The Academy
at Shotton Hall

Y11 SUBJECT SUPPORT

2025 Examinations

ART

Course Overview:

2 components, each marked out of 96 across 4 Assessment Objectives

AO1 /24 – Research & Contextualisation
AO2 /24 – Materials, techniques & processes
AO3 /24 – Recording of Ideas
AO4 /24 – Outcome(s)

Weightings:

Component 1 (Coursework) = **60%** Component 2 (Exam) = **40%**

The 'BIG HITTERS'

Research pages MUST show **analysis**. Discuss the visual elements present in the work, the context surrounding the work made, how it was created and form your own opinions about it.

Development of ideas is very important. It's not enough to simply 'decide' on an idea. You must develop it through sampling, testing and trialling. Errors and mistakes are important – you learn from these and they help you make decisions.

Top Tips for SUCCESS

- **Attend** all lessons
- Play to your **strengths** – use materials you are **confident** in using
- Complete as much preparation as possible before the exam
- **Annotate all designs and ideas –** your insights and decisions are very important!
- Present everything carefully – how you lay work out and present it is very important.

How to support your child in Art:

Ask them about their portfolio. Ask why they have selected the artists and made the decisions they have. Your child should be able to talk you through their portfolio as it is a personal journey. 'I don't know' should not be a response.

Decisions and ideas should be evidenced in notes and annotations – check they are throughout.

Useful Websites:

- BBC Bitesize – Art and Design https://www.bbc.co.uk/bitesize/subjects/z8tnvcw
- Student Art Guide www.studentartguide.com

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

CITIZEN

Course Overview:

2 exam papers, each marked out of 80 across 3 Assessment Objectives

AO1/15: Demonstrate knowledge and understanding of citizenship concepts, terms, and issues.
AO2/15: Apply knowledge and understanding of citizenship concepts, terms and issues to
•contexts and actions.
AO3/20: Analyse and evaluate a range of evidence relating to citizenship issues, debates and
•actions, including different viewpoints, to develop reasoned, coherent arguments and make substantiated judgements.

Weightings:

Paper 1 – 50% Paper 2 – 50%

The 'BIG HITTERS'

- Source based questions – Answers will not be found within the source, but they will support the structure of your answer. Application of knowledge to the information given
- Extended answers – Develop a case, review evidence and draw conclusions
- Active Citizenship – Your own citizenship investigation – planning and critically reflection.

Top Tips for SUCCESS

- Attend all lessons
- Attend Teams revision sessions
- Be aware of current issues in the media
- Use case studies (real life examples) to support your answers
- Practice past exam questions
- Use your revision packs

Key Dates

Paper 1: 8th May
Paper 2: 15th May

How to support your child in Citizenship:

Ask them about their revision packs – 4 in total for each section of the exam. Your child should be able to talk through key words and their meanings, different case studies and current issues (locally and nationally) in the media in relation to Life in Modern Britain, Politics and Participation and Rights and Responsibilities.
Check they can apply knowledge from their revision packs to past exam questions. These can be self-assessed using the mark schemes.

Useful Websites:

https://www.primrosekitten.com/pages/aqa-gcse-citizenship
https://studyrocket.co.uk/revision/gcse-citizenship-studies-aqa

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**



Course Overview:

CRAFTS

AO1 – Recall knowledge and show understanding
AO2 – Apply knowledge and understanding
AO3 – Analyse and evaluate knowledge and understanding
AO4 – Demonstrate and apply relevant technical skills, techniques and processes
AO5 – Analyse and evaluate the demonstration of relevant skills, techniques and processes.

Weightings:

Non-exam assessment (NEA) - 60% Examined assessment (EA) - 40%

The 'BIG HITTERS'

Research pages MUST show **analysis**. Discuss the visual elements present in the work, the context surrounding the work made, how it was created and form your own opinions about it.

Development of ideas is very important. It's not enough to simply 'decide' on an idea. You must develop it through sampling, testing and trialling. Errors and mistakes are important – you learn from these and they help you make decisions.

Top Tips for SUCCESS

- **Attend** all lessons
- Play to your **strengths** – use materials you are **confident** in using
- Complete as much preparation as possible before the exam
- **Annotate all designs and ideas –** your insights and decisions are very important!
- Present everything carefully – how you lay work out and present it is very important.

How to support your child in Creative Crafts:

Ask them about their portfolio. Ask why they have selected the art movement and made the decisions they have. Your child should be able to talk you through their portfolio as it is a personal journey. 'I don't know' should not be a response. Encourage primary research.

Decisions and ideas should be evidenced in notes and annotations – check they are throughout.

Useful Websites:

www.vam.ac.uk/page/d/design-styles/
www.designmuseum.org/design
www.detail-online.com/magazine/material-aesthetics-33530/
www.sciencelearn.org.nz/resources/2659-properties-of-materials-introduction

Recommended Resources / Revision Techniques

Student POD

Knowledge Organisers

Revision Guides

Flashcards

Comp Sci

Course Overview:

2 written exam papers, 80 marks each.

Paper 1 covers 6 computer systems topics:

- 1.1 Systems architecture, 1.2 Memory and storage, 1.3 Computer networks, connections and protocols, 1.4 Network security, 1.5 Systems software and 1.6 Ethical, legal, cultural and environmental impacts of digital technology.

Paper 2 covers 5 Computational thinking, algorithms and programming topics:

- 2.1 Algorithms, 2.2 Programming fundamentals, 2.3 Producing robust programs, 2.4 Boolean logic and 2.5 Programming languages and Integrated Development Environments.

Weightings: Paper 1 = 50%, Paper 2 = 50%.

OCR GCSE Computer Science (9-1) - J277.

The 'BIG HITTERS'

Paper 1 essay question: This is worth 8 marks (10% of paper). Be sure to include:

- At least 2 positives and 2 negatives for each stakeholder/bullet given in the question.
- Use BLT (because, leading to, therefore) to ensure each point made is explained including the impact.

Paper 2 algorithm questions:

- Answer in Python
- Leave blank room at top of answer for a loop as usually mentioned at end of question
- Tick each bullet to make sure included
- Even if don't know all, at least do inputs and outputs!

Top Tips for SUCCESS

- Remember all paper 1 & 2 definitions!
- Use technical language throughout
- Always the word **data** and **NOT information**
- Have verbal explosion for explain & describe questions write everything known about key topic words in questions
- Include context in answers e.g. if the question asks why secondary storage is needed for videos, answer should include the word videos
- Read BBC technology articles
- Always check the number of marks and make the same number of points/linked comments are in answer.
- Answer all questions, guess if needed!

How to support your child in Computer Science:

- Test them on definitions to check they can recall them exactly
- Encourage reading of BBC technology news articles to support in answering the essay question
- Discuss technology news and what the ethical, legal, cultural and environmental impacts are of it, for example use of artificial intelligence, driverless cars, data security, 2 factor authentication, the digital divide
- Encourage practicing Python using sites such as https://www.codingame.com/start.

Useful Websites:

- https://www.youtube.com/playlist?list=PLDO5nbrV0BKK6YtBzPPkTk7yBSxUBs0t6
- https://www.memrise.com/course/1427644/j276-gcse-computer-science-glossary/
- https://student.craigndave.org/
- https://www.cambridgegcsecomputing.org/register-as-a-learner
- https://www.bbc.com/bitesize/subjects/z34k7ty

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

DANCE

Course Overview:

The BTEC course is 3 units with 2 internally assessed units and 1 externally assessed unit.

