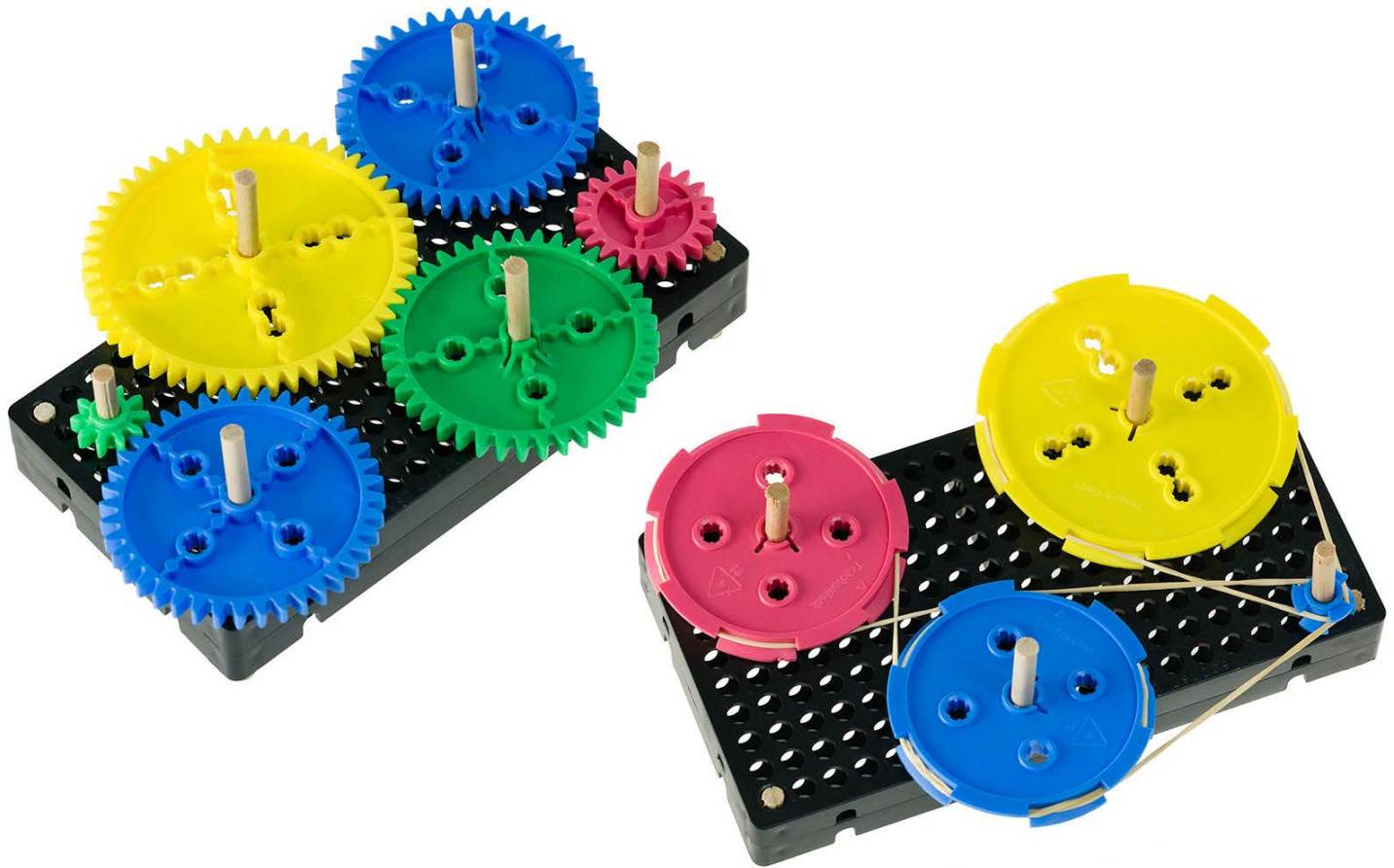




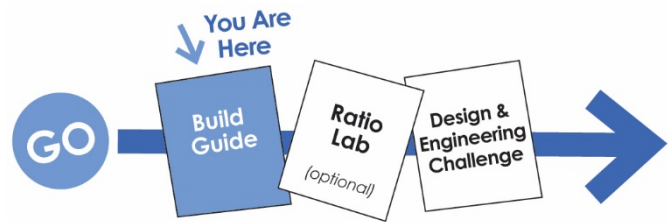
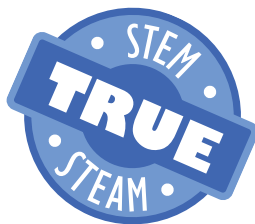
Gears & Pulleys Tinker Set - Build Guide



► If Doing This Activity With Young Children:
Have an adult assemble it first (using this build guide),
and then give to children to tinker and engineer with.

WARNING!

Small Parts, Choking Hazard,
For ages 4 and Up.
Use only with Adult Supervision.



Download Documents at teachergeek.org/learn

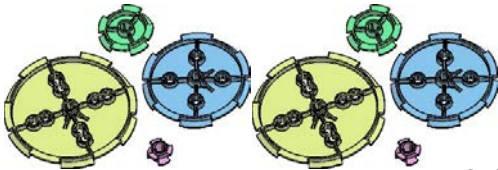


Gears & Pulleys Tinker Set - Build Guide



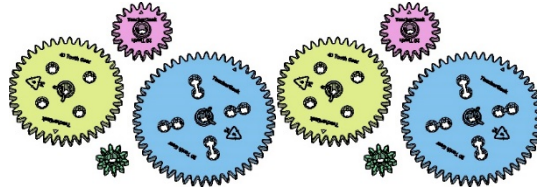
TeacherGeek Supplies

You'll need these components to create one Gears & Pulleys Tinker Set.



8 – Pulleys

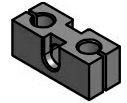
Two of the following pulleys:
9mm, 25.5mm, 55.5mm, 70mm



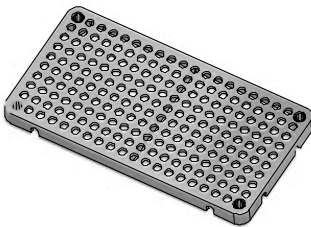
Colors will vary.

8 – Gears

Two each of the following gears:
