

22 April 2024

Dear Parent/Carer,

Year 9 Science Examinations

I am writing to inform you that your son/ward will be taking science examinations during the week of 13 May. The examinations will cover all topics in biology, chemistry and physics that have been taught in Year 7, 8 and 9. A detailed revision list is contained on the next page and will also be put on INSIGHT for your son/ward along with some additional revision resources.

9A1/9A2/9A3		9D1/9D2/9D3	
Biology	Tuesday 14 May	Biology	Monday 13 May
Chemistry	Wednesday 15 May	Chemistry	Wednesday 15 May
Physics	Thursday 16 May	Physics	Friday 17 May

The examinations will take place during their science lesson, in their teaching room, so students are to head to class immediately, fully prepared with pen, pencil, ruler and calculator. This is to ensure that the examinations start on time.

The results of this examination will be used to determine any Year 10 GCSE sets, so it is essential that your son/ward spends time at home revising in preparation.

Your son/ward will require the following equipment for the examination, none will be provided on the day:

- Pen
- Pencil
- Ruler
- Rubber
- Calculator

A few revision tools that your son/ward can use to study are:

- CGP KS3 revision guide
- SAM learning
- <http://www.bbc.co.uk/education/levels/z98jmp3> - BBC Bitesize

Thank you for supporting your son/ward through this important period of time.

Yours faithfully,



Miss N Stead
Curriculum Leader Science / Assessment Year Group Lead

The end of KS3 exams will cover the key concepts that you have studied in biology, chemistry and physics during Year 7, 8 and 9. These concepts are essential for GCSE Science, so it is important that you revise them thoroughly.

You will sit three exams - biology, chemistry and physics. Each will last 1 hour. Questions on 'Working Scientifically' could come up on any of the exams.

Working Scientifically

TOPIC	WHAT YOU NEED TO BE ABLE TO DO...
Experimental Skills and Investigations	<ul style="list-style-type: none"> • Predict the outcome of an investigation. • Plan an experiment, including identifying suitable variables: <ul style="list-style-type: none"> ○ independent variable (the factor that you deliberately change or choose the values of). ○ dependent variable (the factor that changes each time you change the independent variable - you measure it). ○ control variables (factors you must keep the same each time to make the experiment a fair test - in a fair test only the independent variable affects the dependent variable, so any factors that could affect the dependent variable are kept the same). ○ Identify the hazards involved in an experiment and suggest ways of reducing these risks (e.g. wearing goggles, wearing gloves, wiping up spillages, not putting the chemical near a flame). • Identify suitable measuring instruments (e.g. thermometer, measuring cylinder, electronic balance, Newton meter, ruler, metre rule). • Record measurements using the correct unit (e.g. N, cm, g, °C). • Record measurements in a results table - independent variable in the left-hand column and dependent variable on the right. Columns must have a quantity (e.g. length) AND a unit (e.g. cm) in the heading.
Analysis and Evaluation	<ul style="list-style-type: none"> • Draw an appropriate graph or chart to represent data. Remember: <ul style="list-style-type: none"> ○ a bar chart is for categoric data (data that has word labels). ○ a line graph is for continuous data (data can have any number value within a range). ○ independent variable on the x-axis, dependent variable on the y-axis. ○ each axis should be labelled with the quantity AND unit. ○ each square should be worth the same amount so that your scale is even. ○ draw a line of best fit through the points on a line graph. Remember to use a sharp pencil and ignore any anomalous (odd) results. If the points are in a straight line use a ruler to draw a straight line of best fit, if the points are in a curve, draw a freehand curved line of best fit - DO NOT join the points dot-to-dot! • Interpret data and observations - identify patterns and draw conclusions to explain what the data show. • Evaluate the method used in an experiment - identify sources of error and explain how the method could be improved.

TOPIC	WHAT YOU NEED TO BE ABLE TO DO...
Microscopes and Cells	<ul style="list-style-type: none"> Name the parts of a microscope and describe how to use it. Identify and name the cell organelles (parts) e.g. nucleus and cell membrane. Explain the function (job) of each organelle. Describe the differences between plant and animal cells. Explain how the following cells are specialised for a particular function - sperm cell, egg cell, root hair cell, ciliated epithelial cell, red blood cell and nerve cell. Describe how substances pass in and out of cells.
Photo-synthesis	<ul style="list-style-type: none"> Describe what photosynthesis is and where it takes place. Write a word equation for the reaction that occurs during photosynthesis. Describe how a leaf is adapted for photosynthesis.
Food Chains and Webs	<ul style="list-style-type: none"> Use food chains and food webs to show how energy flows between different organisms in an ecosystem. Explain what will happen to the numbers of other organisms in a food chain or food web if the numbers of one organism increases or decreases. State the meaning of the term bioaccumulation and explain its impact.
Human Body	<ul style="list-style-type: none"> Name the food groups that make up a balanced diet and describe why we need each one. Name the parts of the digestive system and describe the function of each part. Explain the role of enzymes in digestion.
	<ul style="list-style-type: none"> Name the parts of the respiratory system and describe their functions. Describe what respiration is and where it takes place. Write a word equation for the reaction that occurs during respiration. Explain how breathing and respiration are different.
	<ul style="list-style-type: none"> Describe the changes that happen to boys and girls during puberty. Name the parts of the male and female reproductive system and describe their functions. Describe the stages of the menstrual cycle. State what fertilisation is and where it takes place. Describe how the developing foetus is protected, how it gets nutrients and oxygen and how it gets rid of waste products while it is in the uterus. Describe what happens to the uterus and cervix when the baby is born.
Microbes + Disease	<ul style="list-style-type: none"> Describe the differences between bacteria and viruses Describe how white blood cells prevent disease. Describe how vaccinations work.
Variation and Inheritance	<ul style="list-style-type: none"> Explain how variation can be inherited or caused by environmental factors. Explain the role of DNA/genes in inheritance. Describe how selective breeding can be used to change a plant or animal's characteristics. Describe how natural selection can cause changes to a plant or animal's characteristics.

