

NAME: _____

Please complete all sections of this workbook

Unit title: Preliminary Assignment

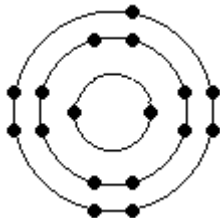
INTRODUCTION TO CHEMISTRY WORK

*Welcome to Chichester College and the start of a very busy but incredibly rewarding course.
In preparation for September, I would like you to complete the following 5 questions.*



QUESTION 1 - This question is about atomic structure and elements.

Give the chemical symbol of the non-metal atom represented by this diagram.



Answer:

Complete the following 2 sentences.

The atomic number of an atom is the number of

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The mass number of an atom is the number of

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Explain why an atom has no overall charge. Use the relative electrical charges of sub-atomic particles in your explanation.

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Explain why fluorine and chlorine are in the same group of the periodic table. Give the electronic structures of fluorine and chlorine in your explanation.

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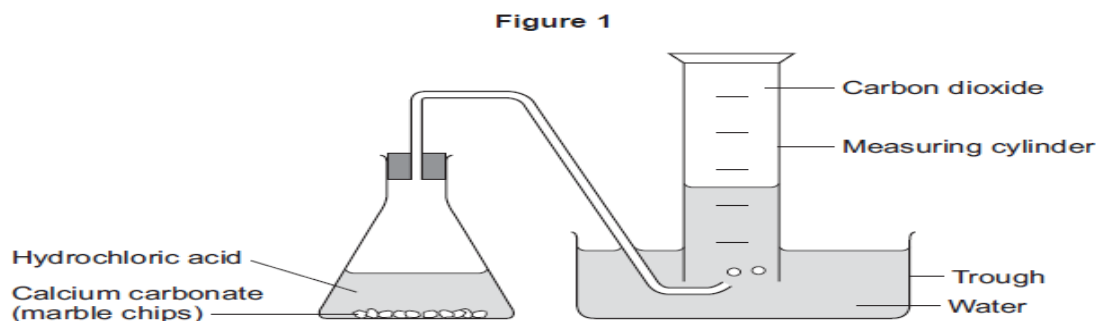
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QUESTION 2 - This question is about rates of reaction.

A student investigated the rate of reaction between calcium carbonate (marble chips) and hydrochloric acid.

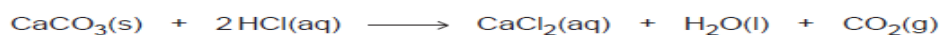
The student used the apparatus shown in **Figure 1**.



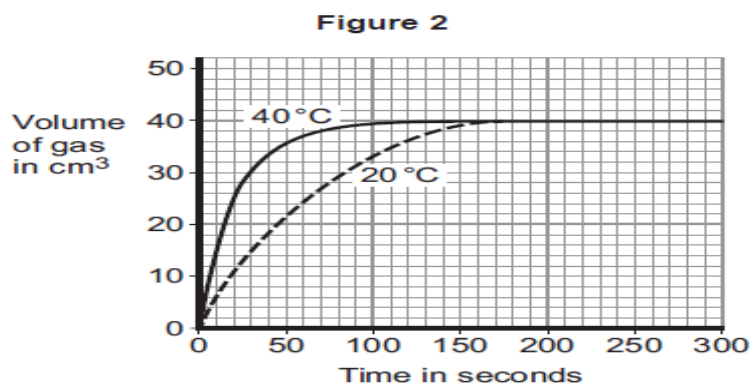
The student:

- recorded the volume of gas collected every 5 seconds
- repeated the experiment using hydrochloric acid at different temperatures.

The equation for the reaction is:



Here is the graph of results plotted from this experiment.



Give a conclusion for the effect of temperature on rate of reaction

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When the acid was at 60°C, the student had collected 30cm³ after 15 seconds. What was the average rate of reaction between 0-15 secs?

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Explain in terms of particles and collisions, what effect increasing the surface area of the CaCO₃ would have on the rate of reaction

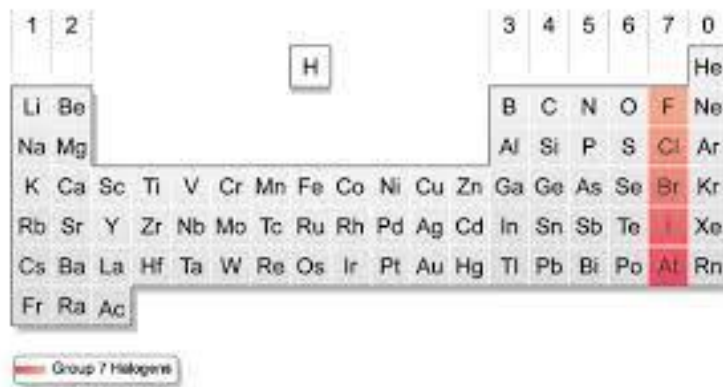
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QUESTION 3 This question is about **The Periodic Table**.