10, 20, 40, 50 Tooth



4 – Blocks



2 – Hole Plates



4 – Dowels

5mmx300mm (12in)



10 – Rubber Bands

Small (#16)

TeacherGeek Tools

This isn't a kit. With TeacherGeek, you get to really build (*cut, ream, screw*). Here are tools you'll need to get started. They can be shared, between kids/groups, if needed.

- TeacherGeek Multi-Cutter
- Tapping Block
- Small Hammer



Get individual tools, or the complete
TeacherGeek / Maker Tool Set

Single [SKU 1823-24](#)

Class Set [SKU 1823-85](#)

Tools for ages 13 and above, or with
adult supervision

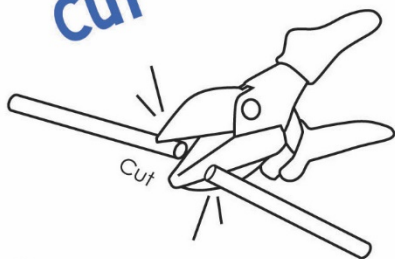
Tip: Save all your materials (even what you cut off). Keep them in a bag. They can be used later.



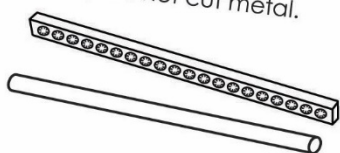
Gears & Pulleys Tinker Set - Build Guide



Cut

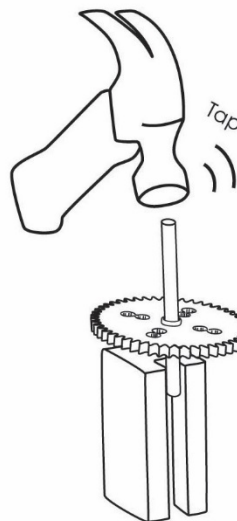


Multi-Cutters cut wood & plastic (like **dowels** and **connector strips**). They do not cut metal.



