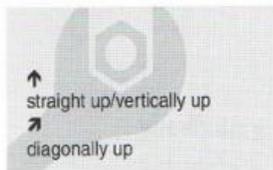
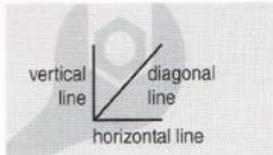


# 4

## Movement

**Start here**



### 1 Directions

1 Label the jetpack man's movements with the words in the box.

backwards down forwards sideways up

2 Work in pairs. Which directions can planes and helicopters fly? Tick the boxes.

Direction	Plane	Helicopter
forwards		
backwards		
up and down		
sideways		



**Reading** 3 Read the text. Check your answers to 2.

Passenger planes can fly forwards, and can turn to the left and to the right. But they cannot fly backwards or sideways. They can fly diagonally up and down, but they cannot fly straight up or straight down.  
 Helicopters can fly forwards, straight up and down, sideways and backwards.  
 Planes and helicopters can both rotate. Planes and helicopters can rotate on their horizontal axis. Helicopters can also rotate on their vertical axis.

**Language**

	It	can	fly	sideways.	
	They	can't/cannot			
Can	it		fly	sideways?	Yes, it can. / No, it can't
	they				Yes, they can. / No, they can't

4 Complete these sentences with *can* or *can't*.

- A helicopter \_\_\_\_\_ fly sideways, but a plane \_\_\_\_\_.
- A plane \_\_\_\_\_ fly sideways, but it \_\_\_\_\_ fly forwards.
- A plane \_\_\_\_\_ fly straight up, but a helicopter \_\_\_\_\_.
- A plane \_\_\_\_\_ fly straight up, but it \_\_\_\_\_ fly diagonally.

**Speaking** 5 Work in pairs. Practise dialogues.

helicopter(s) / rocket(s) / plane(s) / fly sideways / fly straight up / fly diagonally up / rotate

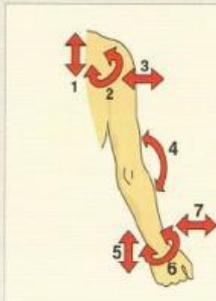
- A: *Can a plane fly forwards?*      B: Yes, it can.  
 A: *Can it fly backwards?*        B: No, it can't.

**Task 6** Work in pairs. Follow the instructions and answer the questions.

Close your fist and hold your arm out straight in front of you.

- 1 Think of your wrist. (Don't move it). How many directions can it move in? One, two, three or four?
- 2 Think of your shoulder. (Don't move it). How many directions can it move in? One, two, three or four?
- 3 Think of your elbow. (Don't move it). How many directions can it move in? One, two, three or four?

**Reading 7** Read the text. Check your answers to 6.



The human arm can move in seven different directions. The arm has three pivots: the wrist, the elbow and the shoulder. The wrist can move in three different directions. At the wrist, the hand can move up and down about  $90^\circ$ , it can move from side to side about  $70^\circ$ , and it

can rotate about  $180^\circ$ . The shoulder can move in the same three directions, but different angles. It can rotate about  $20^\circ$ . The elbow can only move in one direction. At the elbow, the forearm can only move up and down. It cannot move sideways or rotate.

**8** Match each movement in the diagram in 7 with a word or phrase from the box.

rotate   move sideways   move up and down

**Listening 9** Listen and choose the correct answers.

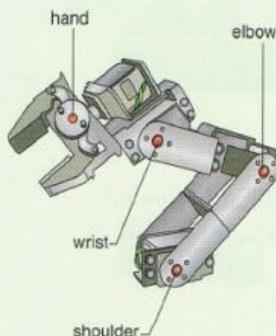
- |                 |               |                  |                |
|-----------------|---------------|------------------|----------------|
| 1 a) $19^\circ$ | b) $90^\circ$ | 3 a) $17^\circ$  | b) $70^\circ$  |
| 2 a) $14^\circ$ | b) $40^\circ$ | 4 a) $118^\circ$ | b) $180^\circ$ |

**Task 10** Work in groups. Look at the diagram in 11 and answer these questions.

- 1 How many directions can this robot arm move?
- 2 Which part of the robot arm has different movements from the human arm. Is it: a) the shoulder? b) the wrist? c) the elbow?

**Language 11** Complete the text about the robot arm with the words in the box.

can   can't   has   is   isn't



This robot arm (1) \_\_\_\_\_ like a human arm. It (2) \_\_\_\_\_ a 'wrist', an 'elbow' and a 'shoulder'.

The 'wrist' (3) \_\_\_\_\_ like the human wrist. It (4) \_\_\_\_\_ three movements. It (5) \_\_\_\_\_ rotate. It (6) \_\_\_\_\_ move from side to side. It (7) \_\_\_\_\_ move up and down.

The 'elbow' (8) \_\_\_\_\_ like the human elbow. It (9) \_\_\_\_\_ one movement. It (10) \_\_\_\_\_ move up and down.

The 'shoulder' (11) \_\_\_\_\_ like the human shoulder, because it only (12) \_\_\_\_\_ two movements. It (13) \_\_\_\_\_ rotate, and it (14) \_\_\_\_\_ move up and down. But it (15) \_\_\_\_\_ move sideways.