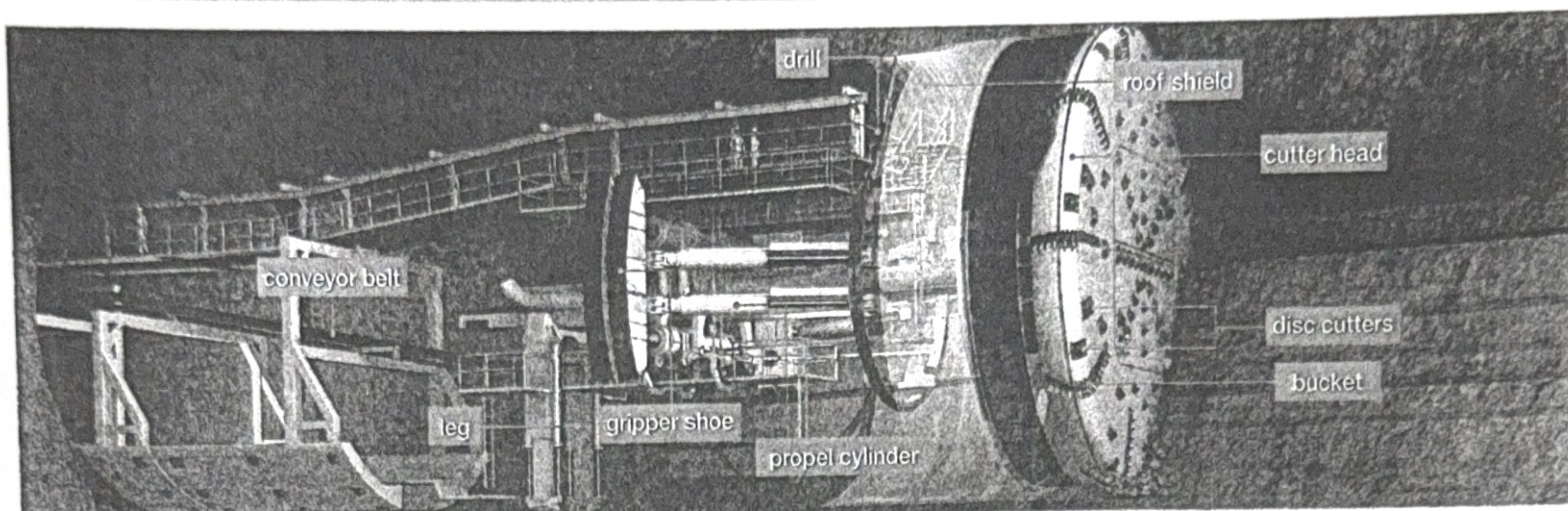


4

Processes

1 Infrastructure



START HERE » 1 What is this? What does it do? How does it work? Discuss with your partner.

LISTENING » 2 4.1 Listen and complete the chart.

READING » 3 Read this article and match these headings to the correct paragraph.

- 2 Collecting Moving 3
 1 Cutting Strengthening 4

Name of TBM:	
Length (m)	
Diameter at start (m)	
Diameter at finish (m)	
Tunneling speed (m/day)	

Hard-rock tunnel boring machines

- The large, circular cutter head contains rotating disc cutters, which act like sharp teeth. Some cutter heads can have 80 or more disc cutters. When the head rotates, the teeth cut large circles into the surface of the rock until the rock breaks.
- Pieces of rock fall to the ground. They are collected by large buckets around the edge of the cutter head. When the cutter head rotates upwards, the rocks fall by gravity onto a conveyor belt. They are then carried to the rear of the machine.
- First, the gripper shoes move outwards and grip the tunnel wall. Then, the propel cylinders push the whole machine forwards. Next, the legs push downwards against the tunnel floor to support the machine. Now, the shoes move back from the wall. Next, the shoes are pulled forwards by the propel cylinders. Finally, the shoes move outwards to grip the next section of wall and the legs are pulled back up from the tunnel floor.
- There are two drills located behind the cutter head. When the machine moves forwards, holes are drilled into the roof of the tunnel. Then, the holes are filled with bolts and cement. This makes the roof stronger.

4 Read paragraph 3 again. Put the numbered actions (A-F) in the correct order. There are seven actions.

- 3 1 A shoes move out (x2) 2 C legs move down E machine moves forward
 B shoes move in D legs move up 4 F shoes move forward

VOCABULARY » 5 Make a list of all the names of parts of the body and clothing in the text in 3.

6 List other technical contexts where the items in 5 are used.

Example: 'teeth' are also found on gears.