Push, Wiggle,

Push, wiggle or tap **dowels** into holes.



Tap

Use a **hammer** and **slider block** to tap **dowels** farther thru holes.

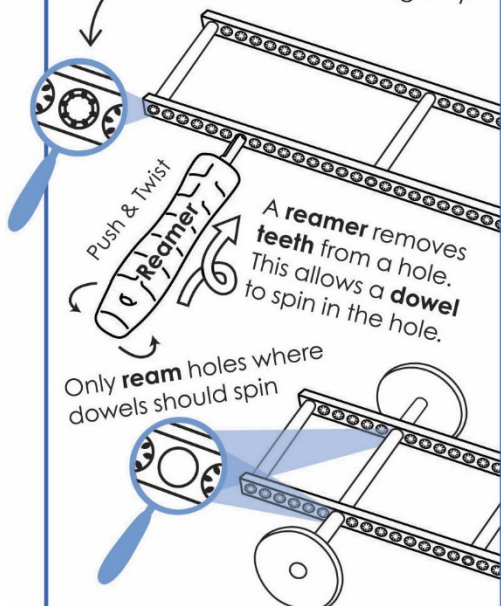
Quick Tip!



Use a **crayon**, or **soap** on the end of a **dowel** to make building easier.

Ream

Most parts have holes with **teeth**. The **teeth** hold **dowels** (keep dowels from falling out).



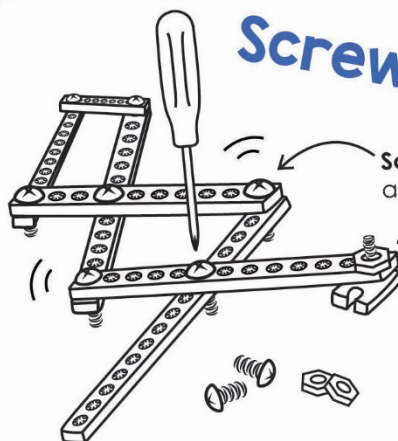
A **reamer** removes **teeth** from a hole. This allows a **dowel** to spin in the hole.

Only **ream** holes where dowels should spin

Never **ream** **pulleys**, **gears**, **wheels**, or any hole a **dowel** stays stuck into.

Screws & Nuts

Do not **ream** holes you will put **screws** into.



Screws (without nuts) can connect parts, and allow them to rotate.

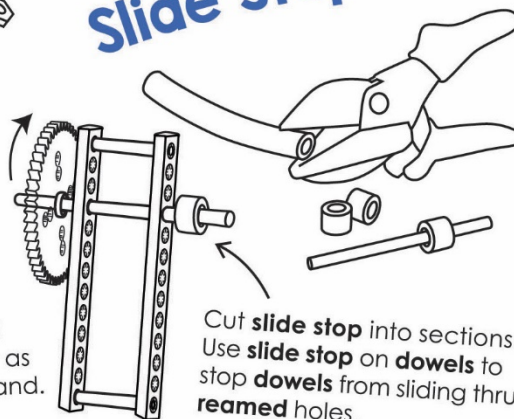
Screws (with a nut) can connect parts, and keep them from rotating.

Stop Clip



Press a **stop clip** onto a **dowel** to keep it from sliding or use it as a hook for a string / rubber band. It takes little force to get it on.

Slide Stop



Cut **slide stop** into sections. Use **slide stop** on **dowels** to stop **dowels** from sliding thru **reamed** holes.

