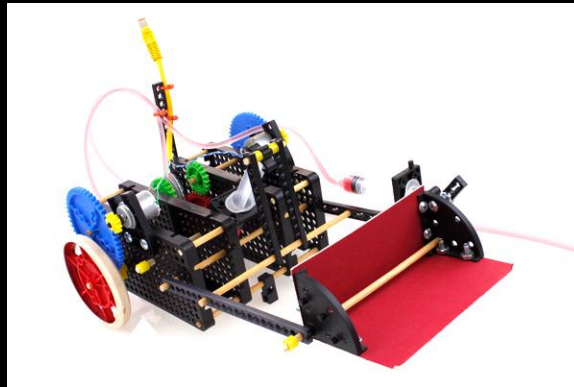


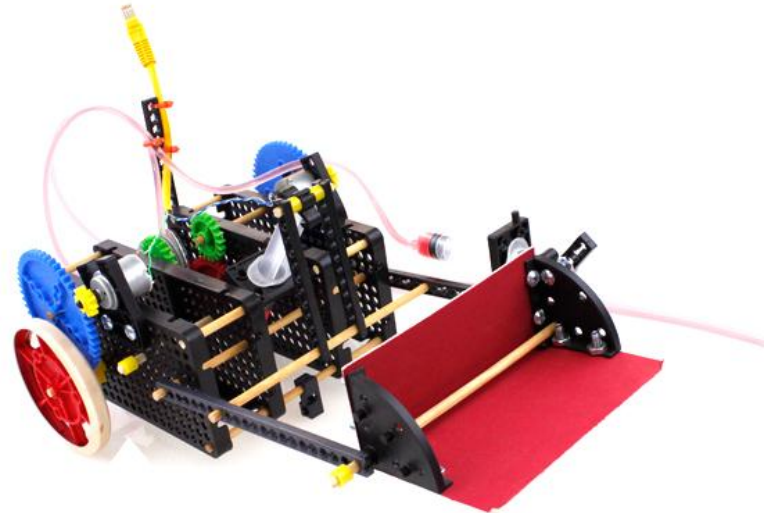
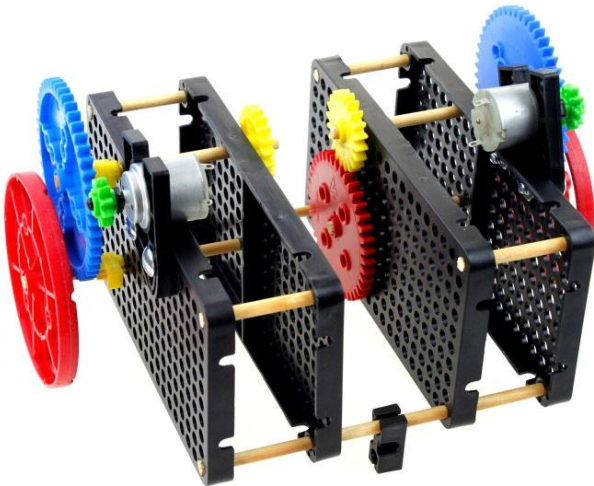
TeacherGeek™ Sumo Bot Vehicle Application Guide

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TeacherGeek's Sumo Bot Vehicle Activity is the perfect way to encourage unique design and innovation. The flexibility of this system also provides the opportunity for creative competitions from the traditional sumo ring (arena) to collecting and delivering balls or blocks to elevated goals by integrating the TeacherGeek hydraulics into the vehicle design.

The following step by step guide is one example of a basic steerable vehicle that can be modified with additional TeacherGeek gears or pulleys for more speed and power. You can also add plows, lifts or whatever your design requires. This is by no means the only or the best design. You are encouraged to incorporate your own ideas and innovations. Design possibilities are limitless and the TeacherGeek system allows you to engineer and reengineer until your ultimate vehicle is complete.



QUICK-START GUIDE

- ❑ The **TeacherGeek Quick-Start Guide** provides a great reference for techniques, tools and tips used to assure successful building.
- ❑ Before beginning construction, take time to review this important information..

