



Year 7 Chemistry Homework

In this booklet you will find copies of the homework question that will be set throughout Year 7 for chemistry. If you lose your homework, please print out the corresponding pages and complete the questions.

- HWK 7C1 States of Matter Pages 2-3
- HWK 7C2 Diffusion and Gas Pressure Pages 4-5
- HWK 7C3 Compounds and Solutions Pages 6-7
- HWK 7C4 Separation Techniques Pages 8-9
- HWK 7C5 The Periodic Table Pages 10-11
- HWK 7C6 Atomic Number and Mass Number Pages 12-13
- HWK 7C7 Chemical Reactions and Word Equations Pages 14-15
- HWK 7C8 Reactions of Metals Pages 16-17
- HWK 7C9 Acids and Neutralisation Pages 18-19
- HWK 7C10 Weathering and Erosion Pages 20-21
- HWK 7C11 Types of Rock Pages 22-23



Year 7 Chemistry Homework



Name:

Due Date

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Boiling **Condensation** **Freezing** **Melting**
Particle **Solid** **Liquid** **Gas**

Scientific vocabulary	Definition
	A very tiny object, such as an atom or molecule, that materials are made from. They are too small to be seen with a microscope.
	In this state, a substance can flow and can also be compressed. The particles move apart quickly in all directions.
	In this state, a substance can flow but cannot be compressed. The particles can move but stay touching each other.
	In this state, a substance cannot be compressed and it cannot flow. The particles cannot move, they only vibrate on the spot.
	The change of state from liquid to solid at the melting point of a substance.
	The change of state from gas to liquid. It can happen at any temperature below the boiling point.
	The change of state from solid to liquid at the melting point of a substance.
	The change of state from liquid to gas that occurs when bubbles of the substance in its gas state form throughout the liquid.

1 Cross out the wrong words to complete these sentences.

- a Solids have shapes that (change easily / are big / stay the same).
- b Solids have volumes that (change easily / are big / stay the same).
- c It is (very easy / fairly easy / very hard) to compress a solid.

2 Tick 'true' or 'false'.

Liquids are able to change shape.

true

false

Liquids do not have a fixed volume.

true

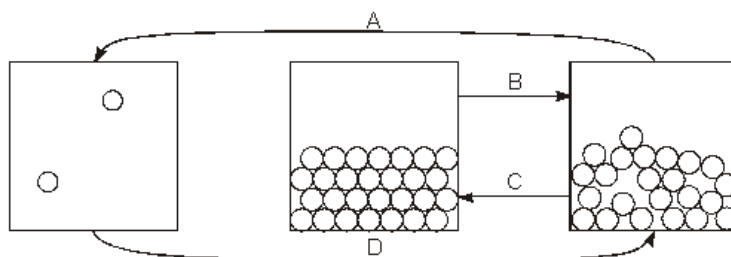
false



Year 7 Chemistry Homework



3 The diagram below shows particles in a gas, a solid and a liquid. Each arrow, A, B, C and D, represents a change of state.



(i) Choose from the following words to complete the sentences below.

boiling condensing distilling evaporating filtering freezing melting

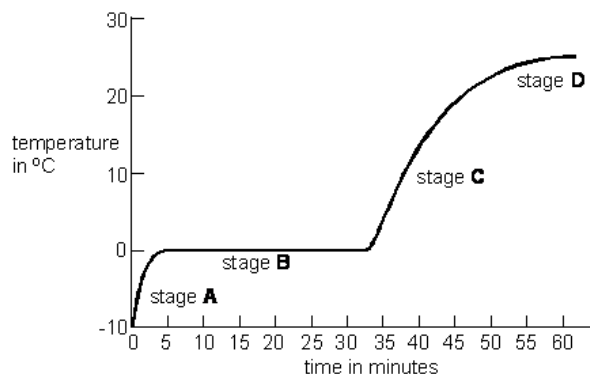
Change of state A is called

Change of state B is called

Change of state C is called

Change of state D is called

4 A test tube of crushed ice is taken out of a freezer and left in a warm room. The graph shows how the temperature in the test tube changes.



(a) What is happening to the ice at stage B?

.....

(b) Four descriptions of the ways molecules could move are given below.

They vibrate around fixed points.

