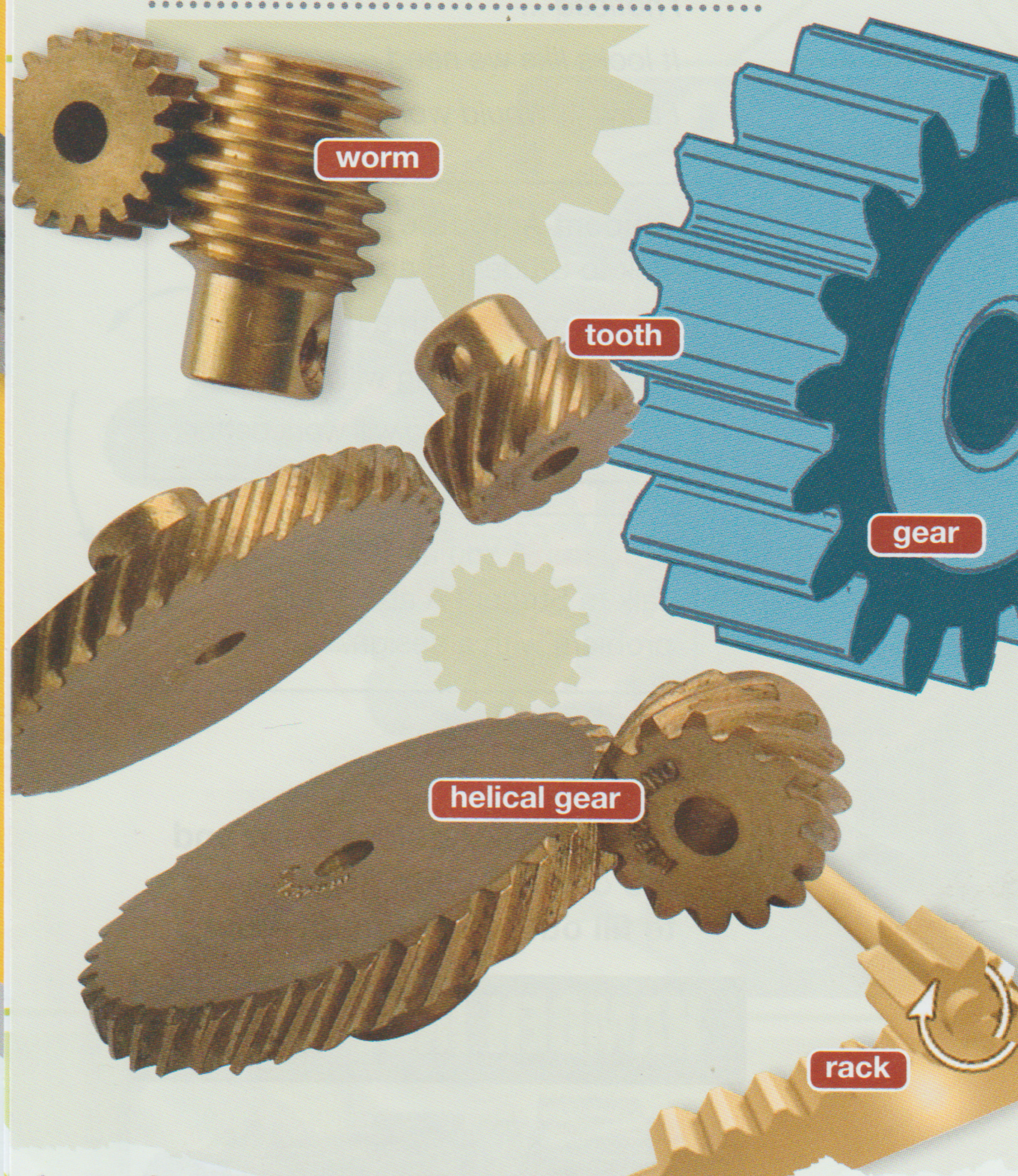


Get ready!

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).