Click on this image to open the full PDF document. 

QUICK-START GUIDE



Build it, try it, change it. TeacherGeek™ components allow you to design and engineer your most imaginative mechanisms. Combine them with other materials and products. More resources are available at teachergeek.com.

DOWELS

Dowels vary in diameter. Some may be too large or small to use.

The ends of dowels may taper and need to be cut off to fit tightly into holes.

CUTTING

Dowels and Connector Strips can be cut with a multi-cutter (best method), saw, side cutters or pruning shears. Wear safety glasses when cutting.



HOLES & REAMING

Components come with holes that dowels press securely into.

Reaming holes to allow dowels to rotate and slide freely.



Turn a reamer back and forth through a hole.

PUSH, WIGGLE, TAP

Push dowels into holes by:

1. Wiggling and pressing with your hands
2. Tapping dowels with a hammer or the side of your cutter.



Tip: Rubbing a dowel with soap or wax allows it to slide easier into holes.



WARNING!!!

Most holes should not be reamed. Do not ream holes which dowels should stay pressed into.

EXAMPLE ASSEMBLY

An example mechanism with two gears that turn together in a frame.



1. Connector strips and dowels are cut. Then they are assembled to make the frame.



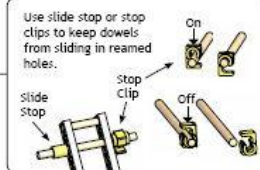
3. Holes in the frame are reamed for the gear axles to rotate in.



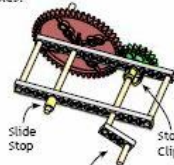
2. Dowels are cut to make axles and pushed into gears.



4. Gear axles are placed through the reamed holes.

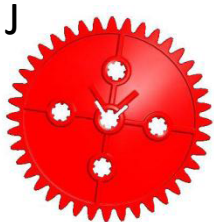
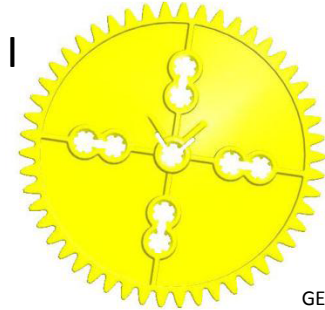
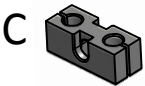
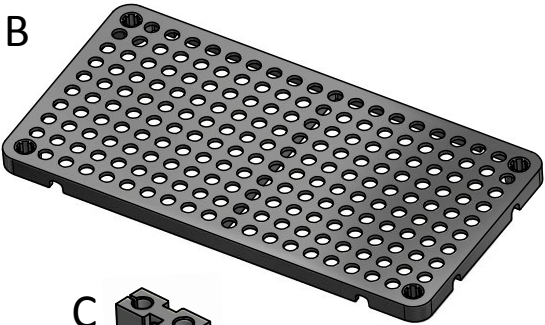
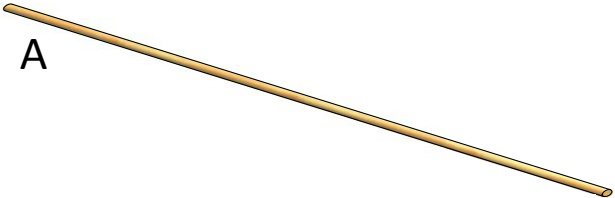


5. Slide stop and a stop clip are put on axles to keep them from sliding out of the reamed holes.

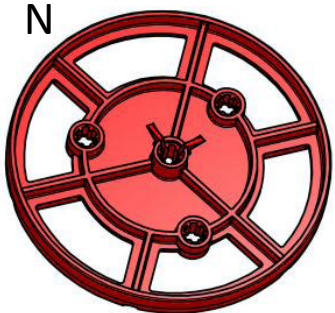
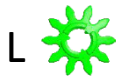
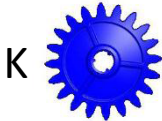