They move past each other and are close together.

They move in straight lines, colliding occasionally.

They all move in the same direction at the same speed.

(i) How do the molecules move at stage A? Write A in the correct box above.

(ii) How do the molecules move at stage C? Write C in the correct box above.



Year 7 Chemistry Homework



Name:

Due Date

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Density

Diffusion

Gas Pressure

Scientific vocabulary	Definition
	The process by which particles in liquids or gases spread out through random movement from a region where there are many particles to one where there are fewer.
	The force exerted per unit area on the walls of a container. It is caused by collisions of particles with the walls.
	The mass of a material in a certain volume.

Q1. Name the process that causes the water to change colour when you add a tea bag.

Q2. Complete the passage below to explain why the water changes colour.

Use the words:

Colour

Lower

Higher

When a tea bag is added to hot water, the substances in the tea bag move from an area where they are in _____ concentration to an area where they are in _____ concentration.

This causes the water to change _____ .

Q3. Does this process happen faster in a liquid or a gas? Tick *one* box.

- A In a gas, because particles in a gas move faster than particles in a liquid.
- B In a gas, because particles in a liquid move faster than particles in a gas.
- C In a liquid, because particles in a liquid move faster than particles in a gas
- D In a liquid, because particles in a gas move faster than particles in a liquid



Year 7 Chemistry Homework



Q4. What is the meaning of the word 'vacuum'? Tick *one* box.

- A A space which contains only air.
- B A space which contains no particles.
- C A space which contains no air.
- D A space which contains only very small particles.

Q5. Describe what happens to gas pressure when the temperature changes.

Q6. Describe what happens to gas pressure when the volume changes.

Q7. Use the words in the box to describe how a bottle collapses when heated, in terms of gas pressure.

LOWER	PRESSURE	COLLIDE	DECREASES	FEWER
-------	----------	---------	-----------	-------

To start, the bottle is heated.

The air molecules inside the bottle _____ with the inside of the bottle, exerting gas _____. When the bottle is removed from the water bath, the temperature inside the bottle _____, so there are _____ collisions between the molecules and the inside of the bottle. As a result, the gas pressure inside the bottle becomes _____ than the atmospheric pressure outside the bottle, which causes the bottle to collapse.



Year 7 Chemistry Homework



Name: _____

Due Date _____

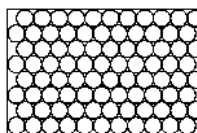
Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Dissolve Insoluble Mixture Pure Substance
Soluble Solute Solution Solvent

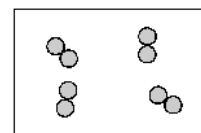
Scientific vocabulary	Definition
	Made up of two or more pure substances that are mixed (not chemically joined) together. Its properties are different from the properties of the individual substances that make it up.
	A single material with no other substances mixed with it. It has the same properties all the way through.
	The solid or gas that is dissolved in a liquid.
	A substance, normally a liquid, that dissolves another substance.
	A substance that can dissolve in a given solvent.
	A substance that cannot dissolve in a given solvent.
	The complete mixing of a solute with a solvent to make a solution.
	A mixture of a solute dissolved in a solvent. All parts of the mixture are the same.

Q1. The diagrams represent the arrangement of atoms or molecules in four different substances, A, B, C and D.

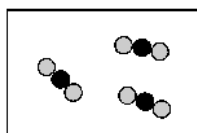
Each of the circles, and represents an atom of a different element.



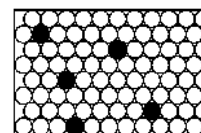
A



B



C



D

- (i) Which substance is compound?
- (ii) Which substance is a mixture?
- (iii) Which **two** substances are elements? and
- (iv) Which **two** substances could be good conductors of heat? and
- (v) Which substance could be carbon dioxide?



Year 7 Chemistry Homework



Q2. Amy's family are at the beach during the summer. Amy and her sister have a bucket containing seawater and sand.

Read the following statements.
Which are **true** and which are **false**?



Tick **one** box for each statement.

