

4

Gears

Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are some different types of gears?
- 2 What is the purpose of a rack and pinion gear?

Gear

A gear is a machine component with teeth. Gear teeth mesh together to transmit torque. When two gears engage, they form a gearset. The driving gear is called a pinion.

The simplest type of gear is a spur gear. Its teeth may project towards or away from the center. Angled helical gears mesh more smoothly than spur gears. Some helical gears have just one continuous tooth. These are called worms. A worm pairs with a worm gear.

Sometimes, gears convert rotational motion to linear motion. Rack and pinion gears serve this purpose. In other cases, a machine transmits power at an angle. This requires bevel gears.



Reading

2 Read the encyclopedia entry. Then, complete the table.

Type of Gear	Features
1 _____	has teeth projecting towards or away from the center
Helical Gear	2 _____
Rack and Pinion Gear	3 _____

Vocabulary

3 Match the words or phrases (1-6) with the definitions (A-F).

- | | |
|----------------|----------------|
| 1 __ worm gear | 4 __ worm |
| 2 __ mesh | 5 __ pinion |
| 3 __ tooth | 6 __ spur gear |

- A a regular protrusion cut into a gear
- B the driving gear of a gearset
- C a gear that meshes with a screw-like gear
- D to come together and interlock
- E a gear with teeth that project radially
- F a type of gear with one continuous tooth

4 Read the sentence pairs. Choose which word best fits each blank.

1 rack / gear

A A _____ is usually a round part with teeth.

B A _____ and pinion turns rotational motion into linear motion.

2 helical gear / bevel gear

A A _____ meets its partner at an angle, usually 90°.

B A _____ has teeth that are cut in a spiral pattern.

5 Listen and read the encyclopedia entry again. What function do rack and pinion gears perform?

Listening

6 Listen to a conversation between two engineers. Mark the following statements as true (T) or false (F).

- ___ The man identifies a type of gear incorrectly.
- ___ The woman prefers to use spur gears.
- ___ Helical gears reduce noise.

7 Listen again and complete the conversation.

Engineer 1: How are the plans for the new transmission system?

Engineer 2: Pretty good. We need to decide what kind of 1 _____ to use.

Engineer 1: We should use 2 _____ .
The shafts meet at right angles.

Engineer 2: That makes sense. But 3 _____
_____ use helical gears if possible.

Engineer 1: Good idea. It'll reduce noise from the gear 4 _____ .

Engineer 2: Exactly. They'll 5 _____ more smoothly.

Engineer 1: I'll look for beveled 6 _____ .

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

How are the plans ...?

We should use ...

I'd like to ...

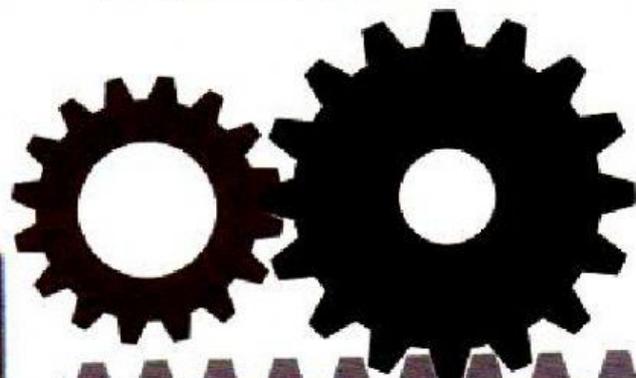
Student A: You are an engineer. Talk to Student B about:

- the plans for a system design
- what type of gear to use
- why you prefer a particular type of gear

Student B: You are an engineer. Talk to Student A about gears for a system design.

Writing

9 Use the encyclopedia entry and the conversation from Task 8 to fill out the prototype specifications.



Johnston Aerospace

Prototype Specifications

Part Number: _____

Type of Hardware: _____ gear

Why was this hardware selected? _____