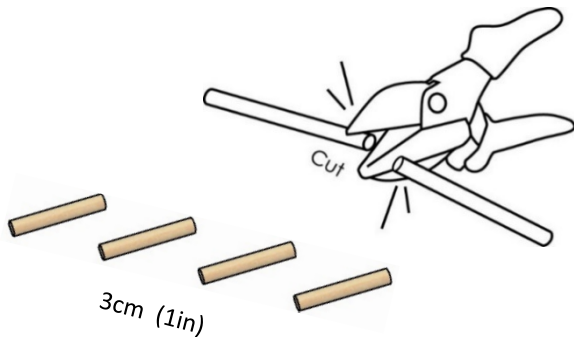


Gears & Pulleys Tinker Set - Build Guide



Build the Base

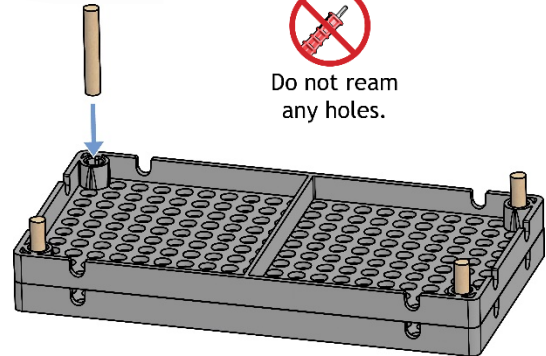
1 Cut four 3cm (1in) dowels.



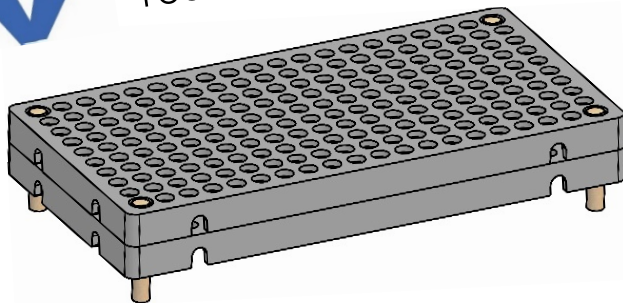
2 Tap or push the **dowels** into two, stacked, upside-down **hole plates**.



Do not ream
any holes.

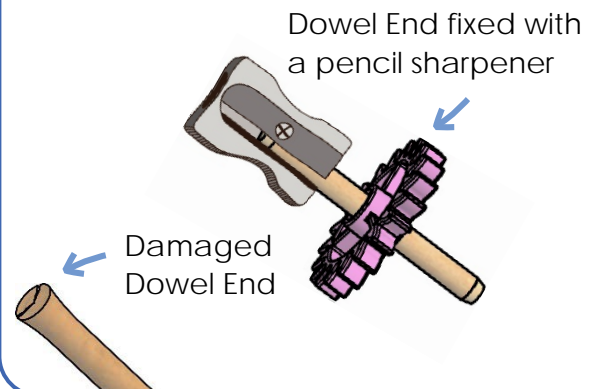


✓ **Congratulations!**
Your **base** is done.



► Now, it's time to construct your gears and pulleys for your tinker set.

Tip: Use a pencil sharpener to clean up damaged dowel ends. Don't sharpen it to a point; only take a little off.



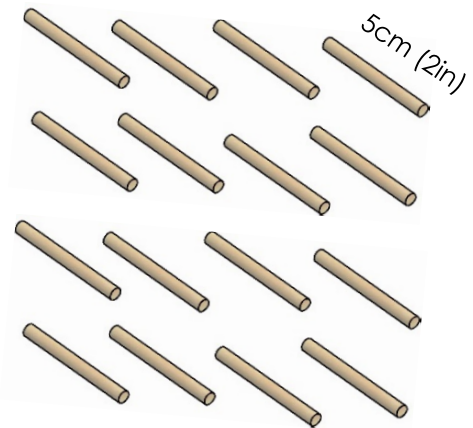
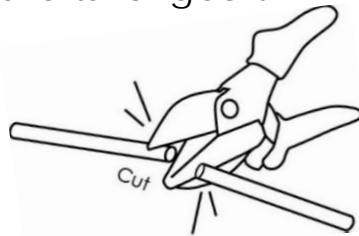


