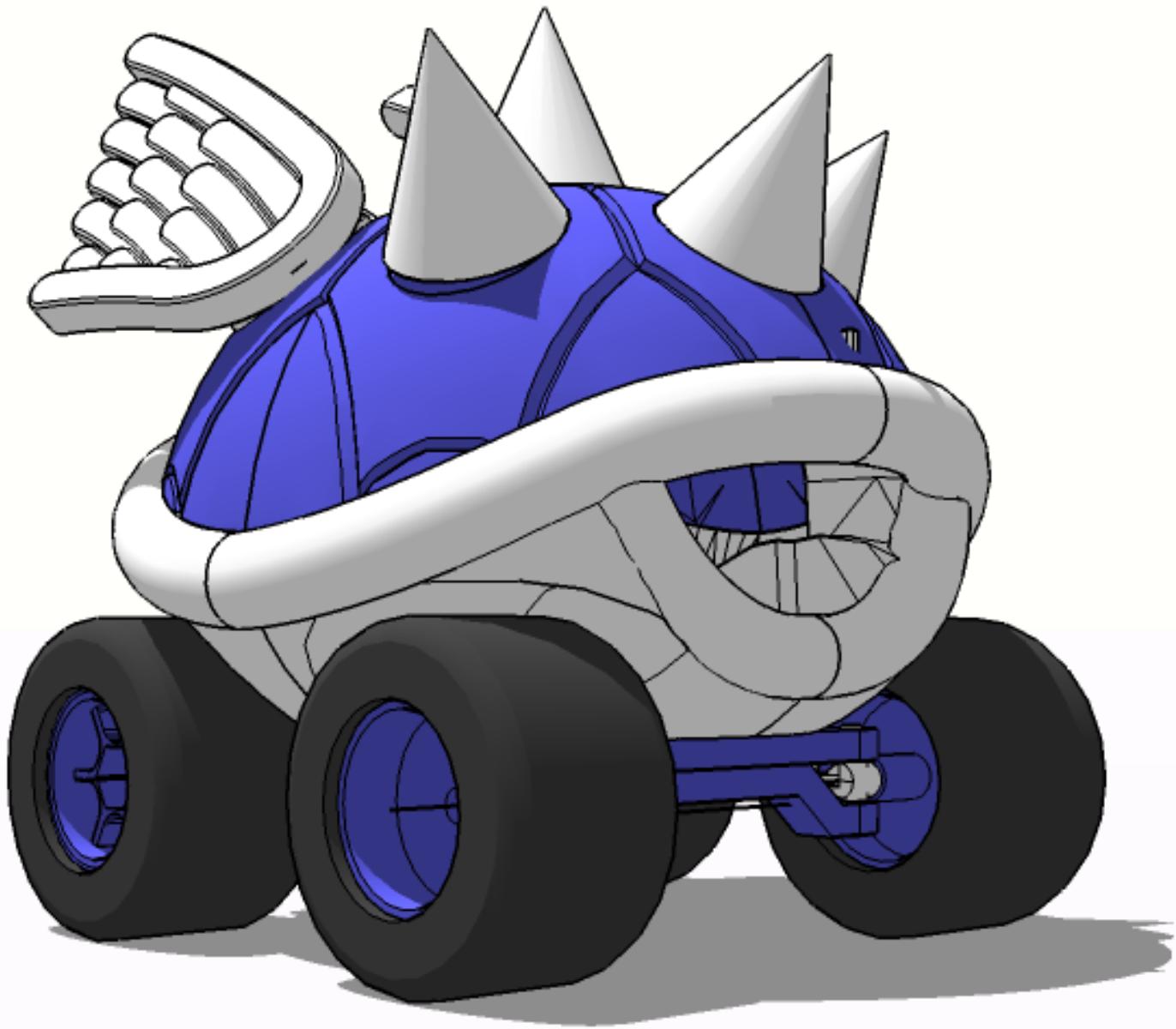


Turtle Shell Racer

High Power Edition



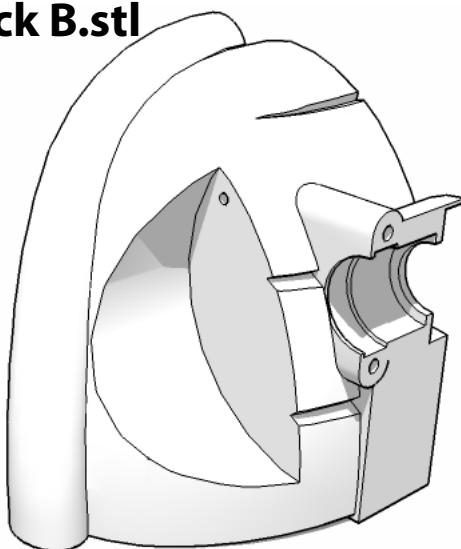
Michael Curry

DistractedArchitect.com

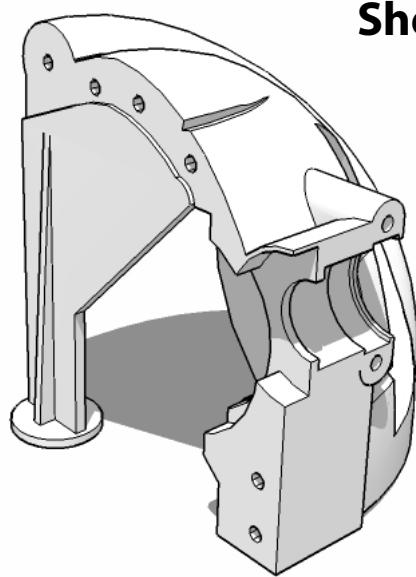
Assembly Instructions and Parts List

Printable Parts- White/Natural

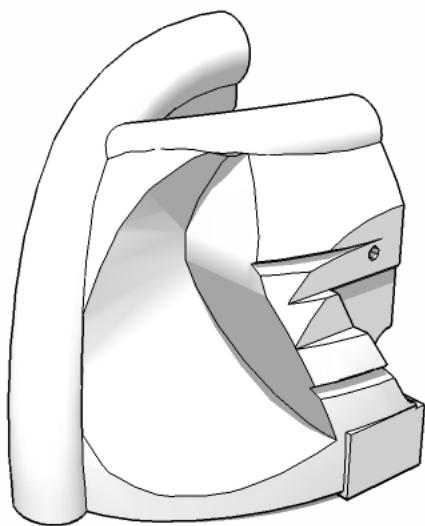
Shell Back B.stl



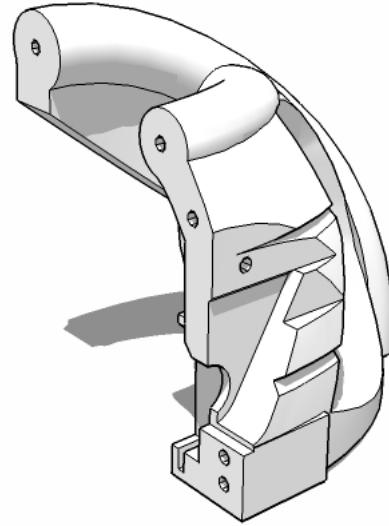
Shell Back A.stl



Shell Front B.stl

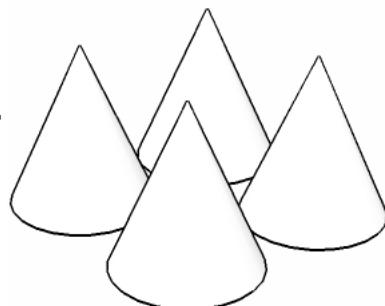


Shell Front A.stl



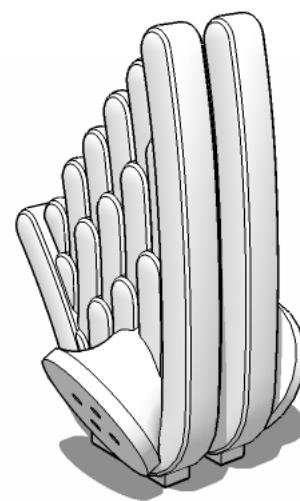
4 Spikes.stl

Blue Shells need
5 Spikes, All other
colors will need
Seven



Wings.stl

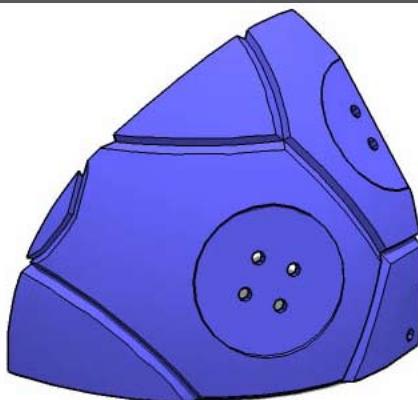
Wings are only
need for Blue
Shells



Printable Parts - Color

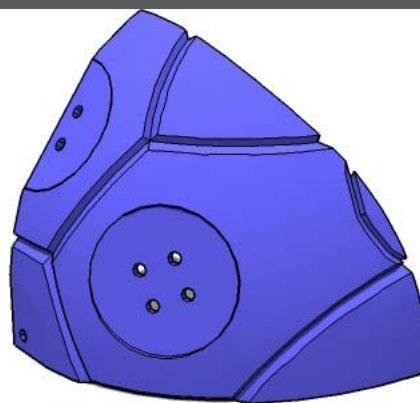
Top B.stl

x2



Top A.stl

x2

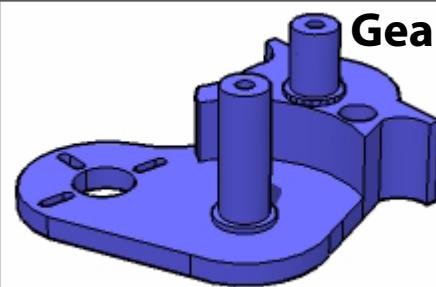


Rear Wheel.stl

x2



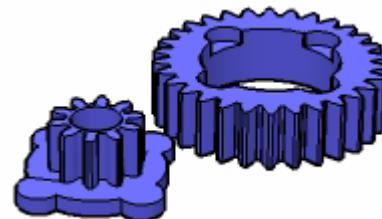
Gearbox Body.stl



Gear 1 and 3.stl



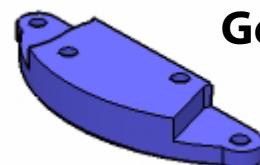
Gear 2.stl



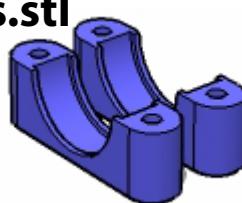
Gearbox Latch.stl



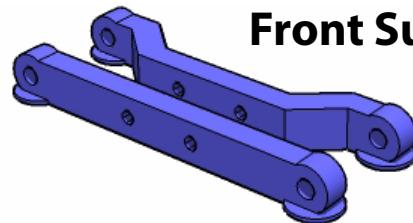
Gearbox Bracket.stl



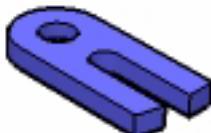
Rear Axle Brackets.stl



Front Suspension.stl



Steering Linkage.stl



Drive Gear.stl

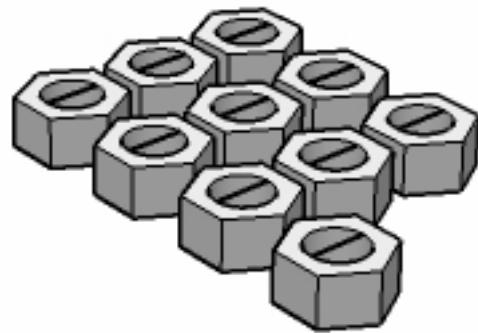


Non-Printable Parts



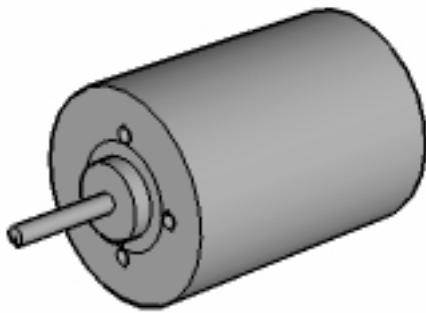
Skateboard Bearings : 4

Available in Packs of 8 at any skateboard shop
Also known as '608 bearings'



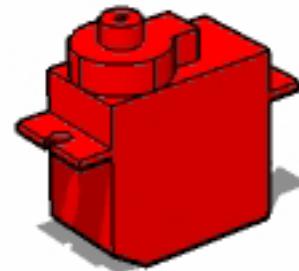
5/16" Nuts : 10

Available at any Hardware Store or Home Center



DC Motor : 1

Any decently sized 12v tolerant DC Motor



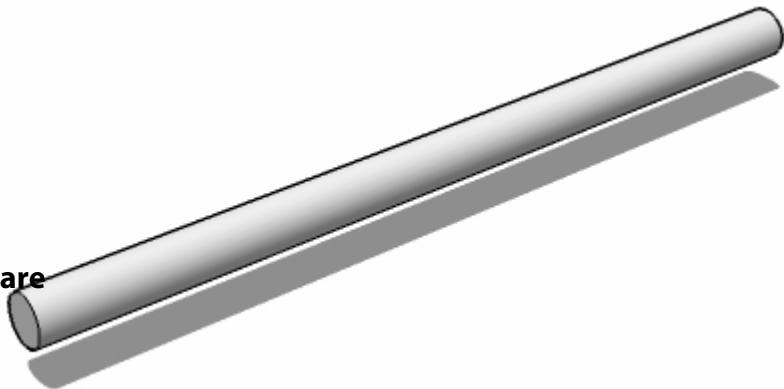
Micro Servo : 1

I like the really cheap ones, but anything in the Micro Servo size category should work

5/16" Threaded Rod : 1

142mm (5 5/8th inches) long

Available in 3 foot lengths at any Hardware Store or Home Center



Assorted M3 Screws

If you own a Makerbot, Ultimaker or Rep Rap Machine, chances are you have a lot of these lying around



Non-Printable Parts

Cheep RC Car :1

This Cheep RC Car will provide some of the non-printable Parts we need.



We will be taking the Tires, and elements of the Front Suspension off this car to use on our shell.

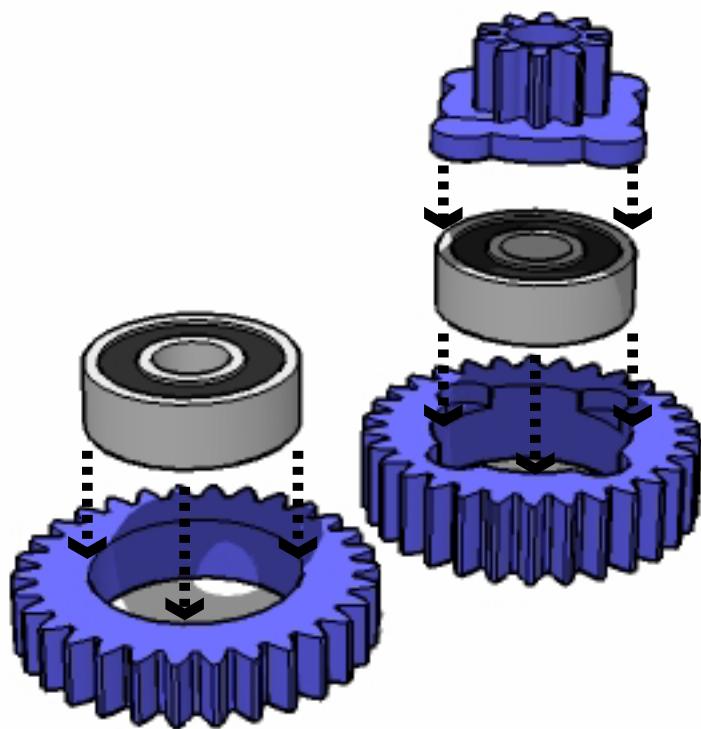
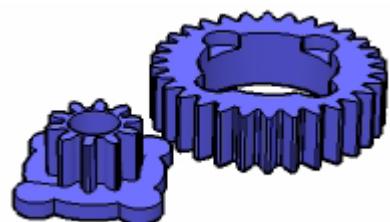
It may seem wasteful to destroy a whole RC Car just for the Tires and Steering, but I have found this to be less expensive than buying 4 RC Car tires from any other source. We are not using the car's electronics because they lack sufficient power to drive this model of the Turtle Shell Racer.

This car will cost you \$12.97 at Wal-Mart or \$15.00 at Target.



