

## KS4 Science: Summary

Science is the pursuit and application of knowledge and understanding of the natural and social world. This is achieved by following a systematic approach to gather evidence leading to testable theories. Science develops questioning skills, ensuring our future generations do not accept statements at face value, but probe the value, reasoning and evidence behind the top line. This is all supported by the six question words... *Who? – How? – Why? – When? – Where? – What?*

At St Mary's, our pupils study Biology, Chemistry and Physics using a narrative-based approach. Ideas are introduced within relevant and interesting settings helping learners to anchor their conceptual knowledge of the range of scientific topics required at GCSE level.

Practical skills are embedded within the specification and learners are expected to carry out practical work in preparation for a written examination that will specifically test these skills.

At *Key Stage Four*, pupils experience one of two pathways. Those pupils more able to manage the extra demand are offered three separate GCSE courses. These are accelerated courses, with one additional hour per fortnight to study an extra (third) GCSE. The rest of the cohort study the Combined Science course, which culminates in the award of two GCSE grades. The units of work studied are similar; however, the separate GCSE courses have additional content not covered by the Combined Science course - this becomes increasingly different as the course progresses, and does leave some space for movement across courses up until the end of Year 10:

<b>B1 : You and Your Genes</b>	<b>C1: Air and Water</b>	<b>P1: Radiation and Waves</b>
<b>B2: Keeping Healthy</b>	<b>C2: Chemical Patterns</b>	<b>P2: Sustainable Energy</b>
<b>B3: Living Together</b>	<b>C3: Chemicals in the Natural Environment</b>	<b>P3: Electric Circuits</b>
<b>B4: Food and Growth</b>	<b>C4: Material Choices</b>	<b>P4: Explaining Motion</b>
<b>B5: Human Body</b>	<b>C5: Chemical Analysis</b>	<b>P5: Radioactive Materials</b>
<b>B6: Life on Earth</b>	<b>C6: Making Useful Chemicals.</b>	<b>P6: Matter</b>
<b>All units are underpinned with opportunities to undertake technical and practical scientific skills, and the development of proficient analysis of data</b>		

## Implementation

### KS4

Teachers primarily teach within their areas of specialism, and follow the syllabi available via the [OCR](#) website.

Resources are shared between department colleagues, with many resources stored within the department area of the [CRL](#).

KS4 pupils extensively (but not exclusively) use exam practice workbook(s) as their main method of homework. Work is marked and marks recorded regularly.

All pupils sit end of unit tests. These are made up of questions from previous exam papers and marked as per the mark scheme provided by the exam board.

Grades are allocated based on representative percentages against the most relevant grade boundaries provided by the exam board.

Grades are recorded on a department spreadsheet within our [CRL](#). This allows regular review of grades to assess pupil progress, and revisit setting of pupils if required.

## Pedagogy

### High Expectations and challenge

This starts with progressive and inclusive lesson objectives that set the tone for the lesson. This was a definite feature of the very best lessons observed (with LO's routinely re-visited). Provide choice from the outset in terms of inclusion, engagement and levels of challenge

### Time on activity

Aim to reduce teacher-speak to 10-15% and allow children to be 'doing' for 85-90% of the time. Appropriate organisation, explanation and demonstration are vital to making this a success. The carefully considered balance of practical tasks, discussion, feedback and writing worked very well in some of the observed lessons

### Check understanding / progression

Show what 'good' / 'outstanding' looks like through clear modelling / demonstration. Defined teaching points are necessary to check for understanding and show progress. These should be used for each topic or concept taught

Use mini-plenaries to check pupils' progress: do not wait until the end of the lesson to find out what pupils have or have not achieved

## Key factors:

- Rigorous monitoring and evaluation of performance, aligned with challenging target setting for individual pupils. The best departments focus strongly on improving the quality of teaching and learning, with staff within Science Departments planning together and sharing good practice
- Teaching is good / outstanding when teachers have a clear understanding of what knowledge, understanding and skills are to be developed; understand how development in scientific enquiry promotes effective learning; understand the relationship between concepts and the cognitive demand they make; and are clear about what pupils already know, understand and can do. The impact of good teaching is seen when pupils understand clearly the standards they have achieved; know what they need to do to improve and are involved in peer and self-evaluation; take part in decision-making, discussion, research and scientific enquiry; and are engaged in science that has relevance to their lives
- The Science Curriculum is typically outstanding in secondary schools when there is clear collaboration among teachers on planning for science and the effective sharing of good practice
- Key factors in promoting pupils' engagement, learning and progress are: more practical Science lessons, and the development of the skills of scientific enquiry
- The most engaging schemes of work in Science are those that provide scope for greater enrichment
- More rigorous monitoring and tracking provides a better basis for teachers to plan with individual pupils in mind. This development aligns with greater challenge for many pupils through more effective target setting.

