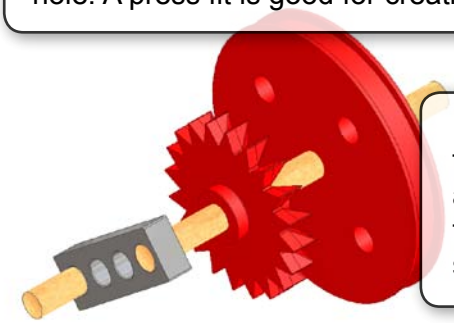
Dowels and Holes

Easy Engineering™ Components come with holes that are the perfect size for a press fit with dowels.

A press fit is one where the dowel is fixed and not able to rotate or slide once it's in the component hole. A press fit is good for creating rigid structures.



Press fits are good for structural connections.



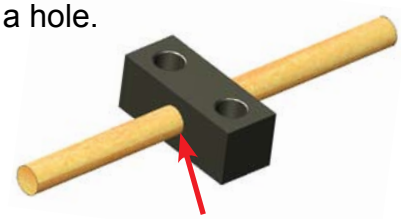
Press fits are good for gears, pulleys and levers that turn together on the same dowel (axle).

Reaming Holes

Learn how to use a reamer on page 3

Slide Fit

A Slide Reamer makes it easier to push or pull a dowel through a hole.



This hole in the perpendicular adaptor was reamed with the Slide Reamer to make it easier for it to slide to the middle of the dowel.

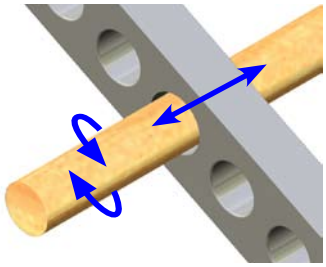
Tip: A Better Slide Fit

After reaming perpendicular adaptors with the slide reamer, slit them with the easy cutter.

Loose Fit

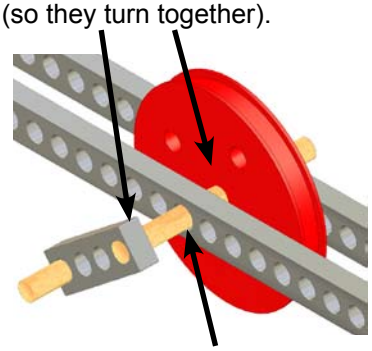
The Loose Reamer creates a hole that dowels can freely rotate in and slide through.

A loose fit is typically used to support axles, wheels and pulleys. It is also used for pivot points.

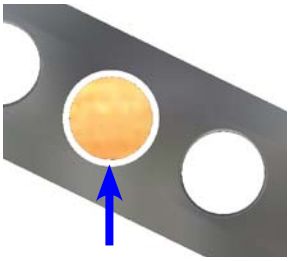


The dowel moves freely in the loose fitting hole.

The crank and pulley are press fit onto the same dowel (so they turn together).

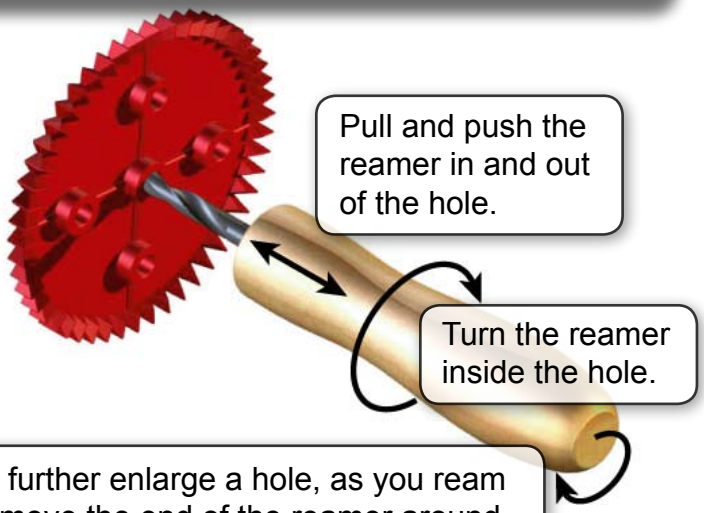


The link strip holes that the dowel needs to rotate in were reamed with the Loose Reamer.



The Loose Reamer creates a hole that is larger than the dowel.

How to Ream Holes



Pull and push the reamer in and out of the hole.