This Photograph of the bottom of the box will help you find the right car

Parts:

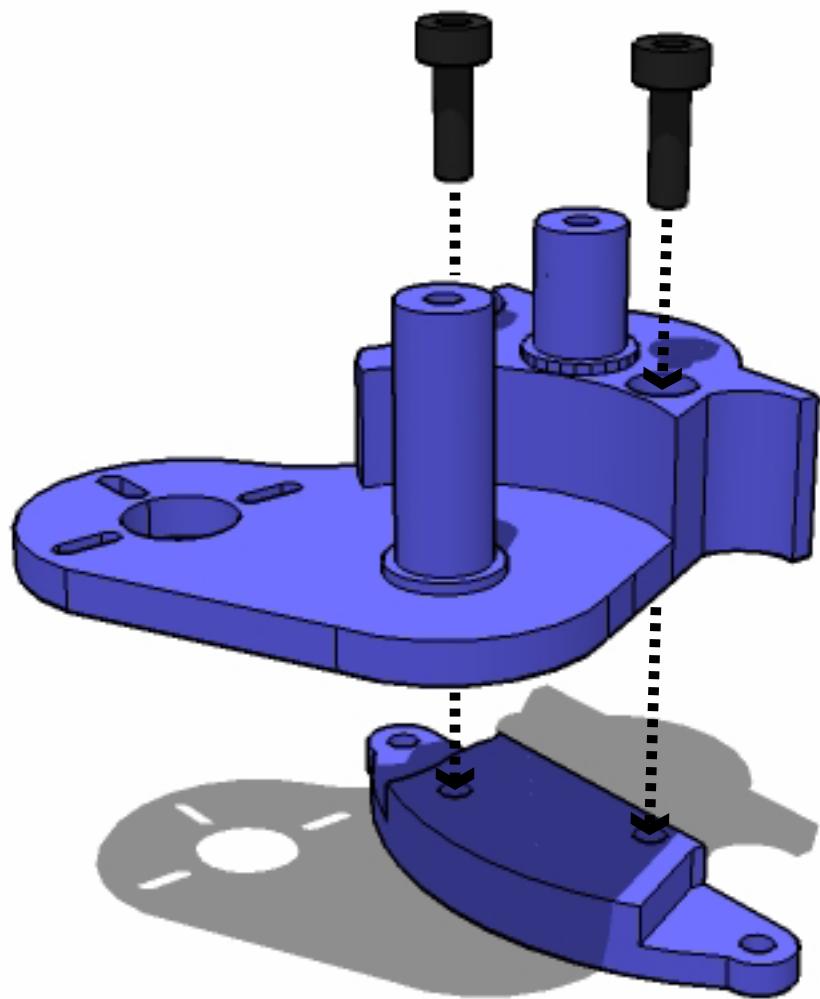
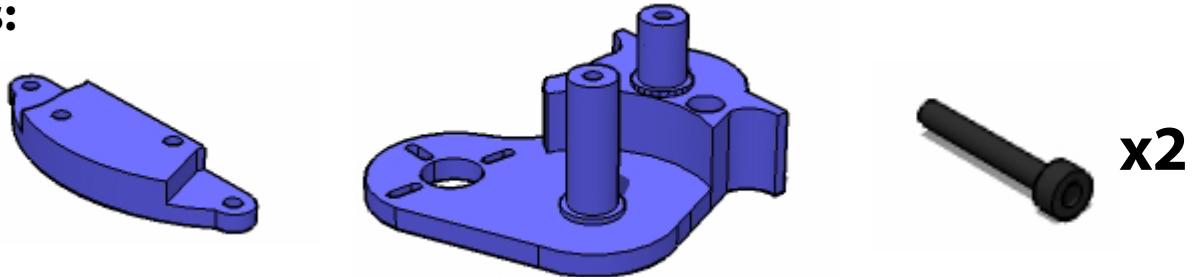


Press the Skateboard Bearing into the Centers of Gears 2 and 3. Some mild hammering may be required.

Press the top of Gear 2 into place so it clips into the slots provided.

Step
1

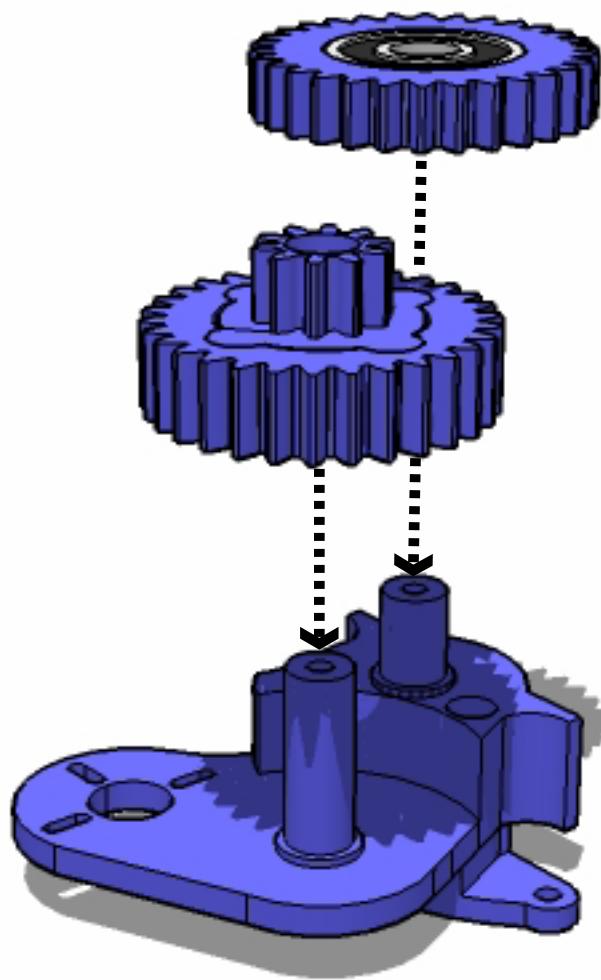
Parts:



Attach the Gearbox Body to the Gearbox Bracket using two short M3 Screws as shown.

**Step
2**

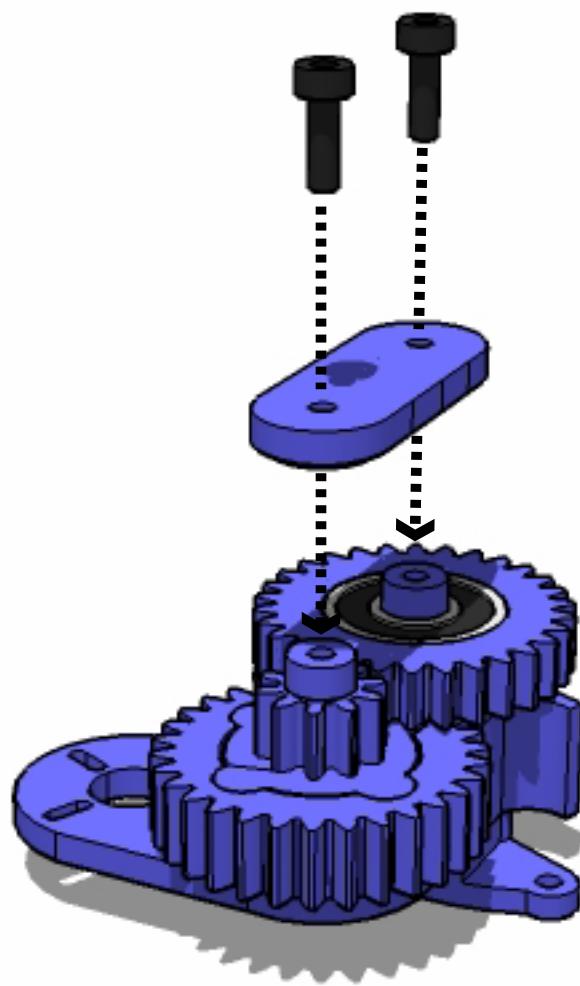
Parts:



Place Gear 2 and Gear 3 onto the shafts of the Gearbox Body as shown.
Ensure the Gears can spin freely on their bearings.

Step
3

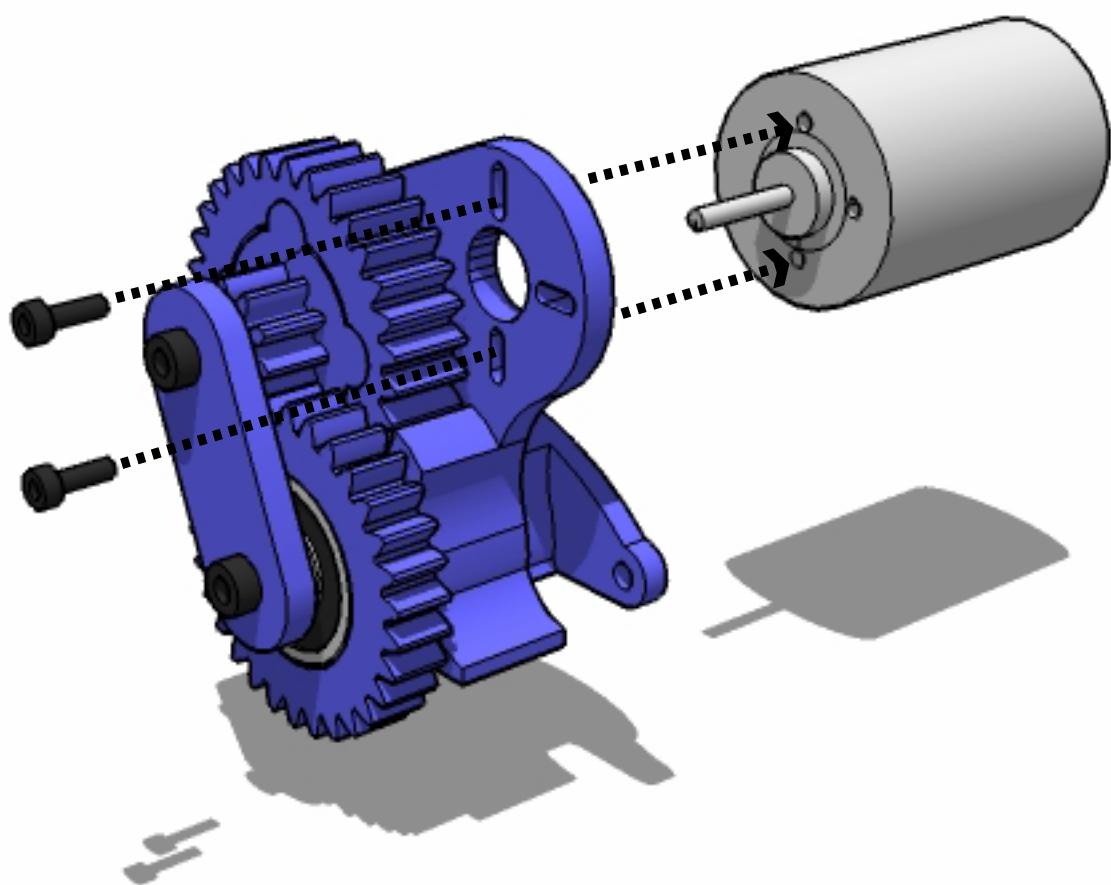
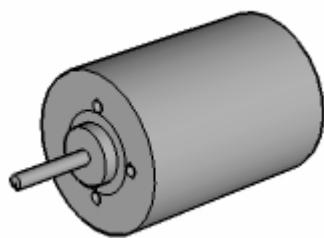
Parts:



**Press the Gearbox Latch onto the tops of the Gearbox Shafts.
For added strength drive two long M3 bolts through the Gearbox Latch and down
the centers of the Shafts**

**Step
4**

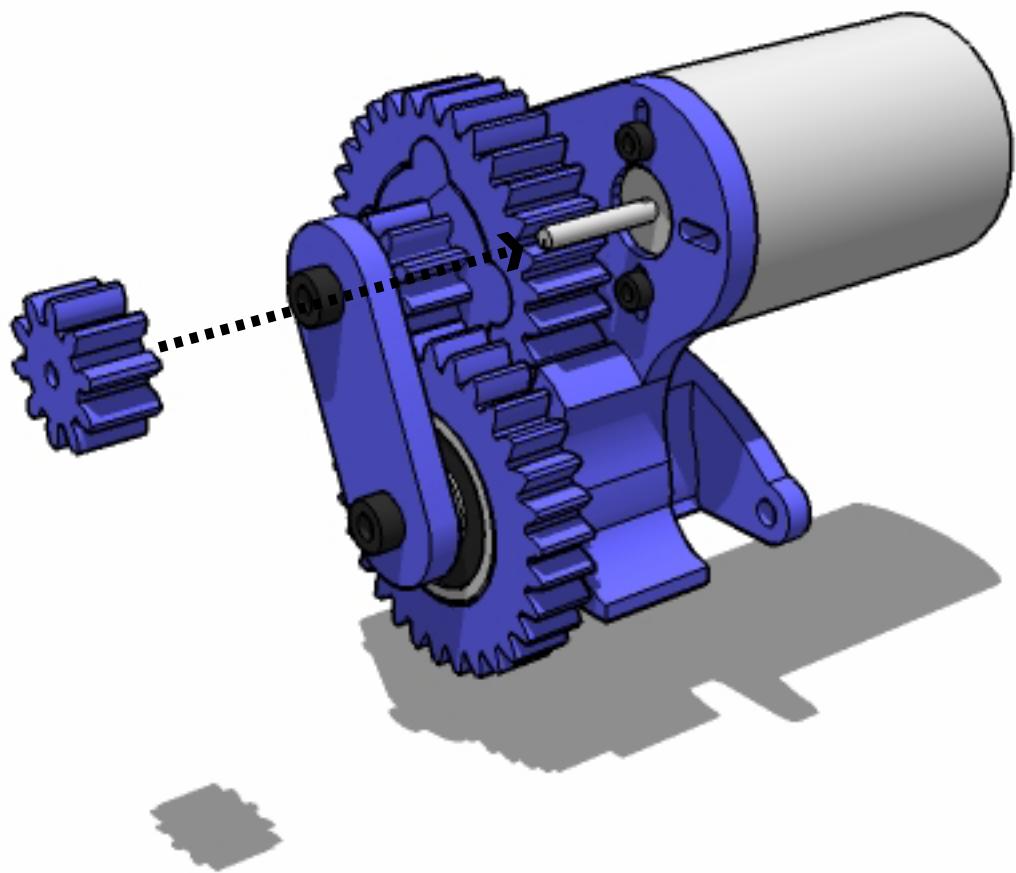
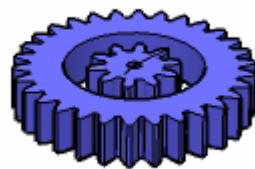
Parts:



Press the Motor into place and secure it with two appropriately sized screws.

**Step
5**

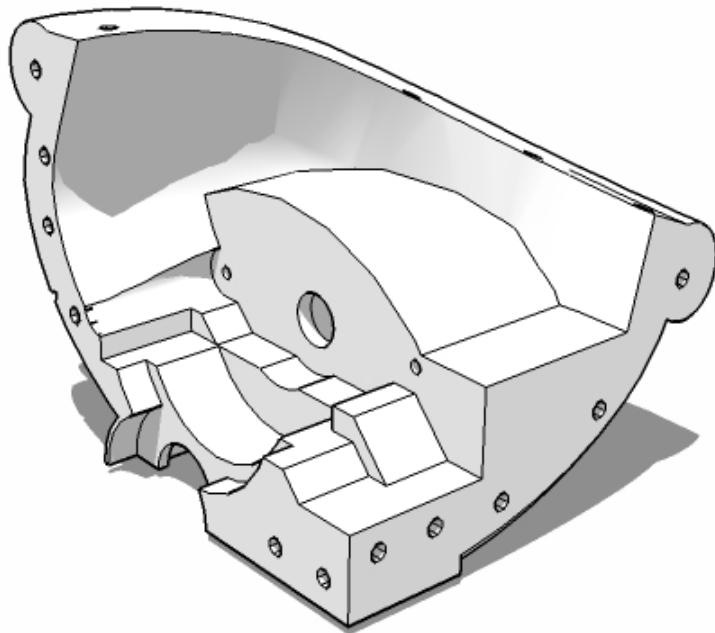
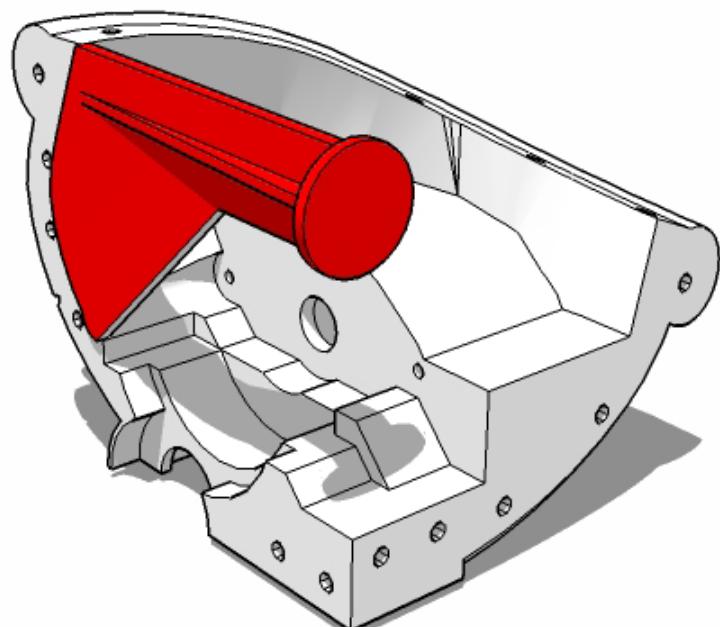
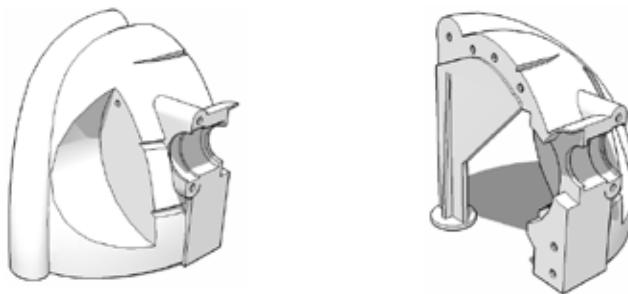
Parts:



Press Gear 1 onto the Motor's shaft so it engages with Gear 2. A C-clamp or small hammer can be used to persuade the gear to go onto the shaft. If the gear does not fit tightly, use epoxy to get a good connection.

