



# INTRO TO TOOLS & BUILDING



**WARNING:**  
**CHOKING HAZARD** — Small parts. Not for children under 3 yrs.

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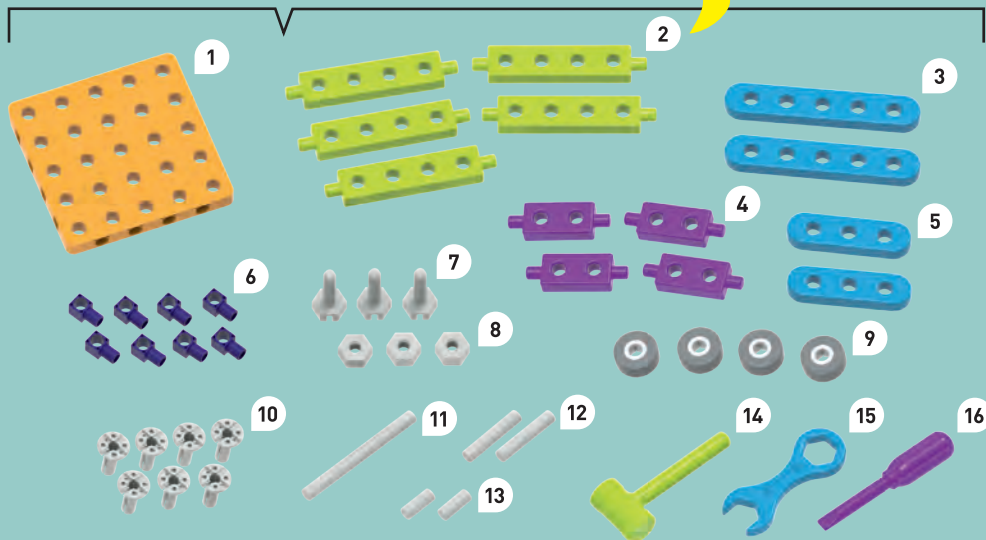


## KIT CONTENTS

What's inside your experiment kit:

*Good to know!*

If you are missing any parts,  
please contact Thames &  
Kosmos customer service  
(see back cover).



## Checklist:

✓	No.	Description	Quantity	Part No.
<input type="radio"/>	1	25-hole base plate	1	7078-W10-A10
<input type="radio"/>	2	4-hole rod	5	7330-W11-I1G2
<input type="radio"/>	3	5-hole rod	2	7330-W11-D1B1
<input type="radio"/>	4	2-hole rod	4	7330-W11-H1P
<input type="radio"/>	5	3-hole rod	2	7330-W11-E1B1
<input type="radio"/>	6	Dowel block with side hole	8	7331-W10-M1P
<input type="radio"/>	7	Bolt	3	8036-W10-U1S
<input type="radio"/>	8	Nut	3	8036-W10-W1S
<input type="radio"/>	9	Wheel	4	8036-W85-C1S
<input type="radio"/>	10	Nail	7	8036-W10-T1S
<input type="radio"/>	11	Long dowel	1	7330-W11-B1S
<input type="radio"/>	12	Medium dowel	2	7330-W11-A1S
<input type="radio"/>	13	Short dowel	2	7268-W11-B1S
<input type="radio"/>	14	Hammer	1	8036-W11-J1G
<input type="radio"/>	15	Wrench	1	8036-W11-G1B
<input type="radio"/>	16	Screwdriver	1	8036-W11-D1P1



## WARNING!

- >> Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled.
- >> Before starting, check the parts list to be sure that all of the correct pieces are included in the kit. Keep the packaging and instructions as they contain important information.
- >> Store the experiment material and assembled models out of the reach of small children.



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Ty and Karlie Omega are siblings. They live in a small city called Makersville. Ty and Karlie's dad is a writer. He writes science fiction stories. Their mom is a mechanical engineer. She designs big machines used in factories.

They live in an awesome warehouse filled with tools, equipment, and building materials. There are always a number of projects going on in the warehouse.

## Dear Parents and Supervising Adults!

Children want to explore, understand, and create new things. They want to try things and do them by themselves.