Unit 1 Exploring Performing Arts
Unit 2 Developing skills and techniques
Unit 3 Responding to a brief

Students have already completed Units 1 and 2

The deadline for Unit 3 is May 15th.

The 'BIG HITTERS'

Analysis of the requirements of the brief. This must show detailed understanding

Creating practical work must be evidenced through video recording and log-books

Top Tips for SUCCESS

Attendance is crucial as they are creating and performing as part of a group.

Time management in the controlled write up is important

Detailed notes can be taken in so take time to prepare these

How to support your child in Dance:

Encourage them to share their creative ideas with you. Ask them to show you the work they are creating

Encourage them to write up their log-books as this will be a homework task

Encourage them to attend all lessons with appropriate kit

Useful Websites:

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**

DRAMA

Course Overview:

Eduqas GCSE Drama course is broken into three components:

Devising Theatre - Students to create and perform their own drama piece based on a range of stimulus given by exam board. Supporting evidence to be completed and written evaluation done in exam conditions.

Performing from a Text - Students to learn and perform 2 extracts from a play chosen by their teacher. This is performed to a visiting examiner from EDUQAS.

Interpreting Theatre – Written exam based on a set text and a Live Theatre Evaluation.

Weightings:

Component 1: Devising Theatre (40%)
Component 2: Performing from a Text (20%)
Component 3: Interpreting Theatre (40%)

The 'BIG HITTERS'

- You must learn your lines from Blood Brothers for the practical examination.
- You will always have two longer questions on ILYM. One on performance and the other on design – remember this can be on any character and any element of design (use the Knowledge Organisers for help!)
- The LTE will have two choices and one question to answer – prepare both and choose the best one on the day.
- Learn the **MRDJ** and **WACM** structures to support your written answers.

Top Tips for SUCCESS

- Remember to be **detailed** and **precise** in your written responses
- Know the original staging conditions of ILYM and have notes on how you would stage each extract.
- Learn your lines for Blood Brothers – remember that your scenes must show a contrast in your character.
- Practise analysing how actors would perform different lines using **MRDJ**.
- Practise the LTE under timed conditions.

How to support your child in Drama:

- Practise rehearsing scenes from Blood Brothers, students must perform completely off script.
- Choose a line from their set text, *I Love You Mum – I Promise I Won't Die*, and ask students to describe how they would perform this line both physically and vocally. Test from the KO.
- Ask them to describe the acting, set design, costume, lighting and sound design from *Dear Evan Hansen*, ask them to describe why this was effective in communicating the story.

Useful Websites:

- BBC Bitesize Drama - GCSE Drama - Eduqas - BBC Bitesize
- 11C/Dr1 Teams Page – all lessons, resources, KO, and WAGOLLS available
- Eduqas ILYM Resource - https://resource.download.wjec.co.uk/vtc/2021-22/wjec21-22_1-2/pdf/i-love-you-mum-i-promise-i-won%27t-die.pdf

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

Course Overview:

Weightings:

ENGIN

Engineering Design Level 1/2 – J822 (OCR - 603/7086/5)

Exam – 40% of total mark

- R038 Principles of engineering design (exam - R/618/5829) - made up of four units
    - Topic Area 1: Designing processes
    - Topic Area 2: Design requirements
    - Topic Area 3: Communicating design outcomes
    - Topic Area 4: Evaluating design ideas

NEA (coursework) units – 60 % of total mark

- R039 Communicating designs (NEA - J/618/5830)
- R040 Design evaluation and modelling (NEA - L/618/5831)

The 'BIG HITTERS'

Section A Exam R038 (10 marks)

Multiple choice

- Units 3: drawing styles, terminology and symbols used in working drawings.

Section B Exam R038 (60 marks)

Short and long based questions

- Unit 1 – What is a design brief and design specification? Why are they used? What should/could they contain? Could you analyse or construct one?
- Units 3: drawing styles, terminology/symbols used in working drawings. Completing a partially started working drawing or adding missing features.

Top Tips for SUCCESS

- Do not cram!
- Get your family and friends involved – give them the knowledge organisers to test you.
- Practice working drawing tasks and memorize the symbols and terminology used (Standard conventions in BS 8888)
- Practice longer mark questions relating to environmental issues, circular economy and planned obsolescence.
- Analyse and explain the ergonomic features of a product including relevant anthropometric data.

How to support your child in Engineering:

Exam: Printed copies of knowledge organisers will be given to students for each of the 4 units for R038. Help them revise by asking questions on a topic on a regular basis. This will improve their recall knowledge.

NEA: Help them proofread coursework. All assignments are on Teams. The mark scheme is attached to the assignment for self-assessment purposes. Ask them what grade they think they would achieve.

Useful Websites:

- **OCR Engineering Design J822 -** Cambridge Nationals - Engineering Design Level 1/Level 2 - J822 - OCR
- TECHNICAL DRAWING (technologystudent.com) - very useful for R038 Unit 3 of R038

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

WJEC Hospitality and Catering Level 2

Course Overview:

Unit 1 The hospitality and catering industry External exam

Unit 2 Hospitality and catering in action Internal NEA coursework

Weightings: Component 1 (Coursework) = **60%** (Exam) = **40%**

The 'BIG HITTERS':

NEA portfolio: Students need to ensure that their NEA portfolio is completed in every area to allow them to reach the higher mark bands. Ensure they have linked the target audience and dishes to each section.

Extended written responses: Try and include as many links and examples as possible. Follow 'PEE' and annotation station with questions over 6 marks.

Top Tips for SUCCESS:

Ensure you have **completed** every section in the NEA with at least 1 example linked to each customer.
Use the **annotation** station help sheet when completing extended written responses.
Understand the terminology and commands used within the question paper.
Proofread all NEA work before submission.
Follow feedback and assessment criteria

How to support your child in Hospitality and Catering:

Proofread their NEA Mock work on OneDrive and offer advice .

Ask them which topics they are studying and to explain the advantages and disadvantages to the customer and establishment.

Ask if they can recall key terminology linked to past examination questions using their knowledge organisers.