## Marking & Feedback

### KEY STAGE 4

#### Year 10 Biology Workbooks (Separates)

- Detailed work completed to this point on: *B1 You and your Genes, B2 Keeping Healthy & B3 Food & Ecosystems*
- The workbooks complement the note books used in lessons – they provide a clear structure and enable pupils to accumulate excellent revision notes whilst practising exam-style tasks
- All workbooks viewed were tidy and organised. Some pupils in the sample have compiled excellent revision notes, also using flashcards to record key notes
- The most effective marking / formative feedback include demonstrations / modelling of exemplar responses and use of questions as very impressive features. One teacher in particular corrects or extends pupil answers superbly (exemplary practice), for example (including some previous examples);

*‘Eukaryotic cells have a membrane bound nucleus but prokaryotic cells...?’ – ‘If the parents test is negative there is no risk to the embryo’ – ‘Explain: What is active medication?’ – Other microbe populations compete with pathogens for resources. This limits their population growth’ – ‘This prevents oxygen getting in and ensures they respire anaerobically’ – ‘It attacks WBC’s making the sufferer vulnerable to further infections’-‘Change in a DNA code results in a different MRNA sequence. This codes for a different sequence of amino acids making an incorrect protein’*

- Some good evidence of challenge whereby pupils are prompted to develop answers or test themselves further:

*‘Explain how. This question is worth 3 marks and you have been given 5 lines to respond. You have only written 7 words and that is clearly not enough’ - ‘You have chosen to complete the three easiest questions in this section. Why not stretch yourself next time?’*

## Year 10 Biology Exercise Books (Separates)

- All books in the sample were neat and tidy (some exceptionally so) with evidently a lot of work completed over the course of Year 10 so far
- *GCSE Biology Progress Sheets* to record and track progress against target (*B1-B6 Test Grades & B1-B6 Workbook % - Year 10 exam grade – Comments*)
- Excellent teacher record keeping (detailed spreadsheet with precise assessment marks (5.33 etc), specific data re: key groups of pupils, pupil average attainment relative to FFT 20... )
- Excellent supporting resources, for example; *OCR (B) Biology GCSE: Topic Notes - Vaccine Action – Measuring under a Microscope – Using Monoclonal Antibodies – Where does the energy go? – Evidence of Photosynthesis – Immunity – Clinical Trials*
- Work presented in a variety of formats – illustrations, graphs, diagrams, calculations, extended or shorter writing, glued in images / worksheets, annotations and notes, tables / grids etc
- Excellent *Year 10 Exam Review* with a precise breakdown of marks on each topic and RAG rated analysis to inform *Next Steps*. Very good *Test Review* sheets for ongoing assessments including pupil self-evaluation comments (*‘Overall, I am happy with the result but feel that I could have done better if I was more specific and clear with my answers. I rushed the ending and did not check my answers too well’*). *Pupils clearly review their assessments in class and add corrections / amendments / improvements using green pen*
- Some very good formative marking with typically clear advice on how to improve, often through further questioning, for example;

*‘What is then graph showing us here? How could we improve the practical?’ – ‘Excellent effort on a challenging piece of work – You need to try to use your chemistry understanding of isotopes to this and apply in this context’ – ‘You need to explain how you know that they are effective or not. Refer to the zones of inhibition’ – ‘Consider what the graph is showing us. There seems to be a problem with your graph readings. What do you think went wrong?’ – ‘You have worked well to process the information. Try to link to the chemistry work on isotopes, it may help’ – ‘Make sure you can answer 5d. Lymphocytes make antibodies to match antigens or the pathogens’*