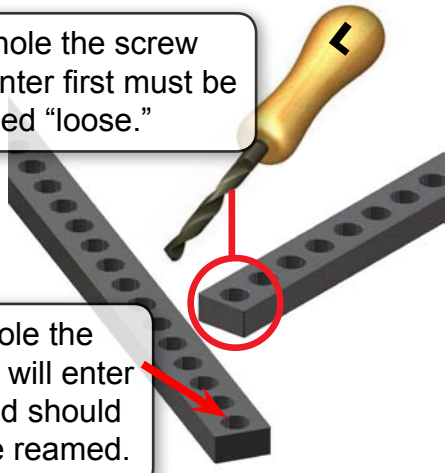
Turn the reamer inside the hole.

To further enlarge a hole, as you ream it, move the end of the reamer around so it is not in line with the hole.

Screws

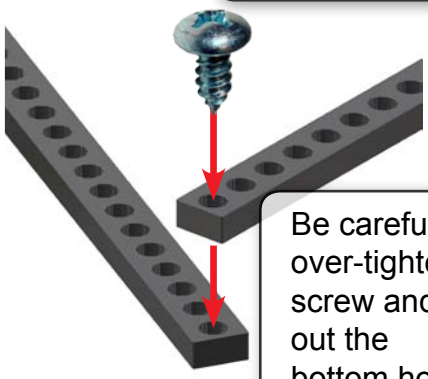
Screws can be used to attach two components together.

The hole the screw will enter first must be reamed "loose."



The hole the screw will enter second should not be reamed.

Turn the screw into both components.



Be careful not to over-tighten the screw and strip out the bottom hole.

Tighten the screw completely to keep components from rotating.

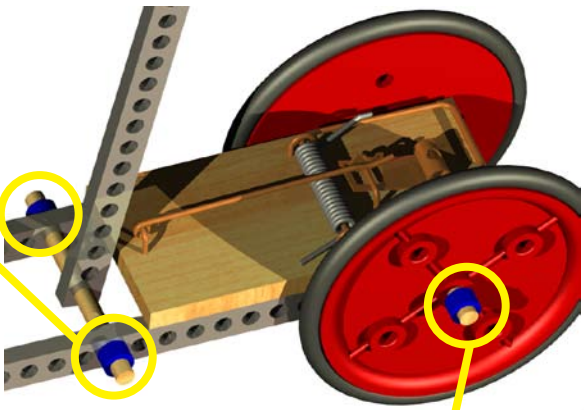
OR

Leave the screw a ¼ turn from tight to allow components to rotate/pivot.

Slide-Stop Material

Slide-Stop Material comes in long lengths. It must be cut into 6mm (~1/4") sections before it can be used.

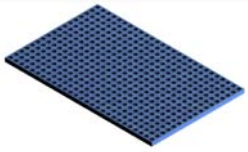
Slide-Stop Material keeps dowels from sliding back and forth in "loose" reamed holes.



Slide-Stop Material keeps components with "loose" reamed holes from sliding back and forth on dowels.

Parts List:

5 Perpendicular Adaptors



1 Blue Base

5 #12 Screws

2 Long Link Strips

1 5mm x 600mm Dowel

Tools Needed:

