## Create Gear Pairs to Simulate Drivetrain Mechanics

The wheels and gears move independently, but we want to make our model have realistic movement. Based on our design, moving one wheel or gear should move all of the wheels and gears for that half of the drivetrain. Using Creo's mechanism tools it is possible to create gear pairs that simulate how the gears of a physical drivetrain work.
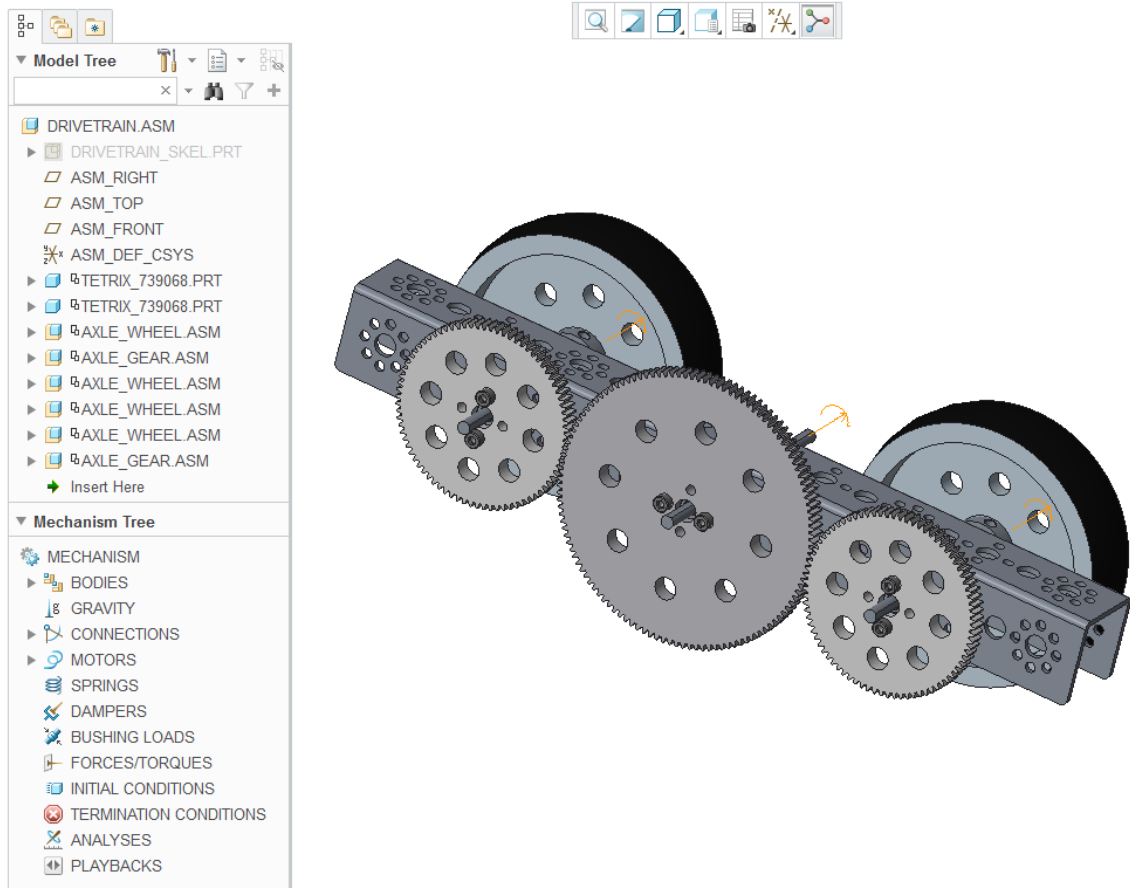
1. Press Ctrl+Alt while clicking and dragging the right front gear to rotate it into a position that meshes its gear teeth to with the teeth of the large central gear.