- 1 ___ The man identifies a type of gear incorrectly.
- 2 ___ The woman prefers to use spur gears.
- 3 ___ 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 ...

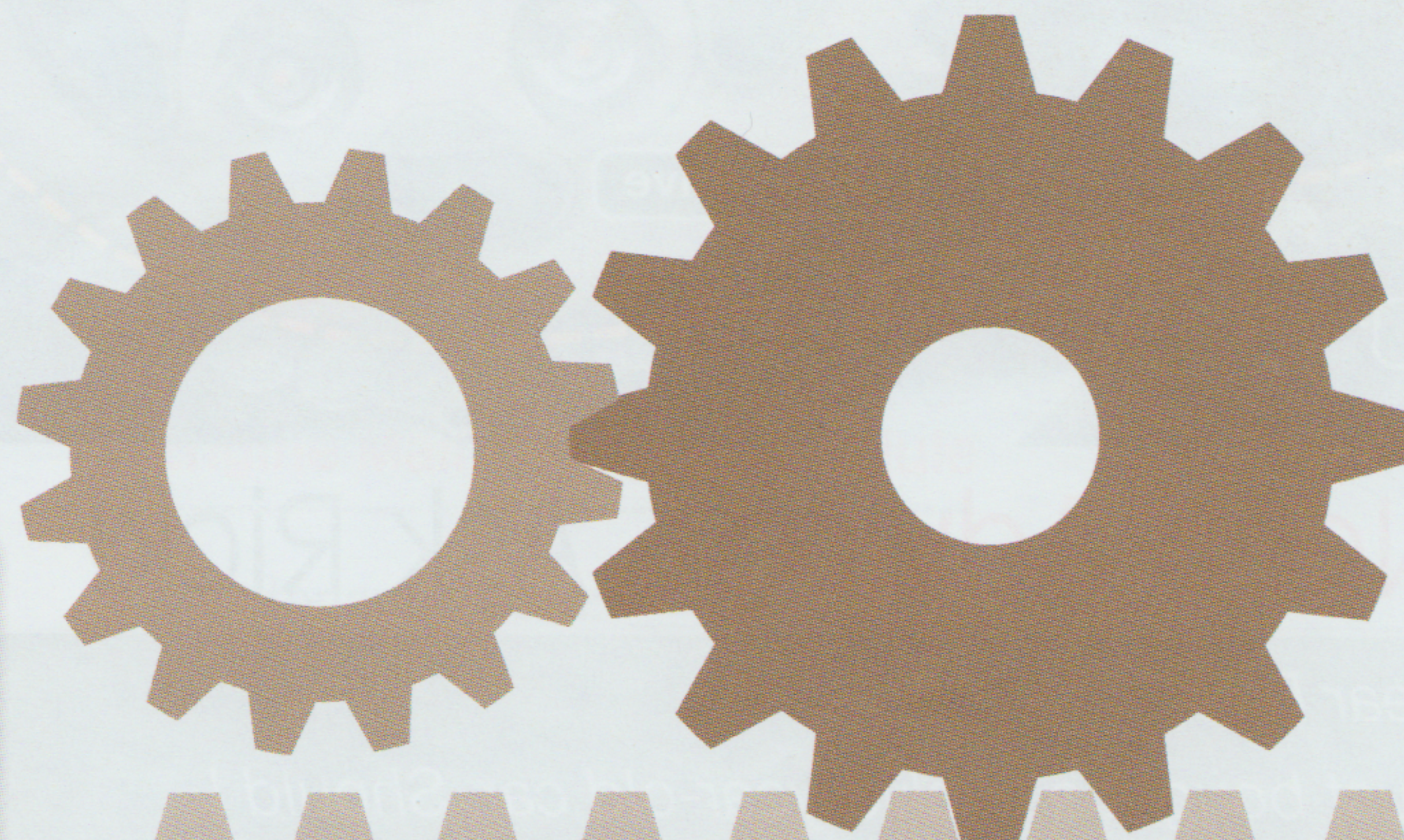
Student A: You are an engineer. Talk to Student B about:

- 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? _____