Useful Websites: WJEC

Specification https://www.wjec.co.uk/media/ukvevv1a/wjec_l1-2-vocaward-hospitality_and_catering_spec-e_11-09-2023-1.pdf

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

GEOG

Course Overview: Three formal examinations.(Sit U1 and U2 for Spring Mock)

Paper 1: Living with the physical environment

What's assessed- 3.1.1 The challenge of natural hazards, 3.1.2 The living world, 3.1.3 Physical landscapes in the UK, 3.4 Geographical skills

How it's assessed-Written exam: 1 hour 30 minutes, 88 marks (including 3 marks for spelling, punctuation, grammar and specialist terminology (SPaG)), 35% of GCSE

Questions - Section A: answer all questions (33 marks), Section B: answer all questions (25 marks), Section C: answer any two questions from questions 3, 4 and 5 (30 marks), Question types: multiple-choice, short answer, levels of response, extended prose

Paper 2: Challenges in the human environment

What's assessed- 3.2.1 Urban issues and challenges, 3.2.2 The changing economic world, 3.2.3 The challenge of resource management, 3.4 Geographical skills

How it's assessed- Written exam: 1 hour 30 minutes, 88 marks (including 3 marks for SPaG), 35% of GCSE

Questions -Section A: answer all questions (33 marks), Section B: answer all questions (30 marks), Section C: answer question 3 and one from questions 4, 5 or 6 (25 marks)m, Question types: multiple-choice, short answer, levels of response, extended prose

Paper 3: Geographical applications

What's assessed 3.3.1 Issue evaluation, 3.3.2 Fieldwork, 3.4 Geographical skills

How it's assessed- Written exam: 1 hour 30 minutes, 76 marks (including 6 marks for SPaG), 30% of GCSE, Pre-release resources booklet made available 12 weeks before Paper 3 exam

Questions - Section A: answer all questions (37 marks), Section B: answer all questions (39 marks), Question types: multiple-choice, short answer, levels of response, extended pros

Top Tips for SUCCESS

- Make sure you answer the correct questions (read instruction carefully)
- Attempt all questions
- When a figure is provided always refer to it 'As shown in figure 1'
- Check you do not miss out questions referring to completing graphs
- Complete all graphical techniques in pencil
- Make sure you know example and case study facts and figures
- Remember the structure for 9 mark questions – Intro + 2/3 PEEL + Conclusion
- Learn your command words
- BUG the question to ensure you interpret it correctly – Box the command word, underline key terms and glance at the marks available.
- Use TEA to help describe graphs – Trend, Examples and Anomalies

How to support your child in Geography:

To support revision ask recall questions (this will be emailed to you with answers)
Ensure your child has access to POD or a revision guide.
Encourage pupils to practice exam papers online where mark schemes are available.AQA | GCSE | Geography | Assessment resources
Encourage your child to attend Friday after-school intervention session.

Useful Websites:

GCSE Geography - AQA - BBC Bitesize

Kerboodle - Sign In (Username – first initial+surname, Password - first initial+surname, Institution code - siq2

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**

H&S

Course Overview:

3 components across 3 assessment objectives.
RO33 Supporting individuals through life events
RO35 Health promotion campaign
RO32 Principles of care (exam unit)

Weightings:

Component 1+2 (Coursework) = 6**0%** Component 3 (Exam) = **40%**
The exam is worth 70 marks. In the exam you will be tested on 4 topics:
The rights of service users in H&S care settings
Person-centred values
Effective communication skills in H&S care settings
Protecting service users and service providers in H&S care settings

Top Tips for SUCCESS

Questions may be about a particular topic area or might require answers that combine information from two or more topic areas.
You must answer all of the questions.
Some questions will be context based. this means they are based on care setting scenarios. You must apply your knowledge to give a response relevant to the care setting scenario.
Some questions will be fact and knowledge based. These questions will not be based on any particular care setting.
Learn the key terms for each topic.
You MUST know things like the rights, the 9 protected characteristics, the difference between safety and security etc...

How to support your child in Health & Social Care:

Students should be able to explain the meaning of the key words and apply these to H&S care scenarios. Check they can apply knowledge from their revision guide to past exam questions. These can be self-assessed using the mark schemes.
If asking revision questions have students relate the answer to how it affects a person in terms of PIES.

Useful Websites:

www.ocr.org.uk/subjects/health-and-social-care

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**



HISTORY

Course Overview:

Edexcel GCSE History

This is split into 3 exam papers with a focus on 4 differing aspects:

- **Paper 1 is a breadth study, focusing on a theme throughout time.**
- **Paper 2 is a depth study paper focusing on a British topic and an international topic.**
- **Paper 3 focuses on a modern period depth study**

Topics for each paper are:

Paper 1: Medicine through Time 1250-present. Case study on the British Sector of the Western Front 1914-1918.
Paper 2: Elizabethan England 1558-1588 & The American West 1830-1890
Paper 3: Weimar and Nazi Germany 1918-1939

Weightings: Paper 1 30%, Paper 2 40%, Paper 3 30%

The 'BIG HITTERS'

-Plan every single question that is over 4 marks on ALL exam papers. It will keep you focused.
-Paper 1 and 2- 16 mark exam question, aim to write 4 paragraphs (agree/disagree/ another agree/disagree) and a DETAILED conclusion.
Paper 2- Narrative account- you must have 3 clear paragraphs a start a middle and an end. Remember, this is like writing a story, it must be in chronological order.
Paper 2- Consequence questions can be positive and negative
Paper 3- Interpretations are always different as historians use different sources of evidence
Paper 3 Q3D- SQOL paragraphs x2 and conclusion

Top Tips for SUCCESS

-Plan every single question that is over 4 marks on ALL exam papers. It will keep you focused.

- **Always start with the big questions first**
- **Do most papers backwards, this will be better for your time management.**
- **Do not miss any questions out**
- **If you can not remember the specifics, explain the event, person or fact in general terms, it still shows knowledge.**
- **Always discuss the provenance of the source! Who made it, when and why!**

How to support your child in History:

History is a heavy knowledge-based topic.
Little and often revision is the best way to revise and not feel overwhelmed! 15/ 20 mins every other night.
Make flash cards with key terms and dates, quizzes, mind maps on one key topics
Plan exam questions!
Watch Youtube videos for content

Useful Websites:

https://www.bbc.co.uk/bitesize/examspecs/zw4bv4j
https://www.tutor2u.net/history
https://www.youtube.com/@gcsehistoryonline5406

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**

Course Overview:

3 units, 2 coursework (NEA), written exam.

iMEDIA

OCR Cambridge NationalsCreative iMedia Level 1/Level 2 - J834.

- R094 Digital Graphics Coursework (NEA) unit has already been completed.
- R097 Interactive Multimedia Products coursework (NEA) unit has already been completed.
- R093 examined unit: Creative iMedia in the media industry. In this unit students will learn about the media industry, digital media products, how they are planned, and the media codes which are used to convey meaning, create impact and engage audiences. Topics include the media industry, factors influencing product design, pre-production planning and distribution considerations.

Weightings: R094 = 25%, R097 = 35%, R093 = 40%.

The 'BIG HITTERS'

Discuss questions: Always answer both sides

Section B questions: All Section B questions will relate to a single scenario. The scenario will always be introduced at the start of Section B and will develop through the section. Make sure answers relate to the given scenario, including key words from it in answers, CONTEXT!

Section B 9-mark question: There will always be one question worth 9 marks that needs an improved version of an idea generation/planning document, with some form of justification for the improvements proposed. This means:

- Recreate the document **AND** annotate **why** these specific improvement have been made.

