Air

Exercise 54:

Solution 1(a):
During the burning of the candle, the oxygen from the air is consumed and carbon dioxide is released. After some time, there is no oxygen, due to which, the candle goes off.

Exercise 55:

Solution 1(a):
When carbon dioxide is bubbled through lime-water, they react together to form calcium carbonate ($CaCO_3$).
$CO_2 + Ca(OH)_2 \rightarrow CaCO_3 + H_2O$
This is the white precipitate. So, lime-water appears little cloudy.

Exercise 56:

Solution 1(a):
Surface of the glass is cooler as compared to the surrounding air. So, the water vapour which is one of the constituents of air, condenses onto the surface of the glass. This is known as condensation. Warm moist air carries invisible molecules of water. When air gets colder it compresses (and if air gets hotter it expands, its volume increases) and at a certain point the water molecules are unable to stay in the air as invisible ‘gas’ (water vapour), and they change their state from gas to liquid.

Solution 1(b):
The air surrounding the ice cube is cooled by the cold ice cubes and when it cools, water vapour in the air condenses into fog. This fog looks like the water vapour comes out of ice.

Exercise 57:

Solution 1(a):
Those cardboards will get covered with dust which is also a part of air.

Exercise 58:

Solution 1(a):
No, water will not enter into the bottle; it will remain in the funnel. This happens because

the empty bottle is filled with air. As long as air is present in the bottle, water will not enter into it.

Solution 1(b):
If he didn't keep the nozzle of the container with kerosene little higher up above the tin, kerosene will not enter into the tin.

Exercise 59:

Solution 1(a):

1. It is impossible to press syringe from both the sides as air is present in the syringe.
2. Syringe can be pressed easily when it is open at one end as there is a way through which air can pass.

Solution 1(b):

1. Blowing up a balloon.
2. Take a bottle half filled with water and turn it upside down, bubbles will be seen. Those bubbles are nothing but the air.

Exercise 60:

Solution 1(a):
Balance will tilt to the side on which the blown balloon is attached as it has air inside it and air has mass.

Solution 1(b):

1. Air brings out changes in the weather.
2. Air helps in the drying of wet clothes and evaporation of sweat from the body.
3. Air helps in the movement of yachts, parachutes, gliders and aeroplanes.
4. Air helps the birds, bats and insects in flying.
5. All living beings require oxygen for respiration which is provided by air.

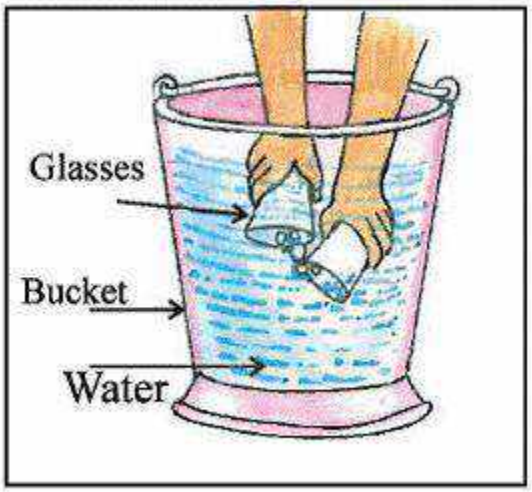
Exercise 61:

Solution 1:
If we keep folding a plastic bag continuously then there will be a stage beyond which we won't be able to fold it. If we press the bag then we can feel the air which is present inside the bag.

Solution 2:
Balloon which is blown up has air in it and air occupies space due to which it requires more space as compared to the balloon without air.

Solution 3:
Air contains oxygen and nitrogen as major constituents and carbon dioxide, argon and water vapours as the minor components. These gases retain their properties in the air. So, air is called a mixture.

Solution 4:
Yes, it is possible. Immerse two glasses inside the bucket in such way that one glass has water and another has air. Now, slightly tilt the glass which has air, due to this, the air escapes and begins bubbling up towards the surface. Glass with water will catch these bubbles and air will force the water out of that jar. Volume of air increases in the glass which has water because air occupies space.



Solution 5:
A puncture repairer will first inflate the tube and then put the tube under water. By doing this, he can easily find out the exact position of the puncture because when the defective tube is immersed under the water, the point where the puncture is present will release air bubbles.