Reamer Set

Easy Cutter

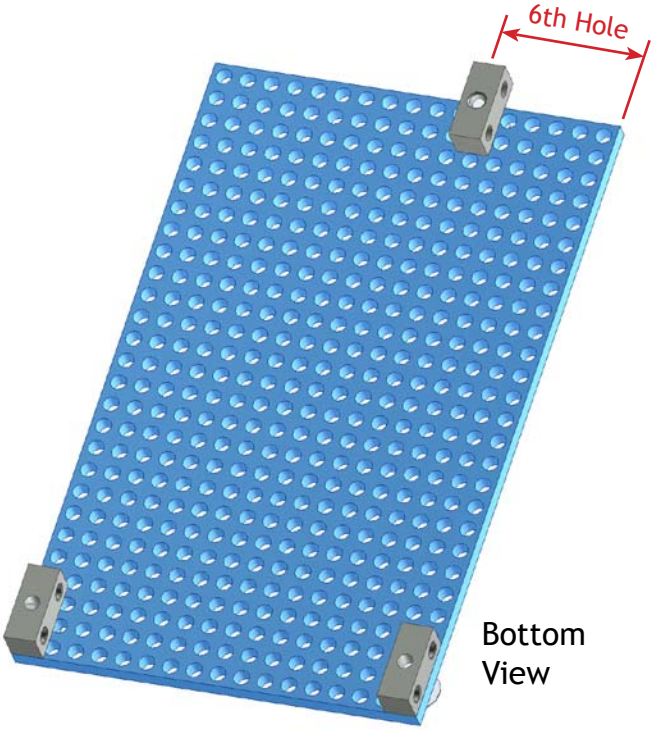
#2 Screwdriver

Metric Ruler

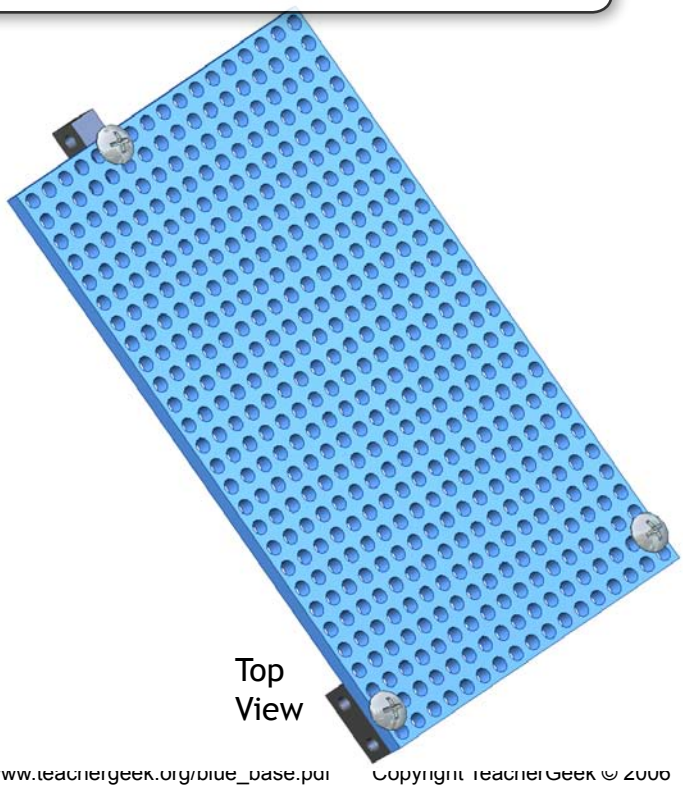
Let's start building!!!

1. Attach Perpendicular Adaptors

Attach perpendicular adaptors to blue base using screws. Ream the hole in the blue base where the screw will enter with the "large" reamer. *Do not ream the perpendicular adaptors.