**Step
6**

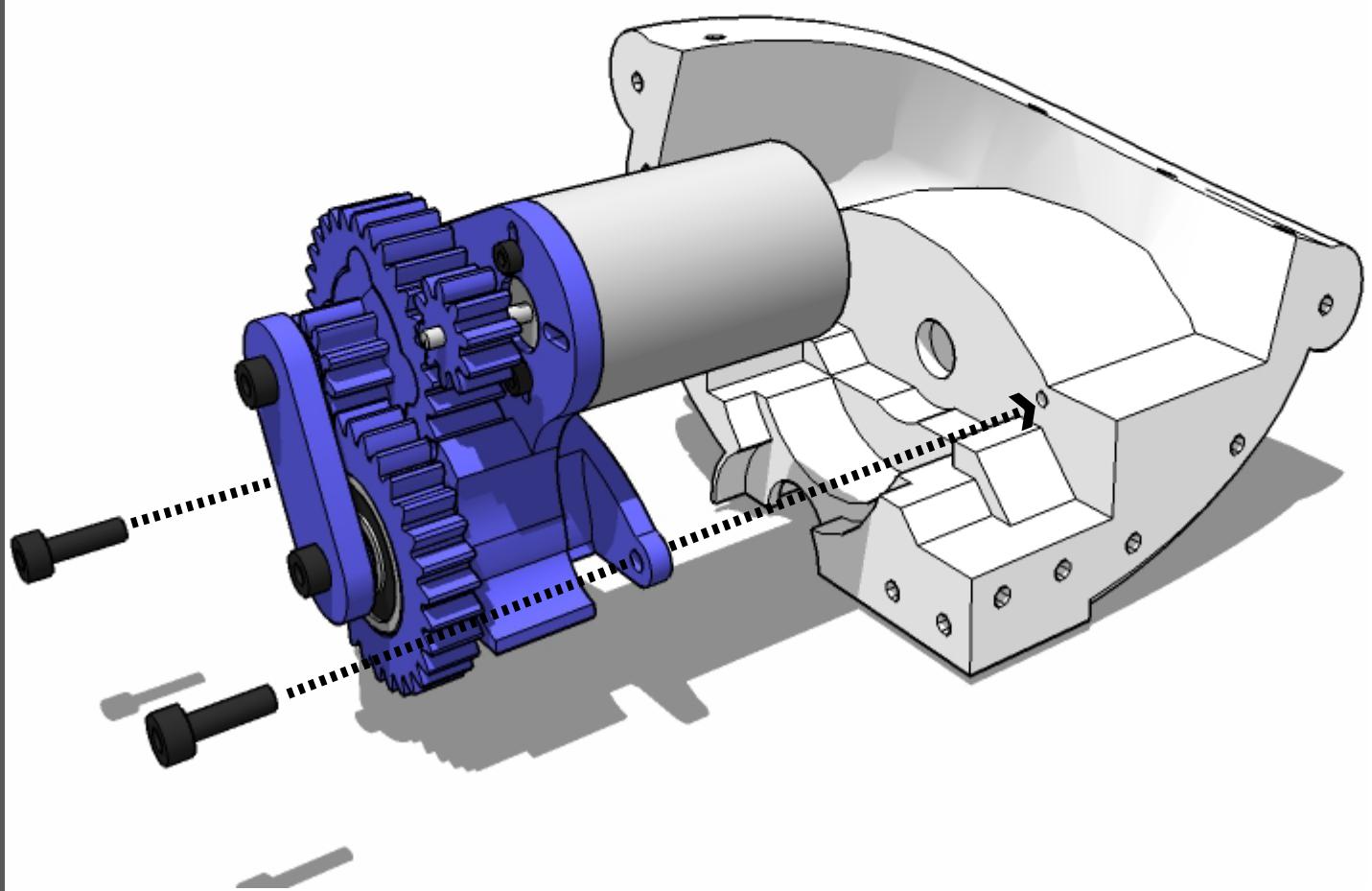
Parts:



Remove the Support Structure from Shell Back A and Shell Back B as shown.

Step
7

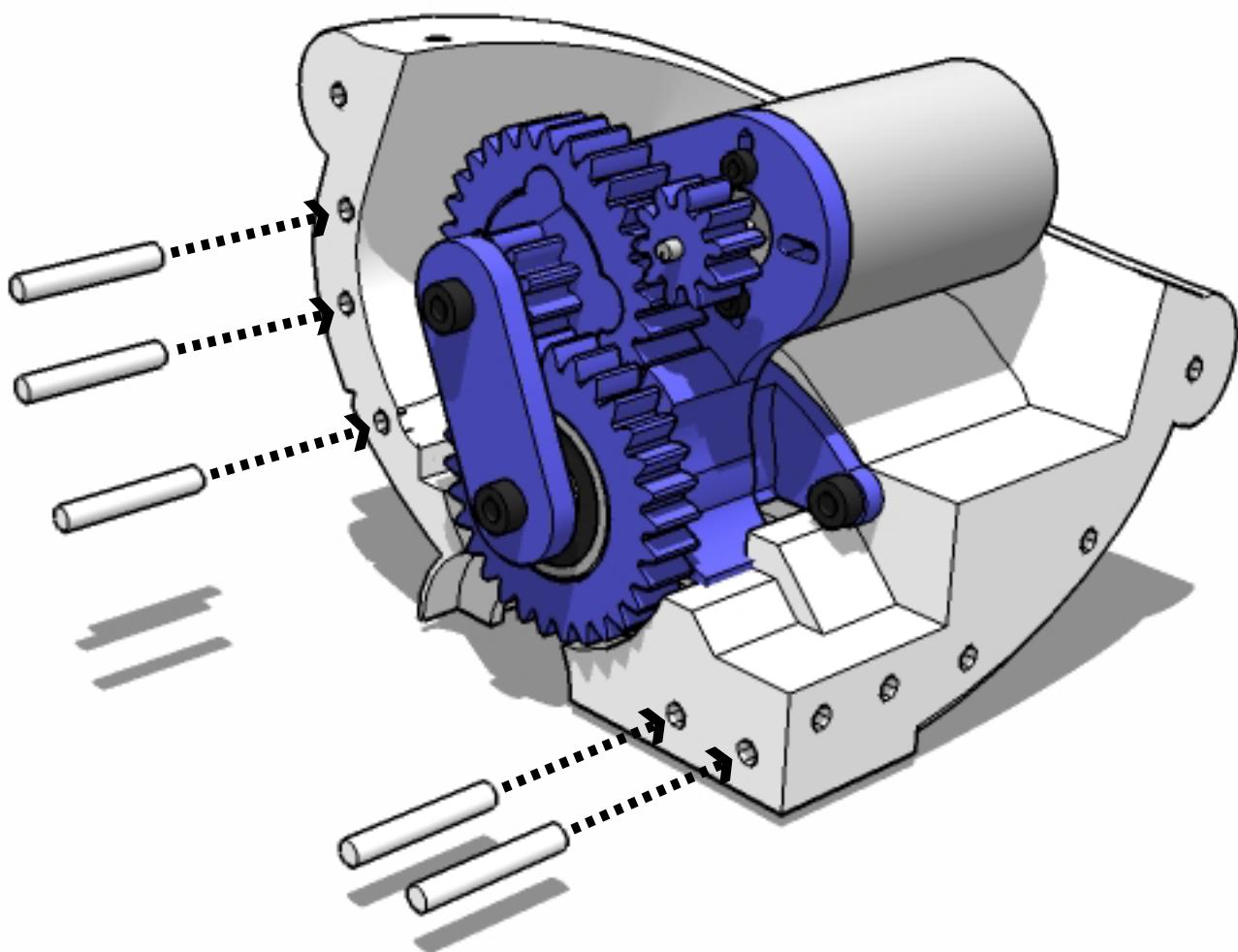
Parts:



Use two M3 Bolts to secure the Gearbox Assembly into Shell Back B

**Step
8**

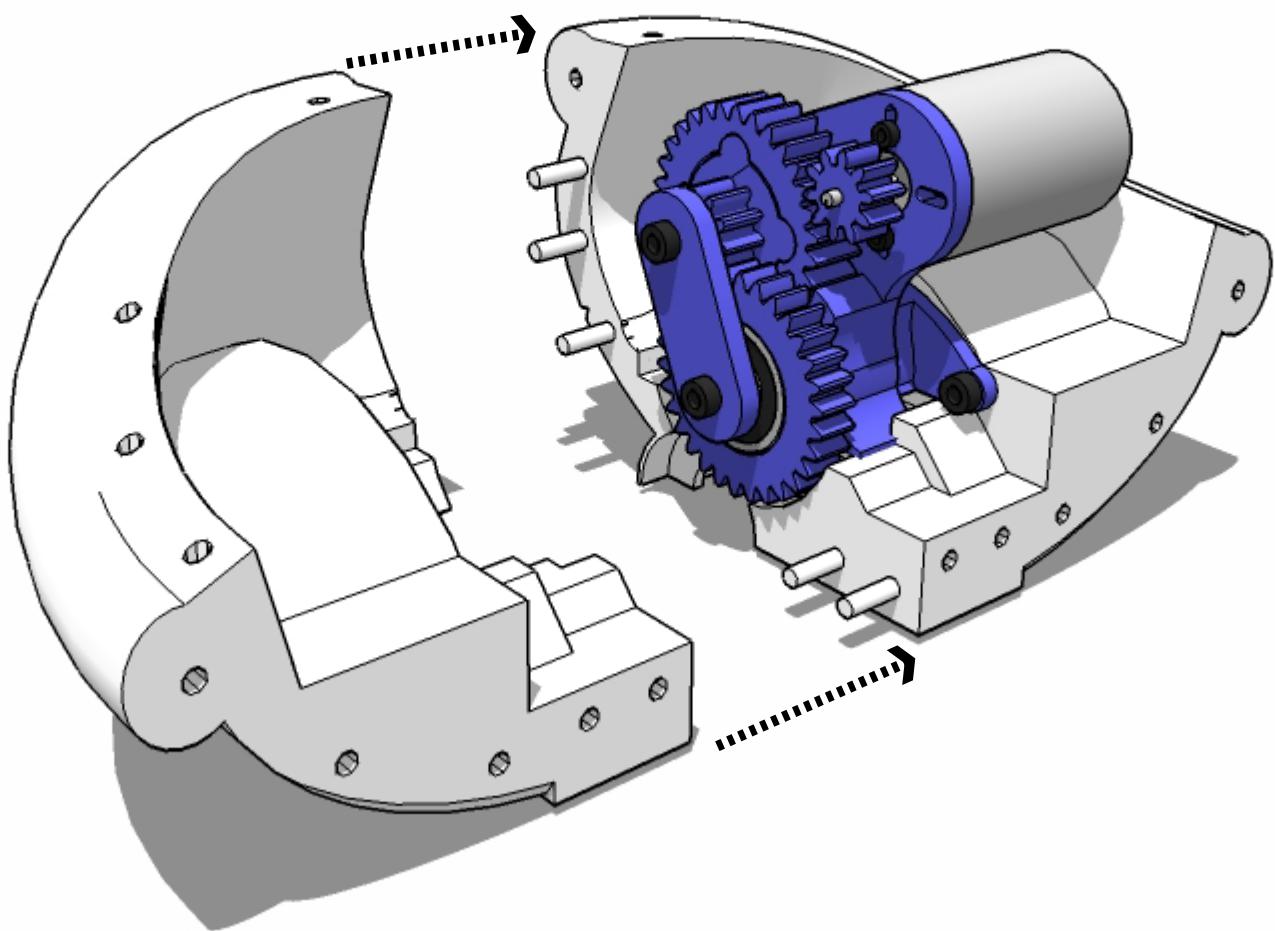
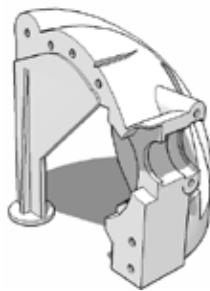
Parts:



**Press Short segments of 3mm filament into the holes on Shell Back B as shown.
Between 5 and 10mm will need to stick out to get a good connection.**

**Step
9**

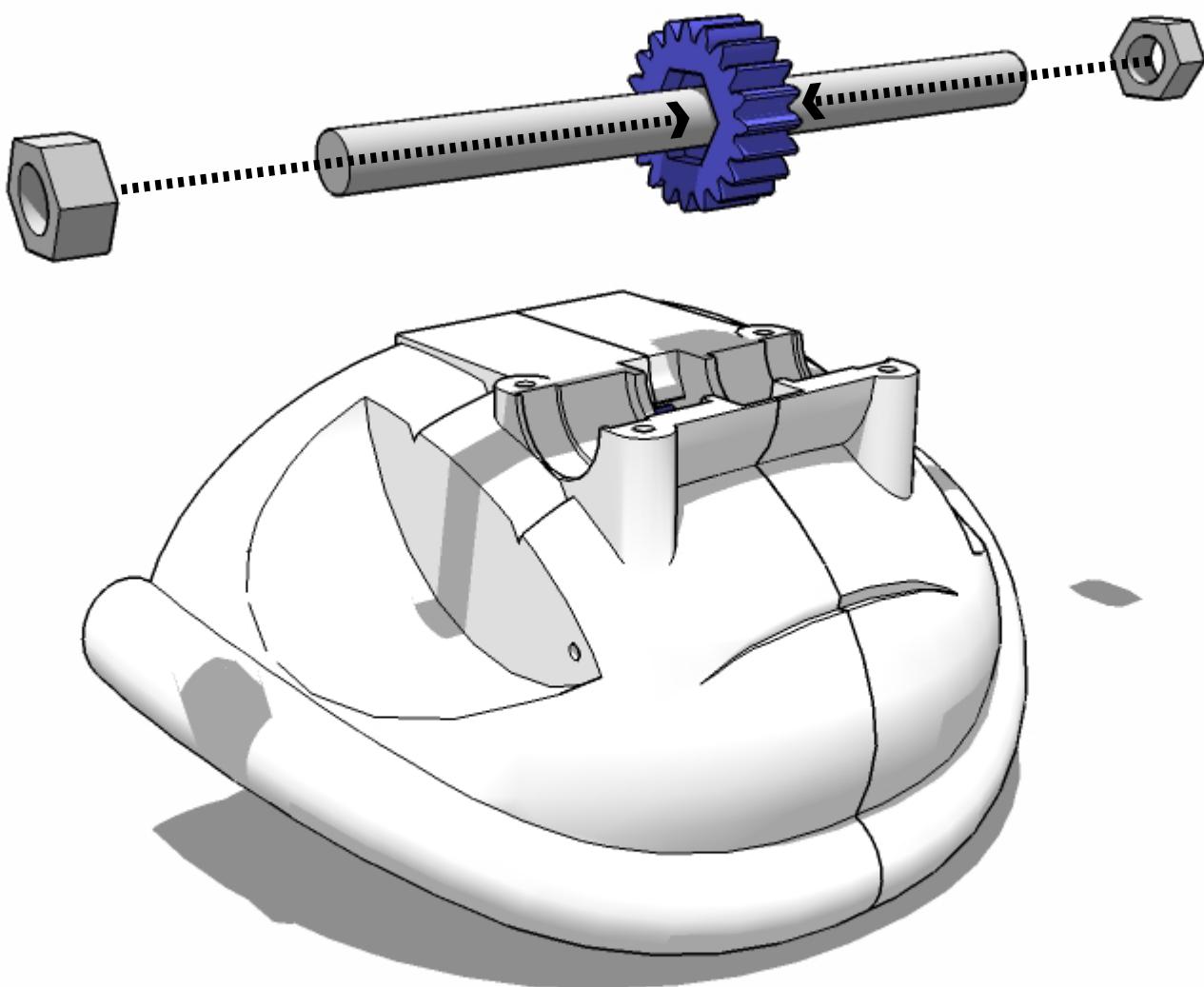
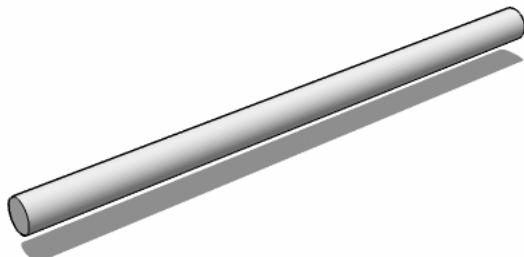
Parts:



Press Shell Back A and Shell Back B together as shown.

**Step
10**

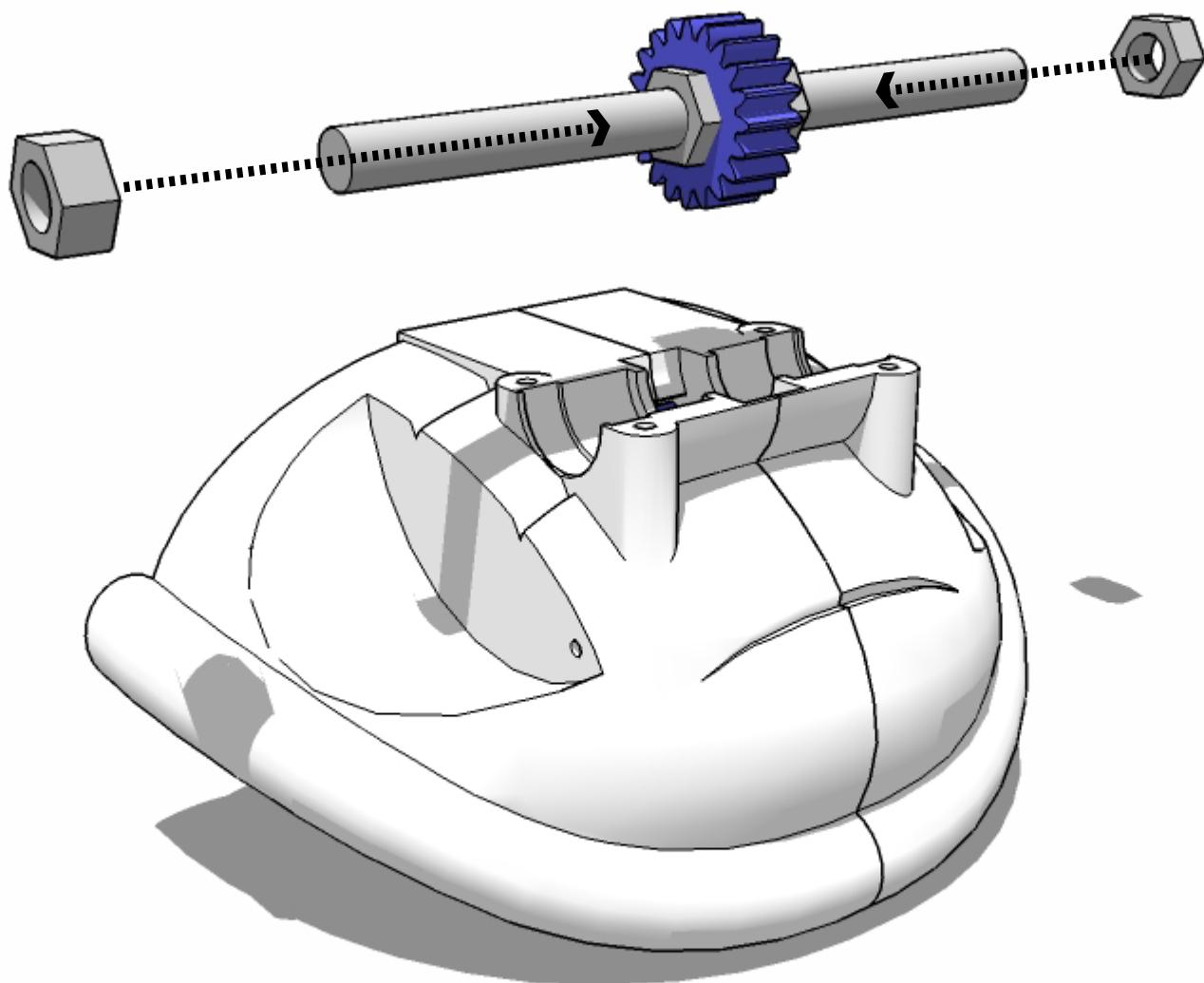
Parts:



Cut the Threaded rod so you have a piece 142mm (5 5/8th inches) long.
Put the Drive Gear in the center of the Threaded Rod and screw a Nut in from each side to hold it in place. Do not tighten the bolts yet.