**Previous Examples:** *‘Excellent measuring – Make sure that you include all units – it is easier to convert mm to um’ – ‘Very good practical and graph – Consider if your heart rate should drop below the resting rate’ – ‘To improve: How does this structure help the plant to work well?’ – ‘Excellent graph work and data analysis – Think about how you would write a full conclusion for this work’ -*

- Some lovely comments to acknowledge effort and to offer encouragement, for example;

*‘Very good use of model answer. The use of cloned in the second paragraph is especially good’ – ‘Excellent score! It shows good revision and clear understanding’ – ‘Excellent work! The ethical Q5 was difficult but you will get better at it with more practice’*

### **Year 10 Chemistry Workbooks & Exercise Books (Separates)**

- Detailed work completed to this point on: *C2: Chemical Patterns & C3: Chemicals of the Natural Environment.*
- The workbooks complement the exercise books used in lessons – they provide a clear structure and enable pupils to accumulate excellent revision notes whilst practising exam-style tasks (*End of Unit / Lesson Quick Tests* – for example, *Greener Methods of Metal Extraction*. Very impressive worksheets are glued into exercise books for reference. *Module Review Sheets* are an excellent feature. Very good supporting resources in exercise books: for example, *Electrolysis of Solutions – Alkanes and Alkenes* -
- All workbooks viewed were tidy and organised. Some pupils in the sample have compiled excellent revision notes, also using flashcards to record key notes
- *Year 10 Target* and *GCSE Target* are prominently displayed in exercise books
- Some detailed and precise marking with demonstrations / modelling of exemplar responses a particularly impressive feature. The most effective marking in workbooks amends, corrects or develops pupil answers with modelled answers. Some examples of best practice marking:

*‘The polarity of the water molecule pulls the ions out of the crystal’ – ‘The ion is OH- and you do not need to show the changes in balanced equations, only in ionic ones’ – ‘Electrons move in shells. The volume of the shells determine the size of the atom’ –*

*'Group 7 gets less reactive as you go down the group so chlorine will displace astatine as it is more reactive than astatine' – 'Add: Unreactive and used as catalysts' – 'It is in period 3 so it has 3 electron shells in total' – 'It is in group 2 so has 2 outer shell electrons. It is in period 3 so has 3 electron shells. Therefore its electron configuration is 2.8.6' – 'The solution would change from colourless to green. The nickel would have a coating of lead' – Previous Examples: 'There is a strong electrostatic attraction between positive metal ions and negative electrons' – ' $12\text{Fr} + \text{P}_4 = 4\text{Fr}_3\text{P}$ '- 'The shared pairs are attracted to each nuclei'- 'The number of protons is the same as the number of electrons in an uncharged atom' - 'Atoms are neutral overall so there must have been positive charge to balance the negative charge of the electrons' – 'Properties follow a trend as molecule size increases' - 'They have molecular formulas that differ by  $\text{CH}_2$ ' – 'This must balance: so start with the full equation... Then focus on Al and Cu for ionic equations' – 'How does  $\text{CO}_2$  cause a temperature increase?' – 'Why can you extract iron but not aluminium with carbon?'- 'Note: Copper is stronger because more energy is required to overcome them so it melts and boils'*

- **Some modelled answers are developed in impressive detail, for example;**

*'The group number tells you the number of electrons in the outer shell, so magnesium has two electrons in its outer shell. The period number tells you how many electron shells there are, so magnesium has three shells. All shells, except the outer shell will be full, so electron structure must be 2.8.2'*

- **Good encouragement, praise and offers of further support: 'If you complete these three questions I will re-mark it'**

## Metals and Non-Metals

1 Metals make up about 80% of all the elements in the periodic table. Aluminium and magnesium are both metals. Grade 4-6

a) Describe where metals and non-metals can be found in the periodic table.

Metals: on the left ✓ (and middle)

Non-metals: right ✓

[1]

b) Which of the statements below is **true**? Place a tick (✓) in the box next to the correct answer.

Elements that react to form negative ions are metals.

Elements that react to form positive ions are metals.  ✓

Elements that react to form positive ions are non-metals.

Elements that do not form ions are metals.

[1]

c) Name **two** types of chemical bond that magnesium or aluminium could form.

ionic bond, metallic bond

[2]

d) Explain why magnesium and aluminium react in a similar way.