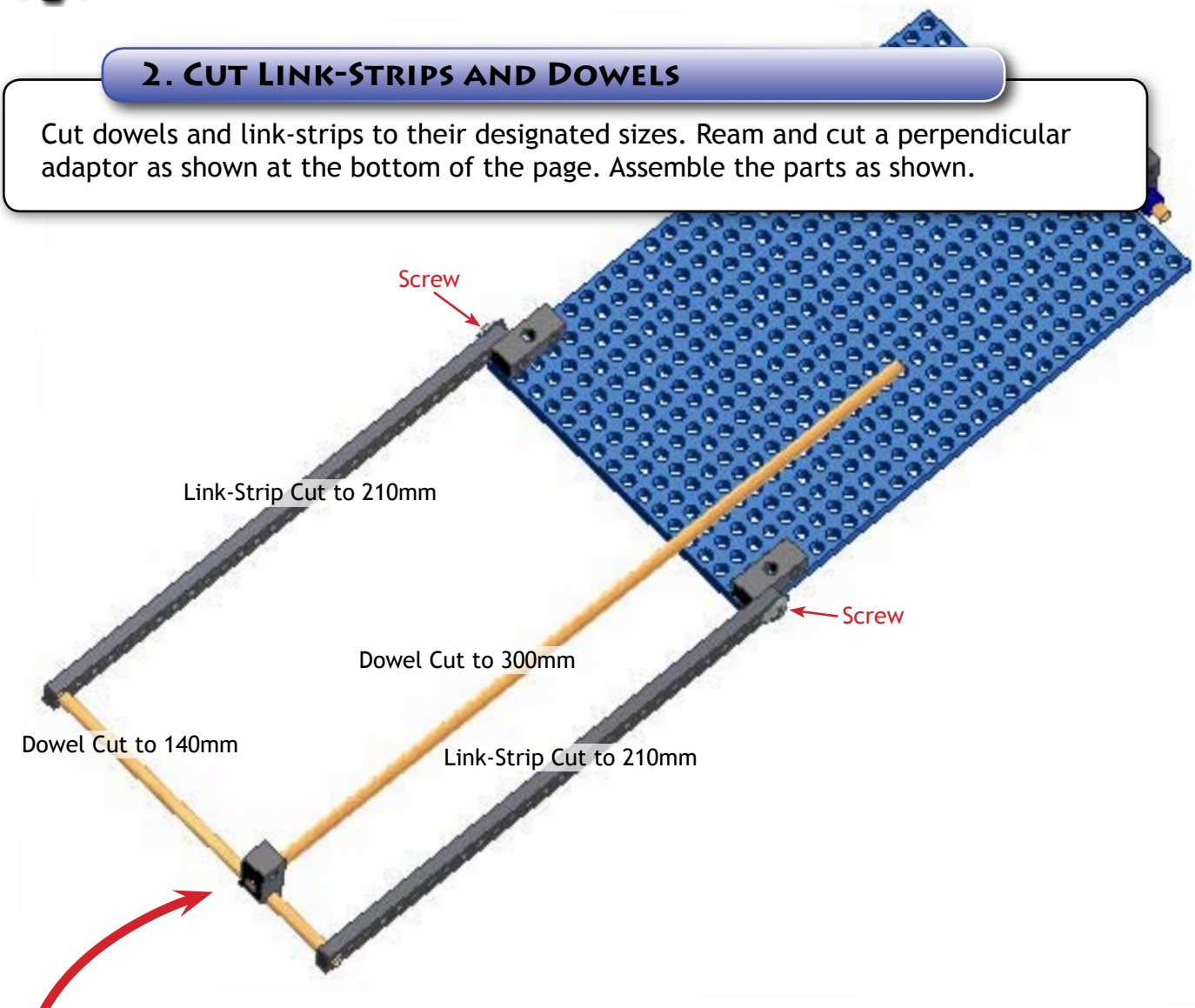
Bottom View



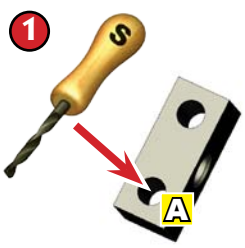
Top View

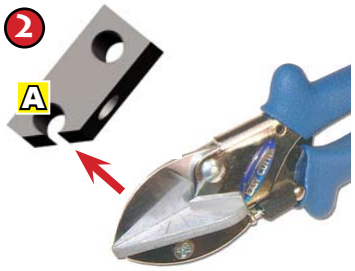
2. Cut Link-Strips and Dowels

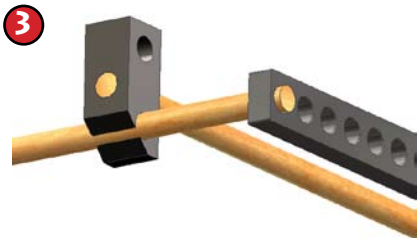
Cut dowels and link-strips to their designated sizes. Ream and cut a perpendicular adaptor as shown at the bottom of the page. Assemble the parts as shown.



1. Ream Hole A in a perpendicular adaptor with the “slide” reamer.
2. Cut the corner off of the perpendicular adaptor. *Only cut to the edge of hole A.
3. Attach the perpendicular adaptor as shown.

