

KS3 Chemistry

The particulate nature of matter

1. What is the particle model of matter?
2. How are particles arranged in a solid?
3. How do particles move in a solid?
4. How are particles arranged in a liquid?
5. How do particles move in a liquid?
6. How are particles arranged in a gas?
7. How do particles move in a gas?
8. Why does a solid keep a fixed shape?
9. Why can a liquid flow and take the shape of its container?
10. Why can a gas spread out to fill its container?
11. How does the distance between particles differ in solids, liquids and gases?
12. How does the movement of particles differ in solids, liquids and gases?
13. What happens to particles when a substance is heated?
14. What happens to particles when a substance is cooled?
15. What happens to the spacing between particles when a substance is heated?
16. What is gas pressure?
17. What causes gas pressure?
18. How does increasing the temperature of a gas affect the movement of its particles?
19. What happens to gas pressure when particles collide more often with the walls of a container?
20. What happens during melting?
21. What happens during freezing?
22. What happens during evaporation?
23. What happens during boiling?
24. What happens during condensation?
25. How can changes of state be explained using the particle model?

Atoms, elements and compounds

1. What is an atom?
2. What is Dalton's simple atomic model?
3. What is an element?
4. What is a compound?

5. What is the difference between an atom and an element?
6. What is the difference between an element and a compound?
7. What is the difference between a mixture and a compound?
8. What are chemical symbols used for?
9. What does a chemical symbol represent?
10. What does a chemical formula represent?
11. How can the formula of a compound show which elements it contains?
12. What does the formula H_2O tell you about water?
13. What does the formula CO_2 tell you about carbon dioxide?
14. How are atoms arranged in a compound?
15. What happens to atoms when a compound is formed?
16. What happens to atoms during a chemical reaction?
17. What does conservation of mass mean?
18. Why is mass conserved during a chemical reaction?
19. What happens to mass during a change of state?
20. Why does the mass stay the same when a substance changes state?
21. How can a chemical reaction change the substances present without changing the total number of atoms?
22. Why can atoms not simply disappear during a chemical reaction?
23. How can chemical formulae be used to represent substances?
24. How can chemical equations represent chemical reactions?
25. Why must a chemical equation have the same number of each type of atom on both sides?

Pure and impure substances

1. What is a pure substance?
2. What is a mixture?
3. What is the difference between a pure substance and a mixture?
4. What happens when a substance dissolves?
5. What is a solution?
6. What is a solute?
7. What is a solvent?
8. What happens to particles when a solid dissolves in a liquid?
9. What is diffusion?
10. How can diffusion be explained using the particle model?
11. Why do particles spread out during diffusion?
12. How does temperature affect the rate of diffusion?
13. What is filtration used to separate?
14. How does filtration separate a mixture?
15. What is evaporation used to separate?
16. How does evaporation separate a dissolved solid from a solution?
17. What is distillation used to separate?
18. How does distillation separate substances in a mixture?

19. What is chromatography used to separate?
20. How does chromatography separate substances?
21. What is a chromatogram?
22. How can chromatography be used to identify substances?
23. How can boiling points help identify a pure substance?
24. How can melting points help identify a pure substance?
25. How can physical properties be used to identify whether a substance is pure?

Chemical reactions

Chemical reactions, equations and reaction types

1. What is a chemical reaction?
2. What happens to atoms during a chemical reaction?
3. Why are chemical reactions described as rearrangements of atoms?
4. What are reactants?
5. What are products?
6. What is a chemical formula?
7. What is a chemical equation?
8. How are formulae used to represent chemical reactions?
9. What does the arrow in a chemical equation mean?
10. Why must chemical equations have the same number of each type of atom on both sides?
11. Write the word equation for the reaction between magnesium and oxygen.
12. What is combustion?
13. What substance is needed for combustion to occur?
14. What happens during combustion?
15. What is the general word equation for the combustion of a fuel?
16. What is thermal decomposition?
17. What happens during thermal decomposition?
18. Write a word equation for a thermal decomposition reaction.
19. What is oxidation?
20. What happens when a substance is oxidised?
21. What is a displacement reaction?
22. What happens during a displacement reaction?
23. Which metal can displace another metal from a compound?
24. How can the reactivity of metals be used to predict a displacement reaction?
25. What is the difference between a reactant and a product?

Acids, alkalis, salts and catalysts

1. What is an acid?
2. What is an alkali?
3. What is neutralisation?
4. How can an acid and an alkali be identified using a neutralisation reaction?
5. What is the pH scale used to measure?
6. What does a pH below 7 show?
7. What does a pH of 7 show?
8. What does a pH above 7 show?
9. What are indicators used for?
10. How can an indicator show whether a solution is acidic or alkaline?
11. What happens when an acid reacts with a metal?
12. What two types of products are formed when an acid reacts with a metal?
13. What gas is produced when an acid reacts with a metal?
14. How can hydrogen gas be tested for?
15. Write the general word equation for an acid reacting with a metal.
16. What is a salt?
17. What happens when an acid reacts with an alkali?
18. What two products are formed when an acid reacts with an alkali?
19. Write the general word equation for a neutralisation reaction.
20. Why is a reaction between an acid and an alkali called neutralisation?
21. What happens to the pH of an acidic solution when an alkali is added?
22. What happens to the pH of an alkaline solution when an acid is added?
23. What is a catalyst?
24. What does a catalyst do to the rate of a chemical reaction?
25. Is a catalyst used up during a chemical reaction?