Top Tips for SUCCESS

- 8 idea generation/planning and design documents remember:
  - What they are
  - What their purposes are
  - What items are included in them
  - How to create them
- When reviewing an idea generation/planning document include PAPNIC (Purpose, audience, positives, negatives, improvements) explaining why for every point made
- When answering a question with 3 or more marks use BLT (because, leading to, therefore) to ensure each point made is explained including the impact
- **Answer all questions, guess if needed!**

How to support your child in Computer Science:

- Test them on the 5 pre-production documents; what they are, their purposes and items in them to check they can recall them exactly
- Practice creating each of the idea generation/planning documents
- Practice the use of BLT (because, leading to, therefore) on questions worth 3 marks or more.
- Practice reviewing idea generation/planning documents for example ones created for Disney https://disneyanimation.com/process/story/

Useful Websites:

- https://www.knowitallninja.com/new-r093-creative-imedia-in-the-media-industry-course/
- https://www.youtube.com/watch?v=GdRbDnSeQXg&list=PL3KFKOfmI1eChW_uH89bZRIeQyOWh7ONn
- https://quizlet.com/search?query=creative-imedia&type=sets
- https://www.bbc.co.uk/bitesize/subjects/ztnygk7
- https://www.ocr.org.uk/Images/616917-exploring-our-exams-a-guide-to-our-sample-assessment-material.pdf

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

LANG

Course Overview:

English Language:

- AQA English Language Paper 1: Explorations in Creative Reading & Writing (1 hr and 45 mins) Thursday 23rd May 2024
- AQA English Language Paper 2: Writer's Viewpoints & Perspectives (1 hr and 45 mins) Thursday 6th June 2024

Weightings:

- Paper 1 = 50%
- Paper 2 = 50%

The 'BIG HITTERS'

P1, Q4 (20 marks) –aim for a three-page response to the statement
P1, Q5 (40 marks) – creative writing – aim for 5 paragraphs (Weather, setting, character, one thing, weather)
P2, Q5 (40 marks) – Writing to argue – aim for 5 paragraphs (intro, facts paragraph, deeper argument, counter-argument, conclusion)

Top Tips for SUCCESS

- **Know the models and sentence starters for each question off by heart**
- **Complete Q5 first**
- **Take care with timings – spend 45 minutes on Q5 then move onto Section A. Ensure you leave enough time for Q4**

How to support your child in English Language:

- **Create a revision timetable**
- **Encourage to complete homework and the KIP Quiz**
- **Create flashcards with your child and test them**
- **Test your child on the language question models**
- **Print past papers from POD & complete a question in timed conditions together**

Useful Websites:

Seneca, BBC Bite Size, You Tube – Mr Bruff, Shotton Hall's Planet E-Stream, POD

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**



LIT

Course Overview:

- AQA Literature Paper 1: Macbeth & Jekyll and Hyde (1 hr 45 mins) Monday 13th May
- AQA Literature Paper 2: An Inspector Calls, Power & Conflict Poetry & Unseen Poetry (essay+8 marker) (2hrs, 15 mins) Monday 20th May

Weightings:

- Paper 1=40%
- Paper 2=60%

The 'BIG HITTERS'

All the literature questions (with the exception of the 8 mark unseen comparison question) are required to be full essay responses and therefore are of equal importance. All need to be averagely 3 pages long and responded to in detail.

Top Tips for SUCCESS

- **Ensure you answer the correct questions on each paper**
- **Do not miss any of the required questions out**
- **Write an extended response for each question (you need at least three pages per essay)**
- **Begin your essay with a thesis statement**
- **End with a conclusion**

How to support your child in English Literature:

- **Create a revision timetable**
- **Discuss the quotation of the day**
- **Encourage to complete homework and the KIP Quiz**
- **Create flashcards with your child and test them - quotation explosions, mini paragraphs, finish the quotation style tests**

Useful Websites:

Seneca, BBC Bite Size, You Tube – Mr Bruff, Shotton Hall's Planet E-Stream, POD

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**



Course Overview

MATHS

Higher Tier – Edexcel Exam Board	**Foundation Tier – OCR Exam Board**
Three papers – 1 hour 30 mins each, all weighted equally, 80 marks per paper	Three papers – 1 hour 30 mins each, all weighted equally, 100 marks per paper
Paper 1 – Non Calculator (16th May)	Paper 1 – Calculator (16th May)
Paper 2 – Calculator (3rd June)	**Paper 2 – Non calculator (3rd June)**
Paper 3 – Calculator (10th June)	Paper 3 – Calculator (10th June)

Top Tips for SUCCESS

- Write a revision timetable for maths – use your QLA document as the basis for this.
- Read questions carefully and make sure you answer the question that is being asked
- Attempt every question on the exam
- Show all of your working out clearly for every question (you get marks for this!)
- If you are stuck with something in revision or homework, don't just leave it blank – ask your maths teacher to explain it – it usually won't take very long to get help like this!
- Practice as many past papers and exam questions as you can – this is the key to success in maths

How to support your child in Maths:

- The best way to revise maths is to do maths! Encourage your child to complete practice of maths either using the websites listed below or the homework and revision material provided by their class teacher
- Encourage your child to ask for help – make sure they know they can speak to their teacher or email them if they get stuck with anything
- Check their homework and make sure they haven't left any questions blank. If they have ask them why and encourage them to ask for help.

Useful Websites:

- **Sparx Maths:** www.Sparxmaths.com - Use this website to look up topics you might be struggling with from your QLA document
- **Dr Frost Maths**: www.drfrostmaths.com Great source of past paper and exam question practice
- **Corbett Maths**: www.corbettmaths.com Range of resources on here including exam style questions. Help videos also available for a huge range of GCSE topics
- **Maths Genie**: www.mathsgenie.co.uk More past exam papers with detailed written solutions. Exam papers grouped by topic with solutions

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

MEDIA

Course Overview:
3 components
Component 1: Exploring the media (80 marks)
Component 2: Understanding media forms and products (60 marks)
Component 3: Creating media products (60 marks)

Weightings:
Component 1 - 40%
Component 2 – 30%
Component 3 – 30%

The 'BIG HITTERS'

Paper 1 Question 2B (25 marks) / Paper 2 Question 3 (20 marks) students need to practise extended writing under timed conditions. They need to also use the writing structure they are taught in class.

Component 1 Section B - students need to know definitive facts about the industries of film, radio and video games.

Coursework - Students must take their own photos (6 in total) and draft their magazine so it looks professional

Top Tips for SUCCESS

- Attend all lessons
- Use the fact sheets
- Use Student Pod where all lessons / PPTs are uploaded
- Practise extended writing under timed conditions
- Make sure you answer all questions on the paper
- Know your theories
- Give detailed analysis

How to support your child in Media Studies:

Ask them about the fact sheets 13 in total for each topic of the exam.
Your child should be able to talk through key themes, media terminology and their meanings.
Check they can apply knowledge from their fact sheets to past exam questions. Create revision clocks and flash cards using the fact sheet.
Ask them about their coursework. Ask why they have selected the photos, colour palettes, cover lines etc and made the decisions they have. Your child should be able to talk you through their coursework in detail.

Useful Websites:

Mrs Fisher's Media Studies Revision Channel Mrs Fisher - YouTube
Seneca Learning Free Homework & Revision for A Level, GCSE, KS3 & KS2 (senecalearning.com)

Recommended Resources / Revision Techniques

Student POD 

Knowledge Organisers 

Revision Guides 

Flashcards 

MFL

Course Overview

Higher Tier

Listening – approx. 45 minutes
Reading – 1 hour
Speaking – 12 mins prep, up to 12 mins speaking time
Writing – 1 hour15 minutes

All papers 25% of the final grade.