They both have three shells as they are in the third row on the periodic table. Both metals so want to lose electrons

[Total 6 marks]

2 Iron is a transition metal. It can react with sulfur, a non-metal, to form iron sulfide. Grade 6-7

a) Using your knowledge of typical metals and non-metals, compare the physical properties of iron and sulfur.

Iron is a solid and a conductor of heat and it is malleable and ductile where as sulfur is a insulator of electricity and it is very brittle. However it is also a solid.

b) Many transition elements can form coloured compounds.

Give **two** other properties that are specific to transition metals.

Good catalysts, form ions of different 'sizes'

[2]

c) Name **two** transition metals, other than iron.

gold, silver

[2]

[Total 8 marks]



$\frac{12}{22}$

64%

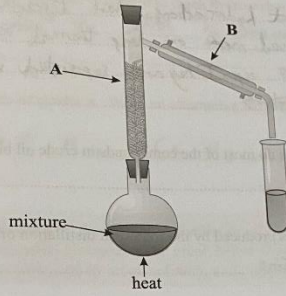
Good effort

# Fractional Distillation of Crude Oil

**PRACTICAL**

A student carries out an experiment to separate a crude oil substitute into different fractions. The student sets up the apparatus as shown in the diagram below.

Grade 6-7



a) Name the pieces of equipment labelled A and B.

i) A: Boiling tube ..... Fractionating column ..... [1] 0

ii) B: cooling system ..... condenser ..... [1] 0

b) State one way in which the equipment has been set up incorrectly, and explain how this could affect the results of the experiment.

The tube going to the collection tube is too low down. This may mean that multiple hydrocarbons are extracted. [2] 0

c) The student uses an electric heater to heat the mixture. Suggest one reason why the student chose not to use a Bunsen burner.

Because crude oil is flammable (some fractions) [1] 0

d) The student changes the collection tube each time the temperature has risen by 50 °C until she has collected four fractions. Explain what is meant by the term 'fraction' in this context.

Different hydrocarbons with a similar carbon chain length / boiling point. [1] 0

[Total 6 marks]

## Year 10 Physics Workbooks (Separates)

- Detailed work completed so far on: *P1 – Radiation & Waves & P3 Electrical Circuits*
- The workbooks typically complement the note books used in lessons – they provide a clear structure and enable pupils to accumulate excellent revision notes whilst practising exam-style tasks
- Most workbooks viewed were tidy and organised. Some pupils in the sample have compiled excellent revision notes. The quality and volume of completed work is impressive
- Photocopied exemplar responses glued in to workbooks as excellent revision resources, for example; *Wave Experiments – Ultrasound & SONAR – Seismic Waves* etc

Sample: *Answers to page 30:*

*1a - The electrons are earthed from the man to the ground travelling in the metal conductor*

*1b – Negatively charged*

*1c – Electrons rub off the cloth onto the rod*

*1d – She is correct as opposite charges repel and two negative charges will repel*

- Some very good formative marking, comments and modelling of exemplar responses / worked examples' for example;

*'Mention parallel to or perpendicular to' – 'Repeat x 3 and measure 5 data points' – 'Draw the normal line correctly: the angle of incidence = the angle of...?'* - *'How would he plot the graph? How many points would he check?'* – *'Use lattice model to describe in more detail'* – *'You need to talk about the balance between absorbed heat and emitted heat at both points'* – *'Write about in parallel – use the lattice model to explain this'* – *'Now mention the transfer of energy'*

- Precise marking on exam-style tasks, for example; 21 out of 25 etc - Pupils have clarity about attainment and progress
- Use of *Feedback Sheets* – see examples

## Year 10 Combined Science Workbooks

- Detailed work completed on: *B1 You & Your Genes, B2 Keeping Healthy, B4 Using Food and Controlling Growth – C3 Chemicals and Natural Environment - P1 Radiation & Waves & P2 Sustainable Energy*
- Good quality pupil work in the workbooks in the sample (both content and quality of written communication)
- Success criteria attached in some books / units to inform self-corrections / assessments
- Some very good formative marking, notably modelling of exemplar responses, worked examples and clear guidance on how to improve further, for example;