They want to learn! They can do all of this with Thames & Kosmos experiment kits. With every single experiment, they grow smarter and more knowledgeable.

## Meet the Omega Family!

Ty loves figuring out how things work. Karlie loves building things.

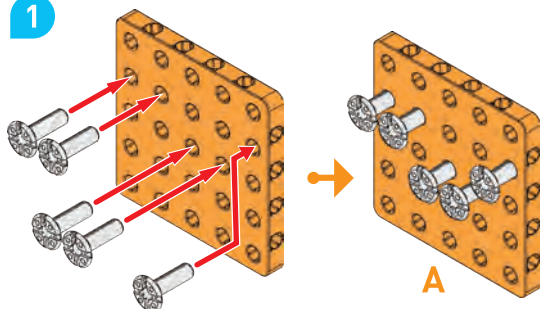
Now it's time for Ty and Karlie to build their very own workbench where they can keep their own tools.

Ty can't wait to figure out how all the tools work, and Karlie is excited to see all the fun models she can build!

*Yay!*  
Let's go!

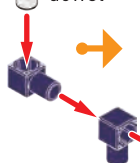
## WORKBENCH

1



2 x2

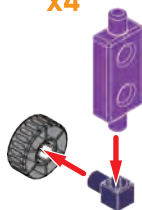
Short  
dowel



B x2

3

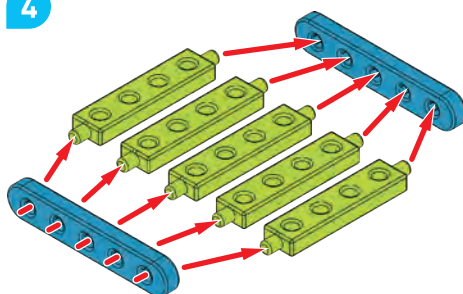
x4



C x4

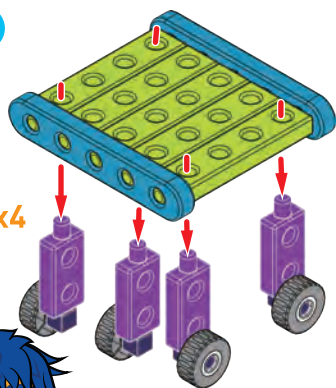


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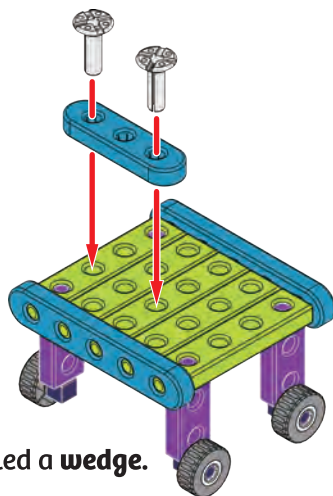


5

C x4



6



A nail is a **simple machine** called a **wedge**.

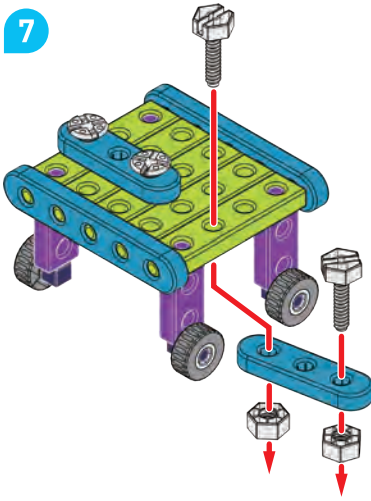
Nails have a triangular shape, where the tip is narrower than the top.

When I hit a nail with a hammer, the direction of **force** changes from downward to outward, which keeps the nail in place.