2. Repeat step 1 to mesh the other wheel gear with the central gear.
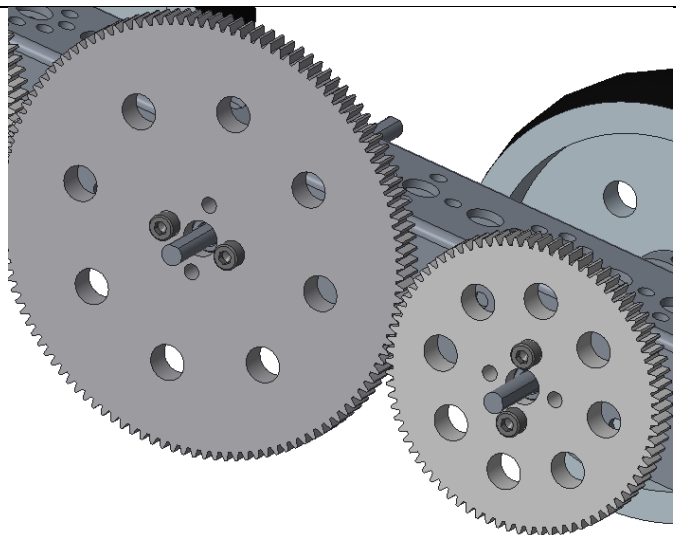
3. From the Application toolbar, select **Mechanism** ⚙.

Mechanism   Animation   Simulate   Simulate Results   PTC Mathcad ▾
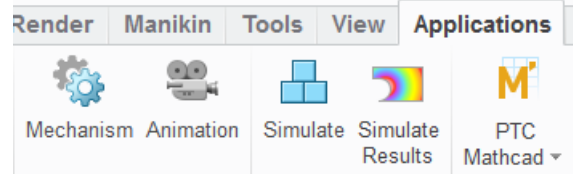
The Mechanism ⚙ application opens a mechanism tree below the model tree. In the graphical area, axis ⤸ icons appear at each of the pin joints.

▼ **Model Tree**

DRIVETRAIN.ASM
▸ DRIVETRAIN_SKEL.PRT
   ASM_RIGHT
   ASM_TOP
   ASM_FRONT
   ASM_DEF_CSYS
▸ TETRIX_739068.PRT
▸ TETRIX_739068.PRT
▸ AXLE_WHEEL.ASM
▸ AXLE_GEAR.ASM
▸ AXLE_WHEEL.ASM
▸ AXLE_WHEEL.ASM
▸ AXLE_WHEEL.ASM
▸ AXLE_GEAR.ASM
   ➜ Insert Here

▼ **Mechanism Tree**

⚙ MECHANISM
▸ BODIES
   GRAVITY
▸ CONNECTIONS
▸ MOTORS
   SPRINGS
   DAMPERS
   BUSHING LOADS
   FORCES/TORQUES
   INITIAL CONDITIONS
   TERMINATION CONDITIONS
   ANALYSES
   PLAYBACKS