6. Cranks are attached.

TEACHERGEEK SUMO BOT PARTS		
PART	QUAN.	DESCRIPTION
A	4	12" DOWELS
B	4	HOLE PLATE
C	1	PERPENDICULAR BLOCK
D	4	10-24 X 1" PAN HEAD MACHINE SCREW
E	4	10-24 HEX NUT
F	2	MOTOR
G	2	MOTOR SHAFT ADAPTOR PIN
H	2	MOTOR MOUNT
I	2	50 TOOTH GEAR
J	2	40 TOOTH GEAR
K	2	20 TOOTH GEAR
L	2	10 TOOTH GEAR
M	4	STOP CLIP
N	2	WHEEL
O	2	WHEEL STRETCH TIRE



GEAR COLORS CAN VARY



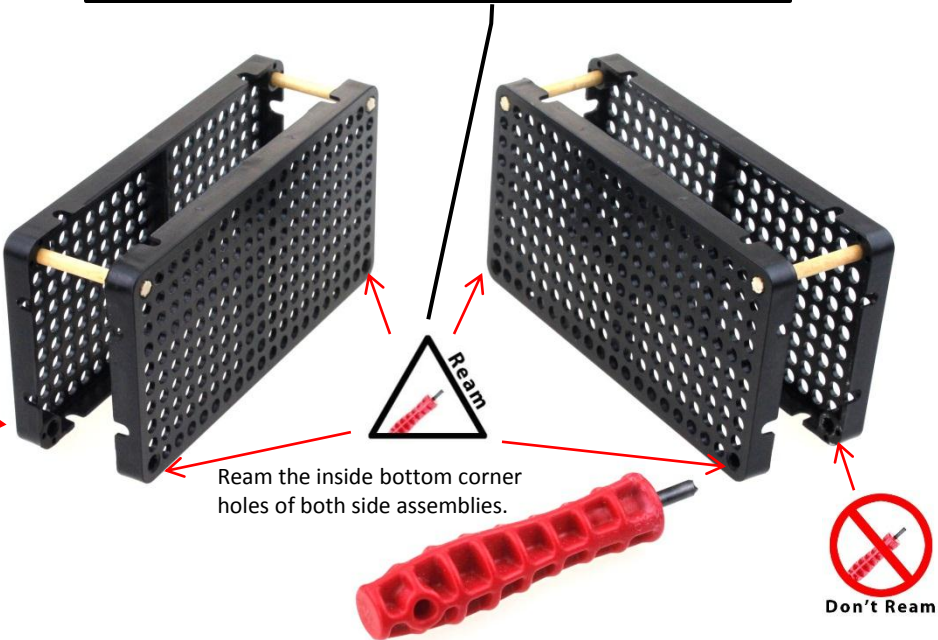
CHASSIS ASSEMBLY

- 1
- ❑ The chassis sides are built using four hole plates and four dowels cut to 51 mm (~2").