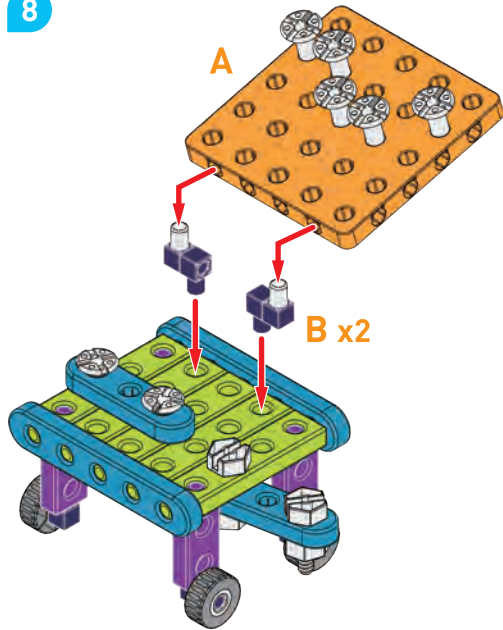




7



8

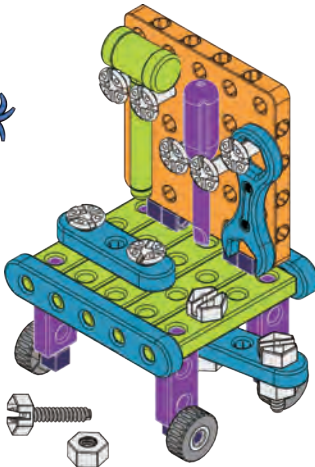


Our workbench is on wheels so that we can move it from project to project. We have an orange **pegboard** to store our hammer, screwdriver, and wrench.

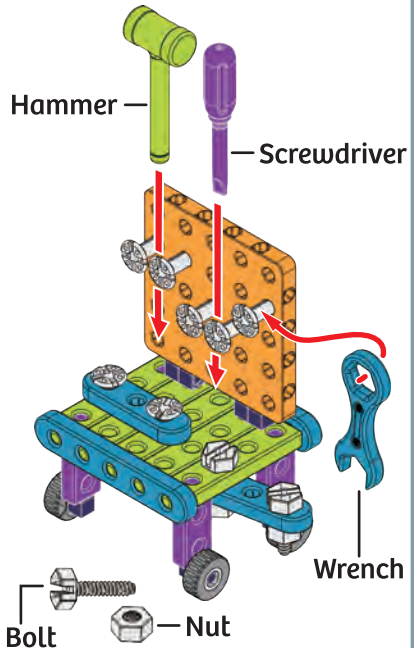
A bolt is a type of **simple machine** called a **screw**. As you rotate a screw, it moves up or down. Screws are often used to hold things together.



*Done!*

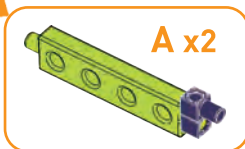
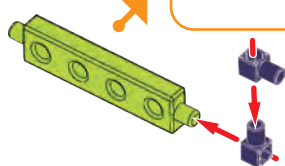


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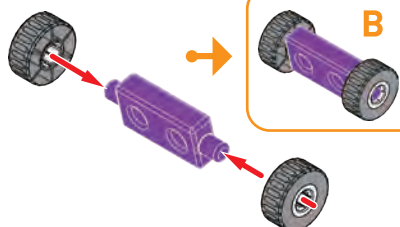


# RACE CAR

1 x2

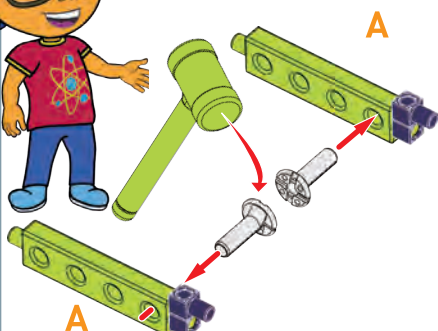


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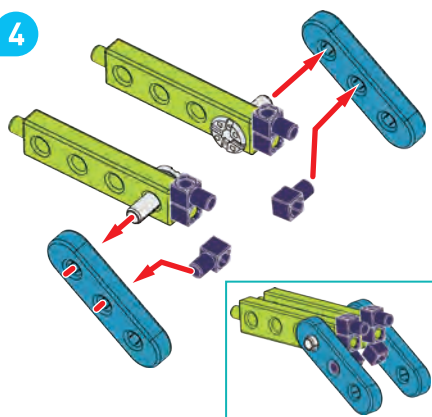


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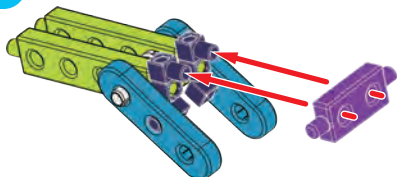
I use a hammer to tap down nails. A hammer usually has a weighted head, which increases the force from my hand.



