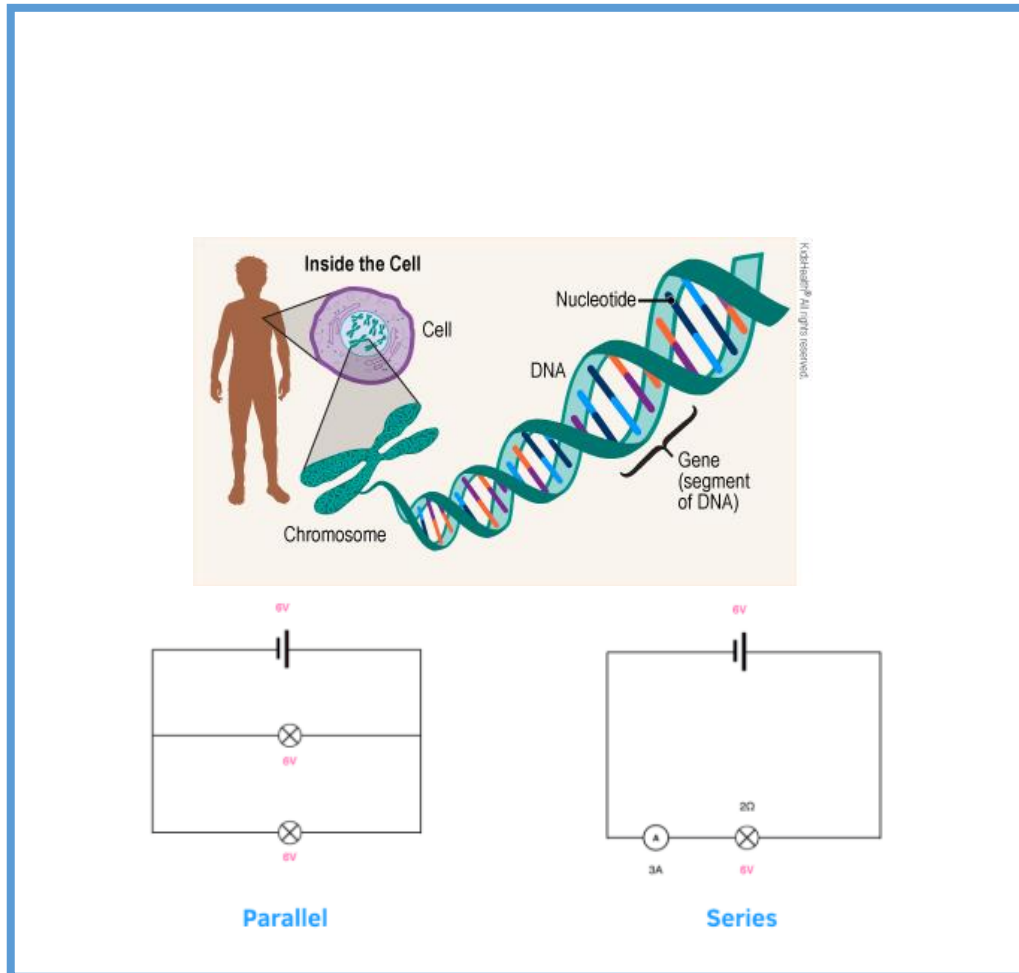


Year 9 Home Learning

Autumn term 1 2026

Name: _____ Class: _____

Dedication



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 panned 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.

Due Date: _____

Task 1

Topic: Genetics

Instructions: Using the booklet and the internet, research and fill in the missing blanks using the word bank below.

Work bank: section, characteristic/protein, parents, offspring, DNA, genetic, alleles, genes, pairs, version, gene, traits

Key words:	Definitions: (Provide a clear and concise definition of the key word.)
1. DNA	Worked example.. The material in cells that carries genetic information. It tells the body how to grow and work.
2. Gene	A gene is a small _____ of DNA that codes for a specific _____.
3. Chromosome	A chromosome is a long structure made of DNA that carries many _____. Humans have 23 _____ of chromosomes.
4. Allele	An allele is a different _____ of the same _____.
5. Inheritance	Inheritance is the passing of _____ from _____ to _____.
6. Mutation	A mutation is a change in the base sequence of _____
7. Genotype	Genotype is the _____ makeup of an organism, made up of the _____ it has.