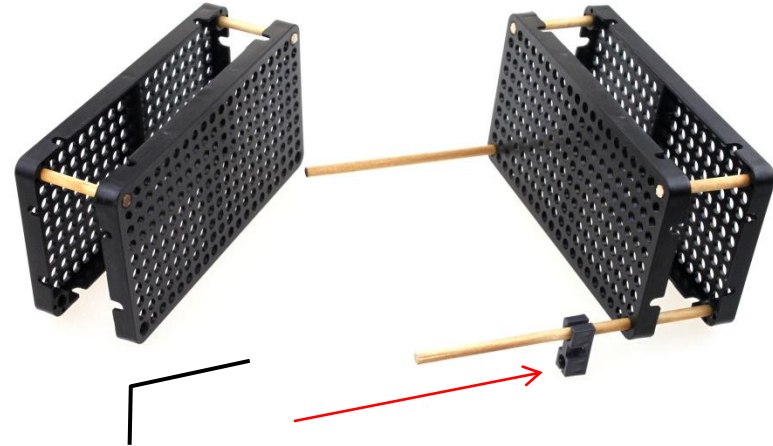
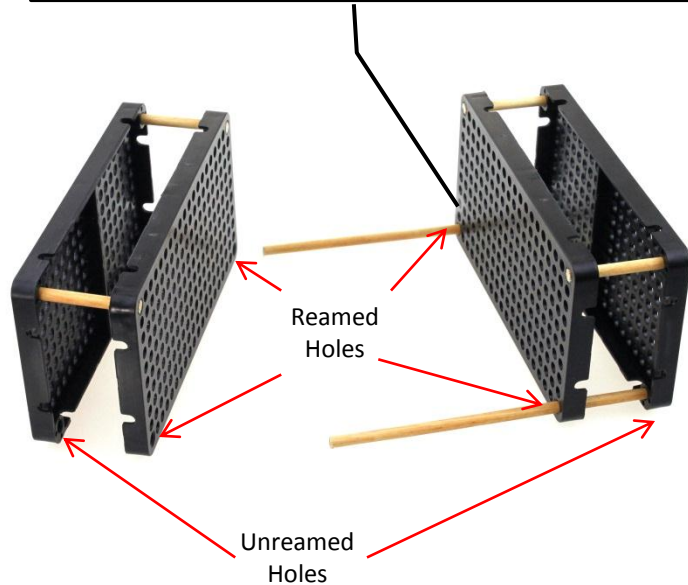
- 2
- ❑ Assemble the sides of the vehicle using two hole plates for each held together with two dowels in the top corner holes as shown.
 - ❑ Ream the bottom inside corner holes as shown. Reaming these four holes only allows you to freely insert the connecting dowel through the mid chassis. Yet, that dowel will be secured in the outside chassis corner unreamed holes.


Don't Ream
Do not ream the outside bottom corner holes of both side assemblies.



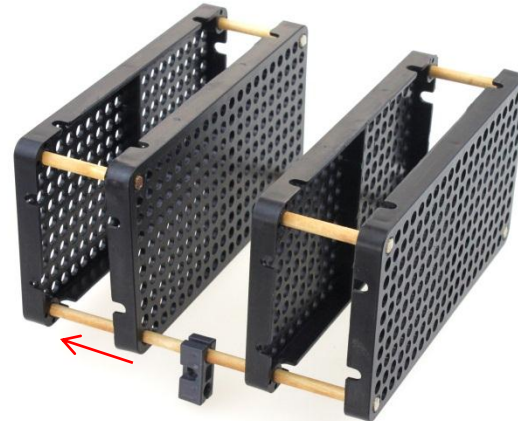
CHASSIS ASSEMBLY

- 3
- ❑ Cut 2 dowels 150 mm (5 7/8")
 - ❑ Slide dowels through the reamed corner holes of one side and insert into unreamed holes of the other hole plate.



- 4
- ❑ Slide the end hole of a perpendicular block on to one of the dowels so it is 19 mm (3/4") from the hole plate as shown.
 - ❑ This establishes the front of the vehicle.


- 5
- ❑ Slide the other ends of the dowels through the reamed holes of the other side and into the unreamed holes of the outside hole plate.
 - ❑ This completes the basic chassis for the vehicle.




MOTOR AND MOUNT ASSEMBLY

6 Motor Assembly Parts


- A 2 Motor Mounts
- B 2 Motors
- C 2 Adaptor Pins
- D 2 10 Tooth Gears



7 Slide the adaptor pins onto the motor shaft.
Hint: Placing the adaptor pin into a 1/4" hole drilled in a small board helps to hold the pin as the motor shaft is inserted.



8 Slide the 10 tooth gear onto the adaptor pin



Tap or push motor shaft to insert into adaptor pin.