Step
11

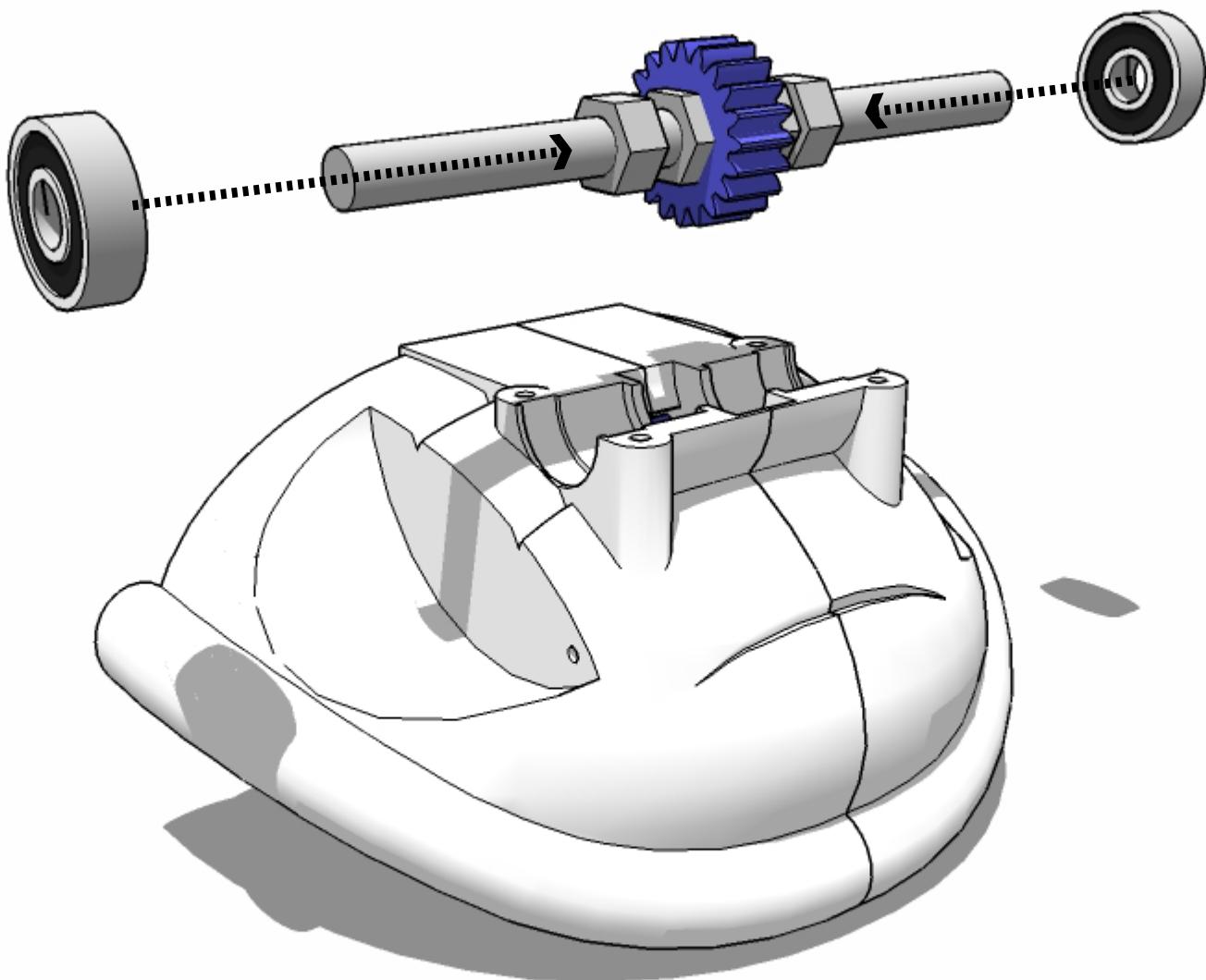
Parts:



**Screw another Nut onto the Threaded Rod from each side.
Do not tighten the bolts.**

**Step
12**

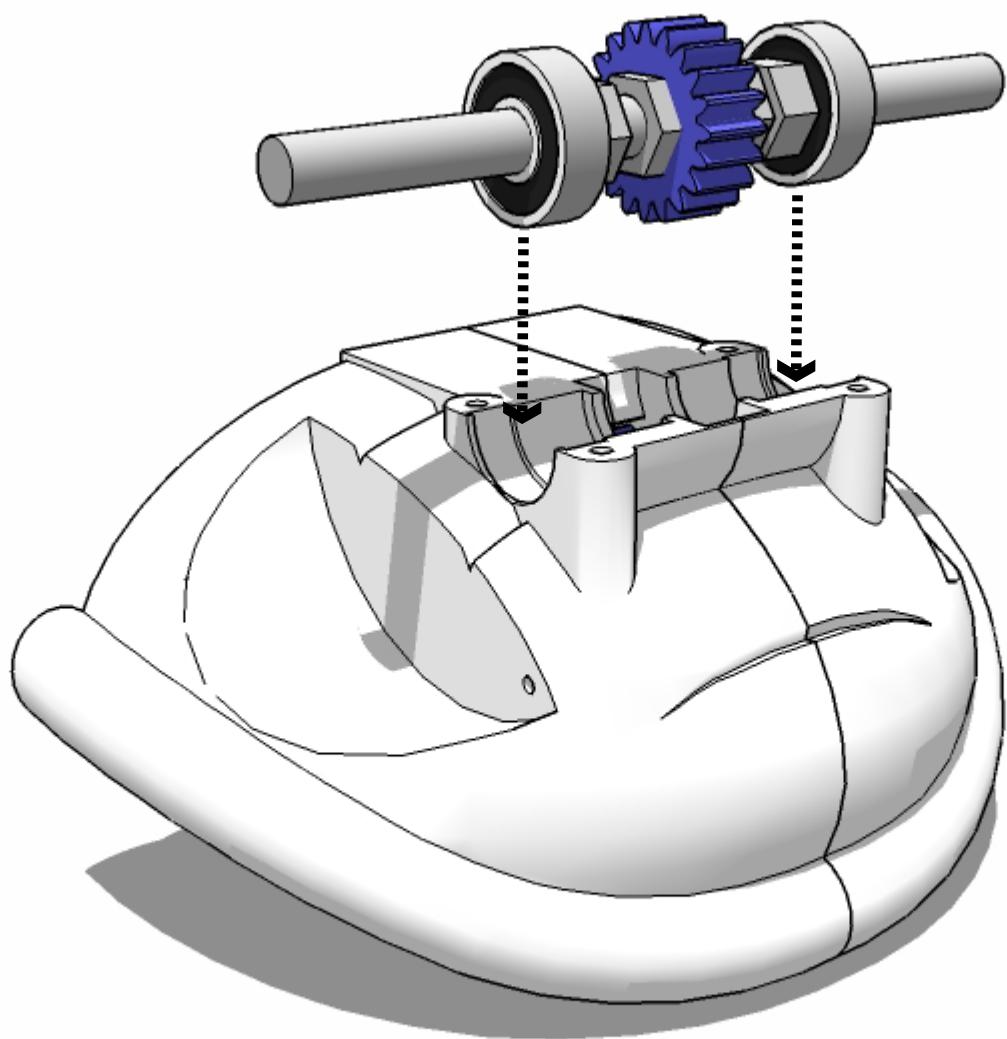
Parts:



Slide a Skateboard Bearing on each side of the Threaded Rod.

**Step
13**

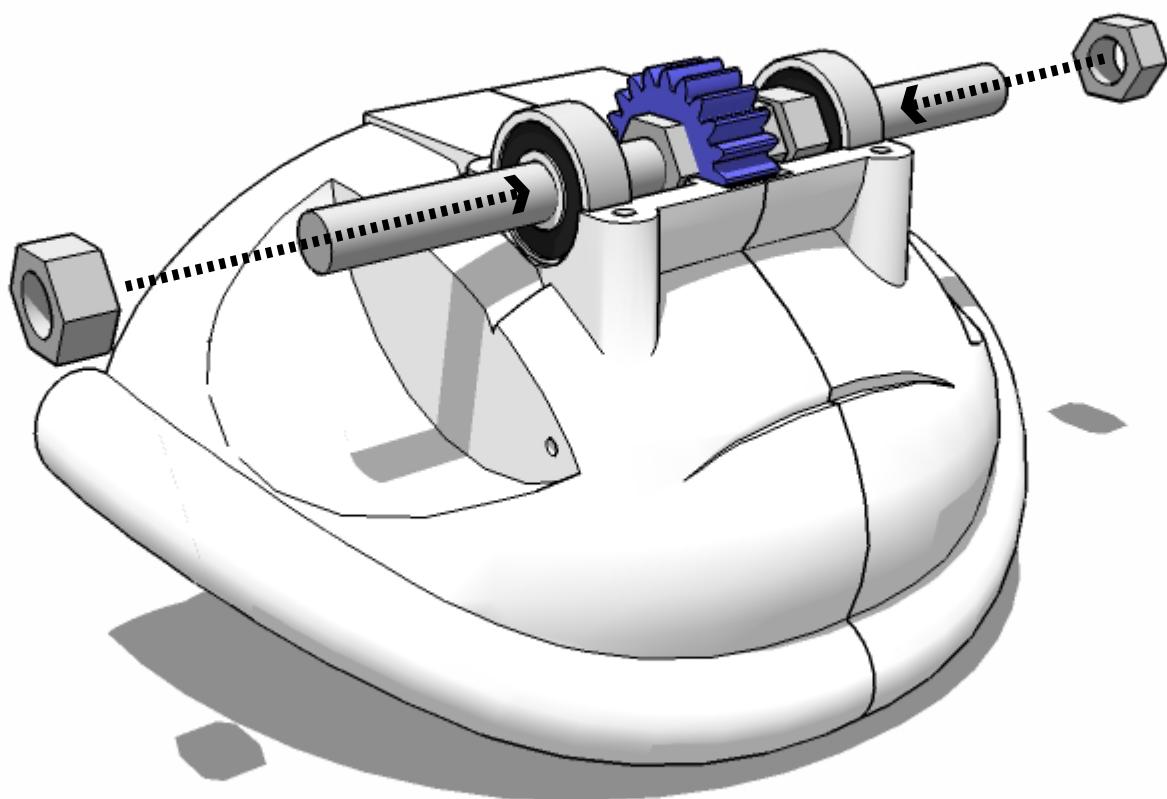
Parts:



**Place the Axel in the back of the Car.
Adjust the Nuts so the Bearings sit in their cradles and the
Drive Gear is engaged with Gear 3.**

**Step
14**

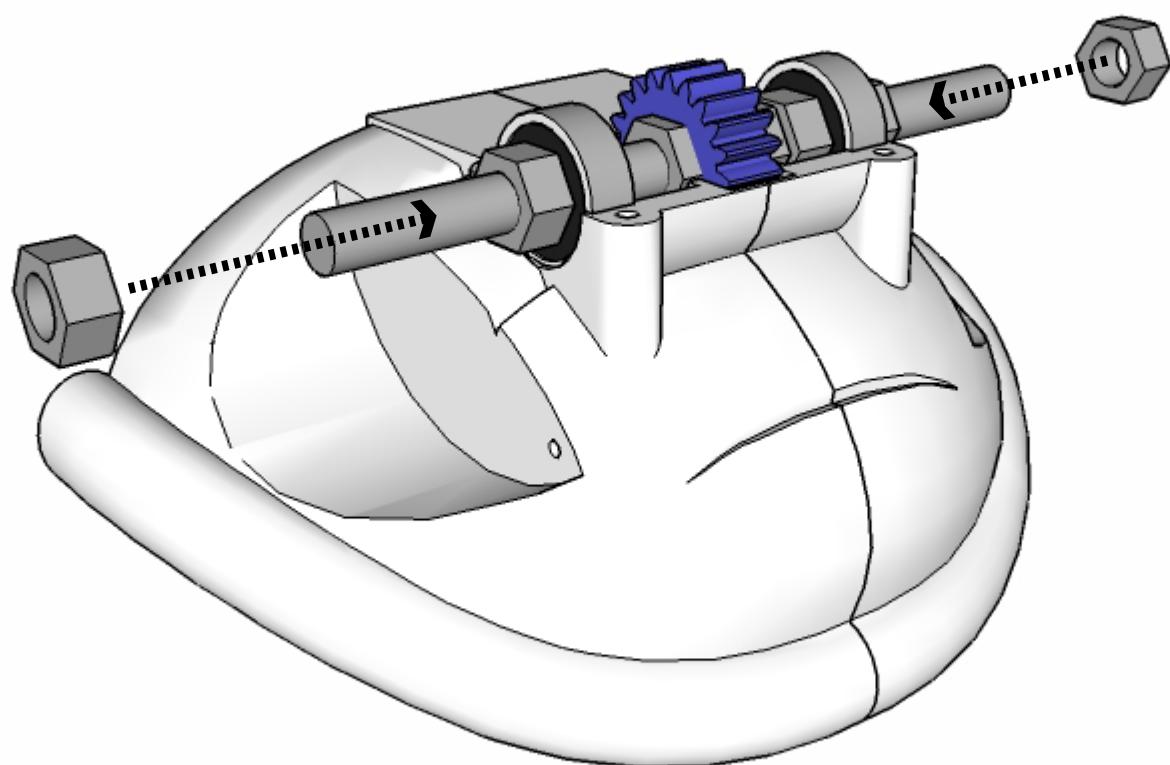
Parts:



Screw a nut down each end of the Threaded Rod.
Adjust all nuts to ensure the Drive Gear is engaged with Gear 3 and the
Bearings are sitting properly in their cradles.
Use a pair of wrenches to tighten all the Nuts against each other.

Step
15

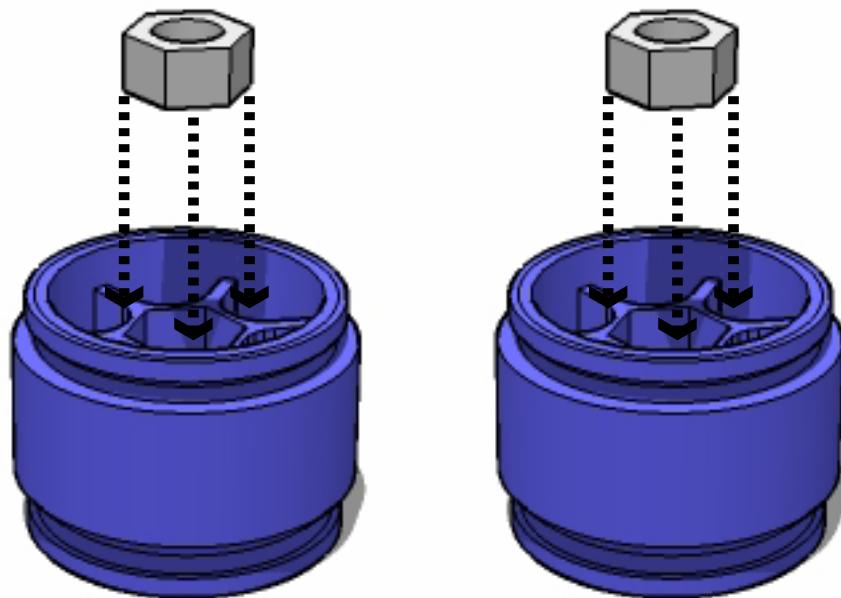
Parts:



Screw another Nut onto the Threaded Rod from each side.
Do not tighten the bolts.