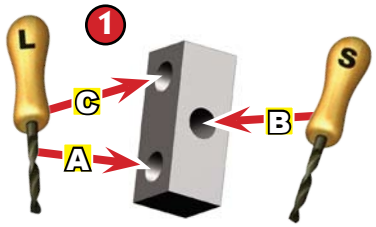


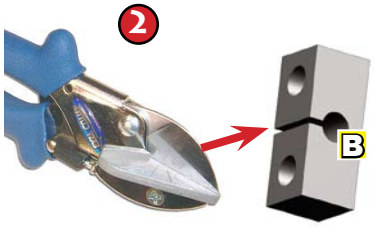




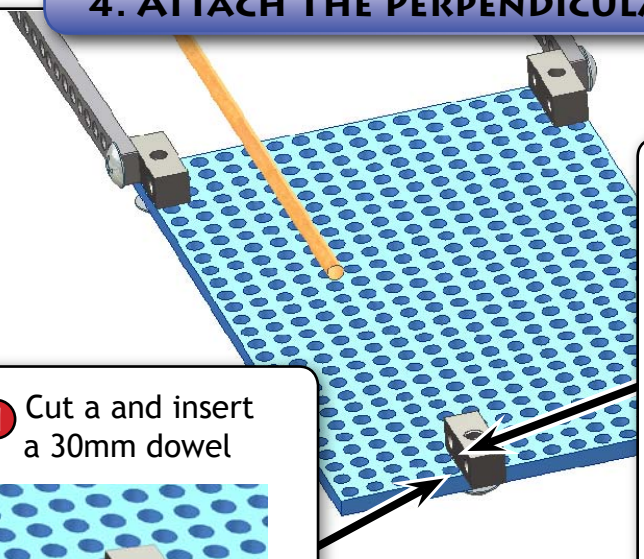
3. Ream and Slit a Perpendicular Adaptor

1. Ream holes A and C in a perpendicular adaptor with the “loose” reamer. Ream hole B with the “slide” reamer.
2. Slit hole B (as shown) with the Easy Cutters.