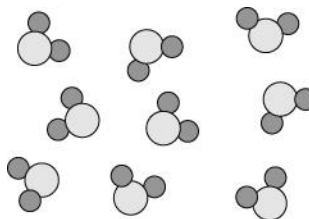
	true	false
Water is a solvent for salt.	<input type="checkbox"/>	<input type="checkbox"/>
Sand sinks in water because water is more dense than sand.	<input type="checkbox"/>	<input type="checkbox"/>
When a solid dissolves in water, the solid is called a solute.	<input type="checkbox"/>	<input type="checkbox"/>

Q3 A compound contains:

- A. only one type of atom.
- B. only one element.
- C. only two elements joined together.
- D. at least two elements joined together.

Q4 The particle diagram opposite shows:

- A. an element.
- B. a compound.
- C. a mixture of elements.
- D. a mixture of compounds.



Q5 What do you see when a solid dissolves in a liquid?

- a the solid disappears
- b the solid sinks to the bottom of the liquid
- c the liquid evaporates
- d the liquid changes colour

Q6 A solution is saturated with a solid solute. What happens when more solute is stirred into it?

- A. The added solute dissolves.
- B. The added solute disappears.
- C. The added solute evaporates.
- D. The added solute sinks to the bottom.



Year 7 Chemistry Homework



Name:

Due Date

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

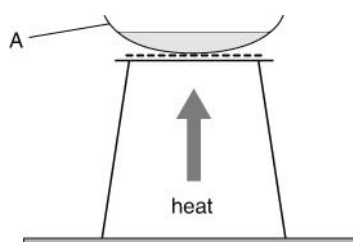
Chromatogram **Chromatography** **Distillation**
Filtrate **Filtration** **Residue**

Scientific vocabulary	Definition
	A way of separating pieces of solid that are mixed with a liquid or solution by pouring through filter paper.
	The liquid or solution that collects in the container after the mixture has passed through the filter paper.
	The solid that collects in the filter paper during filtration.
	A technique that uses evaporation and condensation to obtain a solvent from a solution.
	A technique to separate mixtures of liquids (often coloured) that are soluble in the same solvent.
	An image obtained from chromatography.

Q1 This apparatus can be used to evaporate a solution.

What is the name of the piece of equipment labelled A? Tick *one* box.

- A watch glass
- B boiling tube
- C pipette
- D evaporating basin



Describe *two* hazards of doing this experiment.

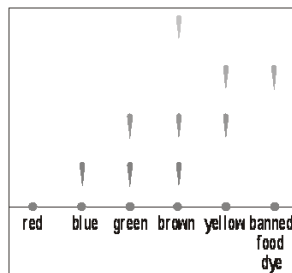
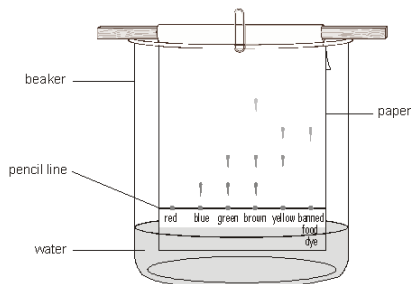
- i _____
- ii _____



Year 7 Chemistry Homework



Q2. Gary wanted to find out if some food colourings contained a banned food dye. He put a drop of each food colouring and the banned food dye onto some special paper. He hung the paper in a beaker of water.



After 10 minutes, the banned food dye and some of the dyes from the food colourings had moved up the paper. Gary's results are shown above right.

(a) Gary wrote the labels on the paper in pencil. Why should he **not** write them in ink?

.....

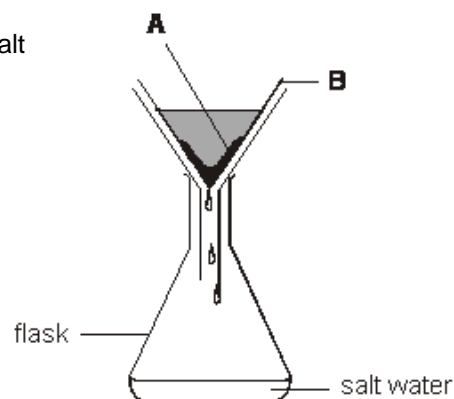
(b) Which method did Gary use to separate the dyes? Tick the correct box.

chromatography	<input type="checkbox"/>	distillation	<input type="checkbox"/>
evaporation	<input type="checkbox"/>	filtration	<input type="checkbox"/>