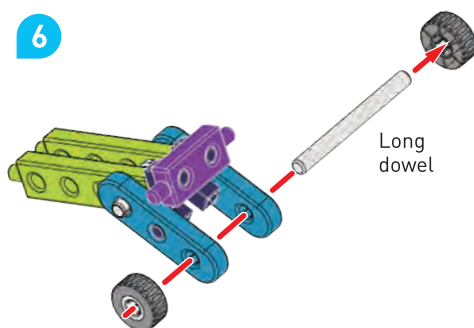
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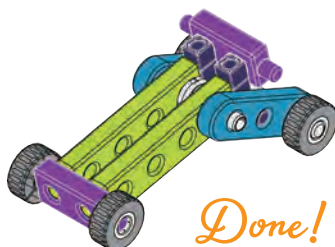
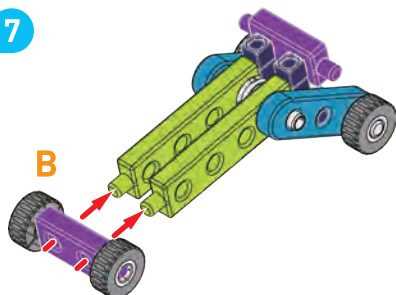
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6



7

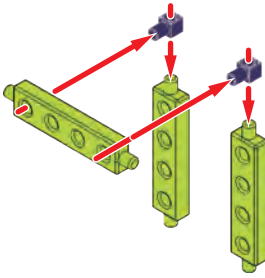


Done!

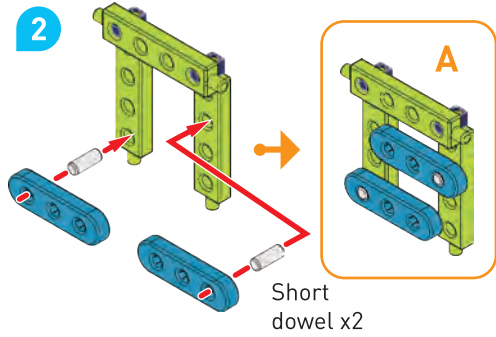


## HOUSE

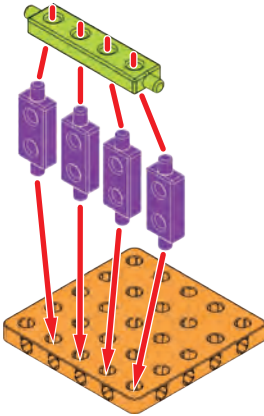
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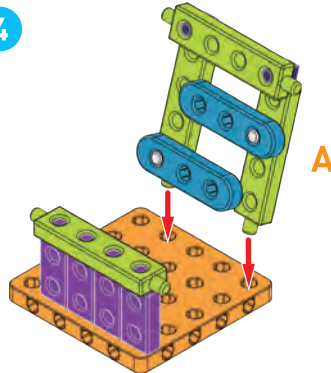
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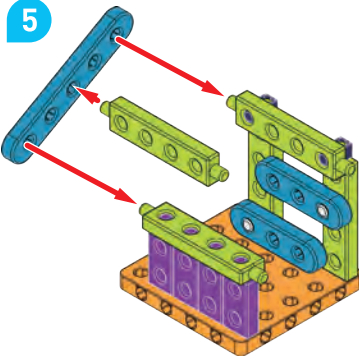
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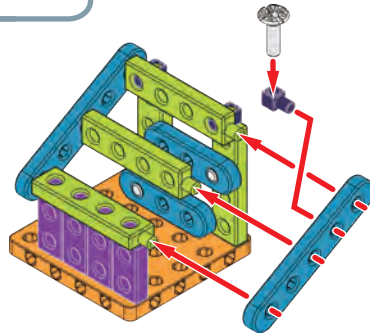
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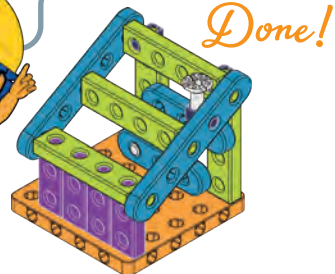
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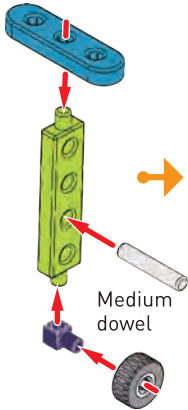