Gears & Pulleys Tinker Set - Build Guide

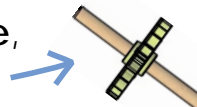


Gears & Pulleys

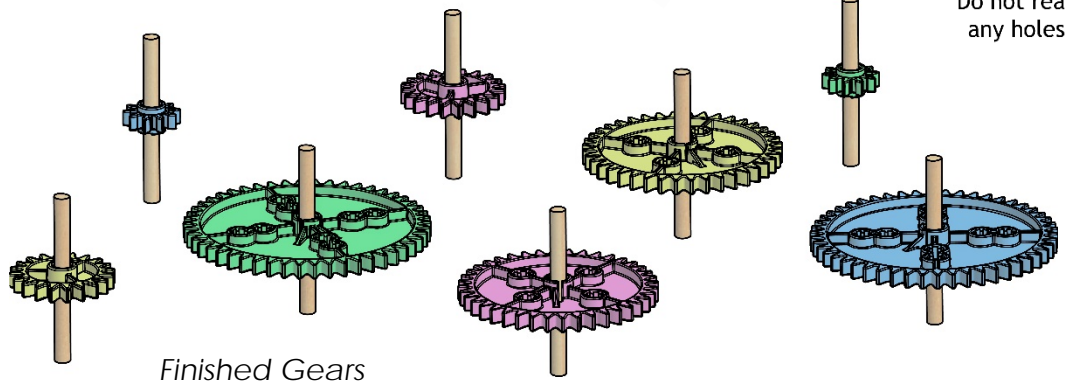
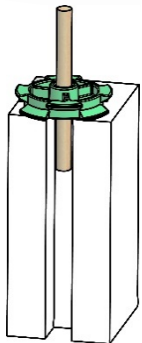
- 3** Cut 16 5cm (2in) dowels.
These will become **shafts** for gears.



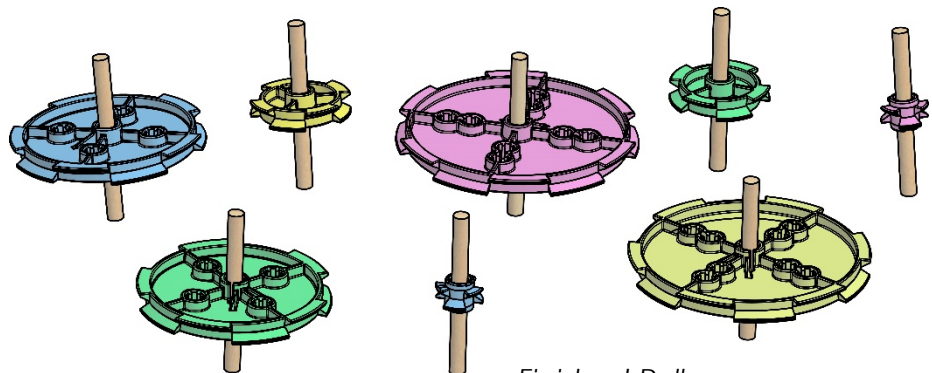
- 4** Tap a **shaft** into each gear's **center hole**,
so the gear is in the center of the shaft.



Do not ream
any holes.



- 5** Tap a **shaft** into each pulley center hole,
so the pulley is in the center of the shaft.



► **Tip:** Tap the dowel
through the gear
or pulley, and down
into the groove
on a tapping block.