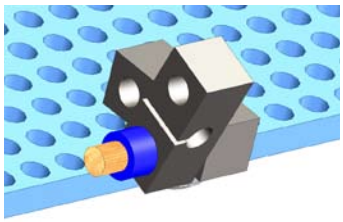


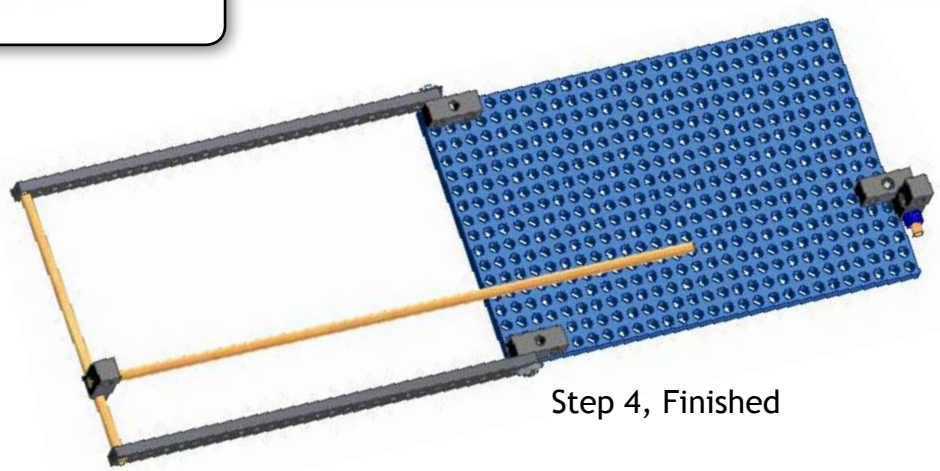
4. Attach The Perpendicular Adaptor



1. Cut a and insert a 30mm dowel

2. Slide the perpendicular adaptor from Step 3 onto the dowel. Secure it with a section of slide stop material.

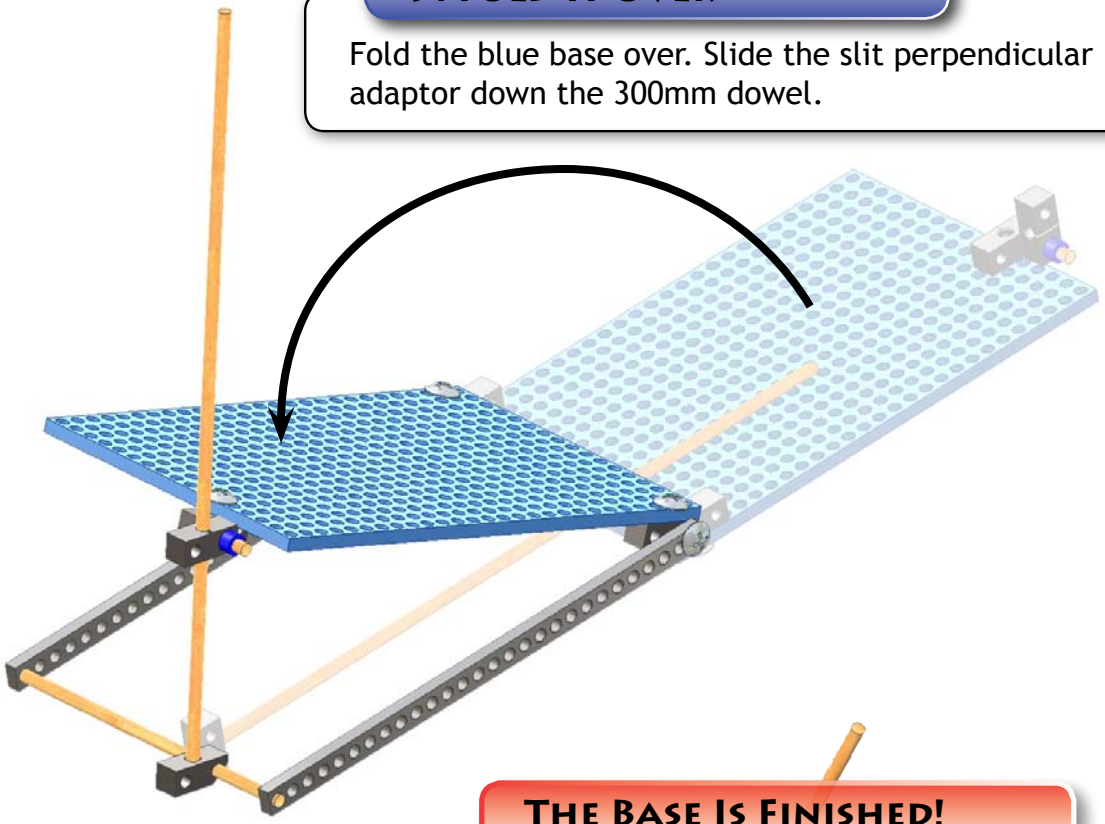




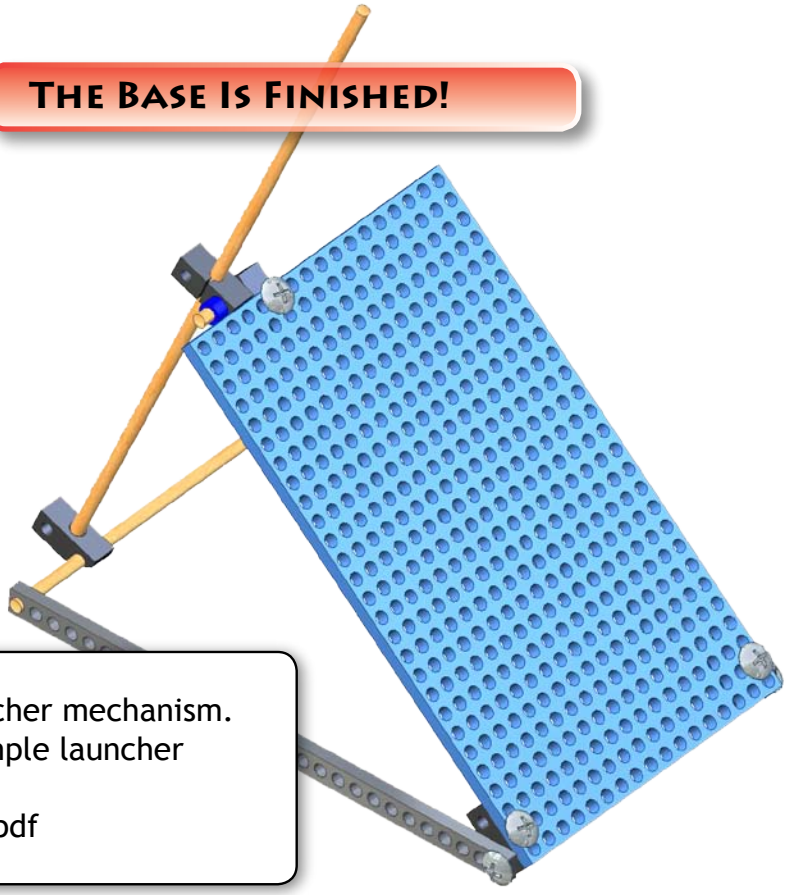
Step 4, Finished

5. Fold It Over

Fold the blue base over. Slide the slit perpendicular adaptor down the 300mm dowel.



The Base Is Finished!



Now it's time to create the launcher mechanism. Instructions for creating an example launcher mechanism can be downloaded: teachergeek.org/blue_launcher.pdf