*'Too much sugar causes release of high levels of insulin. The body stops responding to insulin' – 'We cannot presume the same pattern for females' – 'Time how long it takes to for the pulse rate to drop to the resting rate' - 'The uneven spread makes it difficult to measure / calculate zones of inhibition' – 'Recall the definitions of each type to improve this answer' – 'This is a really good effort. Now make sure that you first write down what you know. Use the correct values (modelled examples)' – Remember: Ethanol and Carbon Dioxide are anaerobic due to lack of O<sub>2</sub>' –  $85+76+80 / 3 = 80.3\text{mm}^2$ ' – 'A risk factor is increasing the likelihood of developing a disease' – 'Develop your answer: It is unevenly spread making it difficult to calculate zones of inhibition' – 'The response to the first infection offers some protection against the new infection' - 'The stomach is not the gut. They compete for resources such as food and space. This limits the growth of pathogen populations'*

**Previous Examples:** *'To increase genetic variety. To produce haploid cells because these join to make a diploid cell at fertilisation' - 'Malaria is communicable. Your next step is to research how malaria is spread between humans' - 'Add: They compete for resources such as food and space. This reduces growth of pathogen populations' – 'Remember: The weakened form cannot replicate, or does so very slowly' – 'This reduces the reservoir of infection' – 'He had reached his maximal rate of O<sub>2</sub> consumption' – 'Mitochondria carries out aerobic respiration' – 'The cells downstream are starved of oxygen and glucose and therefore die' – To improve: How do you measure wavelength? Add this' - 'Frequency and wavelengths are attempted very well. Now show your workings and complete all questions'*

## Combined Science Workbooks – Sample of very good marking

A scientist carried out an investigation into the effects of two different antibiotics (A and B) on two different cultures of the bacteria *Staphylococcus aureus* (culture 1 and 2). The two different cultures were spread across two separate agar plates. Three paper discs were then placed on the surface of each plate: one soaked in antibiotic A, one soaked in antibiotic B and one control disc soaked in sterile water. The agar plates were then incubated for two days to allow the bacteria to grow. The diagram below shows the results of the experiment.

a) Suggest an explanation for the lack of a clear zone around antibiotic B in culture 2.  
 there is lack of clear zone around antibiotic B because the solution hasn't worked. The bacteria is resistant to this antibiotic.

b) Explain why the clear zone around antibiotic B in culture 1 is larger than the clear zone around antibiotic A in culture 1.  
 Because antibiotic B has reacted more against the bacteria.  
 Antibiotic B is more effective at killing this bacteria.

c) Culture 1 was spread on four different agar plates and retested with antibiotic A. The size of the clear zones around the antibiotic on each plate are shown in the table below.

Plate	1	2	3	4
Area of clear zone (mm <sup>2</sup> )	85	76	12	80

i) Calculate the mean size of the clear zone around antibiotic A for all four plates.  

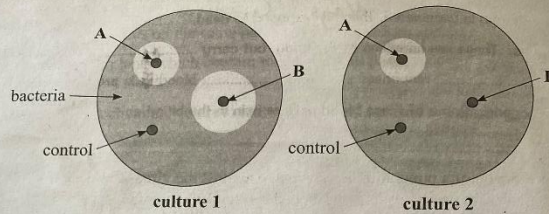
$$\frac{85 + 76 + 80}{3} = 80.3 \text{ mm}^2$$
  
 mean size of clear zone =  $63.25 \text{ mm}^2$   
 This is clearly an anomaly.

ii) Suggest an explanation for the result on plate 3.  
 it hasn't reacted as much as the others. Too little antibiotic was used.

[Total 7 marks]

## Combined Science Workbooks – Sample of very good marking

1 A scientist carried out an investigation on two different cultures of the bacteria *Staphylococcus aureus* (culture 1 and 2). The two different cultures were spread across two separate agar plates. Three paper discs were then placed on the surface of each plate: one soaked in antibiotic A, one soaked in antibiotic B and one control disc soaked in sterile water. The agar plates were then incubated for two days to allow the bacteria to grow. The diagram below shows the results of the experiment.



- a) Suggest an explanation for the lack of a clear zone around antibiotic B in culture 2.

~~Because~~ Because the two strains of bacteria are different B is ineffective on culture 2. (12)

- b) Explain why the clear zone around antibiotic B in culture 1 is larger than the clear zone around antibiotic A in culture 1. The clear area around

Antibiotic B is larger because it ~~reached~~ has reached differently. It is more effective at killing this bacteria. (12)

- c) Culture 1 was spread on four different agar plates and retested with antibiotic A. The size of the clear zones around the antibiotic on each plate are shown in the table below.