Foundation Tier

Listening – approx. 35 minutes
Reading – 45 minutes
Speaking – 12 mins prep, up to 9 mins speaking time
Writing – 1 hour

All papers 25% of the final grade.

Top Tips for SUCCESS

- Vocab, vocab, vocab – the more you know, the easier it will be. Schedule time to practise vocab in small chunks … 5-6 terms at a time rather than whole lists.
- Practise key verb phrases to make sure you know them, especially for the past and future tense.
- Follow and practise all guidance your teacher gives you. If they tell you to use specific sentence starters, mnemonics or use certain vocabulary … do it!

How to support your child in French:

- Listen to them recite their speaking exam General Conversation questions – it doesn't matter if you don't understand! Help them memorise their answers and test them again and again. They have a speaking booklet with written answers which have been marked by their teacher.
- Help with practising vocabulary. Again, it doesn't matter if you understand or not. Use the English to prompt them to say or write the French. Make flashcards with key verb phrases.
- Encourage small but detailed bursts of revision – aim to master 5-6 items of vocabulary in 10-15 minute segments rather than allocating hours at a time.

Useful Websites:

BBC Bitesize French: https://www.bbc.co.uk/bitesize/examspecs/zr8bmfr

Quizlet: https://quizlet.com/bcalvertSH/folders/aqa-vocab?i=2amyrw&x=1xqt

ZigZag listening resources – Student POD

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**

MUSIC

Course Overview:

Component 1: Performing (2 pieces)
Total duration of performances: 4-6 minutes
Recorded in School
Component 2: Composing (2 pieces)
Total duration of compositions: 3-6 minutes
Component 3: Appraising
Written examination: 1 hour 15 minutes

Weightings:

Performance: 30%
Composition: 30%
Appraising: 40%

The 'BIG HITTERS'

Film Music: 10 Mark question. This question is about MAD TSHIRTS.
What is happening
Why is it happening
Link to the action in the film

Performance: 30% This can be done many times until the best it can be. Just get it done.

Top Tips for SUCCESS

- Make sure performance is the best it can be.
- Spend time on the compositions - develop the music.
- Use Student Pod where all lessons / PPTs are uploaded
- Listen to different music and analyse it.

How to support your child in Music:

Make sure they a practicing for the performance. We need a solo and ensemble (group) piece.
Questions to ask while listening to music: How many beats in the bar? What instruments can you hear? Can you tell me about the style of this music?
Ask them to answer using MAD TSHIRTS one thing for each letter, using music terminology.

Useful Websites:

BBC Bitesize GCSE Eduqas Music
Shotton Music GCSE OneNote
Teaching Gadget – Music Games and Resources **(Students have Login details)**

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**



PE

Course Overview:

- AQA GCSE PE Paper 1- /78 marks. 1 hour 15min Exam.
- AQA GCSE PE Paper 2- /78 marks. 1 hour 15min Exam.
- NEA- Practical performance in 3 sports (x1 individual, x1 team sport and x1 from either).
- NEA Analysis of Performance in Sport written piece of coursework.

Weightings:

Paper 1= 30%
Paper 2 = 30%
NEA Practical = 30%
NEA Coursework= 10%

Top Tips for SUCCESS

Thoroughly revise EVERYTHING. Make sure you know the facts. Tasks such as flashcards and recall questions are a great way of embedding this.

Practice makes perfect. Once you have the knowledge you should apply it to different contexts. In PE exams there are a large variety of contexts given so practicing application using exam questions is very beneficial. Think about applying your knowledge to different sports and sports people.

During the exam read questions carefully identifying the command word and the context it is asking you to consider. ALWAYS answer questions, do not leave any blank! Make sure you fulfill what the question is asking you, particularly for the long answer questions.

How to support your child in PE:

Ensure students have a structured revision plan.
Ensure your child has access to their revision guide , POD, One Note or revision materials provided.
Encourage pupils to practice exam papers online where mark schemes are available.
Encourage your child to attend after-school revision sessions.

Useful Websites:

PE Classroom- Home - The PE Classroom
Planet PE - https://www.youtube.com/channel/UCZYYCR8YjZlb5S3DMZW3u7g
BBC Bitesize- https://www.bbc.co.uk/bitesize/examspecs/zp49cwx
Seneca Learning- https://senecalearning.com/en-GB/
AQA past exam papers- https://www.aqa.org.uk/subjects/physical-education/gcse/physical-education-8582/assessment-resources

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**



PHOTO

Course Overview:

2 components, each marked out of 96 across 4 Assessment Objectives

AO1 /24 – Research & Contextualisation
AO2 /24 – Materials, techniques & processes
AO3 /24 – Recording of Ideas
AO4 /24 – Outcome(s)

Weightings:

Component 1 (Coursework) = **60%** Component 2 (Exam) = **40%**

The 'BIG HITTERS'

Research pages MUST show **analysis**. Discuss the visual elements present in the work, the context surrounding the image, how it was created and form your own opinions about it.

Development of ideas is very important. It's not enough to simply 'decide' on an idea. You must develop it through sampling, testing and trialling. Errors and mistakes are important – you learn from these and they help you make decisions.

Top Tips for SUCCESS

- **Attend** all lessons
- Play to your **strengths** – use techniques you are **confident** in using
- Complete as much preparation as possible before the exam
- **Annotate all designs and ideas –** your insights and decisions are very important!
- Present everything carefully – how you lay work out and present it is very important.
- **TAKE A LOT OF PHOTOS –** Camera app only. No snapchat/filters or angles.

How to support your child in Photography:

Ask them about their portfolio. Ask why they have selected the photographers and made the decisions they have. Your child should be able to talk you through their portfolio as it is a personal journey. 'I don't know' should not be a response.

Decisions and ideas should be evidenced in notes and annotations – check they are throughout.

Useful Websites:

- BBC Bitesize – Photography www.bbc.co.uk/bitesize/topics/zdymp9q
- Student Art Guide www.studentartguide.com

Recommended Resources / Revision Techniques

Student POD | **Knowledge Organisers** | **Revision Guides** | **Flashcards**



RE

Course Overview:

2 exam papers, each marked out of 96 across 2 Assessment Objectives

•AO1: Demonstrate knowledge and understanding of religion and beliefs including:

- beliefs, practices and sources of authority
- influence on individuals, communities and societies
- similarities and differences within and/or between religions and beliefs.

•AO2: Analyse and evaluate aspects of religion and belief, including their significance and influence.

Weightings:

Paper 1 – 50% Paper 2 – 50%

The 'BIG HITTERS'

- Understand the format of the exam – one, two, four, five and twelve mark questions
- 5 mark question – Two detailed explanations with a relevant quote
- 12 mark extended writing – give different views (for and against) forming a discussion. Provide a conclusion

Top Tips for SUCCESS

- Attend all lessons
- Attend Teams revision sessions
- Practice past exam questions
- Use your revision packs
- Learn quotes

Key Dates

Paper 1: Christianity and Islam 13th May
Paper 2: Thematic Studies 21st May

How to support your child in RE:

Ask them about their revision packs – 8 in total for each section of the exam. Your child should be able to talk through key words and their meanings, different religious beliefs and teachings and supporting quotes in relation to Christianity and Islam.
Check they can apply knowledge from their revision packs to past exam questions. These can be self-assessed using the mark schemes.