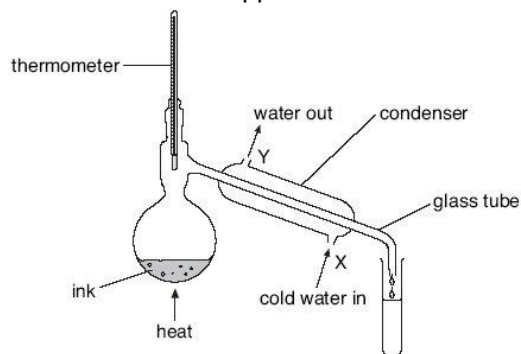
Q3. Chris collected some sea water near a beach. The sea water had salt dissolved in it. It had sand mixed in it.

Chris separated the sand from the salt water as shown below.

- (i) What is this method of separation called?
- (ii) What is substance A?
- (iii) What is the part labelled B?.....



Q4. Rema used the apparatus below to distil 100 cm³ of water-soluble ink.



(a) Which processes occur during distillation? Circle the correct letter.

- A - condensation then evaporation
- B - evaporation then condensation
- C - melting then boiling
- D - melting then evaporation

(b) Give the name of the colourless liquid that collects in the test-tube.



Year 7 Chemistry Homework



Name:

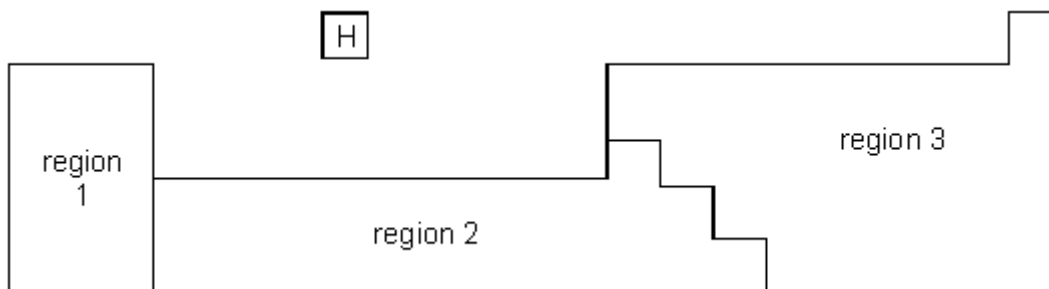
Due Date

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Group	Metal	Non-Metal	Period	Periodic Table
Scientific vocabulary	Definition			
	An arrangement of elements in the order of their atomic numbers, forming groups and periods.			
	All the elements in the columns (labelled 1 to 7 and 0) in the periodic table.			
	A horizontal row in the periodic table.			
	Elements on the left of the stepped line of the Periodic Table. Most are shiny, good conductors of electricity and heat, malleable and ductile, and solid at room temperature.			
	Elements on the right of the stepped line of the Periodic Table. Most are dull, poor conductors of electricity and heat, brittle, and solid or gaseous at room temperature.			

Q1.

The diagram shows an outline of part of the Periodic Table of Elements.



- (a) What is the name of the element with the symbol H?
- (b) In which regions of the Periodic Table are the following types of element found?
- (i) non-metals (such as oxygen and chlorine); Region
- (ii) very reactive metals (such as sodium and potassium); Region
- (iii) less reactive metals (such as copper and zinc). Region
- (c) Why is copper sulphate **not** found in the Periodic Table?

.....



Year 7 Chemistry Homework



Q2. Elements can be represented by symbols.

Complete the table below by adding the missing names and symbols.

Element	Symbol
Helium	_____
Copper	_____
_____	Mg
_____	Cl
Iron	_____
Sulfur	_____
_____	Na
_____	Al

Q3 Which of the following lists contains only elements?

- A. air, iron, iodine, magnesium
- B. zinc, gold, aluminium, oxygen
- C. nitrogen, copper, mercury, water
- D. chlorine, argon, sodium, limestone

Q4 Which list contains only non-metal elements?

- A. oxygen, nitrogen, argon, silicon
- B. chlorine, oxygen, sulfur, iron
- C. bromine, helium, carbon, air
- D. gold, silver, platinum, mercury

Q5 Metals like aluminium are used to make cooking pots because they are ...