Carpenters use tools to build houses, often using pieces of wood called **lumber**. The connection between two pieces of lumber is called a **joint**. Most roofs are sloped so that rain and snow slide off.

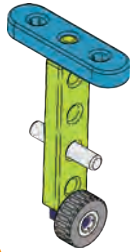


## AIRPLANE

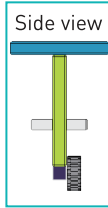
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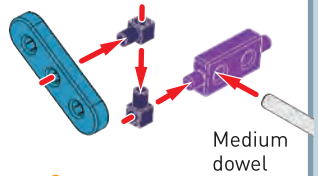
A



Side view



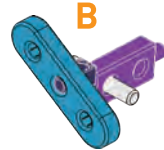
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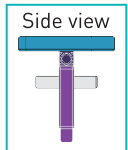
Medium dowel



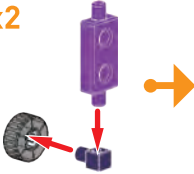
B



Side view



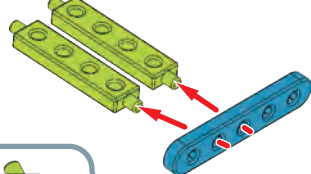
3 x2



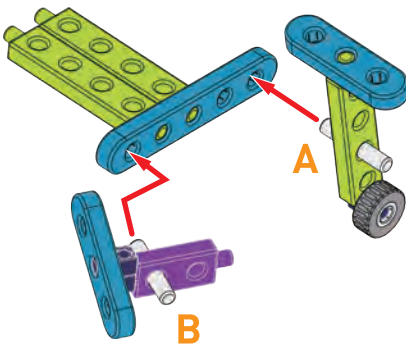
C x2



4



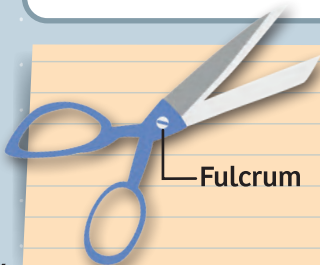
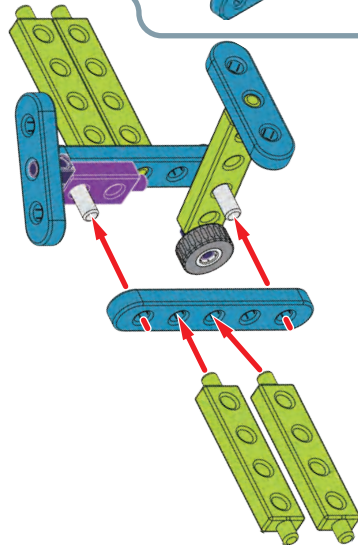
5



A

B

6



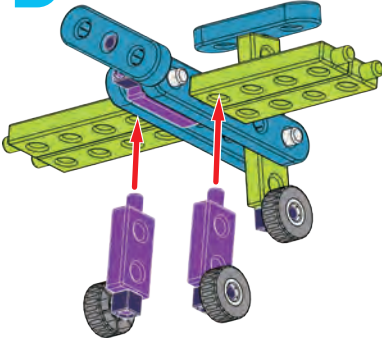
Fulcrum

A scissor is a **simple machine**. Actually it is two simple machines in one! Each of the blades is a **wedge**, and the two arms that squeeze together are **levers**. The point where the two arms connect and pivot around is called the **fulcrum**. Levers increase the force that is applied to them.