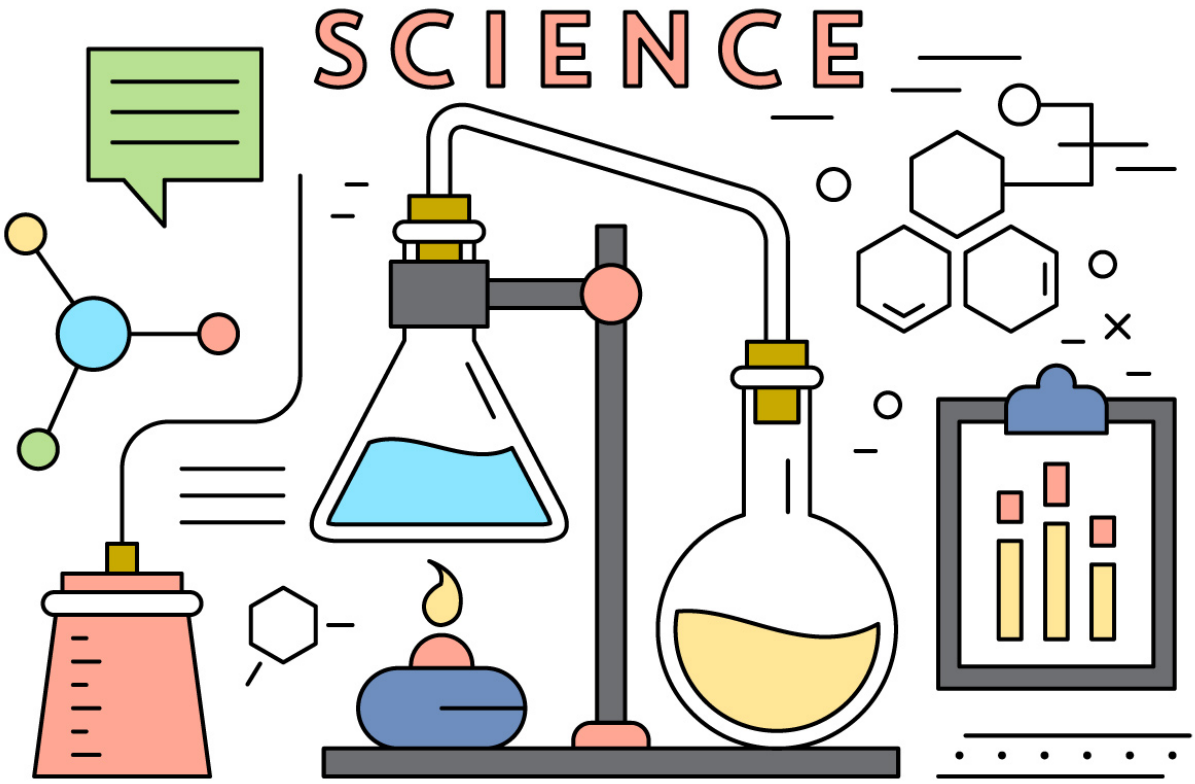
Useful Websites:

Christianity and Islam - https://www.bbc.co.uk/bitesize/examspecs/zjgx47h
Revision videos - https://www.youtube.com/playlist?list=PLKt35O75wIr1NR8HAlAnbUjGRlxAx3c27
https://www.savemyexams.com/gcse/religious-studies/aqa/a/18/revision-notes/

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**





Science Exam Dates

Biology P1 Tuesday 13th May PM

Chemistry P1 Monday 19th May AM

Physics P1 Thursday 22nd May AM

Biology P2 Monday 9th June PM

Chemistry P2 Friday 13th June AM

Physics P2 Monday 16th June AM

Course Overview:

BIOLOGY

Paper 1
What's assessed?
Topics 1-4: Cell biology; Organisation; Infection and response; and Bioenergetics

Paper 2
What's assessed?
Topics 5-7: Homeostasis and Control, inheritance, variation and evolution, Ecology

How it's assessed
- Written exam 1 hour 45 minutes - GCSE Biology or 1 hour 15 minutes – GCSE Combined Science
- Foundation and Higher Tier
- 100 marks – GCSE Biology or 70 marks GCSE Combined Science
- 50% of GCSE Biology or 16.7 % GCSE Combined Science

Questions
Multiple choice, structure, closed short answer and open response.

Top Tips for SUCCESS

Prepare and follow a revision programme.
Thoroughly revise EVERYTHING. Attention to detail is important. Make sure you know the basics. Tasks such as flashcards and practicing recall questions (found on the OneNote) are a great way of embedding this. This should include keywords as using the correct vocabulary in biology is very important.
Practice makes perfect. Once you have the knowledge you should apply it to different contexts. In biology exams there are a large variety of contexts given so practicing application using exam questions is very beneficial. During the exam read questions carefully identifying the command word, checking for details such as how many boxes to tick, use of significant figures and standard form, unit conversions and rearranging equations.

How to support your child in Biology:

- Ensure your child has a place to work in without distraction and encourage independent study.
- Ensure your child completes all homework set and ask teachers for support if needed.
- Help them remember - use flashcards / revision guides to test their recall.
- Play biology podcasts on car journeys - available on OneNote.
- Encourage completion and self-assessment.

Useful Websites:

BBC Bitesize – GCSE Biology**:** GCSE Biology (Single Science) - AQA - BBC Bitesize
Save my Exams – AQA GCSE Biology: AQA GCSE Biology 2018 | Save My Exams
Physics & Maths Tutor – AQA GCSE Biology Revision: AQA GCSE (9-1) Biology Revision - PMT (physicsandmathstutor.com)
Maths Made Easy (MME) - GCSE Biology Revision: GCSE Biology Revision | Worksheets | Biology Past Papers (mmerevise.co.uk)
Seneca: Free Homework & Revision for A Level, GCSE, KS3 & KS2 (senecalearning.com)

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**



Biology Revision list – Paper 1 (Bold subtopics are separate science only)

Topic	Subtopic	Completed
Cell Structure	Structure of plant and animal cells	
	Prokaryotic and eukaryotic cells	
	Specialised plant and animal cells	
	Diffusion	
	Osmosis	
	Active transport	
	Exchange surfaces	
	Culturing microorganisms	
Cell Division	The cell cycle and cell division	
	Stem cells	
	Bacterial Growth	
Digestive System	Tissues and organs	
	The digestive system	
	Enzymes	
Circulatory System	The blood	
	The blood vessels	
	The heart	
	Problems with the heart	
	Gas exchange and the respiratory system	
Plant Tissues	Structure of the leaf	
	Transport in plants – xylem and phloem	
	Transpiration	
Communicable Disease	Health	
	Communicable disease and pathogens	
	Types of disease – HIV, Measles, TMV, Salmonella, Gonorrhoea, Rose Black Spot Malaria	
	Defence Mechanisms	
	Vaccination	
	Antibiotics, Painkillers and Drugs (Aspirin, Digitalis, Penicillin)	
	Developing Drugs – Drug trials	
	Monoclonal antibodies	
	Plant Disease	
Non-communicable Disease	Risk factors, correlations and causal mechanisms.	
	Impact of smoking, alcohol, diet, exercise and carcinogens	
Photosynthesis	Photosynthesis	
	Rate of photosynthesis	
	How plants use glucose	
	HT – Making photosynthesis efficient	
Respiration	Aerobic respiration and anaerobic respiration	
	Metabolism and the liver	
Required Practical's	Microscopes - Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included.	
	Osmosis - Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.	
	Bacterial growth – Investigating impact of antiseptic on bacterial growth	
	Food Tests - Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein	
	Impact of pH and temperature on enzyme activity - Investigate the effect of pH on the rate of reaction of amylase enzyme	
	Photosynthesis - Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	

