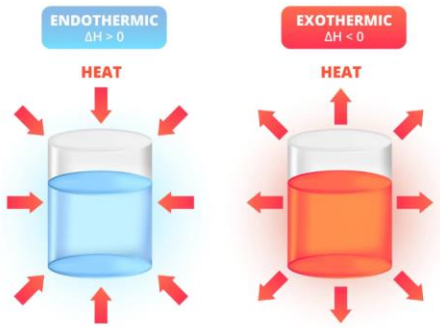
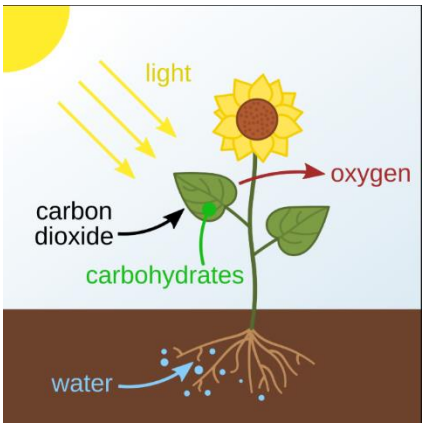
Year 9 Home Learning

Autumn term 2 2026

Name:_____ Class:_____

Aspiration





Home Learning expectations

- -Written by yourself, in your own words.
- -Completed by the due date.
- -Finished to the best of your ability.
- -Closely followed the instructions.
- -Green penned and improved when needed.
- -Peer or self-assessed when asked to.
- -Presented so it is clear and neat
- -Proof read the work to ensure spelling, punctuation and grammar is to the best of your ability.

Task 8

Topic: How Science Works: Planning a practical. Literacy task.

Instructions: Read the information and complete the questions.

Title: Investigation into how the concentration of acid affects the rate of reaction

In this practical, you will investigate the effect of hydrochloric acid concentration on the rate of reaction with magnesium ribbon.

Place a 2 cm piece of magnesium ribbon into a beaker containing 20 cm^3 of hydrochloric acid. Start a stopwatch as soon as the magnesium is added to the acid. Observe the reaction and record the time taken for the magnesium ribbon to dissolve completely.

Repeat the experiment using a range of hydrochloric acid concentrations. Ensure that the length of magnesium ribbon, volume of acid, and temperature remain constant throughout the investigation.

Record your results in a suitable table and look for patterns in the data. Use your results to determine how acid concentration affects the rate of reaction and explain your findings using collision theory.

Complete the questions below:

1. **What is the independent variable in this experiment? (1 mark)**

_____

2. **What is the dependent variable in this experiment? (1 mark)**

_____

3. **Name two control variables that must stay the same. (2 marks)**
   1. _____
   2. _____
4. **What is the aim of the practical? (1 mark)**

   _____
5. **What happens when magnesium reacts with hydrochloric acid? (1 mark)**

   _____
6. **Why is it important to keep the length of the magnesium ribbon the same? (2 marks)**

   _____

7. **Why does changing the concentration of acid affect the rate of reaction? (2 marks)**

_____

Teacher ticks here	Tick	Student comment: How to improve
Excellent homework **(good comment)**		
Good/completed		
Requires improvement		
Incomplete/unsatisfactory		

Peer assessed / Self-

Due Date: _____

Task 9

Topic: Electrical Power – Topic review

Instructions: Complete the following activities, use the information from your booklet to help you:

1. Match each electrical quantity to its correct unit. [5 marks]

Current	Volts (V)
Voltage	Joules (J)
Resistance	Watts (W)
Power	Ohms (Ω)
Energy	Amperes (A)

2. Fill in the blanks about energy and power. [6 marks]

energy | power | kilowatts | second | watts | kilowatt-hours

Power is the amount of _____ transferred every _____. Power is measured in _____. A device that uses more energy each second has a higher _____ rating. Multiplying power in _____ by time in hours gives energy in _____.