Step
16

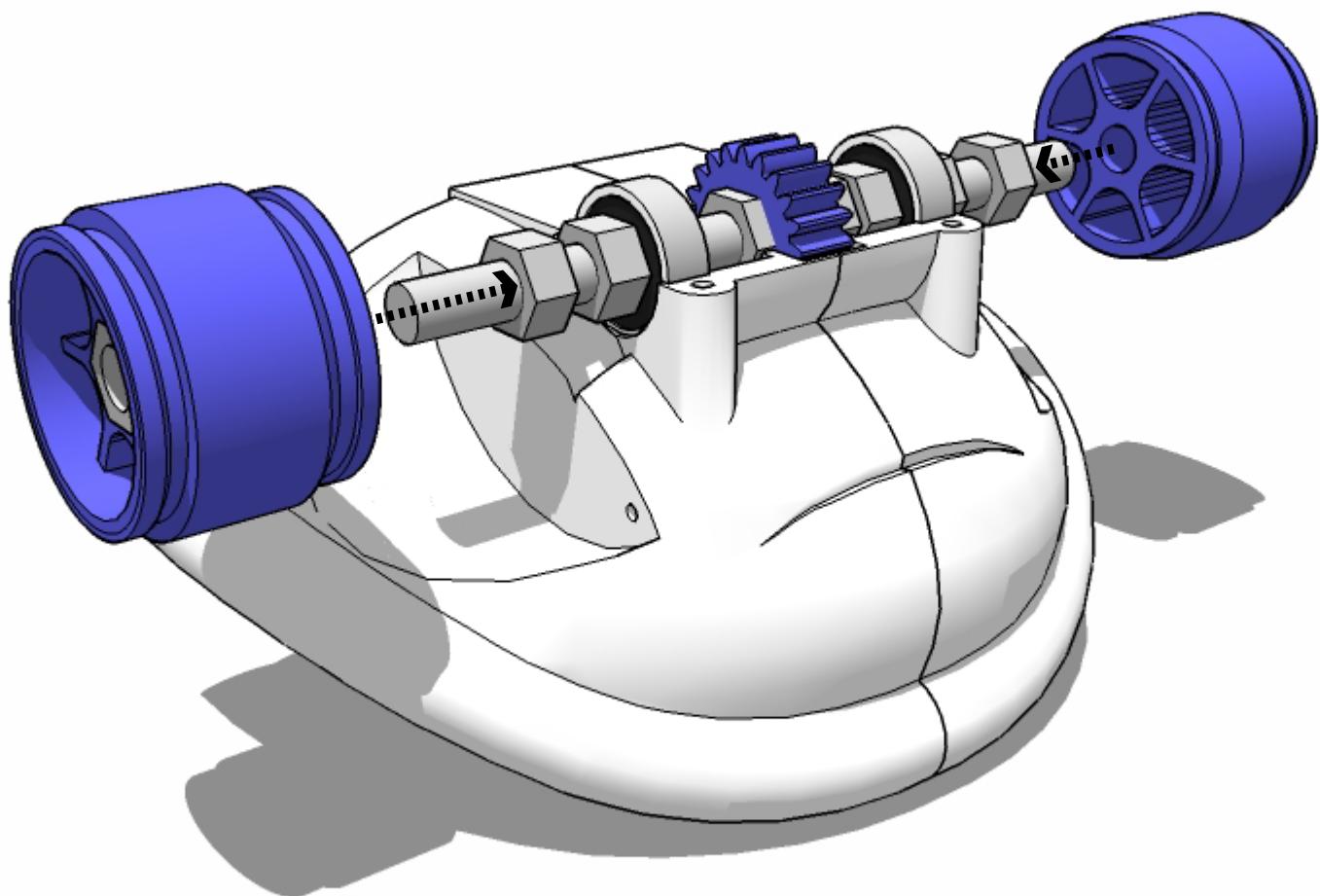
Parts:



Press a Nut into the Nut Shaped space in both Rear Wheels. Use a hammer or C-clamp to persuade them into place.

**Step
17**

Parts:

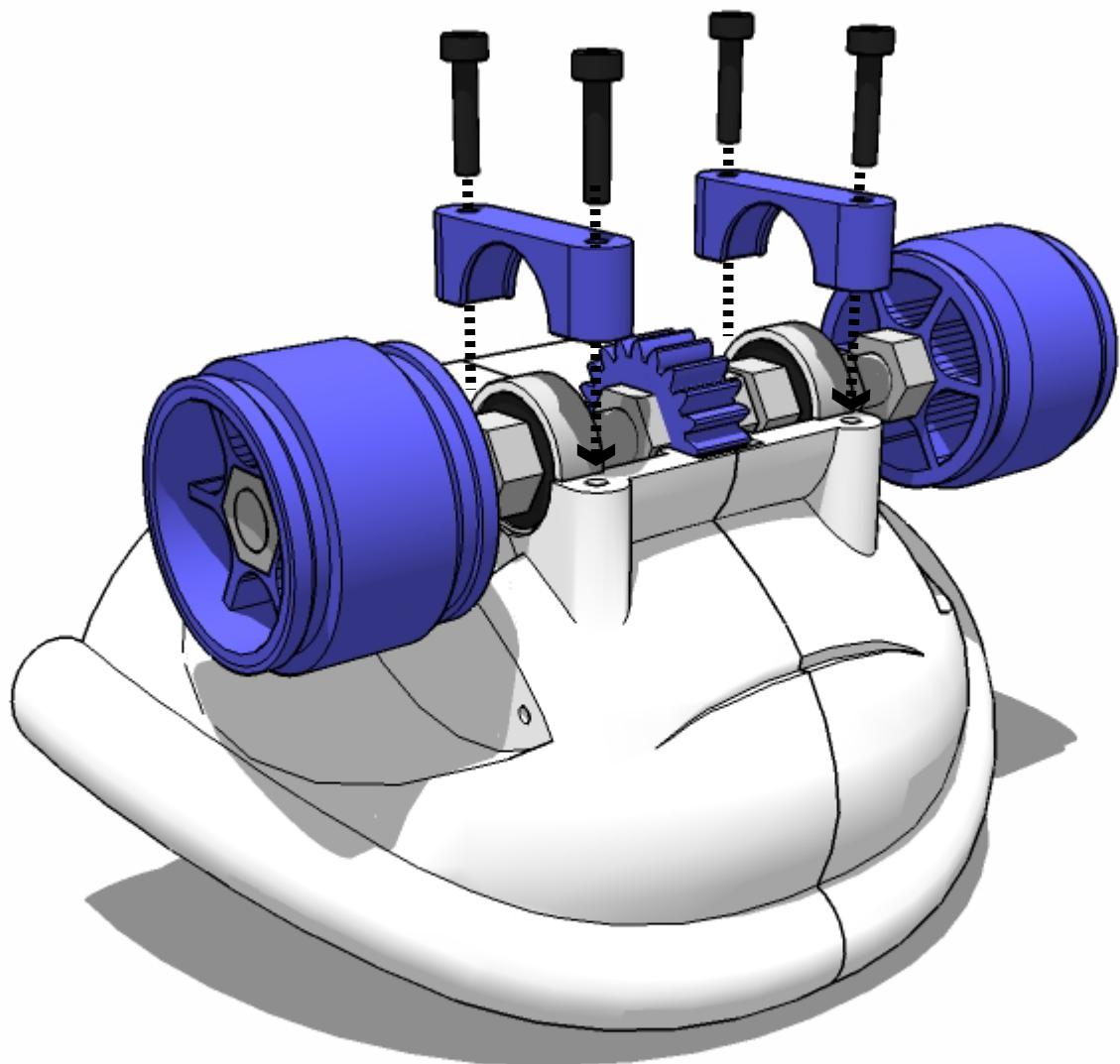


Screw the Rear Wheels into place. The end of the threaded rod should be level with the inside of the Rear wheel.

Tighten the Rear Wheel and Nut against each other.

**Step
18**

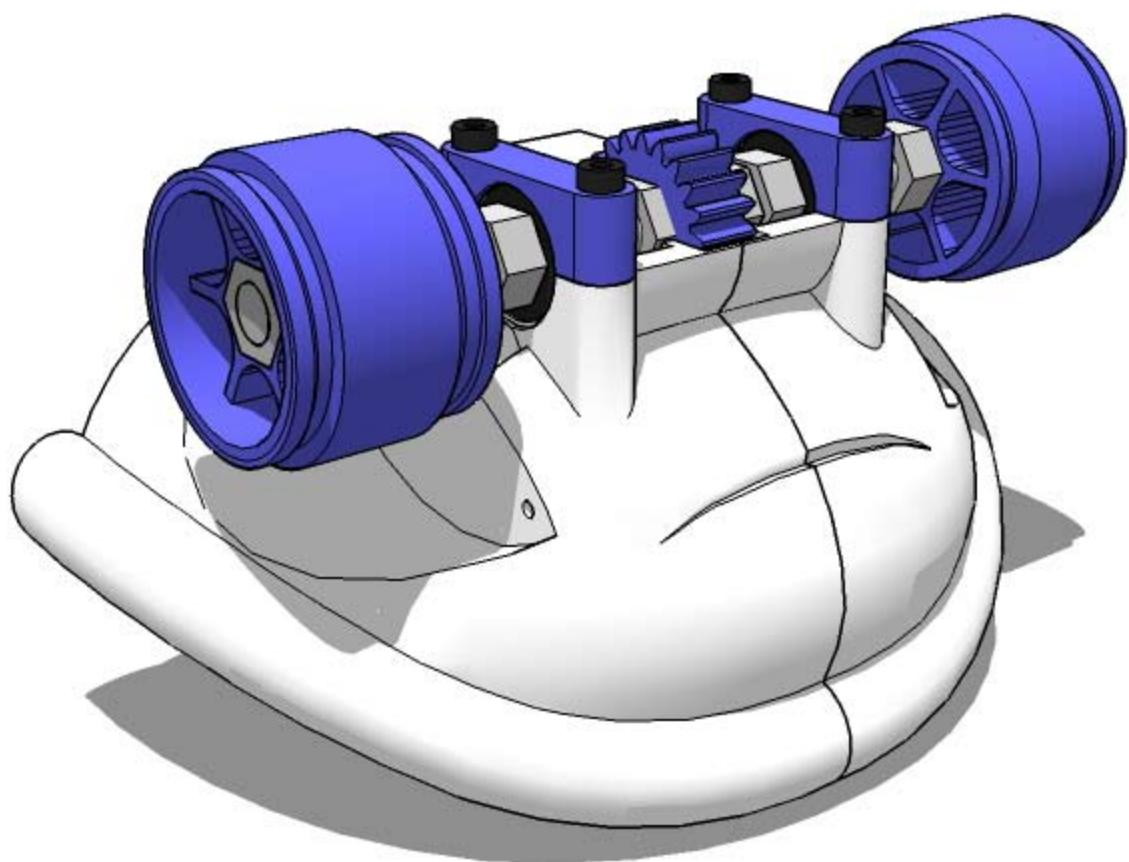
Parts:



Place the two Rear Axel Brackets in Place and Secure them with M3 Screws.

**Step
19**

Parts:

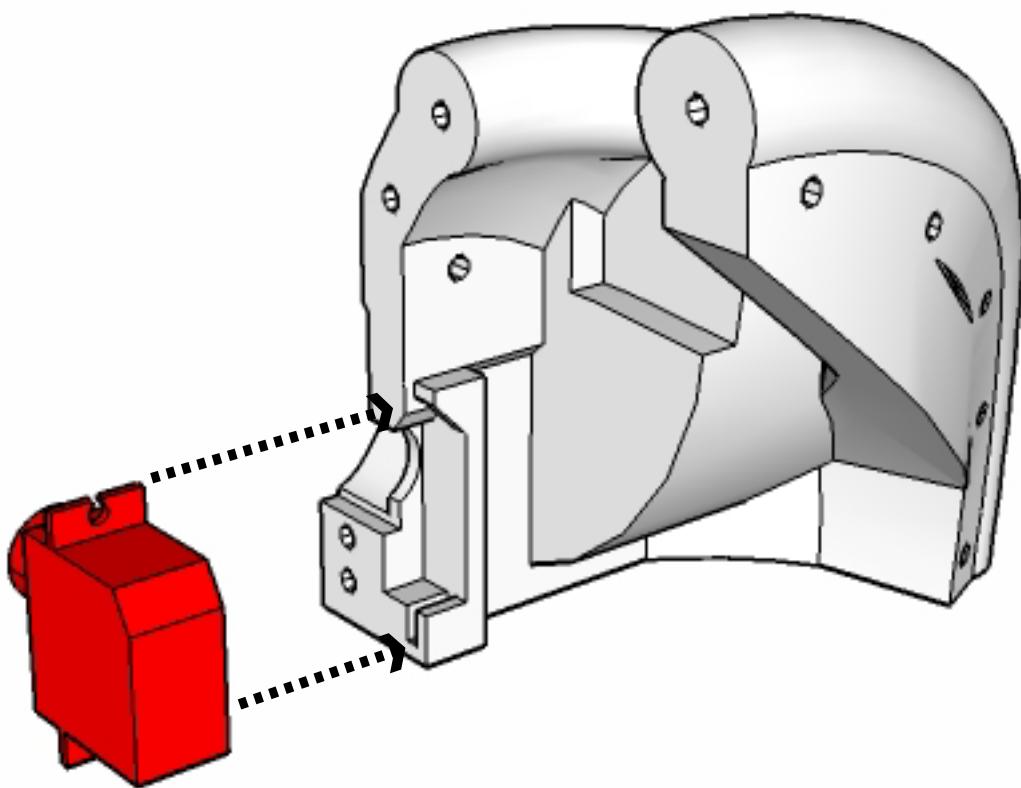
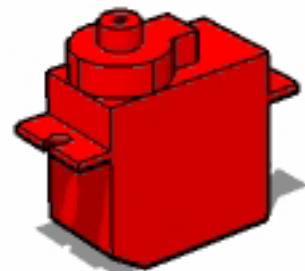


Check Your Work!

The Bearings should spin freely. The Drive Gear and Gear 3 should be engaged.
The Rear wheels should not be touching the body.

Step
20

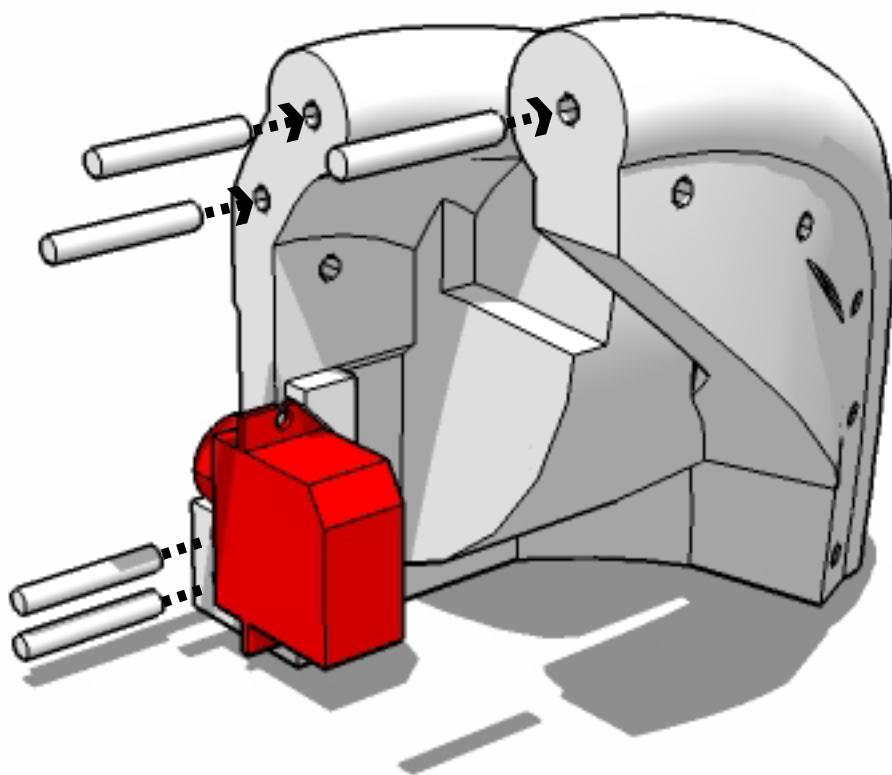
Parts:



**Press the Micro Servo into Shell Front B as shown.
You may need to use a knife to adjust the hole to your particular servo.**

**Step
21**

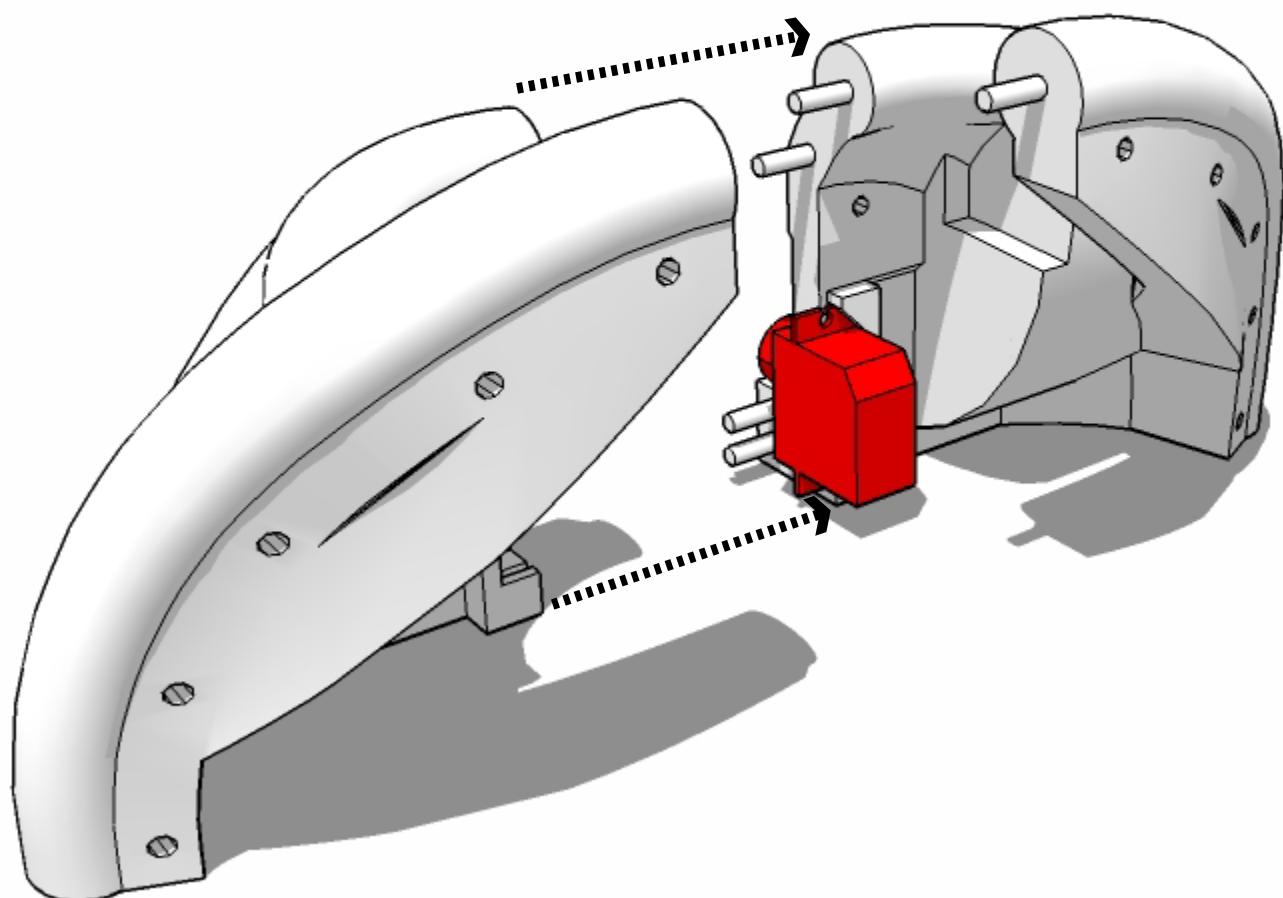
Parts:



Press Short segments of 3mm filament into the holes on Shell Front B as shown.
Between 5 and 10mm will need to stick out to get a good connection.