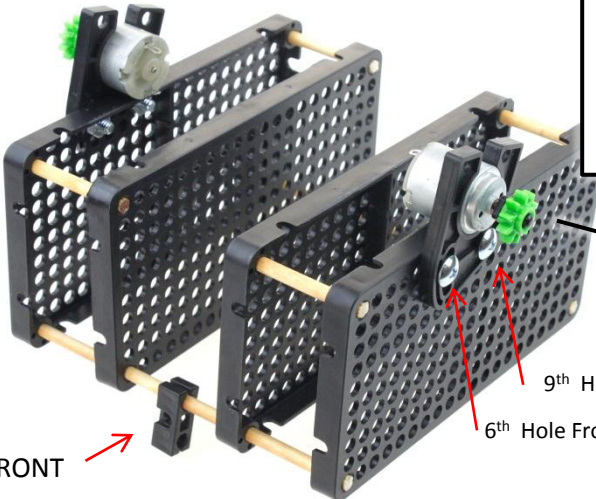
To hold adaptor pin place into 1/4" hole drilled in small board.

9 Slide the motors into the motor mounts as shown.



Note the long adjustable slot in the mounts are on opposite sides.

10 Using four 10-24 x 1" machine screws and nuts attach the mount assemblies to the outside of the chassis. Use the 6th and 9th holes from the front in the top row. The long adjustable slots go toward the front of the vehicle as shown.



VEHICLE FRONT

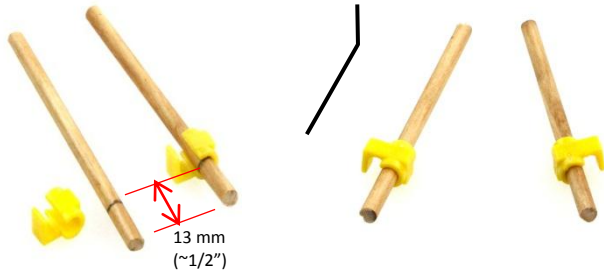
9th Hole From Front (Top Row)
6th Hole From Front (Top Row)



GEARS, WHEELS AND AXLES

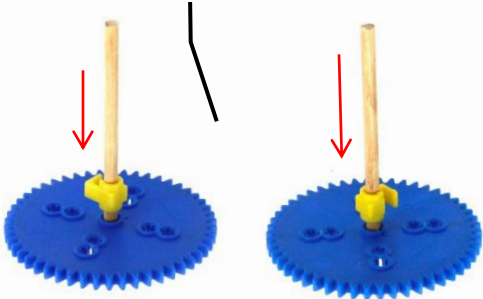
11

- ❑ Cut two dowels 89 mm (3 ½").
- ❑ Draw a pencil line 13 mm (½") from one end of each dowel.
- ❑ Install a TeacherGeek clips so they align with pencil marks as shown.



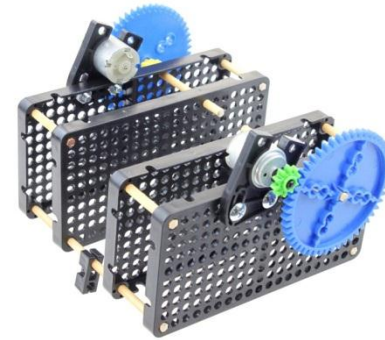
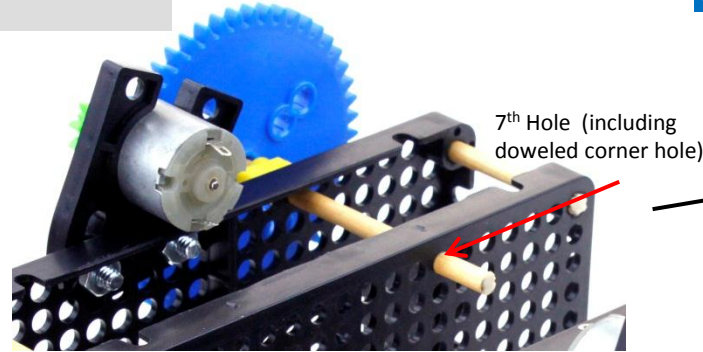
12

- ❑ Place two 50 tooth gears on a flat surface.
- ❑ Insert the ends of the dowels through the center hole of the gears as shown.