This question is about the halogens (Group 7).



1		2												3	4	5	6	7	0	
				H																He
Li	Be											B	C	N	O	F	Ne			
Na	Mg											Al	Si	P	S	Cl	Ar			
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr			
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe			
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn			
Fr	Ra	Ac																		

Group 7 Halogens

How do the boiling points of the halogens change down the group from fluorine to iodine?

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Sodium bromide is produced by reacting sodium with bromine. Sodium bromide is an ionic compound. Write down the symbols of the **two** ions in sodium bromide.

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Chlorine reacts with sodium bromide solution to produce bromine and one other product. Complete the word equation for the reaction.



Why does chlorine displace bromine from sodium bromide?

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Suggest which halogen could react with sodium chloride solution to produce chlorine.

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QUESTION 4 This question is about bonding.

Describe the structure and bonding in sodium chloride.

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When sodium chloride solution is electrolysed, one product is chlorine. Name the **two** other products from the electrolysis of sodium chloride solution.

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Many people do not have enough iodine in their diet. Sodium chloride is added to many types of food. Some scientists recommend that sodium chloride should have a compound of iodine added. Give **one** ethical reason why a compound of iodine should **not** be added to sodium chloride used in food.

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The bonding in iodine is similar to the bonding in chlorine.

Draw a diagram to show the covalent bonding in iodine. Show the outer electrons only.

Explain why iodine has a low melting point.

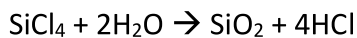
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Explain, in terms of particles, why liquid iodine does not conduct electricity.

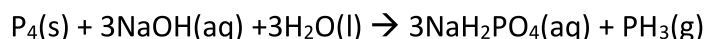
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QUESTION 5 This question is about chemical quantities.

Calculate the mass of H₂O required to react completely with 5.0 g of SiCl₄:



Calculate the mass of phosphorus required to make 200 g of phosphine, PH₃, by the reaction:

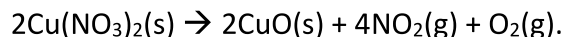


Lead (IV) oxide reacts with concentrated hydrochloric acid as follows:



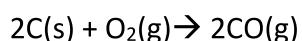
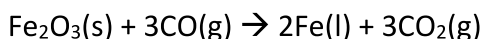
What mass of lead chloride would be obtained from 37.2g of PbO₂, and what mass of chlorine gas would be produced?

When copper (II) nitrate is heated, it decomposes according to the following equation:



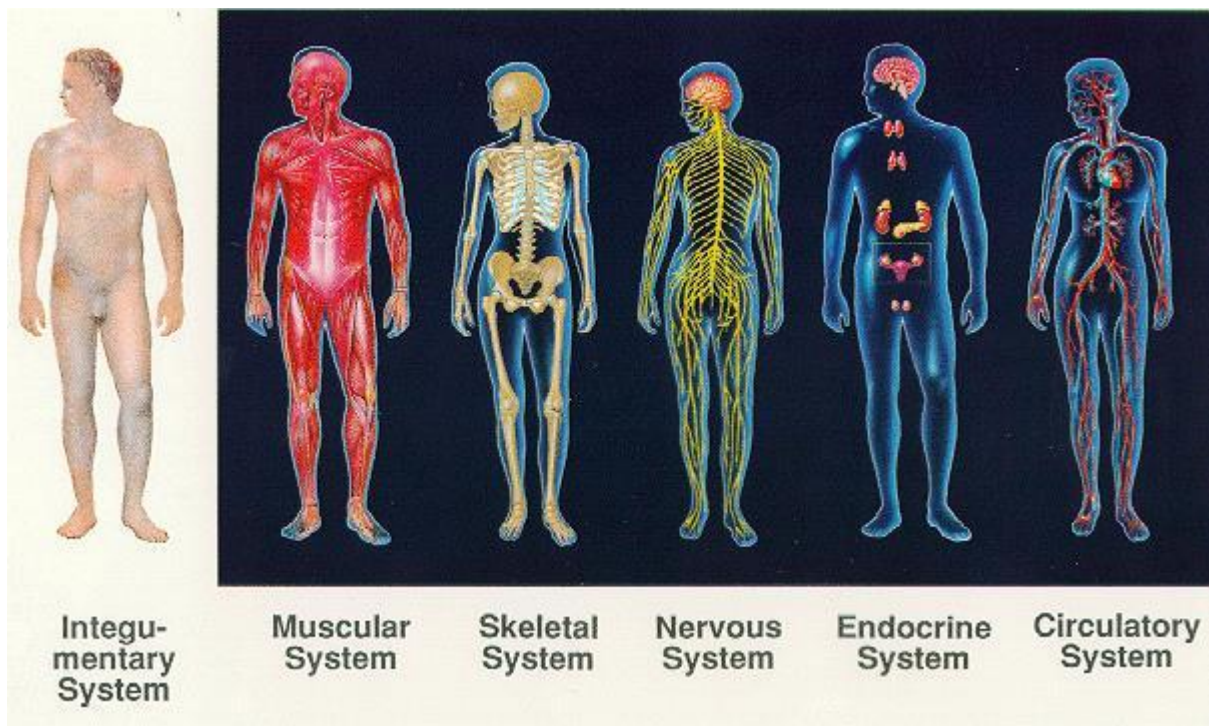
When 20.0g of copper (II) nitrate is heated, what mass of copper (II) oxide would be produced? What mass of NO₂ would be produced?