Plate	1	2	3	4
Area of clear zone (mm <sup>2</sup> )	85	76	12	80

- i) Calculate the mean size of the clear zone around antibiotic A for all four plates.

$$\frac{85+76+80}{3} = 80.3 \text{ mm}^2$$

This is clearly an anomaly.

mean size of clear zone =  $63.25 \text{ mm}^2$  (12)

- ii) Suggest an explanation for the result on plate 3.

Maybe Not enough ~~Antibiotic~~ Antibiotic was used (11)

[Total 7 marks]

Combined Science Workbooks – Sample of very good marking

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A child throws a stone into a pond. The stone creates ripples when it hits the water, which spread across the pond.

a) The ripples pass a leaf floating on the pond. State whether or not the leaf will be carried to the edge of the pond. Explain your answer.

The leaf will not reach the end of the pond, this is because ripples go up and down rather than going left to right / right to left. *- waves only transfer energy* [2]

b) The ripples have a wavelength of 15 mm. Given that their frequency is  $1.4 \times 10^4$  kHz. Calculate their speed in m/s. Show your working.

$15 \times 0.014 = 0.21$  mm  
 $0.015 \text{ m} \times 14 \text{ kHz} = 0.21 \text{ m/s}$   
 Speed =  $0.0021 \text{ m/s}$  [4]  
 [Total 6 marks]

A vibrating violin string produces a sound wave. A violinist is practising in a village hall. Her teacher sits at the back of the hall to listen.

a) State the medium the sound waves travel through to reach the teacher.

air [1]

b) The violinist plays a note with a frequency of 149 kHz. The sound waves travel at a speed of 340 m/s. Calculate the wavelength of the sound waves. Give your answer to two significant figures.

$340 \text{ m/s} \div 2490 = 0.1365$   
 Wavelength =  $0.14$  m [4]

c) The violinist then plays a note with a frequency of 220 Hz. The violinist plays this note for 5.0 seconds. Calculate how many complete waves are produced by the vibrating string in this time.

*wave speed*  
 $220 \times 5 = 1100$  Number of waves = 1100 [2]  
 [Total 7 marks]

**Exam Practice Tip**  
 You'll often be given a frequency in kHz, which stands for kilohertz. Don't let this put you off — just remember to convert it to Hz before using it in an equation. To convert it, you need to know that  $1000 \text{ Hz} = 1 \text{ kHz}$ .

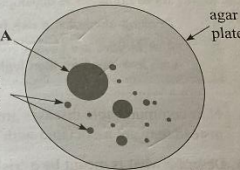
Chapter P1 — Radiation and Waves

2 An investigation is carried out to examine the effects of different antibiotics on a species of bacteria. A solution of agar is prepared and poured into a Petri dish. It is then left uncovered to dry.

Grade 6-7

- a) Once the agar is dry the plate is examined and found to be contaminated. There are several small bacterial colonies on the agar plate, as illustrated in the diagram below, which is shown at the actual size of the plate. Calculate the area of colony A in the diagram.

area =  $\pi r^2$   
 $\pi = 3.14$   
 $3.14 \times 5 \times 5 = 78.5 \text{ mm}^2$   
 $\pi = 3.14$   
 $\pi = 5 \text{ mm}$   
 $\pi = 25 \text{ mm}$   
 $78.53981634$



Area of colony A = 78.53981634 mm<sup>2</sup> (1) PT

Use  $\pi = 3.14$  not the pi button!

- b) A different agar plate is prepared for the experiment. Give **one** aseptic technique that should be used when preparing the new plate so that it doesn't become contaminated.

clean work space and lid opened very slightly (1) PT

- c) Once the new plate is ready, bacteria grown in a culture vial are spread over the surface of the agar using an inoculating loop. Give **two** aseptic techniques that should be used when spreading the bacteria.

keep the lid as closed as possible and  
heald near a fire and burn the loop to  
kill any other bacteria (2) PT

- d) The diagram on the right shows what the plate looked like after it had been incubated. Explain why it might be difficult to test the effects of different antibiotics on this plate of bacteria.

because all bacteria isn't  
spread evenly so it would have  
different results Difficult to  
calculate/measure any zones of  
inhibition (1) PT



[Total 7 marks]

**Exam Practice Tip**

When you're finding the area of a clear zone or of a bacterial colony, make sure that you're really careful with your measurements. Also make sure to write out all of your working — it'll be easier to check your work to see if you've made any silly mistakes and you might also pick up some marks for your working even if your final answer is wrong.