Energetics

1. What is meant by an energy change?
2. What happens to energy when a substance changes state?
3. What happens to energy when a solid melts?
4. What happens to energy when a liquid boils?
5. What happens to energy when a gas condenses?
6. What happens to energy when a liquid freezes?
7. Why do changes of state involve energy changes?
8. What is an exothermic chemical reaction?
9. What happens to the surroundings during an exothermic reaction?
10. What is an endothermic chemical reaction?
11. What happens to the surroundings during an endothermic reaction?
12. How can a temperature change help identify an exothermic reaction?

13. How can a temperature change help identify an endothermic reaction?
14. What happens to the temperature of the surroundings during an exothermic reaction?
15. What happens to the temperature of the surroundings during an endothermic reaction?
16. What is the difference between an exothermic and an endothermic reaction?
17. How does an exothermic reaction transfer energy?
18. How does an endothermic reaction transfer energy?
19. Why can changes of state be described as involving energy changes?
20. What happens to particles when energy is supplied to a substance?
21. What happens to particles when energy is removed from a substance?
22. How is energy involved when particles change their arrangement?
23. How can heating cause a change of state?
24. How can cooling cause a change of state?
25. Why are energy changes important when describing chemical reactions and changes of state?

The Periodic Table

1. What is the Periodic Table?
2. Why are elements arranged in the Periodic Table?
3. What information does the Periodic Table provide about elements?
4. What is a period in the Periodic Table?
5. What is a group in the Periodic Table?
6. What is the difference between a period and a group?
7. Where are metals generally found in the Periodic Table?
8. Where are non-metals generally found in the Periodic Table?
9. What are physical properties?
10. What are chemical properties?
11. Why do different elements have different physical properties?
12. Why do different elements have different chemical properties?
13. What was Mendeleev's contribution to the Periodic Table?
14. How did Mendeleev arrange the elements?
15. Why did Mendeleev leave gaps in his Periodic Table?
16. How did Mendeleev use patterns to predict undiscovered elements?
17. How can the position of an element in the Periodic Table help predict its reactions?
18. What are common physical properties of metals?
19. What are common physical properties of non-metals?
20. How do metals and non-metals differ in their chemical properties?
21. What is a metal oxide?
22. What is a non-metal oxide?

23. What happens to the acidity of many metal oxides when they react with water?
24. What happens to the acidity of many non-metal oxides when they react with water?
25. How can the Periodic Table be used to predict patterns in the properties and reactions of elements?

Materials

1. What is the reactivity series?
2. Why are metals placed in a reactivity series?
3. Where is carbon placed in the reactivity series?
4. Which metals are more reactive than carbon?
5. Which metals are less reactive than carbon?
6. What does it mean for a metal to be more reactive than another metal?
7. How can the reactivity series be used to compare metals?
8. What is a metal oxide?
9. How can carbon be used to obtain a metal from its metal oxide?
10. Why can carbon remove some metals from their oxides?
11. Which metals can be obtained from their oxides using carbon?
12. Why can some metals not be obtained from their oxides using carbon?
13. What are ceramics?
14. What are common properties of ceramics?
15. What are polymers?
16. What are common properties of polymers?
17. What are composites?
18. What is a composite made from?
19. How can the properties of a composite differ from the materials used to make it?
20. Why are ceramics useful for some applications?
21. Why are polymers useful for some applications?
22. Why are composites useful for some applications?
23. How does the reactivity of a metal affect how it can be obtained from its ore?
24. Why is carbon useful in extracting some metals?
25. How do ceramics, polymers and composites differ in their properties?

Earth and atmosphere

1. What are the main layers that make up the structure of the Earth?
2. What is the Earth's crust?
3. What is the Earth's mantle?
4. What is the Earth's outer core?

5. What is the Earth's inner core?
6. What is the Earth mainly made of?
7. What is a rock?
8. What is the rock cycle?
9. How are igneous rocks formed?
10. How are sedimentary rocks formed?
11. How are metamorphic rocks formed?
12. What is weathering?
13. How can rocks be broken down into smaller pieces?
14. How can sediments become sedimentary rock?
15. How can heat and pressure change existing rocks into metamorphic rocks?
16. What are Earth's natural resources?
17. Why are some of Earth's resources described as limited?
18. What is recycling?
19. How can recycling reduce the use of Earth's limited resources?
20. What is the carbon cycle?
21. How is carbon dioxide removed from the atmosphere?
22. How is carbon dioxide returned to the atmosphere?
23. What gases make up most of Earth's atmosphere?
24. How does human activity increase the amount of carbon dioxide in the atmosphere?
25. How can increased carbon dioxide in the atmosphere affect Earth's climate?