C6.3 Summary questions

1. a. the layer above the Earth’s surface containing a mixture of gases
   b. a gas in the atmosphere, such as carbon dioxide and methane, which reduces the transfer of energy to space by infrared radiation
   c. a substance released into the environment that may cause harm to living things

2. a. Three of: Earth’s atmosphere has more oxygen / nitrogen / water vapour, and much less carbon dioxide.
   b. carbon dioxide and nitrogen
   c. The Earth cooled, the water vapour condensed to form oceans.
   d. Plant and algae photosynthesise, which absorbs carbon dioxide and releases oxygen. This reduced the amount of carbon dioxide and increased the amount of oxygen.

3. a. \( N_2 + O_2 \rightarrow 2NO \)
   b. \( 2NO_2 + H_2O \rightarrow HNO_2 + HNO_3 \)

4. a. Fossil fuels contain sulfur compounds which are oxidised to sulfur dioxide when the fuel burns.
   b. Breathing difficulties / named respiratory problem, e.g. bronchitis, asthma
   c. Two environmental problems, e.g. damage to stonework, metalwork, kills trees, kills aquatic life

5. a. a substance that increases the rate of reaction without being used up, by lowering the activation energy needed
   b. Many journeys will be short, e.g. to the shops, so the catalytic converter will not be working properly and harmful substances will be released.

6. a. Infrared radiation is emitted by the Earth’s surface, this is absorbed by greenhouse gas molecules, then re-emitted in random directions so that it warms the atmosphere.
   b. i. For example, to avoid false measurements from vehicle emissions.
   ii. The carbon dioxide level has increased, e.g. from 0.032% in 1965 to 0.04% in 2015.
   iii. Growth of plants – more plants and photosynthesis in the summer so the amount of carbon dioxide is reduced then, and it goes back up in the winter.