

Science: 10 Week Revision Plan

Date	Topic and actions			Practice Paper
	Biology	Chemistry	Physics	
Week 1: March 17 th 2020	<p><u>Paper 1 Cells</u></p> <p>During this week you need to revise parts of the cells and what each part does.</p> <p>The organelles are listed below:</p> <ul style="list-style-type: none"> • Nucleus – Controls the activity of the cell • Mitochondria – Releases energy, the site of aerobic respiration • Cell membrane – Allows substances to move into and out of the cell • Ribosomes – Makes proteins (protein synthesis) <p>You need to know the difference between a eukaryotic cell and a prokaryotic cell.</p> <p>Eukaryotic cell – This has a true nucleus – animal or plant cell</p> <p>Prokaryotic cell – A bacterial cell which does not have a nucleus.</p> <p>Task – Define the following words:</p> <ol style="list-style-type: none"> 1. Active transport 2. Osmosis 3. Diffusion <p>Challenge – Where do these take place?</p>	<p>During each week you should spend some time reviewing the previous weeks revision.</p> <p>Paper 2: Chapter 6 -Rates of Reaction. Key Questions:</p> <ol style="list-style-type: none"> 1. Name the 5 things that can speed up a reaction 2. Using the sentence ‘more frequent or successful collisions’, explain why they speed up reactions. 3. Write a method to investigate the rate of reaction with changing concentration. 4. Remember the equation to calculate rate: Change/ time 5. Higher only: describe how changes affect equilibrium 	<p>PAPER 1: Chapter 1 – Energy</p> <p>Memorise the following equations:</p> $\text{kinetic energy} = \frac{1}{2} \times \text{mass} \times \text{speed}^2$ <hr/> $\text{GPE} = \text{mass} \times \text{gravitational field strength} \times \text{height}$ <hr/> $\text{power} = \frac{\text{work done}}{\text{time taken}} = \frac{\text{energy transferred}}{\text{time taken}}$ <hr/> $\text{efficiency} = \frac{\text{useful energy output}}{\text{total energy input}}$ $\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$ <p>Answer these questions:</p> <ol style="list-style-type: none"> 1. What are the different energy stores? 2. What is the conservation of energy? 3. What does efficiency mean? 4. Define specific heat capacity. 5. What is a renewable energy source? 6. What is the biggest advantage of most renewable energy sources? 	<p>Use PhysicsandMathstutor.co.uk to complete practice questions on each topic.</p> <p>Ensure that you select AQA as the exam board.</p> <p>Speak to your teacher for more practice questions as required.</p>

<p>Week 2: March 23rd</p>	<p><u>Cell division – Paper 1</u></p> <p>Keywords:</p> <p>DNA – Double Helix made from 2 strands. It has 4 bases A, T, C & G.</p> <p>Chromosomes – You have 23 pairs, 46 in total.</p> <p>Mitosis – This is how normal body cells divide. Cells need to divide for growth and repair.</p> <p>Task – Learn the stages of mitosis.</p> <p>Answer the following questions:</p> <ol style="list-style-type: none"> 1) What is a stem cell? 2) Where do you find stem cells? 3) Why are stem cells good for treating disease? 4) What are the two types of stem cells? 5) Why do some people not agree with stem cell treatments? 	<p>Paper 2: Chapter 7 Hydrocarbons and crude oil.</p> <p>You need to learn the names/ formula and diagrams for the first 4 alkanes (methane, ethane, propane, butane)</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. What is a hydrocarbon? 2. Describe the process of fractional distillation of crude oil. 3. Name the different properties of long and short chain hydrocarbons. 4. What is the difference in complete and incomplete combustion of a hydrocarbon fuel? 5. Why do we carry out cracking? 6. How is cracking done? 	<p>PAPER 1: Chapter 2 – Electricity</p> <p>Memorise these equations:</p> <p>charge flow = current × time</p> <hr/> <p>potential difference = current × resistance</p> <hr/> <p>total resistance = resistance of component 1 + resistance of component 2</p> <hr/> <p>power = current × potential difference</p> <hr/> <p>power = (current)² × resistance</p> <hr/> <p>energy transferred = power × time</p> <hr/> <p>energy transferred = charge flow × potential difference</p> <hr/> <p>Answer these questions:</p> <ol style="list-style-type: none"> 1. How does current behave in a series circuit? 2. How does potential difference behave in a parallel circuit? 3. Draw circuit symbols for an LED, Diode, Thermistor, LDR, Cell, Battery and Fuse. 4. Draw the I-V characteristic graphs for a resistor, filament bulb and diode. 5. What is the National grid? 6. What is the role of transformers in the National grid? 	