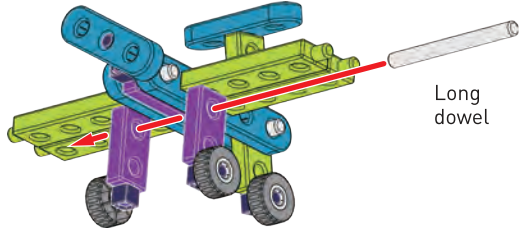




7



8



This plane has a **propeller** in the front and two large wings on the sides. The **rudder** on the back of the plane helps it steer left and right.

*Done!*



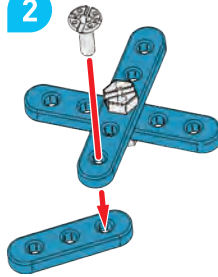
## SCISSORS

1

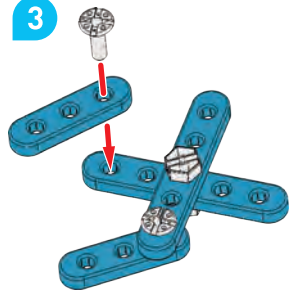
Use a screwdriver to rotate the bolt. Turn it clockwise to tighten and counterclockwise to loosen.



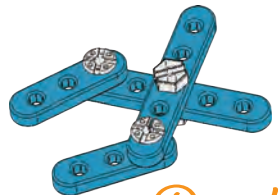
2



3



Use a wrench to hold the nut in place as you turn the bolt.

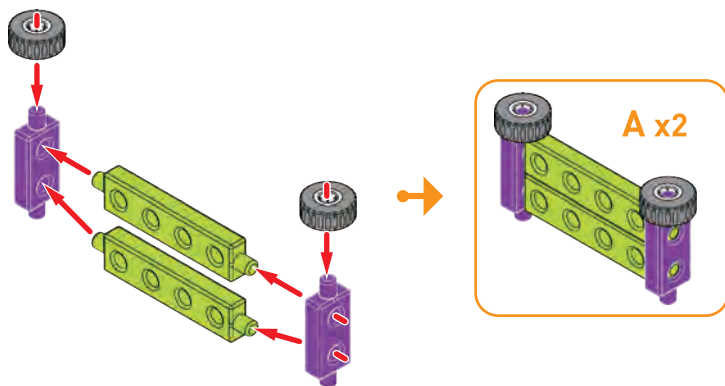


*Done!*

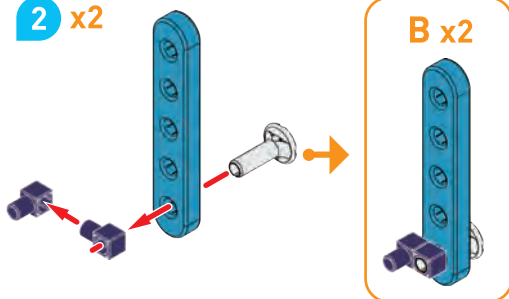
Here's how I remember which way to turn the bolt: "Righty-tighty, lefty-loosey."

# TOOLBOX

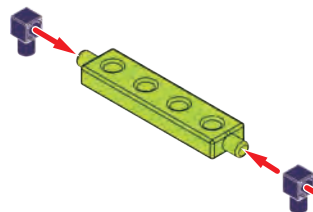
1 x2



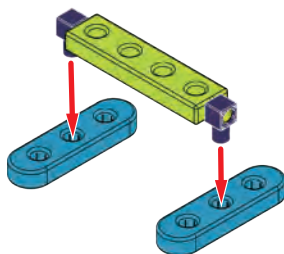
2 x2



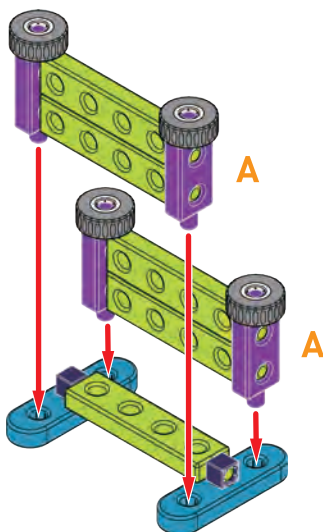
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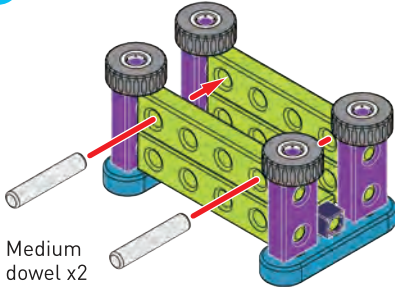
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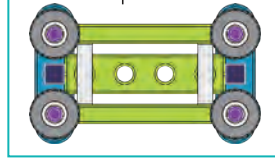
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6