Biology Revision list – Paper 2 (Bold subtopics are separate science only)

Topic	Subtopic	Completed
Nervous Control	Homeostasis	
	The structure of the nervous system	
	Reflexes	
	The Brain and the eye	
Hormonal Control	Structure of the endocrine system	
	Controlling blood glucose levels and diabetes	
	HT Only Negative Feedback	
	Human reproduction – male and female systems	
	The menstrual cycle – stage and control by hormones	
	Contraception	
	HT Only – Fertility drugs and IVF	
	Controlling Temperature	
	Kidneys	
	Plant hormones	
Repro/inheritance	Types of reproduction – sexual and asexual – organisms that reproduce both ways	
	HT only Use of Hormones to treat infertility	
	Advantages and disadvantages of sexual and asexual reproduction	
	Meiosis	
	Genetic structures, the human genome and **DNA Structure**	
	Protein Synthesis and mutations	
	Inheritance and inherited diseases	
	Screening	
Evolution	Variation	
	Evolution – Natural Selection – Darwin and Wallace	
	Fossils	
	MRSA and antibiotic resistant bacteria	
	Classification	
	Selective Breeding and genetic modification	
	Cloning	
Ecology	Communities	
	Distribution and abundance	
	Competition in plants and animals	
	Adaptations of plants and animals	
Organising ecosystem	Feeding relationships – food chains	
	Decay, carbon and water cycle	
Biodiversity	Increasing human population	
	Pollution – Land, water and air and impact on biodiversity	
	Greenhouse effect, global warming and the impact on biodiversity	
	Maintaining biodiversity	
	Food security	
	Trophic levels	
	Food production	
Required Practical's	Reaction time - Plan and carry out an investigation of the effect of a factor on human reaction time.	
	Tropisms – Investigate the impact of light or gravity on the growth on plants.	
	Measuring distribution and abundance - Use sampling techniques to investigate the effect of a factor on the distribution of this species	
	Decay – Investigate the impact of temperature on decay of milk	

Course Overview:

CHEMISTRY

Paper 1

What's assessed?

Topics 1-5: Atomic Structure and the periodic table; Bonding, structure, and the properties of matter; Quantitative Chemistry; Chemical Changes; and Energy Changes

Paper 2

What's assessed?

Topics 6-10: The rate of chemical change, Organic chemistry, Chemical analysis, Chemistry of the atmosphere, Using resources.

How it's assessed

- Written exam 1 hour 45 minutes - GCSE Biology or 1 hour 15 minutes – GCSE Combined Science
- Foundation and Higher Tier
- 100 marks – GCSE Biology or 70 marks GCSE Combined Science
- 50% of GCSE Biology or 16.7 % GCSE Combined Science

Questions

Multiple choice, structure, closed short answer and open response.

Top Tips for SUCCESS

Prepare and follow a revision programme

Use the revision lists as a checklist to ensure you tthoroughly revise EVERYTHING.

Attention to detail is important. Make sure you know the basics. Tasks such as flashcards, mind maps and practice of recall questions (found on the OneNote) are a great way of embedding this.

Practice makes perfect. Make sure you try to apply the knowledge to past exam papers. This will help identify gaps in your revision strategy and exam technique.

During the exam read questions carefully identifying the command word, checking for details such as how many boxes to tick, use of significant figures and standard form, unit conversions and rearranging equations.

Do not cram before your exam!

How to support your child in Chemistry:

- Ensure your child is using their revision guide to support revision and homework.
- Test them on keyword definitions from the revision guide.
- Support your child to make flashcards to help them remember the key information.
- Make sure your child is completing past papers, not leaving out any questions and using the mark scheme to identify their strengths and weaknesses
- Check insight and make sure all homework is fully completed.
- Encourage completion and self-assessment.

Useful Websites:

BBC Bitesize – GCSE Chemistry**:** GCSE Chemistry (Single Science) - AQA - BBC Bitesize

Save my Exams – AQA GCSE Chemistry: AQA GCSE Chemistry 2018 | Save My Exams

Physics & Maths Tutor – AQA GCSE Chemistry Revision: AQA GCSE (9-1) Chemistry Revision - PMT (physicsandmathstutor.com)

Maths Made Easy (MME) - GCSE Chemistry Revision: GCSE Chemistry Revision | Worksheets | Past Papers | MME (mmerevise.co.uk)

Seneca: Free Homework & Revision for A Level, GCSE, KS3 & KS2 (senecalearning.com)

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**

Chemistry Revision list – Paper 1 (Bold subtopics are separate science only)

Topic	Subtopic	Completed
Atoms	Atoms elements and compounds	
	Mixtures	
	The development of the nuclear model of the atom	
	Subatomic particles and their properties	
	Size and mass of atoms	
	Relative atomic mass	
	Electronic structure	
	The Periodic table and its development	
	Metals and Non metals	
	Group 1,7 and 0	
	Transition metals	
Structure & Bonding	Chemical bonds and the states of matter and symbols	
	Ionic – bonds, compounds and properties	
	Covalent – bonds (simple and giant), compounds and properties, polymers	
	Structures and bonding of carbon – graphite, diamond, graphene and fullerenes	
	Nano particles	
	Metallic – bonds, compounds and properties. Alloys	
Quantitative chemistry	Conservation of mass and balanced symbol equations	
	Relative formula mass	
	Mass changes	
	Moles and balancing equations	
	Amounts of substances (reacting masses), limiting reactants	
	Concentration of solutions	
	Yield and atom economy	
	Volumes of gases	
Chemical changes	Reactivity of metals and metal oxides	
	Extraction of metals and reduction	
	Oxidation and reduction (oil rig)	
	Reaction of acids with metals	
	Neutralisation of acids and salt production	
	Soluble salts	
	Titrations	
	pH scale and neutralization	
	Strong and weak acids	
	Electrolysis – the process	
	Electrolysis of molten and aqueous ionic compounds	
	Using electrolysis to extract metals – aluminium	
	Half equations	
Energy changes	Exothermic and endothermic reactions	
	Reaction profiles – energy level diagrams	
	Energy change during a reaction (bond breaking and making) – calculations	
	Chemical cells and fuel cells	
Required practical's	Electrolysis - Investigate what happens when aqueous solutions are electrolysed using inert electrodes	
	Titration - determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.	
	Making a pure, dry soluble salt - Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate.	
	Exothermic and endothermic reactions – measuring energy change.	