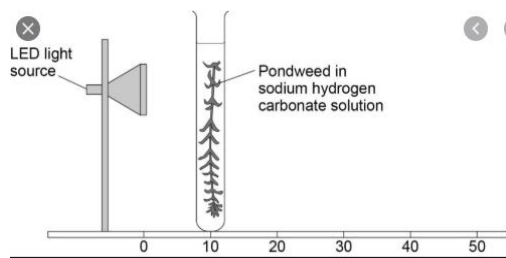
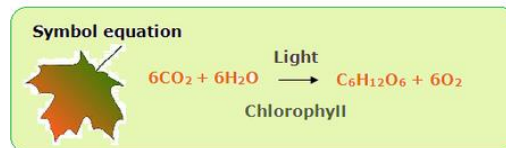
<p>Week 3: March 30th</p>	<p>Paper 1 – Organisation part 1</p> <p>You will need to revise the following areas:</p> <p>1 – The digestive system – Can you label it?</p> <p>2 – The heart – Can you label it?</p> <p>3 – Enzymes – Can you name all of the enzymes and what they do?</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. Can you describe the structure of an artery? 2. Can you describe the structure of a vein? 3. Can you describe the structure of a capillary? 4. What is the function of a valve? 5. What does it mean by double circulatory system? 6. Can you name the parts of the blood? 	<p>Paper 1: Chapter 1 Atomic Structure and the Periodic Table</p> <p>You will have a copy of the periodic table in your exam- make sure you know how to use it.</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. What is the difference between an element, a compound and a mixture? 2. Describe different ways of separating mixtures. 3. How has the model of the atom changed over time. 4. How is Mendeleev’s periodic table different to today’s table? 5. Why was Mendeleev’s table better than other scientists at that time? 6. Explain patterns in reactivity of Group 1 and Group 7. <p>TRIPLE ONLY</p> <ol style="list-style-type: none"> 1. Describe the properties of the transition elements. 	<p>PAPER 1: Chapter 3 – Particle model of matter</p> <p>Memorise this equation:</p> $\text{density} = \frac{\text{mass}}{\text{volume}}$ <p>Answer these questions:</p> <ol style="list-style-type: none"> 1. Describe how to calculate density using the displacement method. 2. Describe how a solid will change state into a liquid and then a gas. Ensure you refer to the kinetic energy and spacing of the particles. 3. Define the following key terms: Specific latent heat, sublimation, evaporation, freezing and condensation. 4. Describe the motion of gas particles. 5. Describe how a gas will create pressure on the walls of a container. 	
<p>Week 4: April 6th</p>	<p>Paper 1 – Organisation part 2</p> <p>Learn the parts of the plant:</p> <ul style="list-style-type: none"> • Waxy Cuticle • Upper epidermis 	<p>Paper 1 : Chapter 2 Bonding: Ionic and metallic Bonding involves the movement of outer shell electrons.</p> <p>Key Questions:</p>	<p>PAPER 1: Chapter 4 – Radioactivity</p> <p>There are no equations to memorise for this topic. Ensure you can still remember the equations above.</p>	

	<ul style="list-style-type: none"> • Palisade mesophyll • Spongy mesophyll • Guard cells • Stomata <p>Key Questions:</p> <ol style="list-style-type: none"> 1. Why is a leaf an organ? 2. What is the function of the stomata? 3. How is the spongy mesophyll adapted for its function? 4. What is the function of the phloem? 5. What is the function of the xylem? 	<ol style="list-style-type: none"> 1. How do you find the number of outer electrons in an element? 2. Draw ion diagrams using square brackets and charge for Sodium and Chlorine. 3. Describe the properties of any ionic compound (boiling point and conduction) 4. Explain why they have these properties 5. Draw a diagram to show metallic bonding with positive ions and delocalised electrons 6. Describe the properties of metals 7. Explain why metals have these properties by referring to bonding. 	<p>Answer these questions:</p> <ol style="list-style-type: none"> 1. Describe the current structure of the atom including relative mass and charges of each sub-atomic particle. 2. Describe how Rutherford's experiment led to his model of the atom. 3. What are the three types of radiation and what is their penetration power? 4. Define half-life and explain how you would calculate this from a decay graph. 5. Describe the difference between contamination and irradiation. 6. Triple only: Describe the process of Nuclear Fission and compare this to Nuclear Fusion. 	
<p>Week 5: April 13th</p>	<p>Paper 1 – Communicable and non-communicable disease.</p> <p>You need to know the following types of pathogens:</p> <ul style="list-style-type: none"> • Bacteria • Fungi • Virus • Protist <p>Bacteria = Salmonella & Gonorrhoea</p>	<p>Paper 1 Chapter 2 Bonding: Covalent and Giant covalent</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. What happens to the electrons in covalent bonding? 2. What type of elements are involved in covalent bonding? 3. Draw a diagram to show the bonding in HCl, Cl₂ and O₂ 	<p>PAPER 2: Chapter 5 – Forces</p> <p>Memorise these equations:</p>	