Step
22

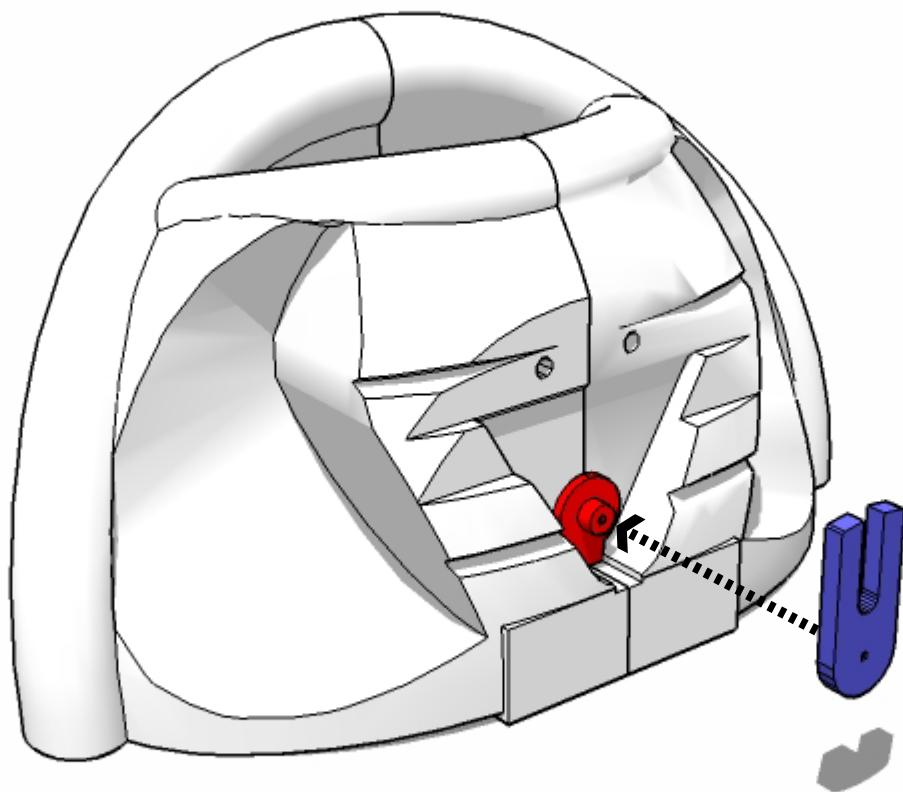
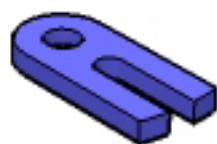
Parts:



Press Shell Front A and Shell Front B together as shown.

**Step
23**

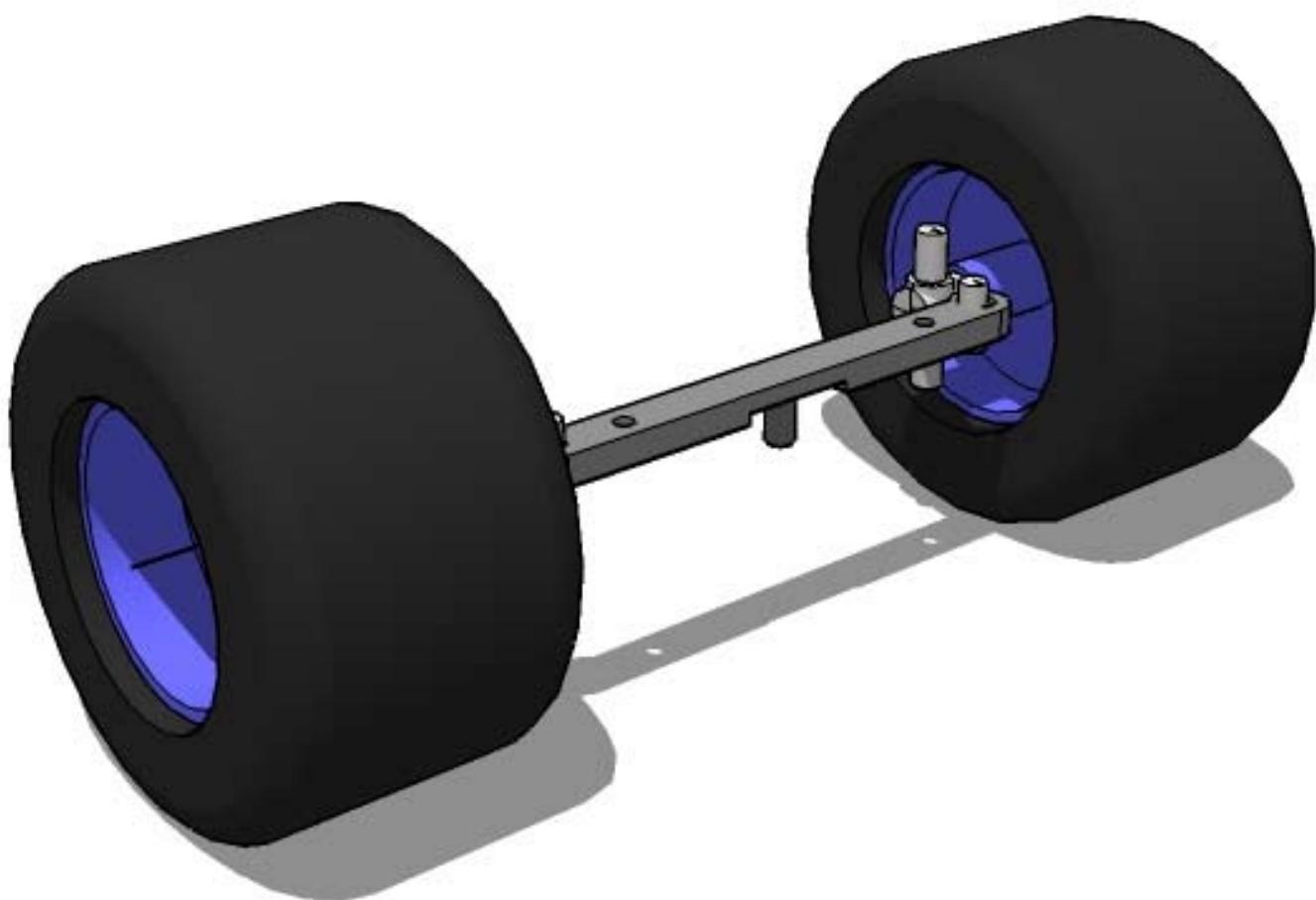
Parts:



Press the Steering Linkage onto the Servo shaft. If your servo came with mounting screws, use one to secure the Steering Linkage in place.

**Step
24**

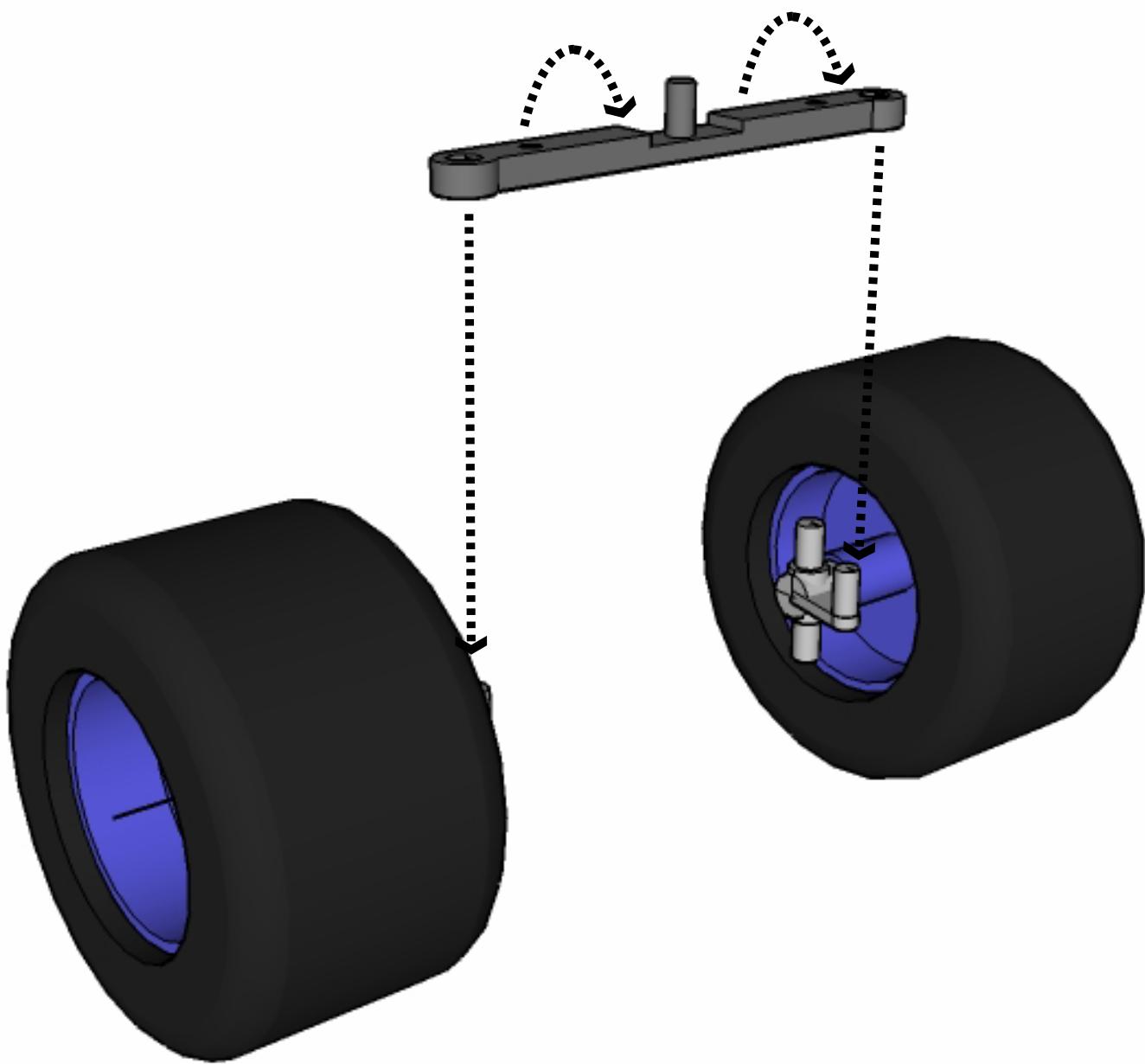
Parts:



Extract these pieces from the front suspension of the Cheep RC Car.
They are: the front wheels, the wheels pivot points,
and the arm that controls the steering.

Step
25

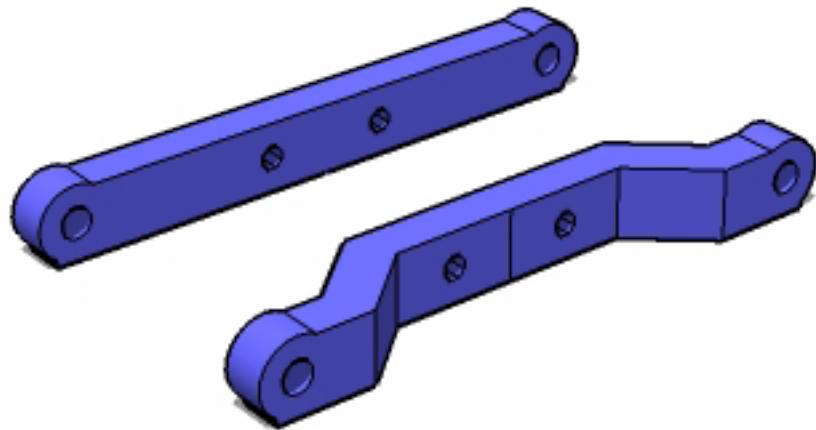
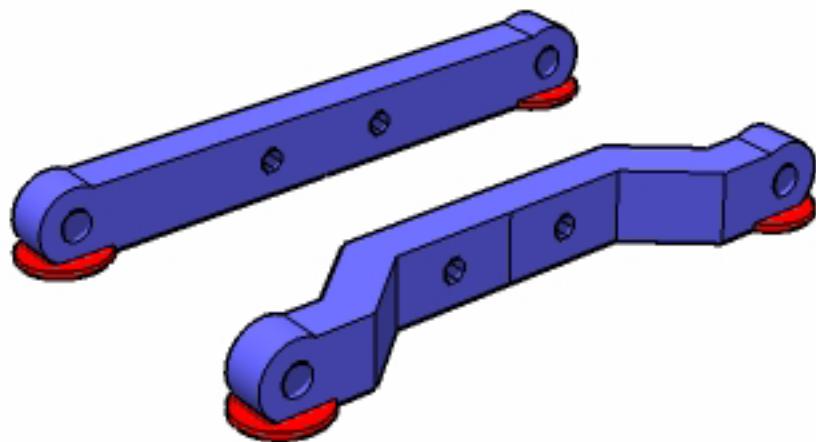
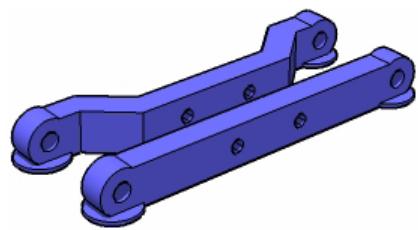
Parts:



Remove the Control Arm from the Pivot Points, Flip it over, and snap it back in place.

**Step
26**

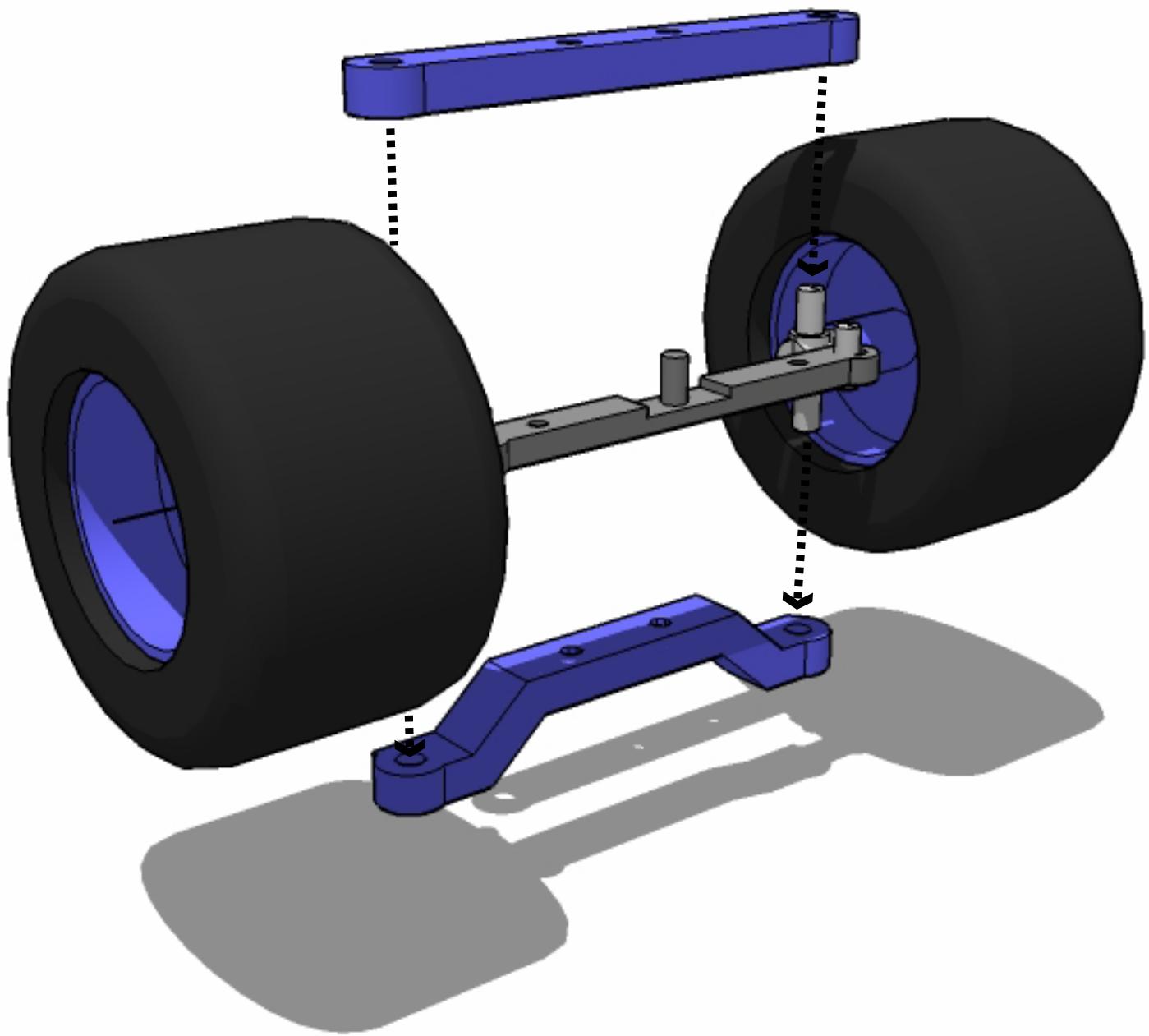
Parts:



Cut the extra material off the Front Suspension as shown.