- A. brittle and good conductors of heat.
- B. malleable and good conductors of heat.
- C. brittle and poor conductors of heat.
- D. malleable and poor conductors of heat.

Q6 All metals are ...

- A. solids.
- B. strong.
- C. brittle and easily broken.
- D. conductors of electricity.



Year 7 Chemistry Homework



Name:

Due Date

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Atom

Atomic Number

Element

Mass Number

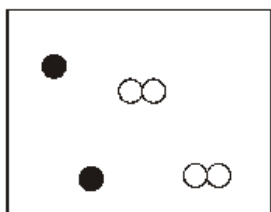
Scientific vocabulary	Definition
	A substance made up of only one type of atom. It cannot be broken down chemically into any simpler substance.
	The smallest part of an element that can still be recognised as that element.
	The number of protons (which equals the number of electrons) in an atom. It is sometimes called the proton number.
	The number of protons plus neutrons in the nucleus of an atom.

Q1.

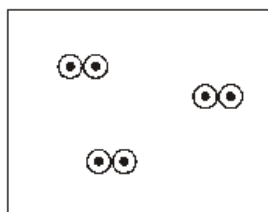
In the 19th Century, a scientist called John Dalton used symbols to represent atoms. The symbols he used for atoms of three different elements are shown below.



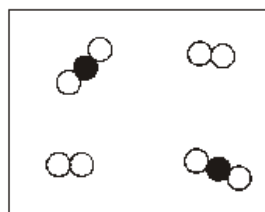
The diagrams below show different combinations of these atoms.



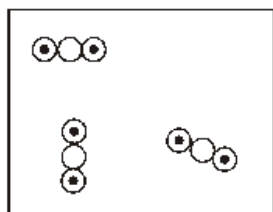
A



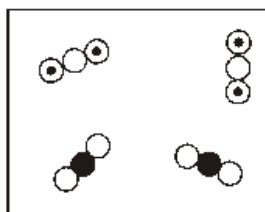
B



C



D



E

- (i) Give the letter of the diagram which shows a mixture of **two** elements
- (ii) Give the letter of the diagram which shows a mixture of **two** compounds
- (iii) Give the letter of the diagram which shows a mixture of an element and a compound



Year 7 Chemistry Homework



Q2: Using a copy of the periodic table find the atomic number and the mass number for the following elements.

Element	Atomic Number	Mass Number
Hydrogen		
Calcium		
Sodium		
Magnesium		
Oxygen		
Carbon		

Q3: Using the numbers found in the previous question, calculate the number of neutrons for each element.

Remember: Neutron number = Mass number – Atomic Number

Element	Calculation (show your working)	Neutron Number
Hydrogen		
Calcium		
Sodium		
Magnesium		
Oxygen		
Carbon		



Year 7 Chemistry Homework



Name: _____

Due Date _____

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Chemical Symbol Word Equation Reactant Product Chemical Reaction Reactive

Scientific vocabulary	Definition
	A change in which atoms are rearranged to create new substances.
	A one- or two-letter code for an element that is used by scientists in all countries.
	A way of representing a chemical reaction simply. The reactants are on the left of an arrow, and the products are on the right. The arrow means <i>reacts to make</i> .
	A substance that is made in a chemical reaction.
	A starting substance in a chemical reaction.
	A substance that reacts vigorously with substances such as dilute acids and water.

Q1. The table shows the observations made when four metals are added to cold water and to dilute hydrochloric acid.

metal	observations with cold water	observations with dilute hydrochloric acid
zinc	no reaction	bubbles of gas form and the metal slowly dissolves
platinum	no reaction	no reaction
potassium	the metal floats and then melts, a flame appears, and sometimes there is an explosion	(cannot be done safely)
nickel	no reaction	a few bubbles of gas form if the acid is warmed

(a) Write the names of these **four** metals in the order of their reactivity.

most reactive

.....

.....

least reactive

(b) Give the name of another metal, **not** in the table, which reacts in a similar to potassium.

.....



Year 7 Chemistry Homework



Q2: Lithium reacts with water. Look at the word equation for this reaction.



(a) One of the reactants is a liquid. Which one?

(b) One of the products is a compound. Which one?

(c) One of the products is a gas. Which one?