<p>Virus =</p> <p>HIV, Measles & TMV</p> <p>Fungal =</p> <p>Athletes foot Rose black spot</p> <p>Protist =</p> <p>Malaria</p> <p>You need to learn the symptoms of all diseases.</p> <p>Drug treatments –</p> <p>You need to revise the stages of clinical trials:</p> <ol style="list-style-type: none"> 1. Testing on healthy cells and tissues 2. Testing on small animals 3. Testing on healthy volunteers 4. Testing on volunteers with the disease <p>Key Questions</p> <ol style="list-style-type: none"> 1. What is a placebo? 2. What is a double-blind trial? 3. Why do we test new drugs? 4. What is a vaccination? 5. How does your body prevent you against disease? <p>TRIPLE – Explain what monoclonal antibodies are?</p>	<ol style="list-style-type: none"> 4. Describe and explain the properties of small covalent molecules. 5. What element is in graphite and diamond? 6. Why does graphite conduct electricity? 7. Why is diamond hard and strong? <p>TRIPLE ONLY</p> <p>What is a nano particle?</p>	<p>$weight = mass \times gravitational\ field\ strength$</p> <hr/> <p>$work\ done = force \times distance$ (moved along the line of action of the force)</p> <hr/> <p>$force = spring\ constant \times extension$</p> <hr/> <p>$moment\ of\ a\ force = force \times distance$ (perpendicular to the direction of the force)</p> <hr/> <p>$pressure = \frac{force\ normal\ to\ a\ surface}{area\ of\ that\ surface}$</p> <hr/> <p>$distance\ travelled = speed \times time$</p> <hr/> <p>$acceleration = \frac{change\ in\ velocity}{time\ taken}$</p> <p>$= \frac{final\ velocity - initial\ velocity}{time\ taken}$</p> <hr/> <p>$resultant\ force = mass \times acceleration$</p> <hr/> <p>* $momentum = mass \times velocity$</p> <p>Answer the following questions:</p> <ol style="list-style-type: none"> 1. Define Newton's first, second and third laws. 2. Draw a velocity time graph and label what each section shows. 3. Define the resultant force. 4. Explain what is meant by thinking, braking and stopping distance. Explain what factors can affect each one. 5. Define the conservation of momentum. 	
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Week 6:
April 20th

Paper 1 – Photosynthesis and Respiration



Questions associated with the practical:

- 1) Why use an LED light?
- 2) What are the three limiting factors of photosynthesis?
- 3) What gas is being produced in the experiment?
- 4) How do you make the experiment more accurate?
- 5) What should you control in the experiment?

Respiration:

Paper 1 Chapter 3

Formula mass is the total of the masses from the periodic table of all the elements in the formula.

It is the larger number on the periodic table.