**Step
27**

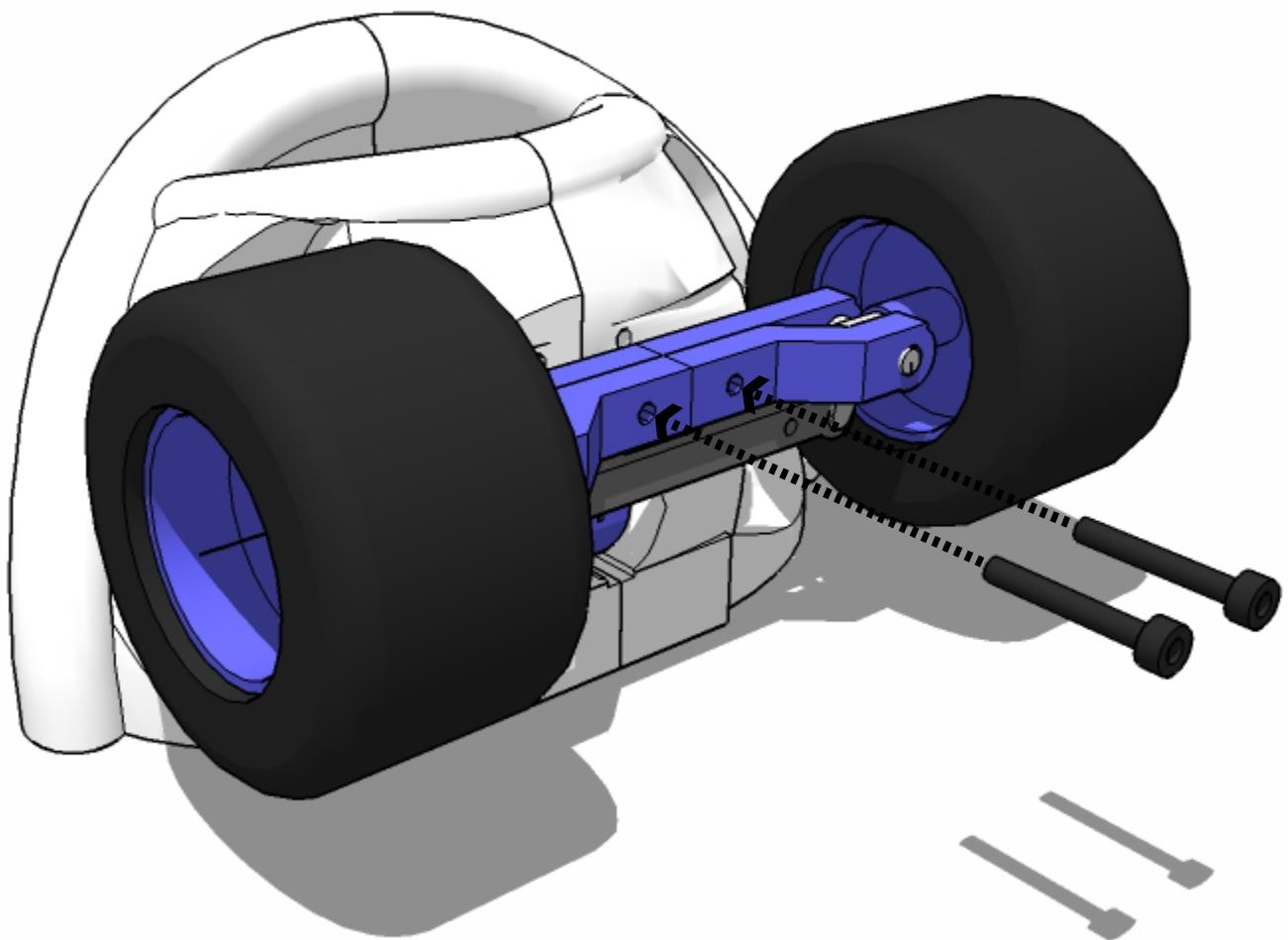
Parts:



Assemble the Front Suspension as shown. Take note of the position of the peg on the Control Arm.

**Step
28**

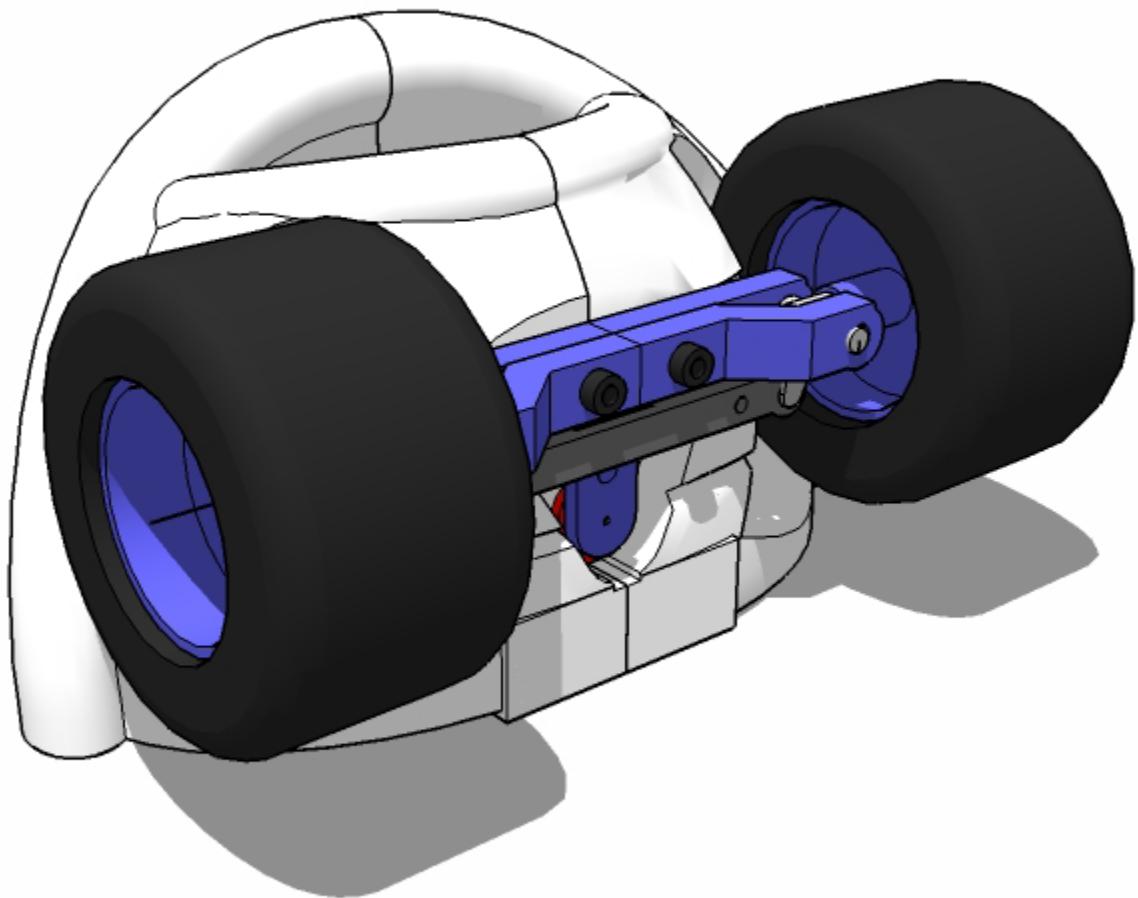
Parts:



**Use 2 M3 screws to attach the Front Suspension to the Front Shell.
The Peg on the Control Arm should go in the Slot on the Steering Linkage.**

**Step
29**

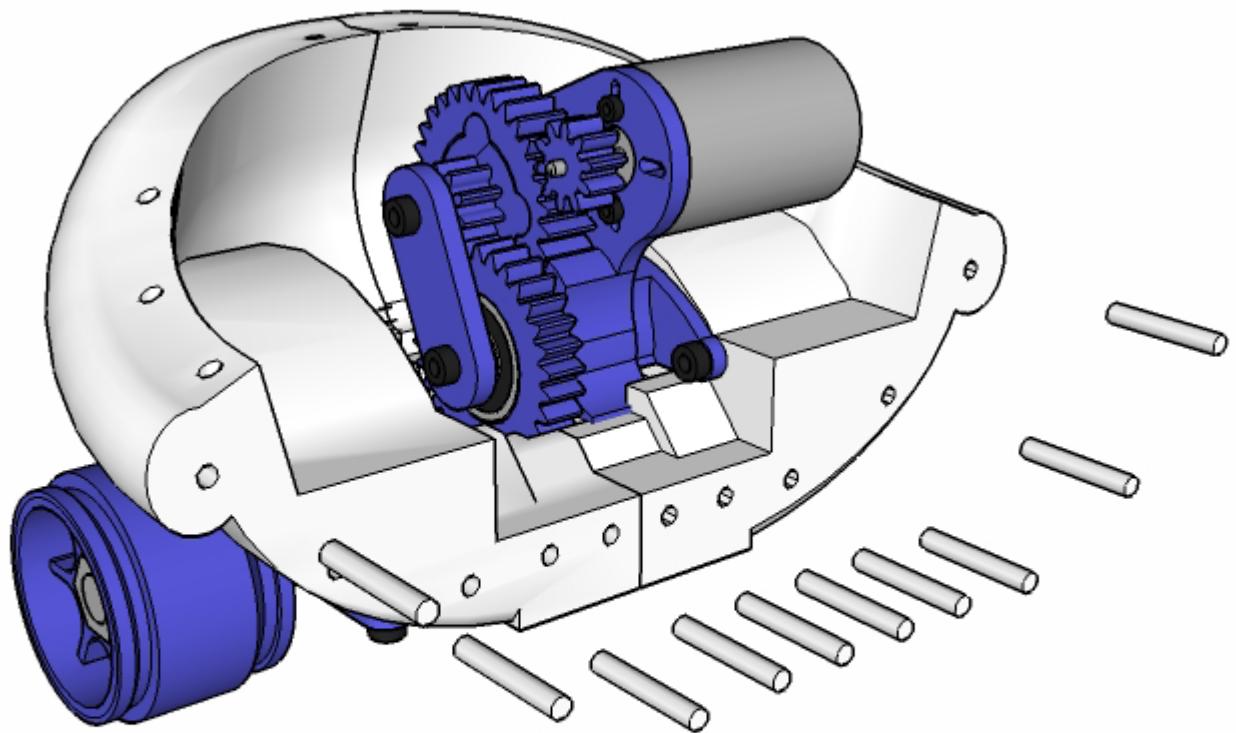
Parts:



**Double check your work.
Make sure the Pin on the Control Arm is in the slot on the Steering Linkage.**

**Step
30**

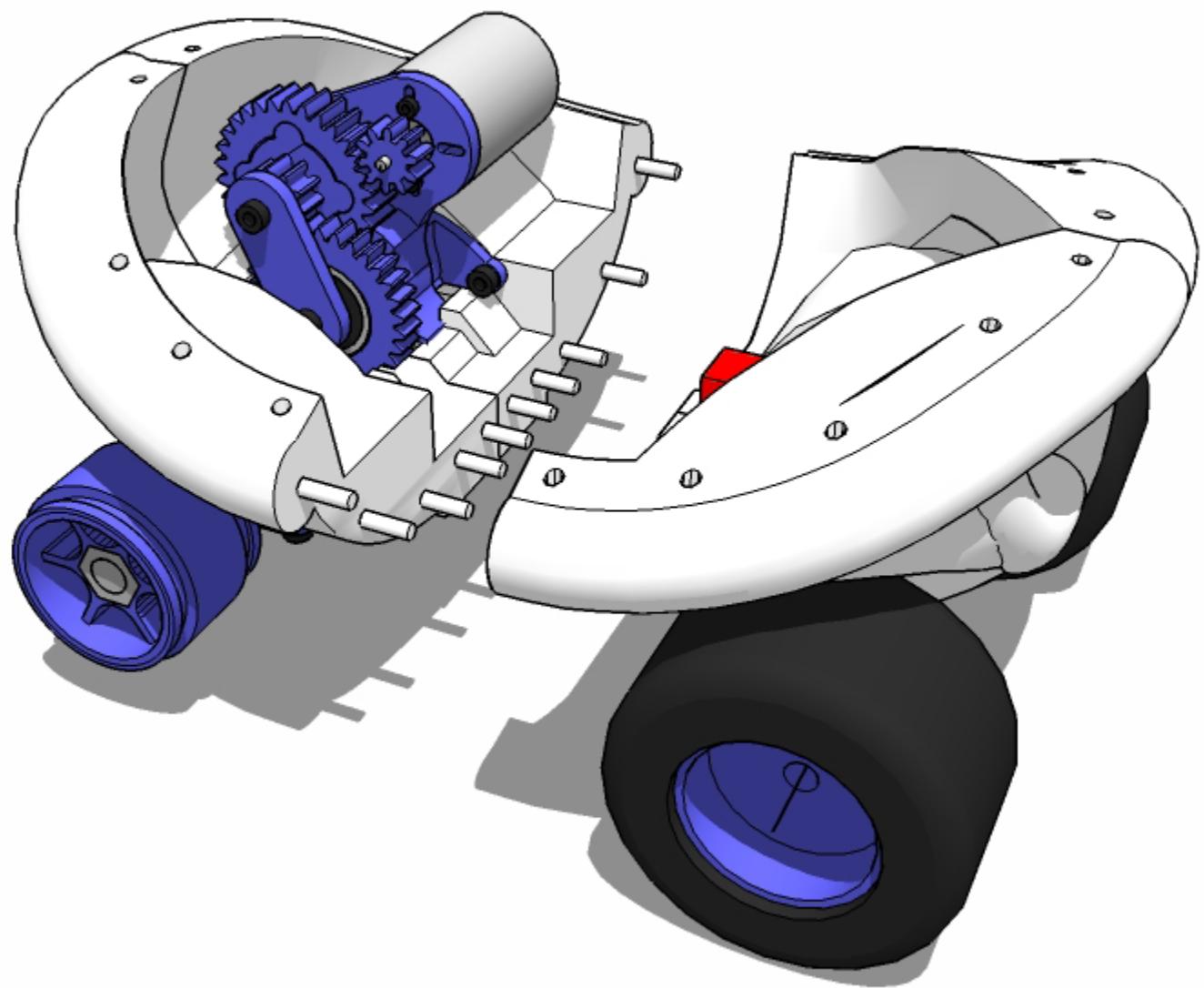
Parts:



Press Short segments of 3mm filament into the holes on Shell Back as shown.
Between 5 and 10mm will need to stick out to get a good connection.