Q3: Write word equations for each of the following reactions.

(a) Sodium reacting with chlorine to make sodium chloride.

.....

(b) Heating copper carbonate to make copper oxide and carbon dioxide

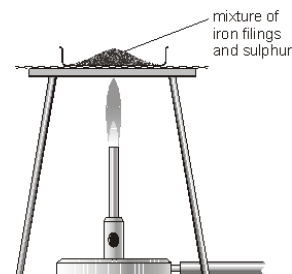
.....

(c) Reacting magnesium hydroxide and dilute sulphuric acid to make magnesium sulphate and water.

.....

Q4 A teacher mixed iron filings with sulphur on a metal tray. She heated the mixture in a fume cupboard. Sulphur is yellow. Iron filings are grey.

The mixture glowed very brightly. The teacher turned off the Bunsen burner. The glow spread through the mixture. When the mixture cooled, a black solid called iron sulphide was left.



(a) From this information, give **one** way you can tell that a chemical reaction took place.

.....

.....

(b) (i) When iron is heated with sulphur, iron sulphide is formed.

Give the name of the solid formed when **zinc** is heated with sulphur.

.....

(ii) Some fossil fuels contain sulphur. When fuels burn, sulphur reacts with oxygen.

Complete the word equation for this reaction.

sulphur + oxygen →



Year 7 Chemistry Homework



Name: _____

Due Date _____

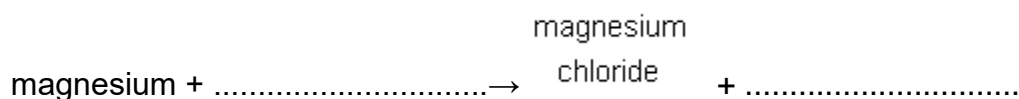
Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Oxidation Reactivity Series Chemical Property Salt

Scientific vocabulary	Definition
	How a substance behaves in its chemical reactions.
	A chemical reaction in which a substance combines with oxygen.
	A list of metals in order of how vigorously they react.
	A compound in which the hydrogen atoms of an acid are replaced by atoms of a metal element.

Q1. (a) Magnesium chloride is formed when magnesium reacts with an acid.

(i) Complete the word equation for the reaction between magnesium and this acid.



(ii) Suggest why magnesium chloride can be made by mixing magnesium with this acid but copper chloride **cannot** be made by mixing copper with this acid.

.....
.....

(b) Copper sulphate is made by adding copper oxide to a different acid.
Give the name of the acid which is used.

.....

Magnesium burns in air giving a very bright light.

(c) Complete the word equation below to show this reaction.





Year 7 Chemistry Homework



Q2. The table contains information about five metals, A, B, C, D and E.

(a) Use the information in the table to arrange the metals in order of reactivity.

most reactive

.....

.....

.....

least reactive

Metal	how it reacts with cold water	how it reacts with hot water
A	no reaction	extremely slowly
B	no reaction	no reaction
C	hardly at all	slowly
D	slowly	quickly
E	quickly	very violently

(b)(i) Which metal in the table could be copper?

.....

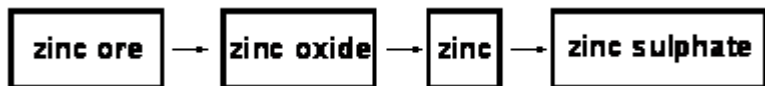
(ii) Which metal in the table could be sodium?

.....

(iii) Which metal in the table could be iron?

.....

Q3. The flow chart shows how zinc sulphate can be obtained.



(a) In the reaction **zinc oxide** → **zinc** an element is removed from zinc oxide to leave zinc. Give the name of the element.

.....

(b) (i) Zinc sulphate can be made in a reaction between zinc and an acid. Give the name of the acid.

.....

(ii) In the reaction between zinc and the acid, hydrogen is formed. Describe the test for hydrogen and the result if hydrogen is present.

.....

.....