Gear Pair Definition

Name

GearPair1

Type

Generic

Gear1 | Gear2 | Properties

Motion axis

Body

Pinion

body6

Carrier

Ground

Pitch Circle

Diameter

0 | in

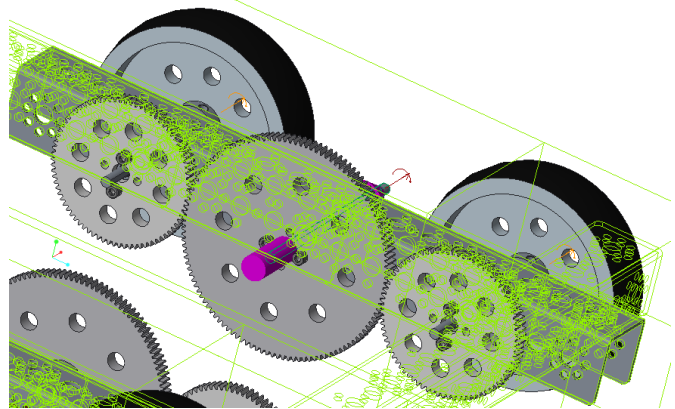Icon location

Apply | OK | Cancel
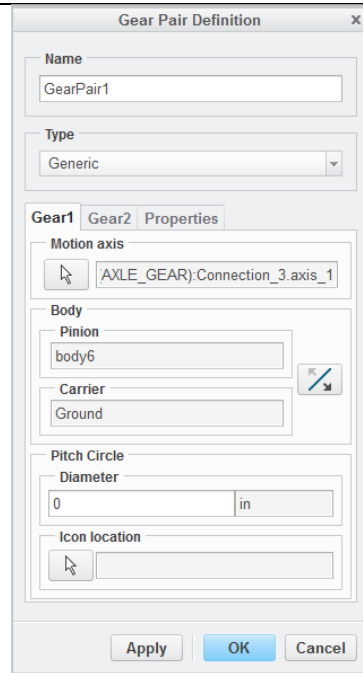
4. From the Mechanism toolbar, select **Gears** ⚙.

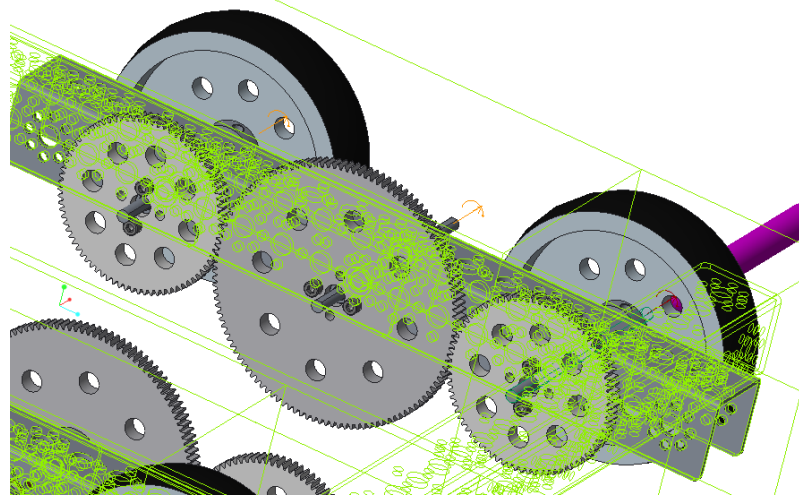The Gear Pair Definition window opens. Use this function to bind gears together in pairs.
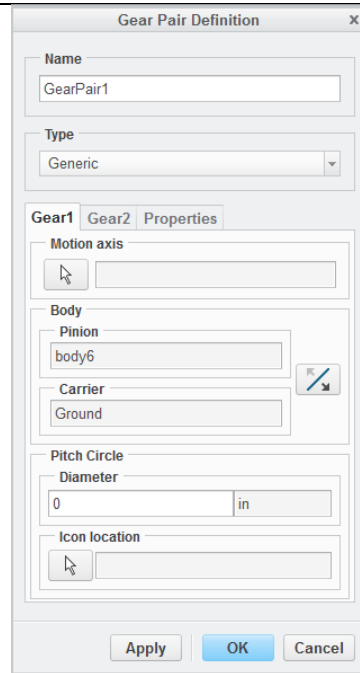
5. Click to select the pin axis icon ⤴ for the large central gear.

6. The selected pin joint components appear purple. Green outlines appear for hidden model features.

The Gear1 tab lists the selected gear axle axis as the motion axis.

