

THE PRESSURE OF AIR

KEY IDEAS

- Air can be compressed or expanded within a confined space
- Air pressure can be used to move objects
- Air pressure can exert a strong force
- Differences in air pressure can make things happen

EXAMPLE QUESTIONS

- How can you capture air?
- How can air make inflatables keep their shape?
- How do you think air makes suction work?

AIR CAN BE COMPRESSED

- When air is forced into a closed container, it squashes or becomes compressed (as in a balloon or a bicycle tyre, for example).
- If the material of the container is stretchy, or has elasticity, the air inside will make the container bouncy.
- Compressed air has a greater density than the air outside the container. This makes the air rush out if it released from its container.
- This is why tyres hiss or balloons 'pop' when punctured.
- Compressed air is used in air mattresses and tyres and also for devices that need a supply of rushing air, such as paint sprayers or air-jet cleaners.
- The collisions of the molecules of the gases that make up the air within the container produce what is called pressure.

SUCTION IS CAUSED BY DIFFERENCES IN AIR PRESSURE

- Suction is a relatively simple phenomenon.
- It is the result of unequal air pressure.

- If some of the air is removed from a container without reducing the container's volume, the inside pressure becomes less than that of the air outside the container.
- The greater pressure, which is on the outside, pushes against the container.
- This is suction.
- A suction cup works because of unequal air pressure.
- Pressing the suction cup firmly against a surface expels much of the air from under the cup.
- The air around cannot return because the sucker is flat and pressed against the surface by the air around it.
- Since there is very little air pressure between the suction cup and the surface, the air pressure on the outside of the suction cup holds it flat. Wetting the suction cup helps to seal it from the air outside.
- A complete vacuum is space that has no air in it at all.
- Therefore, there is no pressure within a total vacuum.
- A vacuum cleaner creates a vacuum inside its canister, which is how it sucks dirt off a surface.

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