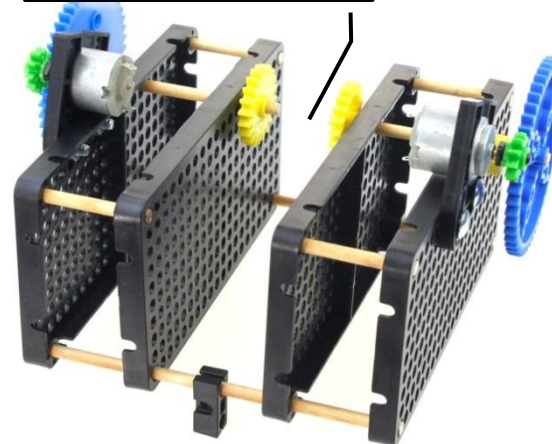
13

- ❑ Slide the other end of the dowel through the top row 7th hole from the back.
- ❑ Repeat through the opposite side as shown.



14

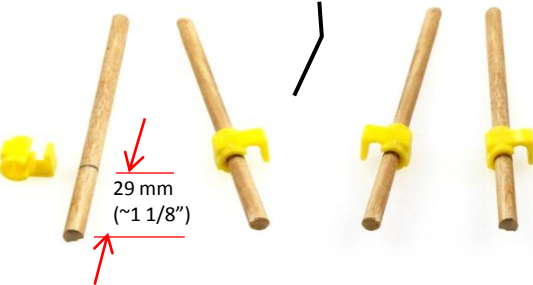
- ❑ Slide a 20 tooth gear on the end of each dowel.
- ❑ Leave about 1/16" clearance so the gears spin freely.



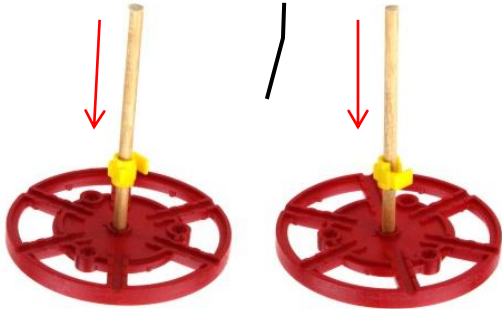
Don't Ream

GEARS, WHEELS AND AXLES

- 15**
- ❑ Cut two dowels 102 mm (~4").
 - ❑ Draw a pencil line 29 mm (~1 1/8") from one end of each dowel.
 - ❑ Install a TeacherGeek clips so they align with pencil marks as shown.

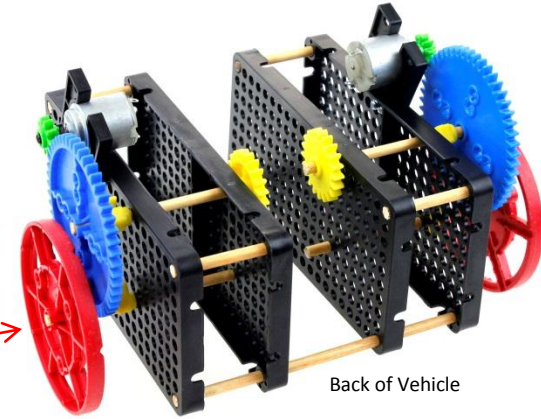


- 16**
- ❑ Slide the end of each dowel through the center of a wheel as shown.

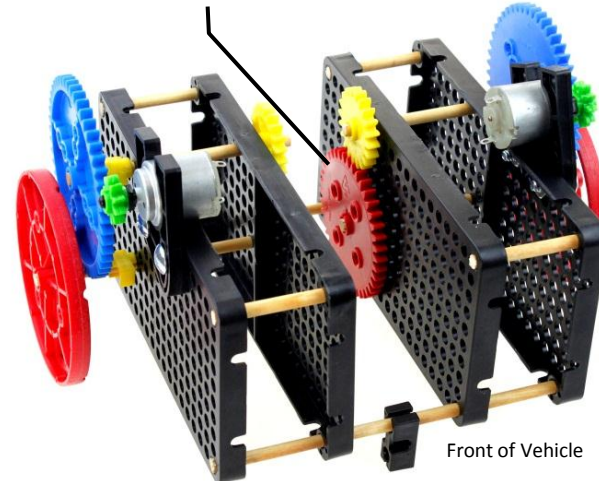


- 17**
- ❑ Insert the dowel and wheel assembly into the same vertical row as the gear axle and four holes up from the bottom.