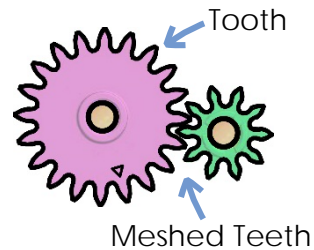
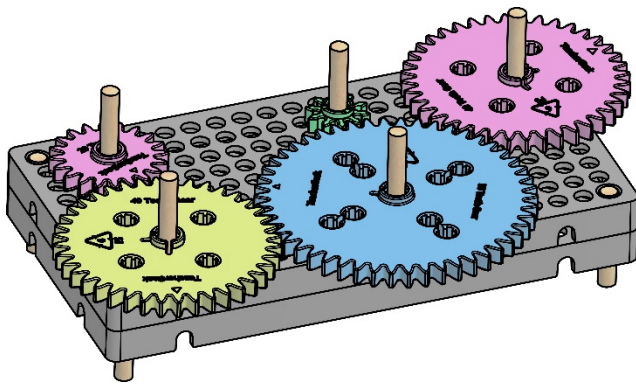


Gears & Pulleys Tinker Set - Build Guide



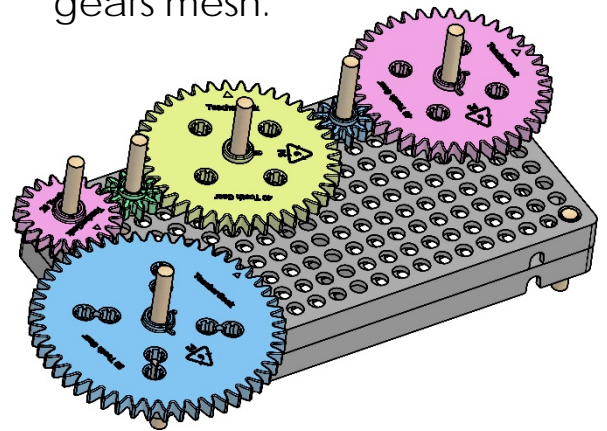
Gear Mechanisms

- 6 Place **gears** into the base. Position them so that the teeth **mesh**. If gears are too close, or too far away, the teeth will not mesh correctly.



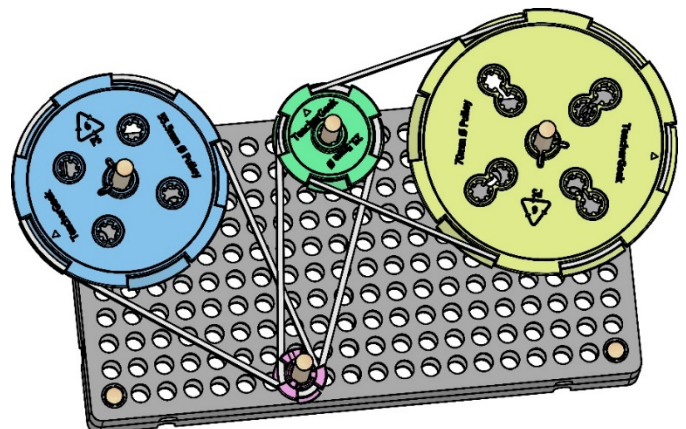
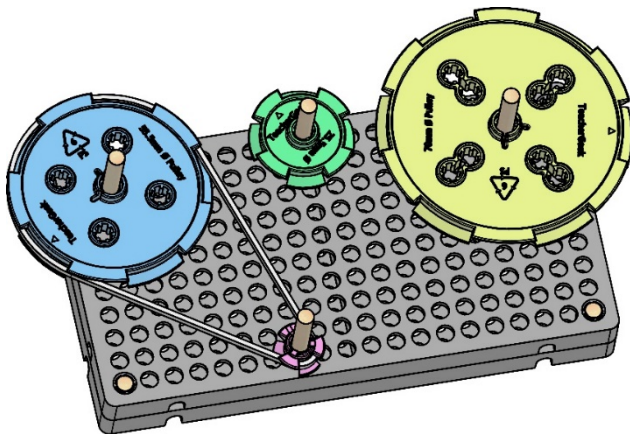
A gear is a wheel with teeth. The teeth **mesh** (connect) with other gears.

- 7 Keep experimenting... Rearrange how the gears mesh.



Pulley Mechanisms

- 8 Place **pulleys** into the base. They should not touch each other. Use **rubber bands** (belts) to connect them.