Gear Pair Definition

Name
GearPair1

Type
Generic

Gear1 | Gear2 | Properties

Motion axis
AXLE_GEAR):Connection_3.axis_1

Body
Pinion
body6

Carrier
Ground

Pitch Circle
Diameter
0   in

Icon location

Apply   OK   Cancel

7. Click the Gear2 tab.

8. Click to select the pin axis icon for the right wheel gear.

The Gear2 tab lists the selected wheel axle axis as the motion axis.
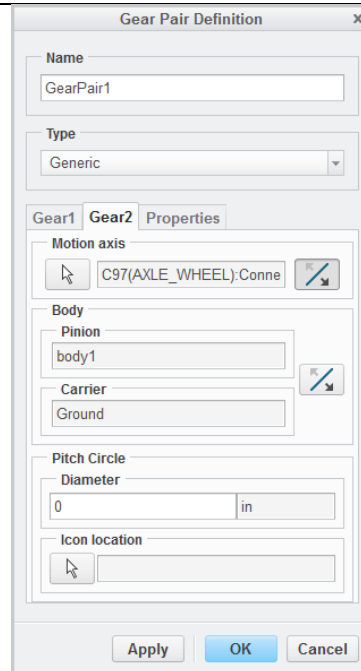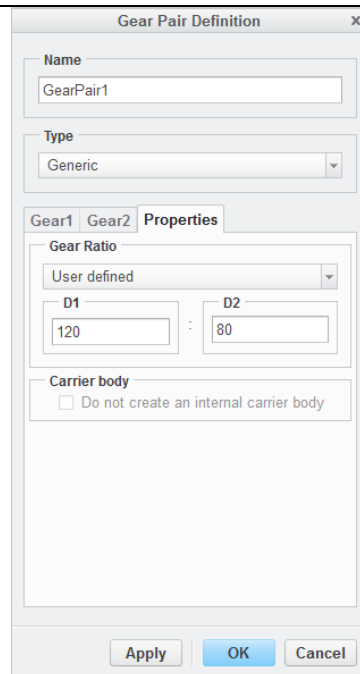
9. Click the Properties tab.

10. Select **User Defined** from the Gear Ratio menu.

11. Set the D1 value to the number of teeth on Gear1.

The example sets the D1 value to **120**.

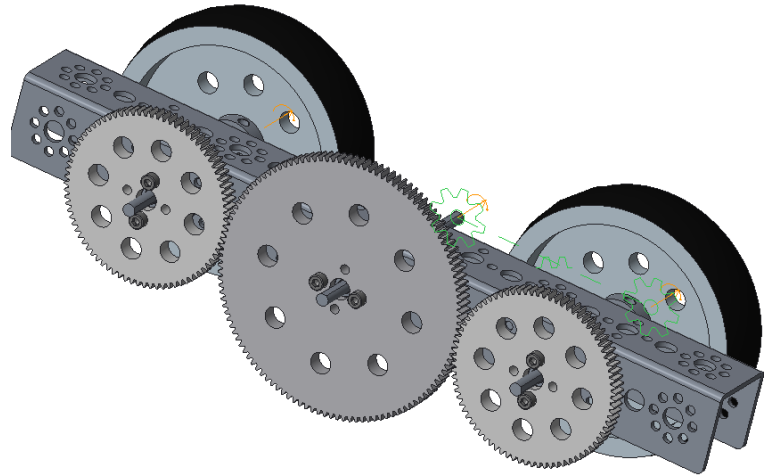12. Set the D2 value to the number of teeth on Gear2.

The example sets the D2 value to **80**.

13. Click **OK**.

Green gear symbols appear in the graphical area to show the pairing.

Test the gears by pressing Ctrl+Alt while clicking and dragging one of the paired gears. The other gear should rotate.

14. Repeat steps 1-13 to create gear pairs between the large gear and the back gear on the right drivetrain and between the large gear and the two wheel gears on the left drivetrain.

15. From the Mechanism toolbar, click **Close** ❌ to exit the Mechanism application.
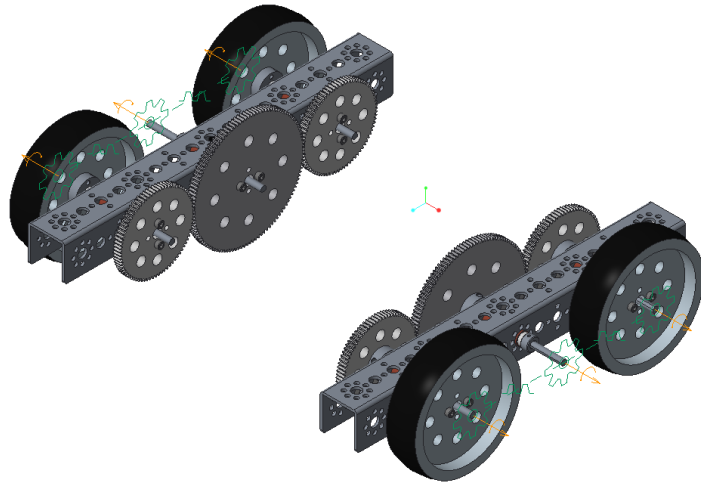
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