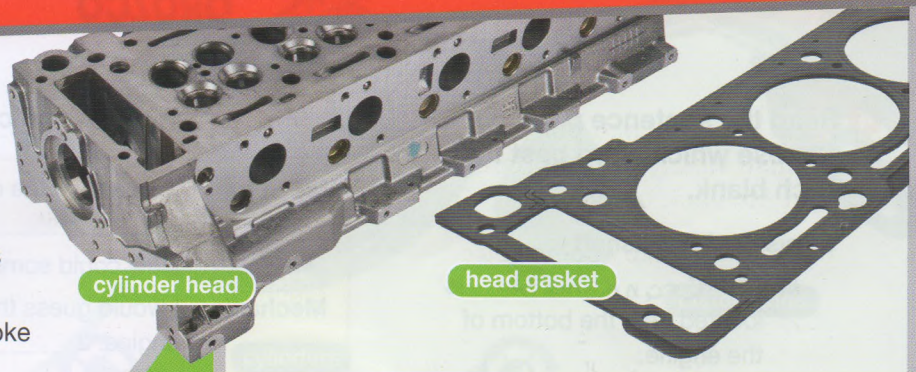
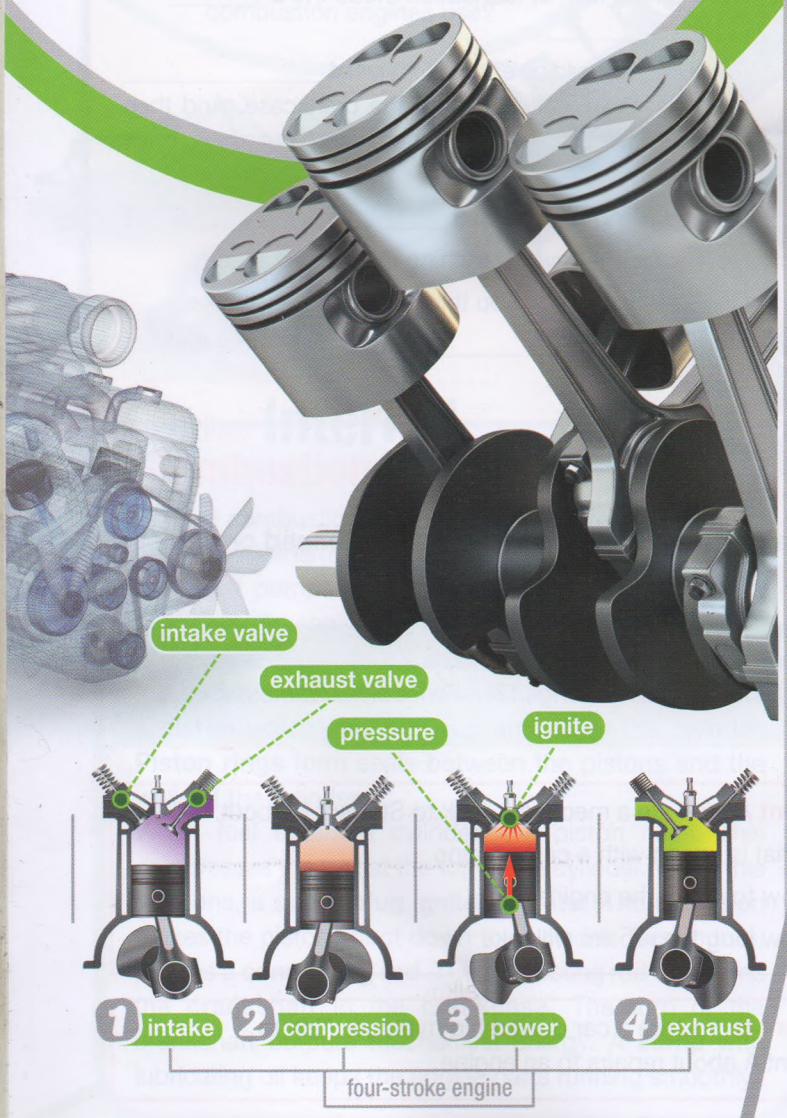
2 The Four-Stroke Engine

Get ready!