Year 7 Chemistry Homework



Name:

Due Date

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Indicator Neutralisation pH Scale Acid Alkali Salt Base

Scientific vocabulary	Definition
	A solution with a pH value less than 7.
	A soluble base.
	A substance that neutralises an acid – those that dissolve in water are called alkalis.
	Substances used to identify whether unknown solutions are acidic or alkaline. The colour is different in acidic and alkaline solutions.
	In this reaction, an acid cancels out a base or a base cancels out an acid.
	This shows whether a substance is acidic, alkaline, or neutral. An acid has a pH between 0 and 7. An alkaline has a pH between 7 and 14. A solution of pH 7 is neutral.
	A compound in which the hydrogen atoms of an acid are replaced by atoms of a metal element.

Q1. Dilute acids react with many things.

Tick the **four** boxes by the correct descriptions.

Tick no more than **four** boxes.

Acids always dissolve glass.

Acids turn universal indicator solution blue.

Acids can be burned as fuels.

Acids may harm your skin.

Acids damage teeth.

Acids react with limestone.

Acids react with metals such as magnesium.

Acids are always poisonous.



Year 7 Chemistry Homework



Q2. pH paper is used to show whether a solution is acidic, neutral or alkaline.

One type of pH paper shows the following range of colours.

colour of pH paper	red	orange	yellow	green	blue	purple
pH value	0 - 4	5	6	7	8 - 10	11 - 14

Some solutions were tested with pH Paper. The results are shown below.

- (a) Complete the following table by placing a tick in the correct column for each substance.

substance	colour of pH paper	acidic	neutral	alkaline
orange juice	red			
egg white	blue			
oven cleaner	purple			
milk	yellow			

- (b) Which substance was the most alkaline?

.....

- (c) Equal amounts of egg white and milk are mixed. What is the most likely pH of the mixture? Tick the correct box.

pH2	pH6	pH7	pH14
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q3.

The chemical formula for hydrochloric acid is HCl. The chemical formula for sodium hydroxide is NaOH.

When they react together, two products are formed. The chemical formula for one product is NaCl.

- (i) Complete the word equation below with the **names** of both products.
- (ii) **On the dotted line**, give the chemical formula of the other product.



- (iii) What is this type of reaction called?

.....



Year 7 Chemistry Homework



Name: _____

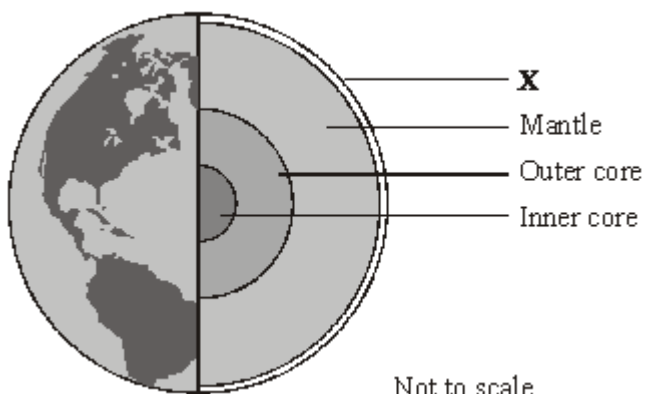
Due Date _____

Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

Porous **Uplift** **Erosion** **Deposition** **Transport**
Sediment **Weathering**

Scientific vocabulary	Definition
	The settling of sediments that have moved away from their original rock.
	The breaking of a rock into sediments and their movement away from the original rock.
	This type of material has small gaps that may contain substances in their liquid or gas states. Water can soak into a porous material.
	Pieces of rock that have broken away from their original rock.
	Movement of sediments far from their original rock.
	This process happens when huge forces from inside the Earth push rocks upwards.
	The breaking down of rock into smaller pieces by physical, chemical or biological processes.

Q1. The diagram gives information about some of the layers that make up the Earth.



What name is given to the outer layer of the Earth labelled **X**?

.....



Year 7 Chemistry Homework



Q2.

- (a) Helen weighed three pieces of rock and soaked them in water. The next day, she weighed them again. Her results are shown below.

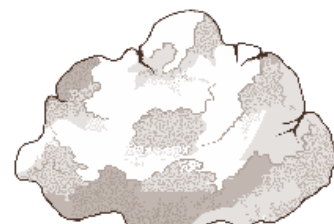
rock	mass before soaking in water (g)	mass after soaking in water (g)
granite	26.3	26.3
marble	20.4	20.4
sandstone	25.5	27.6

Rocks that have lots of small spaces are described as **porous**.

