Lesson 3: Assemble the drive mechanism

In this lesson, you complete the assembly of a VEX EDR Clawbot robot. Using the VEX Guide for Building the Clawbot for reference, you open a partially completed robot assembly then assemble the supplied components onto the robot. At the completion of this lesson, the robot will be ready for the Clawbot arm assembly.

Learning Objectives:

- Create a new project and upload files to the project.
- Open an existing robot assembly.
- Insert robot components into the current design.
- Assemble the components using the VEX Guide for Building the Clawbot for reference.
- Insert the wheel subassemblies into the design and assemble them to the robot.

Step 1: Create a new project and upload files to the project

1.	Start Fusion 360.		
2.	Click Show Data Panel.		Autodesk Fusion 360 Autodesk Fusion 360 Show Data Panel MODEL Skettch BROWSER (Unsaved)
3.	Click Leave Data Details.		E Autodesk Fusion 360
4.	Click New Project.	F. Autodesk Fusi Phillip D PROJECTS	on 360 ollan Seek New Project Create New Project
5.	Enter VEX EDR_LESSON3 then press Ent	er.	R_LESSON9 F. Autodesk Fusion 360 Phillip Dollan
No	te: You can name the project as noted o	r use a	DRO JECTS
nai	me provided by your instructor.		A VEX EDR_LESSON3
6.	Double-click on VEX EDR_LESSON3 to m	ake it the a	active project.
7.	Click Upload.		Autodesk Fusion 360
8.	Select the supplied file, <i>VEX IQ.f3z</i> , and components are uploaded to the project	then click t.	Upload. The robot



9.	Click Hide Data Panel.	F . /	Autodesk	Fusion 360						
		<	\bigtriangleup	VEX EDR	LESS.	g	٩	× Hide D	Data P	anel
				Data	Pe	eople				
			® v]	Upload	New Folder	¢			NODEL -

Step 2: Open an existing robot assembly

1.	Open VEX EDR_LESSON3.		
2.	Click Show Data Panel then click	< A VEX EDR_LESS 2 9	2 ×
	People. You should be the only person	Data People	1
	currently in the project.	Enter email addresses I Invite	۲
3.	Click Data then click Hide Data Panel.		
4.	Click New Project.		

Step 3: Insert robot components into the current design

1.	Click Display Settings > Object Visibility then click Joints Origins to	Visual Style Mesh Display Environment
	displayed on the model.	Effects All Work Features Object Visibility ✓ Camera ✓ Ground Plane Offset ✓ Origin Points ✓ Senter Full Screen Ctrl+Shift+F User Work Axes ✓ User Work Axes ✓ User Work Points ✓ Image: Statches ✓
2.	Click Move to Beginning.	COMMENTS
3.	Click Play then review the first few stores robot.	eps in modeling the
4.	Click Move to End.	
5.	Refer to the VEX Guide for Building the	he Robot. Move to Step 16.
6.	Click Show Data Panel.	
7.	Right-click G60_276-2169 then click Insert into Current Design.	Geo_276-2169 1/11/18 Geo Geo Geo Inset into Current Design Neur Neuring from Design Neur Neuring from Design Start Live Review
8.	Click OK.	
9. •	Repeat the previous workflow for the components into the position shown COL_276-2010 (2 required)	e following components. Drag the before clicking OK.



Step 4: Assemble the components using the VEX Guide for Building the Clawbot for reference

1.	Hide the data panel.
2.	Zoom and pan to view the model as shown.
3.	On the Assemble panel, click Joint.
4.	In the Joint dialog, from the Type list, select Slider.
5.	Select the circular edge on the end of the shaft as shown.
6.	Rotate the model then select the edge on the bearing flat as shown.



7.	In the Joint dialog, click Flip then click OK.		
8.	On the Assemble panel, click Enable Contact Sets.	ASSEMBLE New Component As-built Joint Joint As-built Joint Joint Origin Rigid Group Drive Joints Motion Link Enable Contact S	J Shift+J
9.	On the Assemble panel, click New Contact Set.	ASSEMBLE ASSEMBLE New Compone Joint As-built Joint Joint Origin Rigid Group Drive Joints Motion Link Enable All Con Be Disable Contact New Contact S	CONSTRUCT nt J Shift+J
10.	Select the shaft then rotate the model and select the motor component as shown.		
No	te: A new folder named Contact: sets is added to the browser.	Select from two ar	more components
11.	Click OK.		
12.	Drag the shaft into the motor until it stops.		
13.	On the Assemble panel, click Disable Contact.		

Step 4a: Assemble the gear and collars onto the model

Rotate the model to view the gear and collars as shown.



2.	On the Assemble panel, click Joint then, if required, click Capture Position.
3.	Select the circular edge on the gear as shown.
4.	Select the joint origin as shown.
5.	In the Joint dialog, from the Type list, select Rigid then click OK.
6.	In the graphics window, right-click then click Repeat Joint.
7.	Select the edge on the collar as shown.
No	te: There is a small chamfer on the collar hole. Make sure you select the larger circlular edge.
8.	Select the edge on the gear as shown then click OK.
9.	In the graphics window, right-click then click Repeat Joint.





Step 5: Insert the wheel subassemblies into the design and assemble them to the robot

1.	Refer to the VEX Guide for Building the Ro	bot. N	Nove to Step	17.
2.	Click Show Data Panel.			
3.	Right-click W4 ASSEMBLY then click	9	1/11/18	Open
				Insert into Current Design
	Insert into Current Design.	٩	• W4_ASSEMBLY 6:28:03 PM	Start Live Review Share Public Link Import New Version
4.	Drag the wheel subassembly away from the robot then click OK.			



1	inserva second wheel subassembly as	INTRA INTRA
6.	shown.	
7	Zoom and pan to view the robot	
	as shown.	
8.	On the Assemble panel, click Joint.	ASSEMBLE CONS
9.	Select the the edge on the gear as shown.	C Select location
10.	Select the joint origin as shown then click OK.	Select location on second c
11.	View the wheel assembly as shown. Note that the gears are not meshing correctly.	
12.	On the timeline, right-click the joint you just created.	Create Selection Set
	You may have to scroll to the end of the timeline to view the joint.	Rename Rename Del Control Del Control De



 3. Click and drag the rotate maniulator clockwise a small amount as shown then enter -3. Review the gear meshing then click OK.
4. On the Assemble panel, click Joint.
5. Select the the edge on the gear as shown.
6. Select the joint origin as shown then click OK.
7. Click and drag the rotate maniulator counter-clockwise a small amount as shown then enter -87. Review the gear meshing then click OK.
8. On the ViewCube, click Home.
9. Save the file.
lote: You can save the current file and use it in the next lesson or use Save
As and save the file as VEX EDK_Lesson4.