## Year 10 Combined Science Exercise Books / Folders

- All of the books in the sample were neat, tidy and well-organised – set formats (dates & headers etc)
- Year 10 and GCSE target grades prominently displayed on some key booklets and complemented by teacher comments: ‘Some good work. You just need to continue to develop your answers in detail to gain more marks and to show everything you know’ - ‘It is worth having a go at the exam questions at the end for practise answering this style of questioning’
- Excellent Test Review Sheets and End of Unit Assessment Forms

B2 – Keeping healthy – Test Review.

Name: SIVANA BILOU JOSEPH

Question No.	Topic.	Marks scored.	Total Marks available.	Success rate.	Next Steps.
1	Immune response	2	13	15%	Revise more. learn immunome response.
2	Bacteria resistance and healthy lifestyles	8	9	88%	-
3	Heart disease studies	7	8	88%	-
4	Antibody action	5	15	33%	Revise. Read & note clearly
5	New drugs and testing	0	12	0%	Study that part clearly, Study Drug taking. Run out of time.

Target Grade: 5m      B2 Test Grade: 3d      B2 Workbook

Key action points - self-evaluation  
 Read the questions clearly.  
 Revise more  
 Turn management  
 I was away for Drug taking

Teacher comment  
You have worked really well in class and are making good progress.  
I agree with your own evaluation

- Impressive amount of work completed over the course of Year 10 – work presented in a variety of formats with excellent supporting resources (for example, B2: Keeping Healthy: What Causes Disease? – Lifestyle Diseases – Treating Diseases – C2: Chemical Patterns - Edward Jenner – Aseptic Techniques – Extracting Metals – Getting Aluminium from its Ore – Reaction of Metals with Water – Microwave Heating – Electromagnetic Spectrum – Global Warming & Greenhouse Gases – The Structure of Our Earth – Resistance and the Length of a Wire – Investigating Magnets – Metallic Bonding - Properties of Metals – Dimitri Mendeleev – Noble Gases – Metals & Non-Metals – Ionic Bonding – Alkali Metals etc

- Very good revision quizzes / end of unit tests (*B2 Being Healthy Foundation End of Unit Test*). Some outstanding literacy support units (*Key Words and Definitions*) -
- Ongoing praise and encouragement is a notable feature of marking, for example;

*'You were absent for Paper One so when you have completed that we can look at your targets again' - 'Attempt the calculation. Even if you get it wrong you will learn from that' - 'Give yourself more credit to try new challenges as it will give you more confidence in science going forward' - 'Excellent practical work. Great sample oof Cu overleaf' - 'You are making progress in the right direction. Look at the positives'*

- Some very good formative marking, notably modelling of exemplar responses, clear guidance on how to improve further and references to target grades in exam / assessment feedback, for example;

*- 'Develop your answer: Less energy is needed to break the forces between the molecules' - 'Add this: right ventricle, artery to lungs, vein from lungs, left atrium, left ventricle, artery to body' - 'No malaria in the UK so sickle cell sufferers do not get the benefits, just the negative side of the illness' - 'To get more marks, explain how these cause a problem?' - 'Some good work on the research task. Just check over the gaps I have filled in to make sure that you understand them. 53% on the exam questions. Well done!' - 'They have a full outer shell so no need to gain or lose electrons' - 'Some good practical work but you need to add detail to the observations. Colour changes ash coatings...' - 'Why do you get hydrogen given off at the cathode with sodium chloride solution and not sodium?' - 'Excellent work. Now include the group numbers and the number of neutrons in the nucleus' - 'Your work is excellent. You have included a lot of detail in the practical notes. Could you draw a diagram of how light is refracted?' - 'Voltage and current is well explained. Very good practical skills too. Consider, how does a light dependent resistor work?' - 'Excellent diagrams of magnetic fields. Can you explain how a transformer works?' - 'A good understanding of current, voltage and electromagnets. Can you now add how a resistor works?' -*