What evidence is there in the table that sandstone is porous, but granite and marble are **not** porous?

.....
 ..

- (b) Helen put the soaked sandstone into a freezer for 24 hours. Water in the spaces in the sandstone froze and expanded.



- (i) What would happen to the sandstone as the water froze and expanded?

.....

- (ii) In the winter this process happens in rock in the countryside.

What is the name of this process?

.....

- (c) Helen placed fresh pieces of granite, marble and sandstone in beakers of dilute sulphuric acid. Only the marble reacted with the acid. Only the marble reacted with the acid.

Use Helen's results to explain why granite is more suitable than marble for a statue in a city centre.

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Year 7 Chemistry Homework



Name:

Due Date

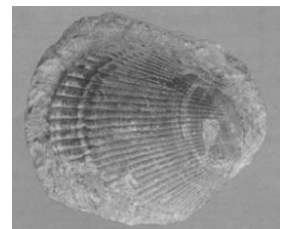
Match the scientific vocabulary below to the definitions in the table.
Try to make sure you can spell and remember what each word means.

- Magma** **Rock Cycle** **Igneous Rock** **Mantle** **Lava**
- Metamorphic Rock** **Sedimentary Rock**

Scientific vocabulary	Definition
	Formed when liquid rock (lava or magma) cools or freezes. Their minerals are arranged in crystals. Examples are granite, basalt, and obsidian.
	Liquid rock that is above the Earth's surface.
	Liquid rock below the Earth's surface.
	The layer of Earth that is below the crust. It is solid but can flow very slowly.
	Formed from existing rocks exposed to heat and/or pressure over a long time. Examples are marble, slate, and schist.
	Sequence of processes where rocks change from one type to another, over a timescale of millions of years.
	Formed from layers of sediment, which can contain fossils. Examples are chalk, limestone, and sandstone.

Q1. The photograph shows a piece of sandstone.

- (i) The sandstone in the photograph contains a fossil.
What is a fossil?



.....

- (ii) What group of rocks does sandstone belong to?

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- (iii) Granite and basalt are igneous rocks. They contain crystals but **no** fossils.
Explain why igneous rocks do **not** contain fossils.

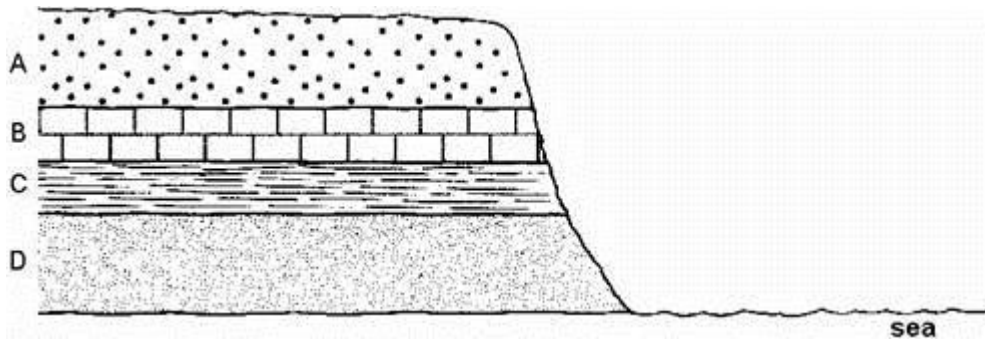
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Year 7 Chemistry Homework



Q2. The diagram shows four different layers of sedimentary rock in a cliff.



(a) Which layer of , A, B, C or D, is probably the oldest?

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(b) Igneous rock is formed when magma cools.

Choose from the following words to complete the sentences below.

gas liquid metal solid

(i) Igneous rock is a

(ii) Magma is a

(c) Rocks are put into groups according to the way they are formed. The groups are **igneous, metamorphic and sedimentary.**

(i) To which group does sandstone belong

(ii) In which group are fossils **never** found?

Q3. The diagram below shows a section through a volcano. Magma is moving up from a magma chamber. Some of the magma erupts to form lava. The liquid lava cools and becomes solid rock.

As the magma cools underground, it solidifies and crystals are formed.

(i) In what way will these crystals be different from the crystals formed when lava solidifies above ground?

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(ii) Give the reason for your answer.

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