WORKED EXAMPLE — EFFICIENCY

Formula: efficiency (%) = (useful energy output ÷ total energy input) × 100

Example: A motor receives 500 J of electrical energy and produces 350 J of useful kinetic energy.
efficiency = (350 ÷ 500) × 100 = 70%

3. An electric bulb is supplied with 200 J of electrical energy. It produces 50 J of useful light energy and the rest is wasted as heat.

e. Calculate the amount of energy wasted as heat. [1 mark]

Answer = _____ J

f. Calculate the efficiency of the bulb. Show your working. [2 marks]

Answer = _____ %

g. Explain what the efficiency value tells you about how well the bulb converts electrical energy into light energy. [2 marks]

_____

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Task 10

Topic: Photosynthesis

Instructions: Complete the tasks about photosynthesis

1. **What is the word and balanced symbol equation for photosynthesis?**

Word equation: _____

Balanced symbol equation: _____

2. **Which subcellular structure is the site of photosynthesis in plant cells?**

---

3. **What colour is chlorophyll?**

---

4. **Which gas do plants take in during photosynthesis?**

5. **What useful substance does a plant make during photosynthesis?**

---

4. Explain why chloroplasts are important in photosynthesis. *Help: What do they contain? What happens here?*

---

5. A plant is kept in a dark cupboard for two weeks. Explain how this would affect photosynthesis and why.

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Task 11

Topic: How science works

Instructions: Complete the following tasks to practice drawing a line of best fit:

1. Why draw a line of best fit? (2 marks)

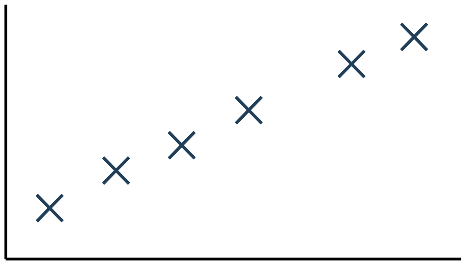
_____

_____

2. Draw a line of best fit on each graph.

   Remember: If the pattern is in a straight line you use a ruler, if it is in a curve you draw the line free hand. This must be a continuous line and not the dots joined up.

3. When drawing a line of best fit we do not include the anomaly.
   a) Circle the anomaly on the graph on the right.
   b) Draw a line of best fit, leaving out the anomaly.



3. Tick the correct answer:
   a. We use a line graph if…
      ☐ Both variables are continuous
      ☐ One of the variables is categorical
   b. We use a bar chart if…
      ☐ Both variables are continuous
      ☐ One of the variables is categorical

4. Ralph shines light on a mirror at different angles of incidence and measures the angle of reflection.
   A. Are these data continuous or categorical?
   b. Should Ralph plot a bar chart or a line graph?

Angle of incidence (degrees)	Angle of reflection (degrees)
10	10
20	20
30	30
40	40

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Task 12

Topic: Photosynthesis: Literacy task, importance of green plants

Instructions: Read through the information below and complete the questions. You can also use lesson 4 from your photosynthesis booklet.

Reading Task: Why Are Plants Important?

Plants and algae use sunlight to make food in a process called photosynthesis. During photosynthesis, they take in carbon dioxide and release oxygen, which humans and animals need to breathe. Plants help reduce global warming by removing carbon dioxide from the air. Tiny ocean organisms called phytoplankton also do photosynthesis and produce about half of the oxygen we breathe.

Plants help clean the air by absorbing some harmful pollution. They also stop desertification, which happens when good soil becomes dry and barren. Tree roots hold soil together and help keep it healthy.

Plants are important parts of habitats. They provide food, oxygen, and shelter for living things. However, habitats can be damaged by deforestation, pollution, and building new towns and cities. We can help by planting more trees and reducing pollution. Protecting plants helps keep our planet healthy for all living things

1. **What gas do plants release during photosynthesis?**

   _____

2. **What can damage plant habitats?**

_____

_____

3. Write the definition of each of the following:

Photosynthesis	Definition =
Habitat	Definition =
Pollution	Definition =

4. Plants photosynthesis, describe 2 ways in which this is important for earth. (3 marks)

_____

_____

_____

5. What is desertification? (1 mark)

_____

_____

6. How are trees and plants beneficial to animals in terms of giving them a place to live? 2 marks)

_____

_____

_____

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Task 13

Topic: How science works

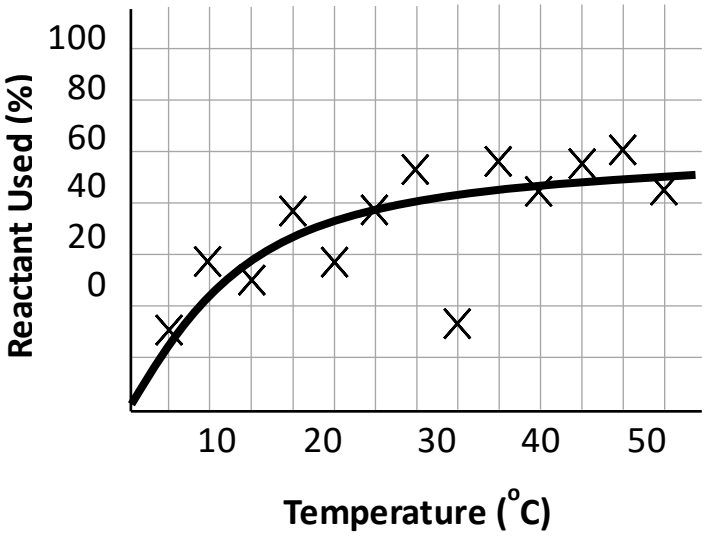
Instructions: Complete the following tasks to practice your scientific skills:

1. On the graph, circle the anomaly
   a. State what the independent variable is below:

   _____

   b. State what the dependent is variable is below:

   _____

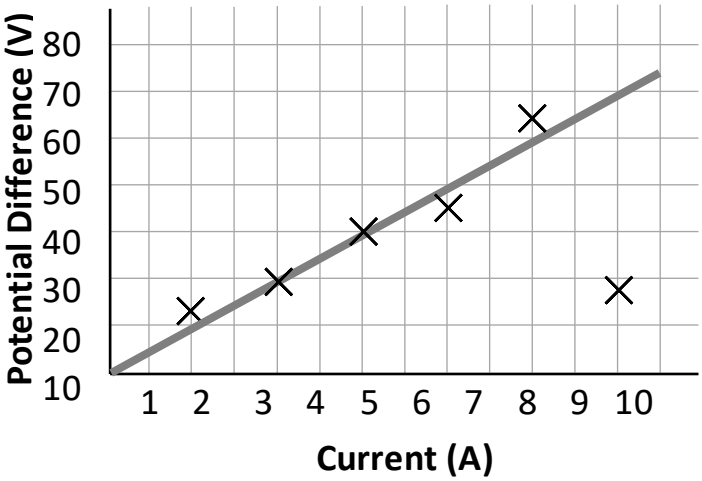


2.
   a. On the graph, circle the anomaly
   b. Describe the pattern of the graph below:

_____

_____

_____



   c. State how much more potential different a current of 5 amps has than a current of 8 amps.

Answer = _____ V.

4. Explain why it is important to ignore anomalies. (3 marks)

_____

_____

_____

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Task 14

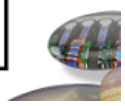
Topic: Chemical reactions

Instructions: Complete the tasks below on the topic 'chemical reactions'.

(1)	(2)											(3)	(4)	(5)	(6)	(7)	(0)
1																	18
1 **H** hydrogen 1.0	2											13	14	15	16	17	2 **He** helium 4.0
3 **Li** lithium 6.9	4 **Be** beryllium 9.0											5 **B** boron 10.8	6 **C** carbon 12.0	7 **N** nitrogen 14.0	8 **O** oxygen 16.0	9 **F** fluorine 19.0	10 **Ne** neon 20.2
11 **Na** sodium 23.0	12 **Mg** magnesium 24.3	3	4	5	6	7	8	9	10	11	12	13 **Al** aluminium 27.0	14 **Si** silicon 28.1	15 **P** phosphorus 31.0	16 **S** sulfur 32.1	17 **Cl** chlorine 35.5	18 **Ar** argon 39.9
19 **K** potassium 39.1	20 **Ca** calcium 40.1	21 **Sc** scandium 45.0	22 **Ti** titanium 47.9	23 **V** vanadium 50.9	24 **Cr** chromium 52.0	25 **Mn** manganese 54.9	26 **Fe** iron 55.8	27 **Co** cobalt 58.9	28 **Ni** nickel 58.7	29 **Cu** copper 63.5	30 **Zn** zinc 65.4	31 **Ga** gallium 69.7	32 **Ge** germanium 72.6	33 **As** arsenic 74.9	34 **Se** selenium 79.0	35 **Br** bromine 79.9	36 **Kr** krypton 83.8
37 **Rb** rubidium 85.5	38 **Sr** strontium 87.6	39 **Y** yttrium 88.9	40 **Zr** zirconium 91.2	41 **Nb** niobium 92.9	42 **Mo** molybdenum 95.9	43 **Tc** technetium	44 **Ru** ruthenium 101.1	45 **Rh** rhodium 102.9	46 **Pd** palladium 106.4	47 **Ag** silver 107.9	48 **Cd** cadmium 112.4	49 **In** indium 114.8	50 **Sn** tin 118.7	51 **Sb** antimony 121.8	52 **Te** tellurium 127.6	53 **I** iodine 126.9	54 **Xe** xenon 131.3
55 **Cs** caesium 132.9	56 **Ba** barium 137.3	● 57–71 lanthanoids	72 **Hf** hafnium 178.5	73 **Ta** tantalum 180.9	74 **W** tungsten 183.8	75 **Re** rhenium 186.2	76 **Os** osmium 190.2	77 **Ir** iridium 192.2	78 **Pt** platinum 195.1	79 **Au** gold 197.0	80 **Hg** mercury 200.6	81 **Tl** thallium 204.4	82 **Pb** lead 207.2	83 **Bi** bismuth 209.0	84 **Po** polonium	85 **At** astatine	86 **Rn** radon
87 **Fr** francium	88 **Ra** radium	● ● 89–103 actinoids	104 **Rf** rutherfordium	105 **Db** dubnium	106 **Sg** seaborgium	107 **Bh** bohrium	108 **Hs** hassium	109 **Mt** meitnerium	110 **Ds** darmstadtium	111 **Rg** roentgenium	112 **Cn** copernicium		114 **Fl** flerovium		116 **Lv** livermorium		