TOPIC	WHAT YOU NEED TO BE ABLE TO DO...			
The Particle Model	<ul style="list-style-type: none"> List the properties of the three states of matter (solid, liquid, gas). Describe the arrangement, movement and forces between particles in each state (solid, liquid, gas). Describe what happens to the particles during changes of state (melting, freezing, boiling and condensing). State the meaning of the terms melting point and boiling point. Use melting and boiling point data to predict the state (solid, liquid, gas) a substance will be in at a given temperature. Use the particle model to explain the physical change dissolving. 			
Elements, Compounds and Mixtures	<ul style="list-style-type: none"> State what elements, compounds and mixtures are. Explain the differences between elements, compounds and mixtures in terms of the particles (atoms or molecules) they are made of. Identify elements, compounds and mixtures from particle diagrams. Name and describe the techniques used to separate mixtures (filtration, evaporation, separating funnel, distillation and chromatography). Choose an appropriate separation technique for a given mixture and explain how why it works. 			
Chemical Reactions	<ul style="list-style-type: none"> Explain how a chemical reaction is different to a physical change. List the observations that help us to identify a chemical reaction. Describe what happens in a chemical reaction in terms of atoms. Explain why mass is conserved in a chemical reaction in terms of atoms. Write word equations, use balanced symbol equations and draw particle diagrams for a given chemical reaction. State what happens in the following reactions: <table style="width: 100%; text-align: center; margin-top: 10px;"> <tr> <td style="width: 33%;">oxidation</td> <td style="width: 33%;">endothermic</td> <td style="width: 33%;">exothermic</td> </tr> </table> 	oxidation	endothermic	exothermic
oxidation	endothermic	exothermic		
Acids, Alkalis and pH	<ul style="list-style-type: none"> Identify whether a substance is a strong or weak acid, strong or weak alkali or neutral from its pH. State what an indicator is and recall the colour changes for universal indicator. Describe what happens and name the products of these reactions: <ul style="list-style-type: none"> ○ neutralisation (acid + alkali or acid + base) ○ acid + carbonate ○ acid + metal Name the salt made in a given acid reaction. 			
Reactivity Series	<ul style="list-style-type: none"> Use the reactivity series to explain why some metals react more vigorously than others. Describe what happens in a displacement reaction. Use the reactivity series to predict whether a displacement reaction will or won't happen. 			

TOPIC	WHAT YOU NEED TO BE ABLE TO DO...
Forces	<ul style="list-style-type: none"> • Identify the forces acting on an object (gravity, friction, air resistance, water resistance, upthrust, normal reaction, tension). • Use force arrows correctly to represent the size and direction a force acts in. • Name the measuring instrument used to measure forces. • Identify force pairs acting on an object and describe what will happen to the object (remain stationary, travel at a constant speed, accelerate, decelerate, change direction or change shape) if these forces are balanced or unbalanced. • Describe how friction can be increased or decreased. • Explain how streamlining can reduce air or water resistance. • Define mass and weight, give their units and explain how they are different. • Calculate the moment (turning effect) of a force, force and distance using the formula: $\text{moment} = \text{force} \times \text{perpendicular distance}$. • Determine what will happen to a 'see-saw' by comparing the clockwise and anti-clockwise moments.
Sound and Light	<ul style="list-style-type: none"> • Describe how sound travels. • Explain why we see lightning before we hear thunder. • Draw ray diagrams to show reflection and refraction. • Explain how we see colour.
Magnets	<ul style="list-style-type: none"> • Describe how magnets behave when two North poles, two South poles or a North and a South pole are placed together. • Explain how to tell the difference between a magnet and a magnetic material. • Draw a diagram to show the field lines around a magnet. • Explain how an electromagnet works.
Electrical Circuits	<ul style="list-style-type: none"> • Use the correct symbols to draw circuit diagrams. • Work out which components (e.g. a lamp or motor) will be on when different switches are opened and closed. • Identify series and parallel circuits and describe what will happen in each if one component (e.g. a bulb) breaks. • Compare the current in series and parallel circuits. • Compare the voltage in series and parallel circuits. • Explain what resistance is.
Speed	<ul style="list-style-type: none"> • Calculate speed, distance and time using the formula: $\text{speed} = \text{distance} / \text{time}$. • Use a distance-time graph to describe a journey (is the object stationary or travelling at a constant speed).