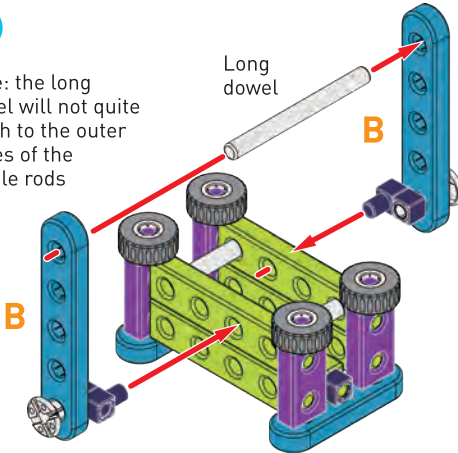


Top view



7

Note: the long dowel will not quite reach to the outer edges of the 5-hole rods



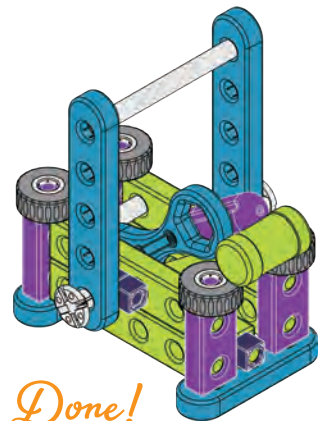
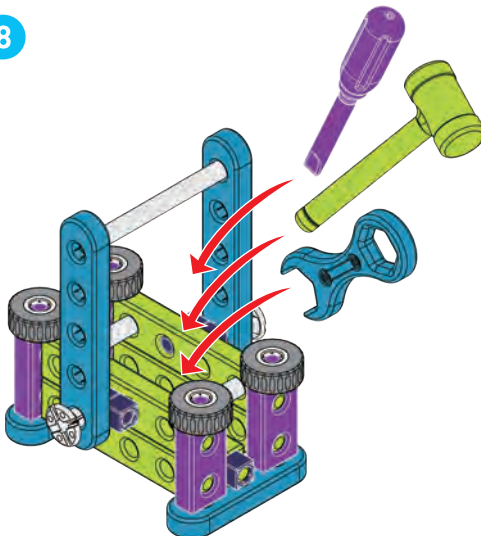
???

With a toolbox, we can carry our tools anywhere!

What project will we tackle next?



8



# Endless possibilities for open-ended creative play

What else  
will YOU  
build?!

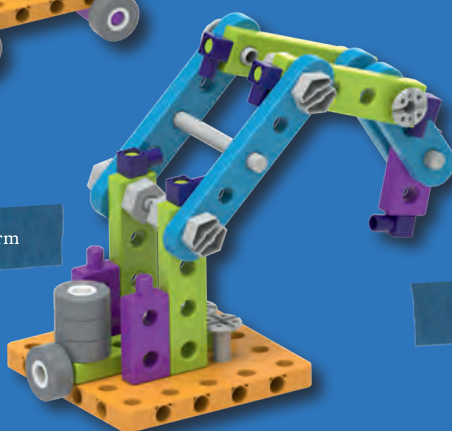
Trolley



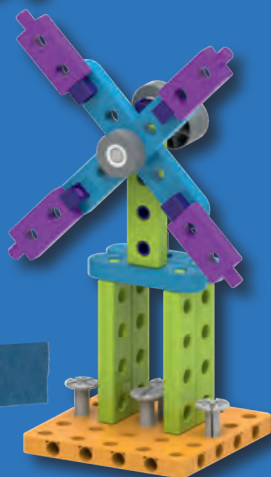
SUV



Robot arm



Windmill



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