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

Task 2

Topic: How science works

Instructions: Complete the tasks below

Key information:

Independent variable: The variable that the investigator deliberately changes or selects different values for. There should only be one independent variable per investigation.

Dependent variable: The variable that is measured or observed as a result of changing the independent variable. It 'depends on' the independent variable.

Control variable: Any variable that is kept constant throughout an investigation to ensure the test is fair. If a control variable changed, it could affect the dependent variable and make results unreliable.

1. Match each term to its correct definition.

[4 marks]

Independent variable

The variable deliberately changed by the investigator

Dependent variable

A data point that does not fit the pattern of the other results

Control variable

A variable kept constant to ensure a fair test

Anomalous result

The variable measured as a result of the investigation

2. A scientist studies the effect of temperature on the rate of evolution in bacteria by measuring how quickly antibiotic resistance develops in bacterial populations kept at different temperatures.

a. Name the independent variable in this investigation. [1 mark]

b. Name the dependent variable in this investigation. [1 mark]

c. Give two variables that must be controlled to make this a fair test. [2 marks]

1. _____

2. _____

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

Peer
assessed /
Self-

Task 3

Topic: Genetics

Instructions: Complete the following tasks to understand how the structure of DNA was discovered. You can use lesson 2 in your genetics booklet to help you.

TIMELINE: KEY EVENTS IN THE DISCOVERY OF DNA

1869Friedrich Miescher first isolated DNA from cell nuclei. He called it 'nuclein'.

1926–1940sScientists confirmed that DNA, not protein, carries genetic information.

1950Erwin Chargaff discovered that A always pairs with T and G always pairs with C (Chargaff's rules).

1952Rosalind Franklin produced Photo 51 — a clear X-ray image showing that DNA has a helical (twisted) shape.

1953Watson and Crick published their model of the DNA double helix in the scientific journal Nature. They used Franklin's X-ray data (shared without her knowledge by Wilkins) to complete their model.

1962Watson, Crick, and Wilkins were awarded the Nobel Prize for Physiology or Medicine. Rosalind Franklin had died in 1958 and Nobel Prizes are not awarded posthumously.

1. Match each term to its correct definition:

DNA

A section of DNA that codes for a specific protein

Double helix

Molecule that carries genetic information in cells

Nucleotide

Technique used to reveal the shape of DNA using X-rays

Gene

A long coiled strand of DNA found in the nucleus

X-ray crystallography

The twisted ladder shape of the DNA molecule

Chromosome

Individual building block that makes up DNA

2. Which of the following correctly describes the structure of DNA? [1 mark]

- A A single strand coiled into a helix
- B Two strands twisted around each other in a double helix
- C Three strands arranged in a triple helix
- D A flat ladder-shaped molecule

3. Which base pairing rule is correct? [1 mark]

- A Adenine pairs with Guanine
- B Thymine pairs with Cytosine
- C Adenine pairs with Thymine
- D Guanine pairs with Adenine

4. Answer the following questions about the key scientists involved in the discovery of DNA.

(a) State what technique Rosalind Franklin used to study the shape of DNA. [1 mark]

(b) Name the two scientists who published the first accurate model of the DNA double helix in 1953. [1 mark]

(c) Give the name of the famous X-ray image produced by Rosalind Franklin that helped reveal the helical structure of DNA. [1 mark]

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

Task 4**Topic: Revision skills homework****Instructions:**

Revise the genetics topic by creating 10 flashcards. Make sure you have the question on one side and the answer on the other.

Example:

Front of revision card:

Describe the structure of DNA (2 marks)

Back of revision card:

- Double helix (1)
- Twisted ladder (1)

