

- If the forces on an object are **balanced**, there is no resultant force. The object stays still, or carries on at a constant velocity.
- If there is a resultant force, then the object will accelerate or decelerate.
- Air resistance (or friction) always opposes movement.

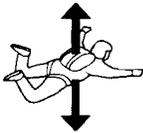
A sky-diver jumps out of a helicopter. He uses air resistance to land safely.

1. Fill in the missing words:



At the start there is only one force on the sky-diver. This is his **w**_____.

This unbalanced or **r**_____ force makes him **a**_____.



As he travels faster, the friction (called **a** **r**_____ or drag) increases.

Eventually the 2 forces are equal and **b**_____, with no **r**_____ force, so he stops **a**_____ and travels at a constant **s**_____.

This speed is called his **terminal velocity**.



When his parachute opens, the air resistance **i**_____. There is now a **r**_____ force upwards. This makes him slow down, until . . .

2. The sky-diver weighs 700 N. Label each of the forces in all of the diagrams with one of these labels:
700 N
less than 700 N
more than 700 N

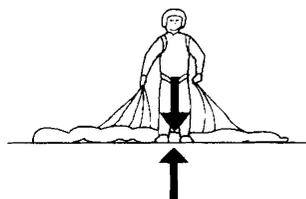


. . . the 2 forces are **e**_____ again.

Because the 2 forces are **b**_____ (with no **r**_____ force) he now travels at a constant **s**_____.

This is his new **t**_____ velocity.

3. In your own words, explain carefully what happens when his parachute opens.
4. Explain why a falling raindrop does not go faster and faster.



When he hits the ground, it pushes up to make him **d**_____ quickly. When he stands on the ground, the ground **p**_____ up on his feet. The upward **f**_____ is equal to his **w**_____ (so there is no **r**_____).