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

1 What happens to fuel as it moves through a four-stroke engine?
2 What is the purpose of a four-stroke engine's compression stroke?





Chapter 3.2 Four-Stroke Engines

Four-stroke engines are one type of internal combustion engine. They go through four stages, or strokes, before repeating. The four strokes are the intake, compression, power, and **exhaust strokes**.

A four-stroke cycle begins with an **intake stroke**. This stroke lets air and fuel into the cylinder through the **intake valve**. The intake and **exhaust valves** are part of the **cylinder head**. A **head gasket** forms a tight seal around the cylinder head.

The next stroke is the **compression stroke**. During this stroke, the piston compresses the air and fuel. This makes the **pressure** in the cylinder very high.

At this point, the spark plug **ignites** the fuel. The resulting explosion drives the piston back down the cylinder. This creates the power of the **power stroke**.

Finally, during the exhaust stroke, the exhaust valve releases the **exhaust**. Once the exhaust stroke is complete, the cycle begins again with another intake stroke.

Vocabulary

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

1 b ignite
2 D power stroke
3 C intake stroke
4 E cylinder head
5 A exhaust valve
6 F four-stroke engine

A the part of an engine that lets spent fuel out of the cylinder
B to make something burn or catch on fire
C the stage in an engine cycle when fuel and air enter the cylinder
D the stage in an engine cycle when an explosion pushes the piston
E an engine that cycles through four independent phases
F the part of an engine that holds the valves and transfers excess heat

Reading

2 Read the textbook excerpt. Then, mark the following statements as true (T) or false (F).

1 T The cylinder head includes the intake and exhaust valves.
2 T Air and fuel become highly pressurized during the power stroke.
3 F The exhaust stroke is immediately followed by an intake stroke.

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

1 **exhaust stroke / compression stroke**

A The Compression stroke increased the pressure inside the cylinder.

B The engine released the burnt fuel during the exhaust estoke

2 **pressure / exhaust**

A Most cars have tailpipes for releasing exhaust.

B Raising the cylinder's Pressure makes it more efficient.

3 **head gasket / intake valve**

A The head gasket seals the cylinder head to the engine.

B The fuel entered the cylinder through the Intake gasket.

5 **Listen and read the textbook excerpt again. When does the fuel in the cylinder ignite?**

Listening

6 **Listen to a conversation between two mechanics. Choose the correct answers.**

1 What are the speakers mainly talking about?

A what fuel an engine uses

B how four-stroke engines function

C what is causing an engine problem

D how they should repair an engine

2 What will the woman do next?

A order new spark plugs

B test the engine

C increase the fuel pressure

D get a few tools

7 **Listen again and complete the conversation.**

Mechanic 1: It looks like the engine completes **1** _____ _____ _____, though.

Mechanic 2: Right. Then it **2** _____ _____ the compression stroke. But then it stops.

Mechanic 1: Do you think the spark plug is **3** _____ _____ _____ the gas?

Mechanic 2: I thought of that. I tested a new one and the same thing happened. I have another idea, though.

Mechanic 1: What's that?

Mechanic 2: I think it's leaking fuel in **4** _____ _____ _____.

Mechanic 1: So there isn't **5** _____ _____ or fuel to set off the explosion?

Mechanic 2: Precisely. That could also prevent **6** _____ _____ _____ from occurring.

Speaking

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

USE LANGUAGE SUCH AS:

Do you know ...? / That could prevent ... / I guess the ...

Student A: You are a mechanic. Talk to Student B about:

- one malfunction that could cause an engine problem
- another malfunction that could cause an engine problem
- how each malfunction would affect the engine

Student B: You are a mechanic. Talk to Student A about possible causes of an engine problem.

Writing

9 **Use the textbook excerpt and the conversation from Task 8 to fill out the engineer's notes.**

Description of engine problem: _____

_____

Possible causes of problem: _____

_____

Ways to check problem:

_____