Mechanical Bearings

Grade Range: Career & Technical Education (CTE)

Lesson Time: 55 minutes

Key Terms Defined	
Bearing	Split
Integral	
Radical plain	
Rolling bearing	
Self-aligning	
Sliding bearing	

Materials and Resources

Activity Overview

Bearings are used to guide and position moving parts to reduce friction, vibration, and temperature. This activity will consider mechanical bearings including rolling contact and plain bearings.

Essential Questions

- What is the function of bearings within the mechanical system?
- What are the different types of bearings?
- What are the basic applications and requirements of each type of bearing?

Objectives

- Identify and classify types of bearings
- Demonstrate correct usage of mechanical bearings in an assembly processes

Introduction

Prior to this activity, students should be familiar with the manufacturing processes of drilling and machining. Ask students to describe the main function of a bearing within a mechanical system. Also ask students to name different types of bearings and describe what happens if the wrong type of bearing is used.

zSpace Activity

Students should provide answers on the provided worksheet.
Answers may vary. Sample answers are provided below.

1. Launch “Fun2 Advanced Manufacturing Mechanical”.
2. Select “Support Parts”.
3. Select “Sliding Bearing”.
4. Select “Radial Plain Bearing” and the “Integral” option. What are possible uses for this type of bearing?

Teacher Note: Students should explain that integral radial plain bearings are used for light loads, low speed, and intermittent work.

5. Select the Exploded view. What are the components of this bearing?

Teacher Note: Students should explain that integral radial plain bearing consist of gear bearing pedestal, socket head cap screws, crank shaft, Woodruff key, bearings, and lubricating nipple.

6. Remove the bearings from the model for further exploration. What purpose do these bearings serve in this application?

Teacher Note: Students should explain the overall purpose of bearings.

7. Select the "Split" option under "Radial Plan Bearing". Why do you think that this bearing is called split?

Teacher Note: Students should explain what a split bearing is.

8. Select the Exploded view. Where is the bearing located?

Teacher Note: Students should explain where bearings are located.

9. Select "Rolling Bearing" and the "Self-Aligning" option.
10. Select Exploded view. What are the components of this bearing?

Teacher Note: Students should explain that self aligning rolling bearing consist of inner ring, outer ring, cage, and balls.

11. Select Bearing Direction.
12. Continue through all "Rolling Bearing" models. What are some of the differences between the different models?

Teacher Note: Students should share different use cases.

13. Select "Gear Shaft Disassembly and Assembly".
14. Select the "Assembly" option.
15. Follow on-screen instructions.

Teacher Note: If needed, review how to assemble.

16. Complete the "Assembly" section.

Closing

In conclusion, ask students how many types of bearings that they can now name. Ask students to provide three facts that they have learned about bearings.

Have students answer the following question:
What are three things that bearings reduce?
Friction, Vibration, Temperature.

Differentiation

- Group students heterogeneously to allow students with a strong command of the English language to assist in reading or interpreting questions
- Provide a handout with a list of vocabulary terms and definitions that will appear in the experience
- Allow students to provide answers that are handwritten, typed, or verbal
- Have students work as partners or in small groups