Key
atomic number
Symbol
name
relative atomic mass

● 57 **La** lanthanum 138.9	58 **Ce** cerium 140.1	59 **Pr** praseodymium 140.9	60 **Nd** neodymium 144.2	61 **Pm** promethium 144.9	62 **Sm** samarium 150.4	63 **Eu** europium 152.0	64 **Gd** gadolinium 157.2	65 **Tb** terbium 158.9	66 **Dy** dysprosium 162.5	67 **Ho** holmium 164.9	68 **Er** erbium 167.3	69 **Tm** thulium 168.9	70 **Yb** ytterbium 173.0	71 **Lu** lutetium 175.0
● ● 89 **Ac** actinium	90 **Th** thorium 232.0	91 **Pa** protactinium	92 **U** uranium 238.1	93 **Np** neptunium	94 **Pu** plutonium	95 **Am** americium	96 **Cm** curium	97 **Bk** berkelium	98 **Cf** californium	99 **Es** einsteinium	100 **Fm** fermium	101 **Md** mendelevium	102 **No** nobelium	103 **Lr** lawrencium



1. Use your periodic table in your diary (or the copy above).
2. Write the chemical formula for the following elements in the table below.

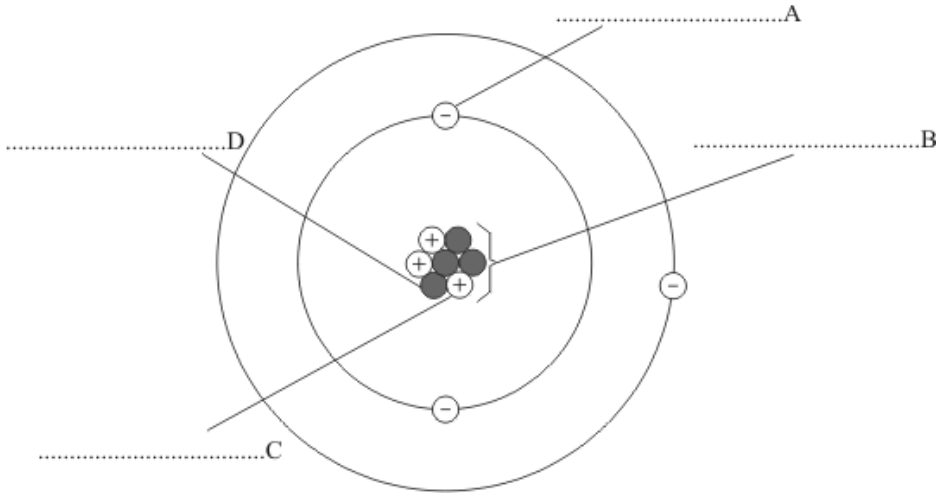
Name of element	**Chemical formula**
Oxygen	
Calcium	
Iron	
Hydrogen	

3. Identify some common elements and compounds below:

Chemical formula of element/compound	**Name of the element/compound**
H_2O	Water
CO_2	
O_2	
Challenge: $C_6H_{12}O_6$	

4. Research the structure of an atom using your booklet or the internet and complete the tasks below:

a. Label the atom's sub-atomic particles



b. Write a sentence explaining the charges of each subatomic particle. Come up with a way to remember this.

_____

_____

c. Write a sentence explaining the masses of each subatomic particle. Come up with a way to remember this.

_____

_____

5. Write down the number of subatomic particles the following elements have:

a. Oxygen

Number of electrons = _____

Number of protons = _____

Number of neutrons = _____

b. Carbon

Number of electrons = _____

Number of protons = _____

Number of neutrons = _____

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