Gears & Pulleys Tinker Set - Build Guide



Bigger Bases

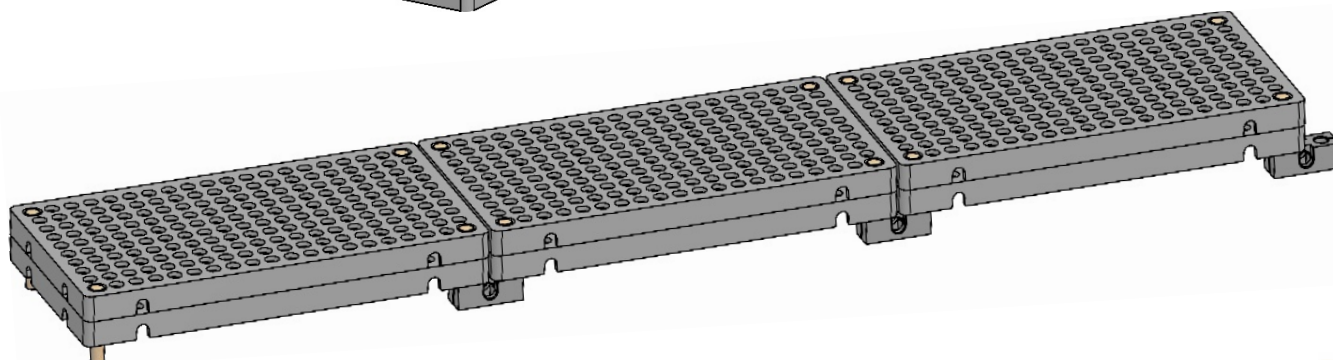
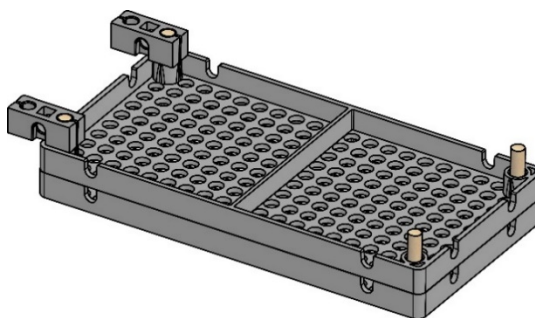
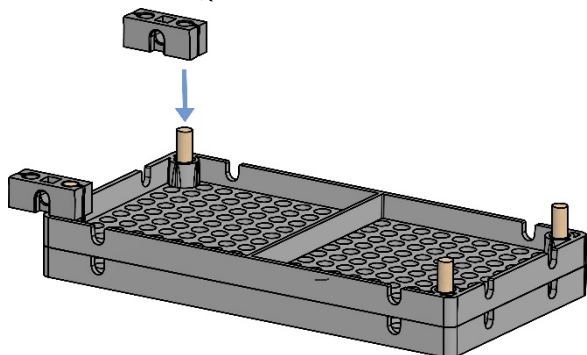
9

Want more room to play with gears and pulleys?
Bases can be **combined** using **blocks**.

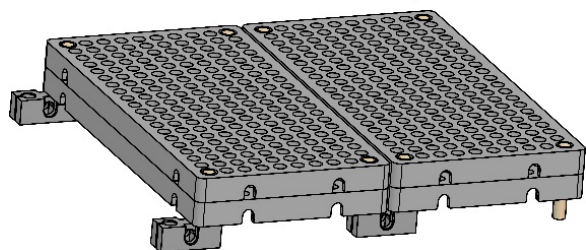


Do not ream
any holes.

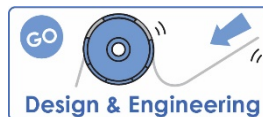
block



Bases can be
combined
long, or wide.



If you are going to do
the optional **Ratio Lab**,
now's the time.



If you are going to do
the optional **Challenges**,
now's the time.

Documents at teachergeek.com/learn