Four holes up seven
holes from back of
vehicle (Same vertical
row as gear axle).



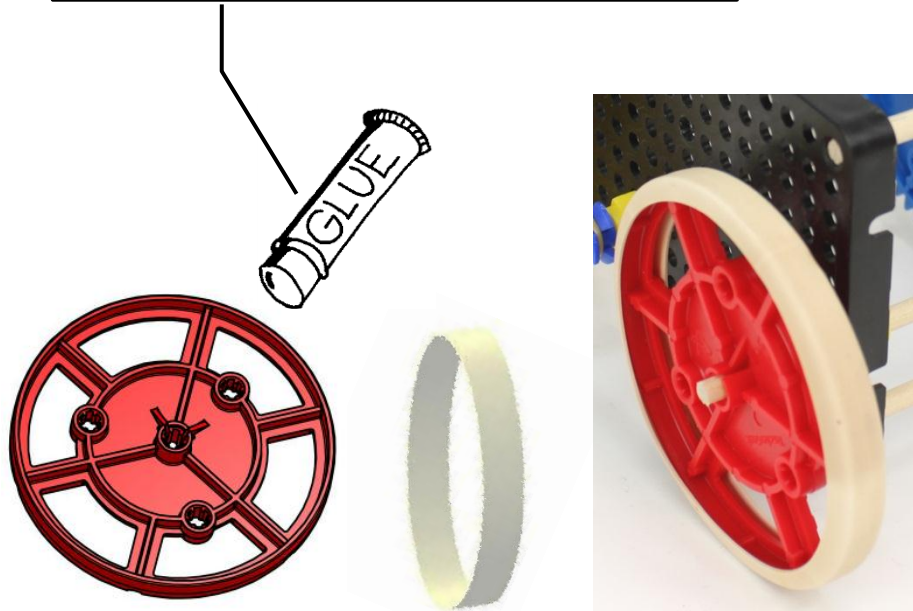
- 18**
- ❑ Slide a 40 tooth gear on the end of each dowel.
 - ❑ Leave about 1/16" clearance so the wheel spins freely.



INSTALLING TRACTION TIRES

19

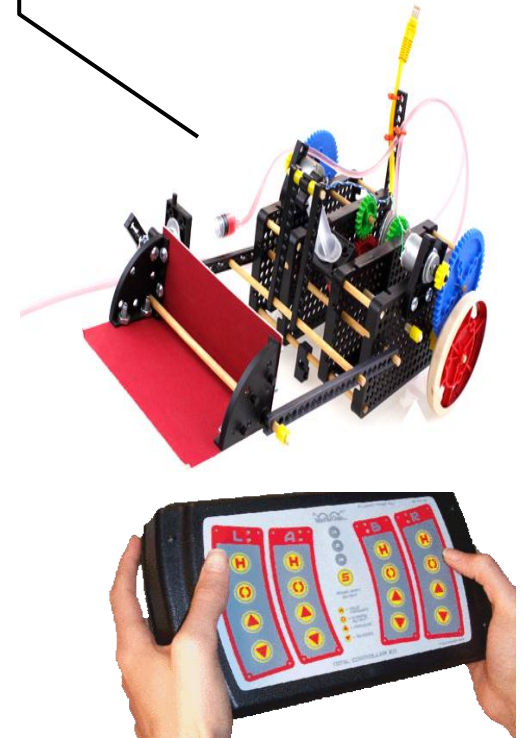
- ☐ Coat the outside of the wheel with a common glue stick.
- ☐ When it becomes tacky, carefully stretch the tire over the wheel.
- ☐ Adjust the tire so it is centered on the wheel.