Learn these equations:

$$\text{Concentration} = \frac{\text{mass}}{\text{Volume}}$$

HIGHER ONLY:

$$\text{Number of moles} = \frac{\text{mass/g}}{\text{Formula mass}}$$

Key Questions:

1. What is an isotope?
2. How do you convert volumes from cm^3 to dm^3 ?
3. What is the formula mass of NaCl?
Higher only:
Practice reacting mass questions from the revision guide.
TRIPLE ONLY

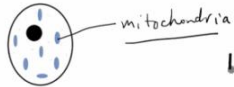
PAPER 2: Chapter 6 – Waves

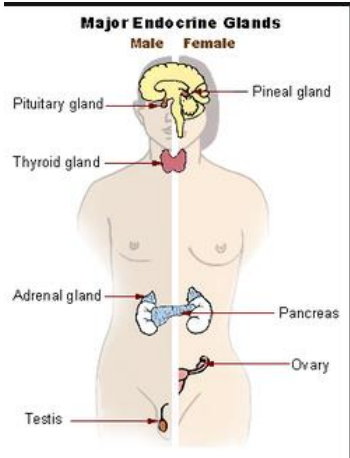
Memorise the following equation:

$$\text{wave speed} = \text{frequency} \times \text{wavelength}$$

Answer these questions:

1. Write a definition for a transverse wave.
2. Write a definition for a longitudinal wave.
3. Write out the electromagnetic spectrum in order and label the uses of each one.
4. Which three parts of the electromagnetic spectrum can be described as ionising?
5. What is refraction and what two things change when a ray is refracted?
6. **Triple only:** Define ultrasound and describe its uses.
7. **Triple only:** Check you can draw ray diagrams for lenses.

	<p style="text-align: center;">Aerobic Respiration</p> <p>Glucose + Oxygen → Carbon Dioxide + Water + Energy</p> <p>$C_6H_{12}O_6 + 6O_2 \longrightarrow 6CO_2 + 6H_2O + \text{Energy}$</p>  <p>In anaerobic respiration, only glycolysis occurs, so only 2 ATP are made</p> <p><u>In animals</u> Glucose → Lactic Acid</p> <p><u>In plants & fungi</u> Glucose → Ethanol + Carbon Dioxide</p>	<p>How do you calculate atom economy and percentage yield?</p>		
<p>Week 7: April 27th 2020</p>	<p>Paper 2 – Homeostasis</p> <p>Revise the reflex arc:</p> <p>Stimulus → Receptor → CNS → Effector → Response</p> <p>TRIPLE -Revise the structure of the eye and the structure of the brain.</p> <p>Learn the hormones which are involved in the endocrine system:</p> <ul style="list-style-type: none"> • ADH • FSH • Oestrogen • Adrenaline • Thyroxine <p>Learn what each of the hormones do and where they are found within the body.</p>	<p>Paper 1 Chapter 4- Acid reactions</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. What ion makes a substance an acid? 2. Learn the names and formula of the 3 common acids. 3. What is the difference between strong and weak acids? 4. What is produced when acids react with metals? 5. What is produced when acids react with alkalis and bases? 6. How do you name the salts produced? 	<p>PAPER 2: Chapter 7 – Electromagnetism</p> <p>There are no equations that need to be memorised for this topic however you do need to be confident in using this one, which is given.</p> <p>Answer these questions:</p> <ol style="list-style-type: none"> 1. What is permanent magnet? 2. What is an induced magnet? 3. Describe how you would find the magnetic field lines of a bar magnet using a plotting compass. 4. Where is the magnetic field strongest on a bar magnet? 5. What are the main advantages of using an electromagnet? 	

	<p>Revise:</p> <ul style="list-style-type: none"> • Methods of contraception both hormonal and barrier methods. • Evaluate the advantages and disadvantages of each method.  <p>ENDOCRINE SYSTEM</p>	<p>TRIPLE ONLY</p> <ol style="list-style-type: none"> 1. How do you carry out a titration? TRIPLE HIGHER Practice calculating concentrations from titration values. 	<ol style="list-style-type: none"> 6. Higher and Triple: Draw a diagram for Fleming's left hand rule and label what each finger represents. 7. Triple only: Write the equation for calculating potential difference in primary and secondary coils for a transformer. Practice this using BBC Bitesize. 	
<p>Week 8: May 4th 2020</p>	<p>Paper 2 – Reduction</p> <p>Revise the difference between mitosis and meiosis.</p> <p>You should be able to compare sexual reproduction to A-sexual reduction.</p> <p>You need to revise the different genetic diseases:</p>	<p>Paper 1 Chapter 4- Metals, Reactivity and Electrolysis Key Questions:</p> <ol style="list-style-type: none"> 1. Why can some metals be extracted using carbon? 2. How are more reactive metals extracted? 3. Describe the method of electrolysis. 	<p>PAPER 2: Chapter 8 – Space (Triple Only) Combined to answer the summary questions below.</p> <p>There are no equations that you need to memorise for this topic.</p> <p>Triple Questions:</p> <ol style="list-style-type: none"> 1. Define the following terms: Solar system, galaxy, 	