Step
31

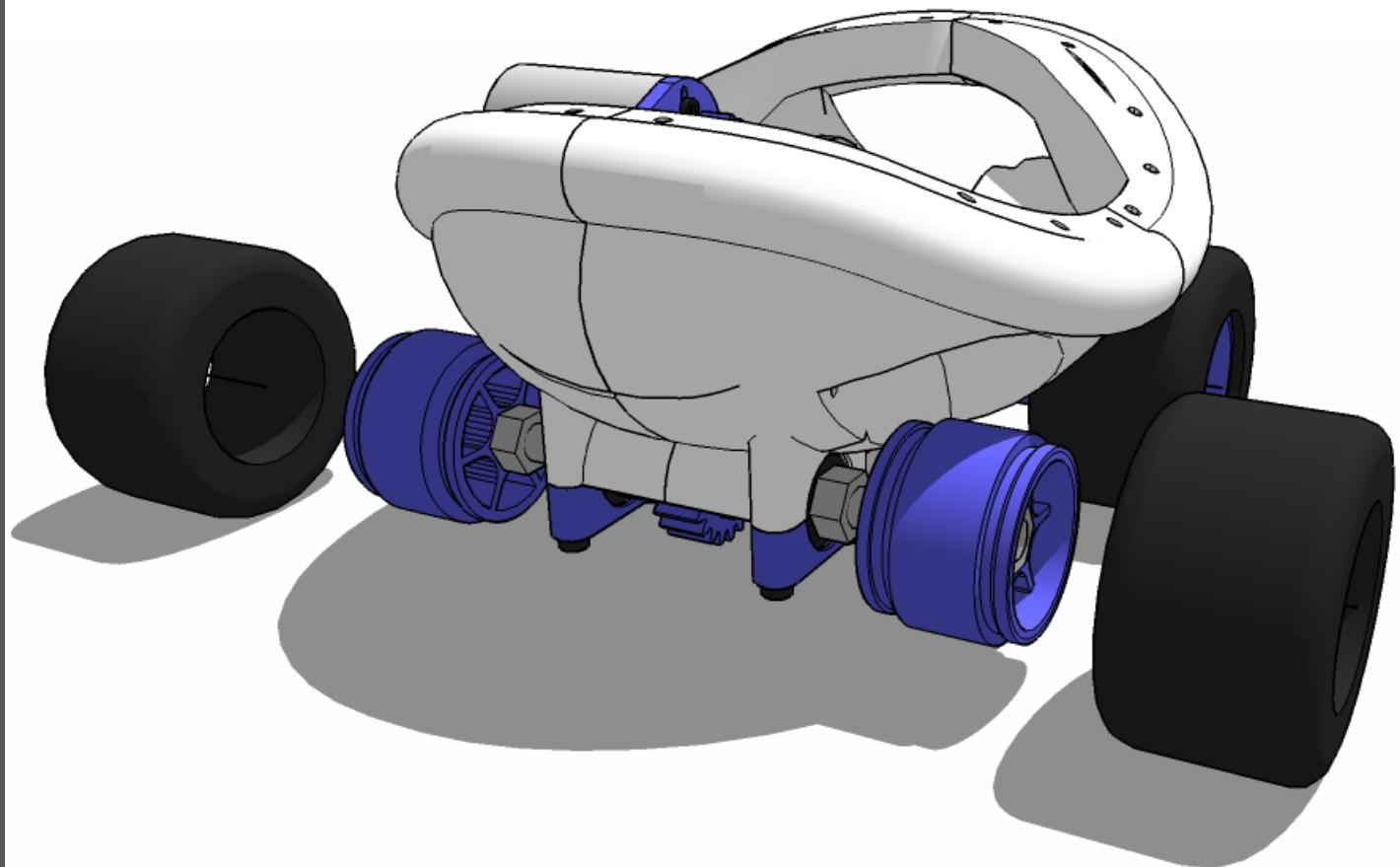
Parts:



Press Shell Back and Shell Front together.

Step
32

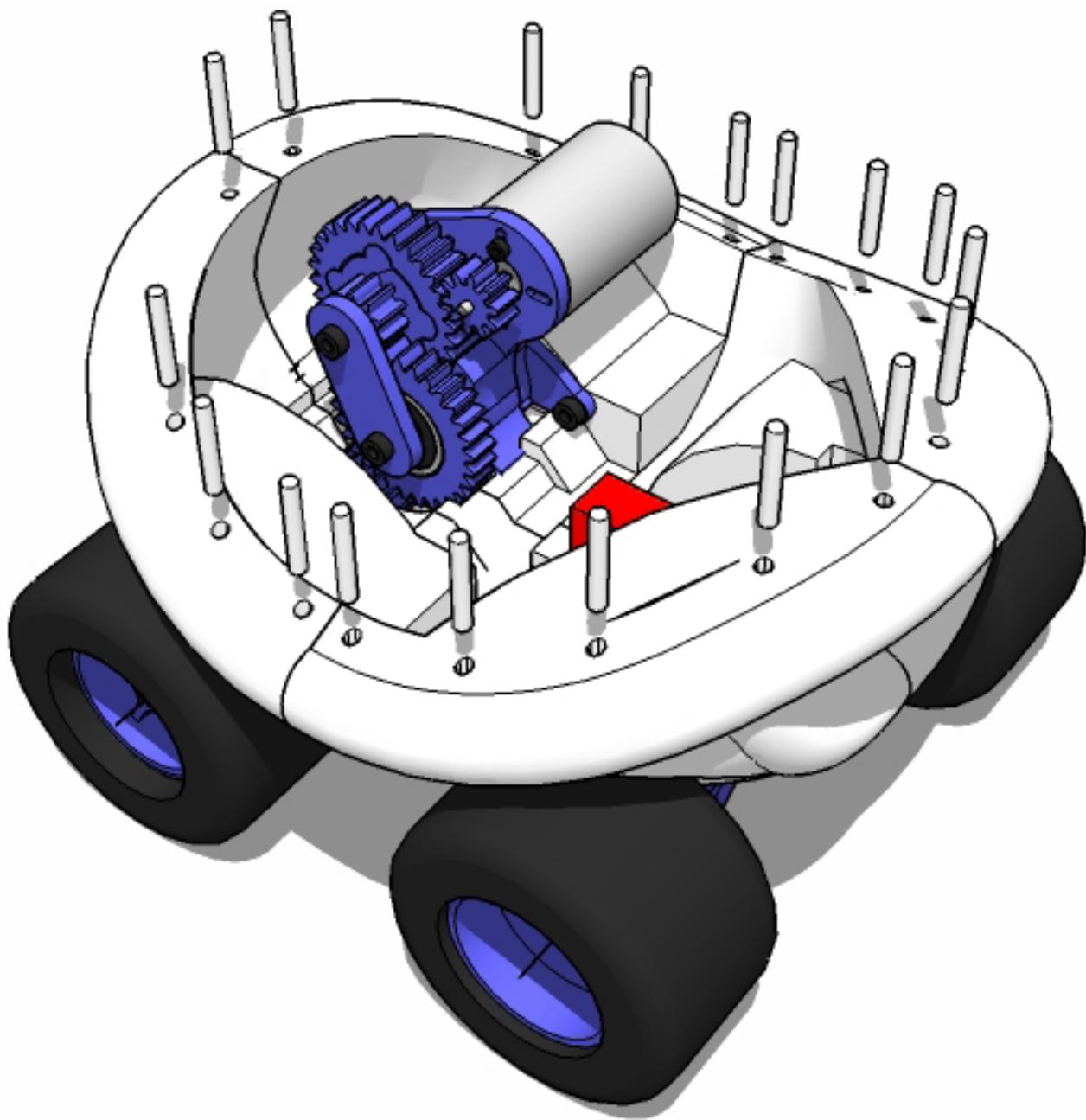
Parts:



Remove the Rear Tires from the Cheep RC Car. Put them on the Rear Wheels.

Step
33

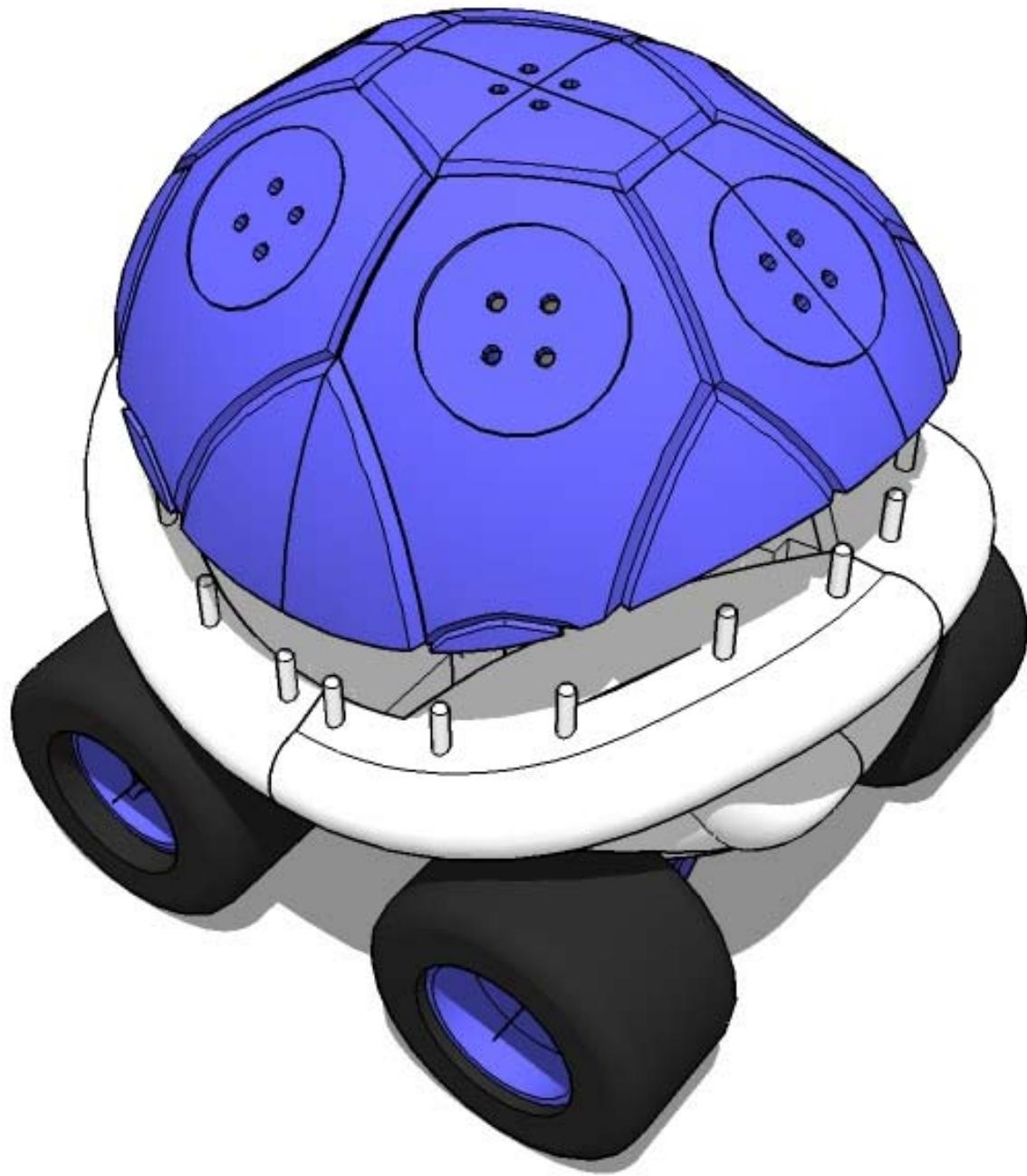
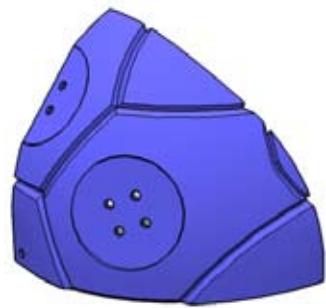
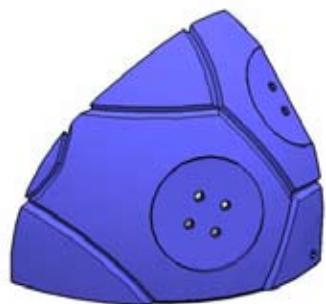
Parts:



**Press Short segments of 3mm filament into the holes on Shell as shown.
In this case only about 5mm will be needed for a good connection.
Also, not all holes need to be filled for the parts to stay together.**

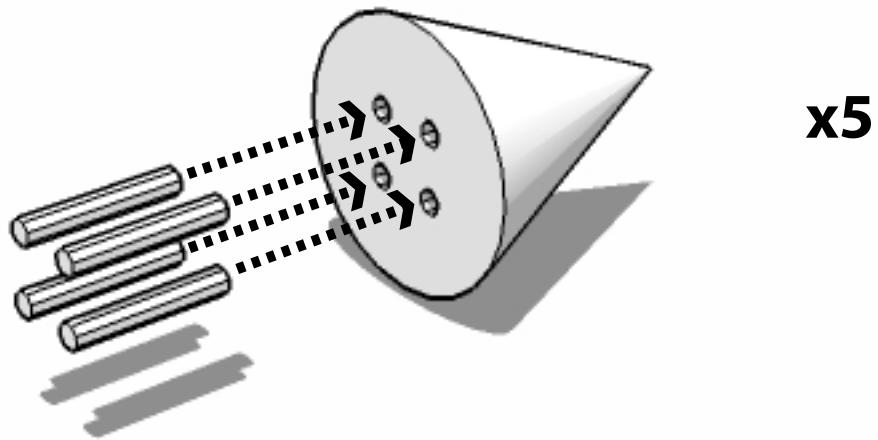
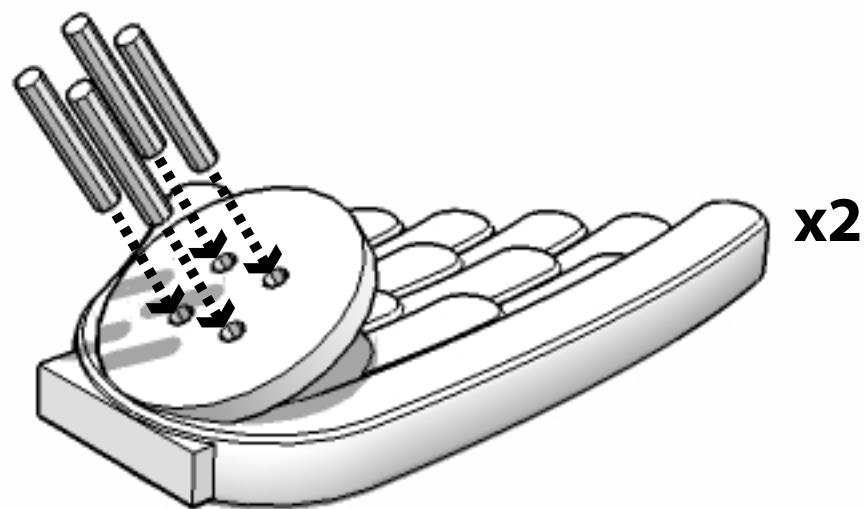
**Step
34**

Parts:



Press the two Top A and two Top B parts in place on the top of the Shell.

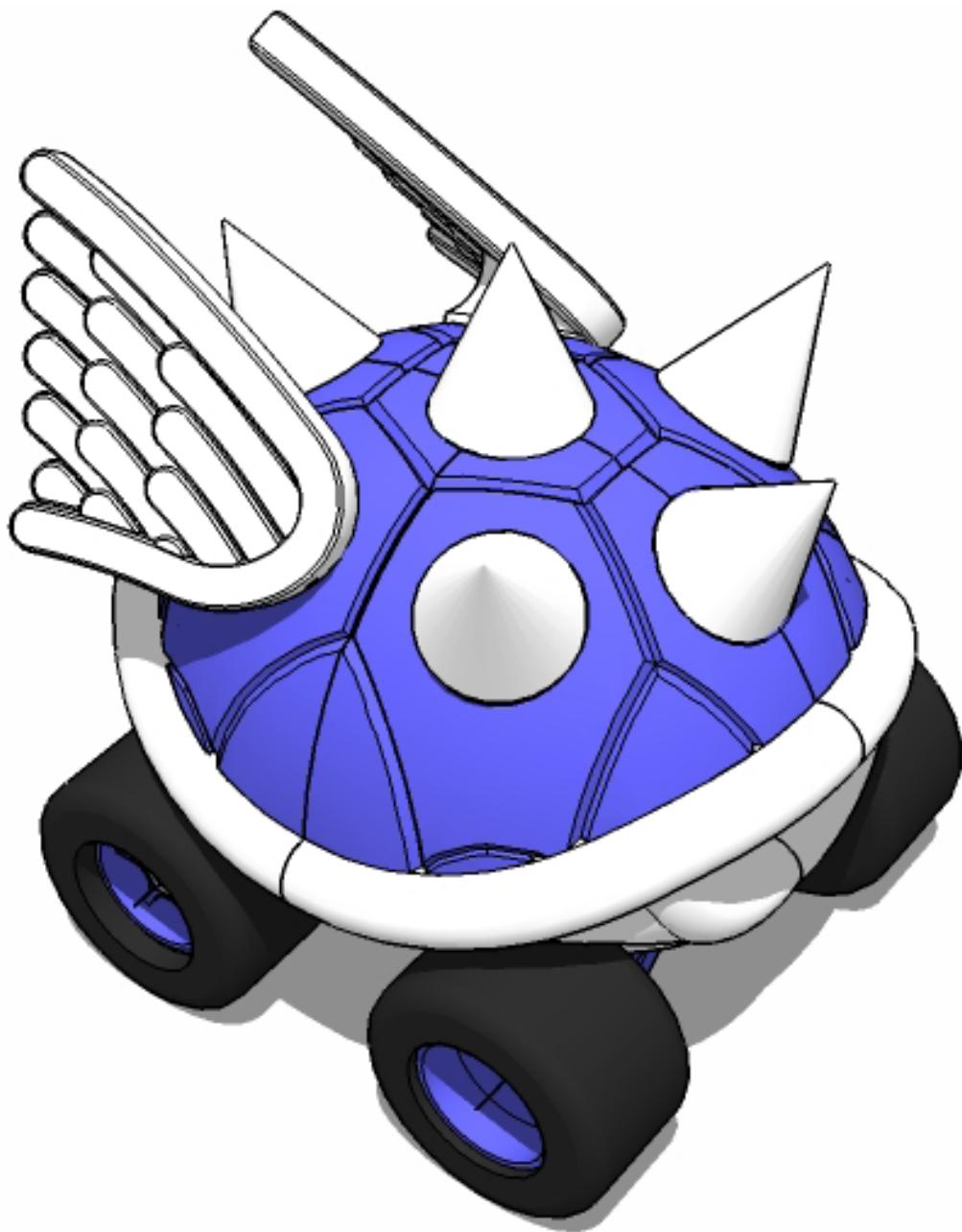
**Step
35**

Parts:

Press Short segments of 3mm filament into the holes on the bottoms of the Wings and Spikes as shown. For a Blue Shell you will need 5 Spike and a set of Wings. For shells of other colors, use 7 Spikes and no Wings.

**Step
36**

Parts:



Press the Spikes and Wings in place as shown. Remember, only Blue Shells have wings. All other colors should have the wings replaced with Spikes.
Now put your hands in the air and celebrate how awesome you are!

Step
37