Task 5

Topic: How Science Works

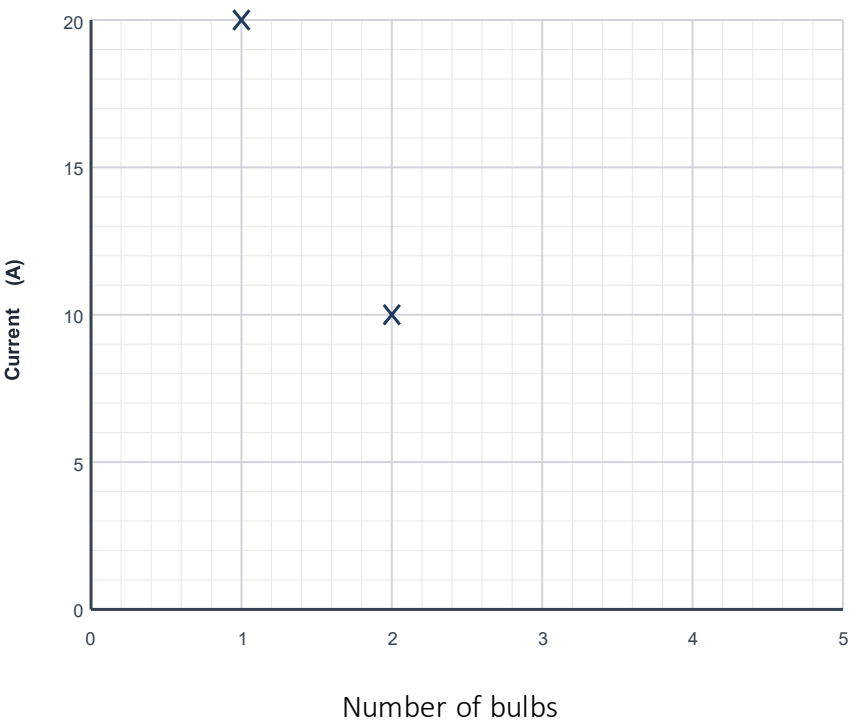
Instructions: Complete the following tasks to practice your graph skills.

1. Use Table 1 and Graph 1 to answer the following questions.

TABLE 1: CURRENT RECORDED AS BULBS ARE ADDED IN SERIES

Number of bulbs	Current (A)
1	20
2	10
3	5
4	2.5
5	1.5

GRAPH 1: CURRENT AGAINST NUMBER OF BULBS IN SERIES



(a) Plot the remaining data points from Table 1 onto Graph 1 and draw a smooth curve of best fit through all six points. [3 marks]

(b) Describe the shape of your graph [2 marks]

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

Due Date: _____

Task 6

Topic: Electricity

Instructions: Use your textbook and the internet to fill in the gaps in the table below. The first one has been done for you. The website 'BBC Bitesize' is recommended to help you complete the homework.

Component	Symbol	Function
switch		A switch used to turn a circuit on (closed) and off (open).
variable resistor		
voltmeter		
ammeter		
cell		
battery		
motor		

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

**Peer
assessed /
Self-**

Task 7

Due Date: _____

Topic: Electricity

Instructions: Complete the following questions on Ohm's Law. You can use lesson 1 and 2 from your booklet to help you and the information below. You will need a calculator.

V = Voltage in volts, I = Current in amps, R = Resistance in ohms

$$V = IR$$

$$R = V/I$$

$$I = V/R$$

Worked example:

Q. An alarm clock draws 0.5 A of current when connected to a 120 volt circuit. Calculate its resistance.

1. Write out the equation you need

$$R = V/I$$

2. Put the numbers from the question into the equation

$$R = 120 / 0.5$$

3. Now use your calculator to calculate the answer

$$R = 240$$

4. Write your answer, don't forget the unit!

Resistance = 240 Unit: Ω

1. Write the equation for calculating resistance

Resistance =

2. Write the name of the unit for resistance and draw the symbol below:

3. A subwoofer needs a household voltage of 110 V to push a current of 5.5 A through its coil. What is the resistance of the subwoofer?

1. Write out the equation you need

2. Put the numbers from the question into the equation

3. Now use your calculator to calculate the answer

4. Write your answer, don't forget the unit!

Resistance = _____ Unit: Ω

4. A Sony Walkman uses a standard 1.5 V battery. How much resistance is in the circuit if it uses a current of 0.01A?

Resistance = _____ Unit: _____

5. A circuit contains a 1.5 volt battery and a bulb with a resistance of 3 ohms. Calculate the current.

Resistance = _____ Unit: _____

6. What current flows through a hair dryer plugged into a 120 Volt circuit if it has a resistance of 25 ohms?

Resistance = _____ Unit: _____

Challenge questions!

- a. What happens to the current in a circuit if a 1.5-volt battery is removed and is replaced by a 3-volt battery?
- b. What happens to the current in a circuit if a 10Ω resistor is removed and replaced by a 20Ω resistor?

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