	<p>Cystic fibrosis and Polydactyl</p> <p>Remember: CF is a recessive condition and you need two copies of the gene.</p> <p>Polydactyl is a dominant condition which means you need one copy of the gene to get the disease.</p> <p>Answer the following questions:</p> <ol style="list-style-type: none"> 1) What is sexual reproduction 2) What is the difference between mitosis and meiosis? 3) Describe selective breeding 4) What is genetic engineering? 5) Describe the structure of DNA 	<ol style="list-style-type: none"> 4. Why does the ionic compound have to be melted first? 5. Explain why the ionic compound splits up when you use electrolysis. 6. What happens at each of the electrodes? <p>HIGHER</p> <ol style="list-style-type: none"> 1. What are the rules for working out the products of electrolysis of solutions? 	<p>universe, satellite, star, planet and moon.</p> <ol style="list-style-type: none"> 2. Draw and label the lifecycle of a star the same size as our sun. 3. Draw and label the lifecycle of a star bigger than our star. 4. Describe how nuclear fusion occurs in a star. 5. Describe how elements larger than Iron are formed. 6. Define redshift and the two things it tells us about a distant galaxy. <p>Combined Science:</p> <ol style="list-style-type: none"> 1. What is work done and what is its unit? 2. Describe how a solid is different to a liquid 3. What does directly proportional look like on a graph? 4. Define the following terms: Resolution of a measuring instrument, zero error, systematic error, random error, and anomalous result. 5. Define terminal velocity. 6. Draw free-body force diagrams for the following situations: A car accelerating, decelerating, travelling at constant speed and stationary. 	
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<p>Week 9: May 11th 2020</p>	<p>Paper 2 – Evolution</p> <p>You need to revise the classification system:</p> <p>Kingdom Phylum Class Order Family Genus Species</p> <p>Question:</p> <ol style="list-style-type: none"> 1) What is the binomial naming system? 2) How is the binomial naming system different to the three-domain system? 3) What is evolution? 4) Who invented the theory of evolution by natural selection? 5) What is a mutation? 6) What does the term extinction mean? 7) What is a fossil? 8) How do fossil forms? 	<p>Paper 1 Chapter 5- Energy Changes</p> <p>Key Questions:</p> <ol style="list-style-type: none"> 1. What is an exothermic reaction? 2. What piece of equipment can you use to tell if a reaction is exothermic? 3. Where is an exothermic reaction useful? 4. What is an endothermic reaction? 5. Where is an endothermic reaction useful? 6. Draw an energy level diagram for an exothermic reaction. 7. Draw an energy level diagram for an endothermic reaction. <p>HIGHER ONLY: Use bond energies to calculate the overall energy change.</p> <p>TRIPLE: How does a chemical cell work? What factors affect the voltage in a chemical cell? How do Hydrogen fuel cells work?</p>	<p>Check you have memorised all equations. Practice your weakest topics using resources from PhysicsandMathstutor.com. Make sure you select AQA as the exam board.</p>	
<p>Week 10: May 18th 2020</p>	<p>Paper 2 – Ecosystems</p> <p>You need to revise:</p> <p>Food chains Pyramids of biomass</p>	<p>Go back over the required practicals for Paper 1</p> <ol style="list-style-type: none"> 1. Making a soluble salt 2. Electrolysis of solutions 	<p>Revise all topics.</p> <p>Check you have memorised all equations. Practice your weakest topics using resources from</p>	

	<p>The carbon cycle Decomposition</p> <p>Key questions:</p> <ol style="list-style-type: none"> 1) What is a predator? 2) What is prey? 3) Define the term herbivore. 4) Define the term carnivore 5) What is an abiotic factor? 6) What is a biotic factor? 	<p>3. Energy transferred in a chemical reaction.</p> <p>TRIPLE EXTRA REQUIRED PRACTICALS.</p> <p>1. Neutralisation (Titration)</p> <p>Revise all topics Practice past papers from physics and maths tutor or AQA website.</p>	<p>PhysicsandMathstutor.com. Make sure you select AQA as the exam board.</p>	

Useful Websites:

www.senecalearning.com

www.aqa.org.uk – All past paper materials can be found here. You are either doing Trilogy combined science or Triple.