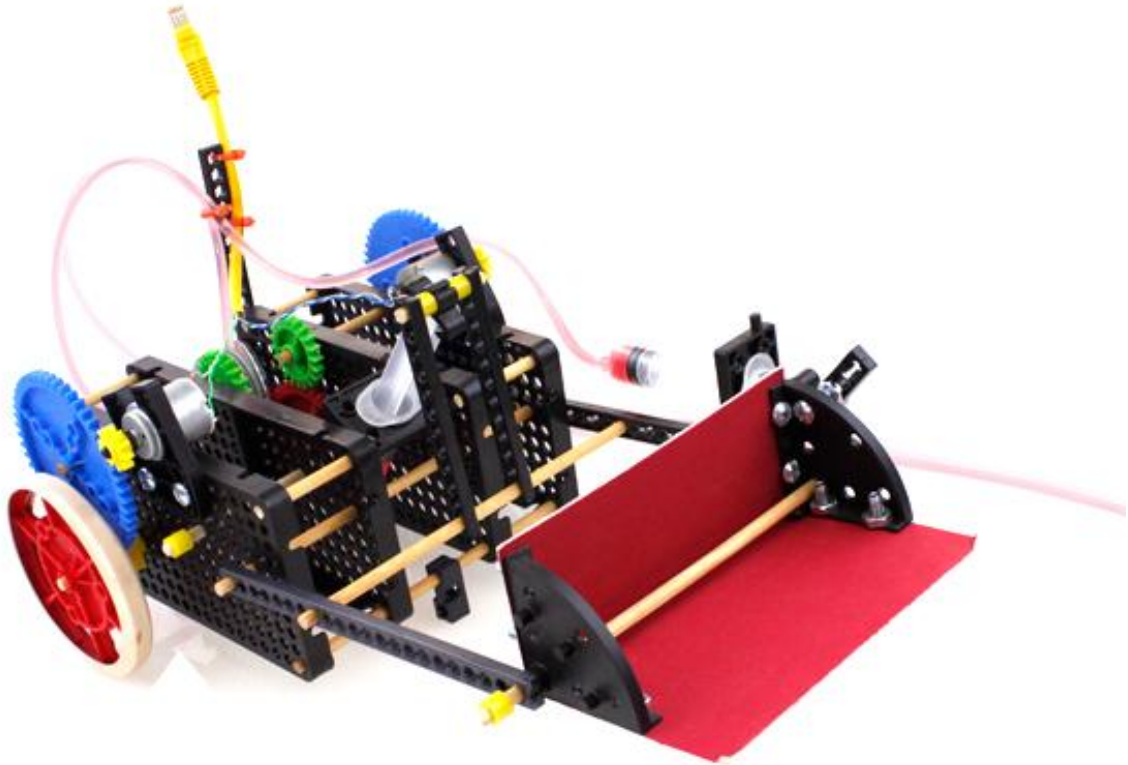
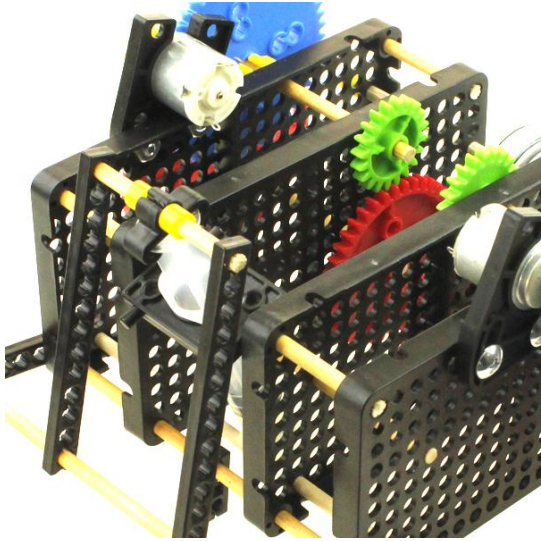
MOTOR WIRING

20

- ☐ Wiring of the motors depends on the type of controller used.
- ☐ If the TeacherGeek Total Controller is used, wiring instructions are included in the Total Controller Guide.
- ☐ If other controllers are used, follow the appropriate wiring diagram.



TRY ADDING TEACHERGEEK HYDRAULICS



TEACHERGEEK PULLEY DRIVEN VEHICLE EXAMPLE