A blast furnace can produce about 700 tonnes of iron a day. How much iron (III) oxide will be consumed? Assuming coke is pure carbon, how much coke would be needed to produce the necessary carbon monoxide?



NAME: _____

Intro to Human Physiology



LO: Be able to discuss the structures of the body

This section of the workbook can be written or typed. Be succinct, and do not exceed available space.

Q1 A cell is a basic unit of a living organism. Research and draw a cheek cell. This should be labelled.

Q2 Cells can be specialised to perform different functions. Choose one of the cells listed, draw it and then explain how it has been specialised for its role. Choose from: muscle cell, intestinal epithelial cell, or alveolar cell.

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Q3 The human body is made up of cells organised into tissues, organs and organ systems. Using an example of your choice, explain how this organisation works (i.e. what cells are present? How are they organised into tissues? What tissues are present in the organs? What organs are present in the system?

Q4 Humans have lots of sets of muscles, many of which are described as being antagonistic. What does this word mean in this context?

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Q5 Humans have serious problems if damage occurs to the nervous system. Unlike our muscles or skin, our nerves are too specialised to easily regenerate. Why would this mean that damage is hard to repair within the nerves?

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Fraction calculations

Work out (show your work)

1. $0.516 \div 0.8$

2. $\frac{18-2 \times 3}{8 \div 2}$

3. $\frac{6}{11} + \frac{7}{9}$

4. $\frac{6}{7} - \frac{3}{5}$

5. $\frac{9}{10} - \frac{5}{6} + \frac{3}{12}$

6. $\frac{4}{11} \times \frac{5}{10} \div \frac{7}{22}$

7. Show that $4\frac{1}{2} \div 1\frac{2}{5} = 3\frac{3}{14}$

Write the decimals as a fraction in its simplest form

8. 0.12

9. 0.084

10. 0.375

Ratios

11. Two towns 4.8km are shown on a map 12cm apart. Find the ratio of the map distance to the true distance in the form $1:n$.
12. A tiled floor has blue and white tiles in the ratio 9:4. What fraction of the tiles are blue?
13. $\frac{1}{8}$ of some counters are red, $\frac{5}{8}$ are blue and rest are green. Find the ratio of red to blue to green.
14. Ashley and Cameron have a combined age of 20. Cameron is 10 years older than Ashley. Find the ratio Ashley's age to Cameron's age in its simplest form.

Percentage

15. A farmer has 380 acres of land. He sells 35% of his land. How much does he have left (percentage and actual value)?
16. Alan's weekly wage of £400 is decreased by 4.75%. Mary's weekly wage of £350 increased by 9.26%. Who now earns more and by how much?
17. 2 years ago, Tom earned £31 000 per year. Last year, he got a rise of 3%. This year, he got a pay cut of 2%. How much does he now earn per year?
18. A café sells 270 ice cream sundaes in April and 464 in May. Find the percentage increase in ice cream sales.

Algebra

Solve:

19. $15 - 2x = 7$

20. $\frac{x}{3} + 2 = -3$

21. $x(2x - 3) = 0$

22. $x^2 - 2x - 8 = 0$

23. $5x^2 + 3x - 2 = 0$

Statistics

Write the definition of words

24. Mean, Mode, Median

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25. Discrete and Continuous data

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26. Primary and Secondary data

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27. Qualitative and Quantitative data

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