

2. Nitrogen (N_2) and carbon dioxide (CO_2).
5. a) 3
b) 4
c) 2
d) 1
6. a) Water vapour (H_2O) and carbon dioxide (CO_2).
b) The flame is yellow when combustion is incomplete; the flame is blue when it is complete (no residue).
8. Nitrogen (N_2).
11. Many possible answers. Examples: Photosynthesis and respiration, meteorological phenomena, dispersal of plant pollen, the greenhouse effect and the aurora borealis.
12. Oxygen (O_2).
13. Nitrogen (N_2) is an unreactive gas because a large quantity of energy is needed to break the triple covalent bond that unites the two atoms of nitrogen (N) in the molecule. This allows it to preserve the freshness of the potato chips.
16. Noble (inert) gases are very unreactive because they have an outermost shell filled to capacity with valence electrons that are strongly attracted by the nucleus.
- Gases of the halogen group are very reactive because they are missing a single electron to complete their outermost shell.
19. a) The two gases will be brought into contact to create combustion; the hydrogen (H_2) is the combustible, and the oxygen (O_2) is the oxidizer.
- b) $2 H_{2(g)} + O_{2(g)} \rightarrow 2 H_2O_{(g)} + \text{energy}$