Chemistry Revision list – Paper 2 (Bold subtopics are separate science only)

Topic	Subtopic	Completed
Rates of reaction	Calculating the rate of a reaction	
	Factors that affect the rate of a reaction	
	Collision theory and activation energy	
	Catalysts	
	Reversible reactions and dynamic equilibrium	
	Energy changes and reversible reactions	
	Equilibrium and Le Chateliers theory	
Organic chemistry	Crude oil, hydrocarbons and alkanes	
	Fractional distillation	
	Properties of hydrocarbons	
	Cracking and alkenes	
	Alcohols	
	Reactions of alkenes	
	Carboxylic acids	
Polymers	**Addition and condensation**	
	Amino acids	
	DNA	
Chemical analysis	Purity, formulations and chromatography	
	Identify gases (hydrogen, oxygen, carbon dioxide chlorine)	
	Identification of ions	
	Spectroscopic methods	
The Atmosphere	The early atmosphere and how it evolved and changed	
	The current atmosphere	
	Greenhouse effect and how human activity has affected these gases	
	Carbon foot print	
	Atmospheric pollutants	
Earth's resources	Potable water	
	Waste water treatment	
	Alternative methods of extracting metals	
	Life cycle Assessments	
	Reducing the use of resources	
Using materials	**Corrosion**	
	Alloys	
	Ceramics, polymers and composites	
	Haber process	
	Fertilisers	
Required practical's	Rates of reaction - Investigate how changes in concentration affect the rate of a reaction using EITHER gas collection method OR change in colour/turbidity	
	Paper chromatography - Separate and tell the differences between different coloured substances. Calculate the Rf value	
	Chemical tests - Use of chemical tests to identify the ions in unknown single ionic compounds	
	Analysis and purification - Water samples from different sources to analysis dissolved matter and purity	

Course Overview:

PHYSICS

Paper 1
What's assessed?
Topics 1-4: Energy; Electricity; Particle model of matter; and Atomic Structure

Paper 2
What's assessed?
Topics 5-7: Forces, Wave and Magnetism and electromagnetism

How it's assessed

- Written exam 1 hour 45 minutes - GCSE Biology or 1 hour 15 minutes – GCSE Combined Science
- Foundation and Higher Tier
- 100 marks – GCSE Biology or 70 marks GCSE Combined Science
- 50% of GCSE Biology or 16.7 % GCSE Combined Science

Questions
Multiple choice, structure, closed short answer and open response.

Top Tips for SUCCESS

Prepare and follow a revision programme
Read **all** of the question, including the 'bit at the top that gives more information'.
Understand the command word, so that you know what the question is asking and that you are answering the question. State, describe, explain, evaluate, compare...
Know standard units and be prepared to convert prefixes into standard units, including multiplying factors.
Show all working out for calculation questions.
Know the difference between significant figures and number of decimal places. Check you have given your answer to the correct significant figures or decimal places

How to support your child in Physics:

- Ensure your child has a revision guide and that they are using it support revision and homework.
- Test them on keyword definitions from the revision guide.
- Get your child to make flashcards to help them remember the key information.
- Make sure your child is completing past papers, not leaving out any questions and using the mark scheme to identify their strengths and weaknesses
- Check insight and make sure all homework is fully completed.

Useful Websites:

BBC Bitesize – GCSE Physics**:** GCSE Physics (Single Science) - AQA - BBC Bitesize
Save my Exams – AQA GCSE Physics: AQA GCSE Physics 2018 | Save My Exams
Physics & Maths Tutor – AQA GCSE Physics Revision: AQA GCSE (9-1) Physics Revision - PMT (physicsandmathstutor.com)
Maths Made Easy (MME) - GCSE Physics Revision: GCSE Physics Revision | Worksheets | Physics Past Papers (mmerevise.co.uk)
Seneca: Free Homework & Revision for A Level, GCSE, KS3 & KS2 (senecalearning.com)

Recommended Resources / Revision Techniques

Student POD **Knowledge Organisers** **Revision Guides** **Flashcards**



Physics Revision list – Paper 1 (Bold subtopics are separate science only)

Topic	Subtopic	Completed
Energy	Energy stores and transfers	
	Conservation of energy	
	Work done	
	Gravitational potential energy	
	Kinetic energy	
	Elastic potential energy	
	Efficiency	
	Power	
	Energy transfers by heating	
	Heating and insulating buildings	
	Specific heat capacity	
	Renewable and non-renewable energy resources	
	Energy trends and issues	
Electricity	Current and potential difference	
	Charge	
	Resistance	
	Series and parallel circuits	
	ACDC	
	Cables and plugs	
	Electrical power	
	Electrical energy and efficiency	
	National grid	
	Static and electric fields	
Particle model of matter	Density	
	States of matter and changes of state	
	Internal energy	
	Specific latent heat	
	Gas pressure	
Atomic structure	Atomic structure and atomic model development	
	Nuclear decay – alpha, beta and gamma	
	Activity and half-life	
	Hazards and uses	
	Fission and fusion	
Required practical's	Specific heat capacity - An investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored.	
	Thermal insulators - Investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.	
	Resistance - Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits: • the length of a wire at constant temperature • combinations of resistors in series and parallel.	
	Component characteristics - Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature	
	Density - Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects.	

Physics Revision list – Paper 2 (Bold subtopics are separate science only)

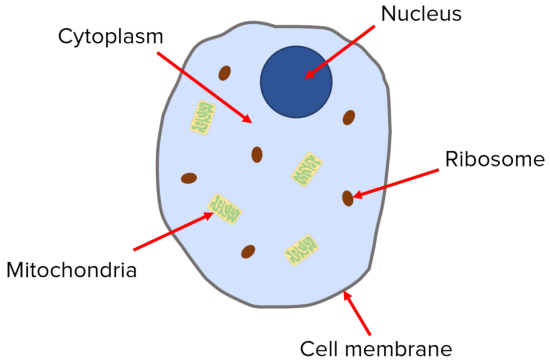
Topic	Subtopic	Completed
Forces	Scalar and vectors	
	Contact and non-contact forces	
	Resultant forces	
	Centre of mass	
	Speed and velocity	
	Distance-time and velocity-time graphs	
	Motion equations	
	Newton's laws of motion	
	Weight	
	Terminal velocity	
	Forces and braking	
	Momentum (HT) and **Changes to momentum**	
	Forces and elasticity	
	Moments, levers and gears	
Pressure	**Fluid pressure**	
	Atmospheric pressure	
	Up thrust	
Wave properties	Transverse and longitudinal waves	
	Wave speed	
	Reflection	
	Refraction	
	Speed of sound	
	S and P waves	
EM waves	The electromagnetic spectrum	
	Uses and dangers of EM waves	
	Black body radiation	
Lenses	**Lenses**	
	Visible light	
	Colour	
Electromagnetism	Magnetic fields	
	Magnetic fields of electric currents	
	Motor effect	
	Loudspeakers	
	Generator effect	
	Microphones	
	Transformers	
Space	**Solar System**	
	Life cycle of the star	
	Orbital motion	
	Red shift	
	Big bang	
Required practical's	Hooke's law - Investigate the relationship between force and extension for a spring.	
	Car track - Investigate the effect of varying the force on the acceleration of an object of constant mass and the effect of varying the mass of an object on the acceleration produced by a constant force.	
	Wave speed - Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements	
	Infrared radiation - Investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.	
	Reflection and refraction - Investigate the reflection of light by different types of surface and the refraction of light by different substances.	

Biology Revision list – Paper 1

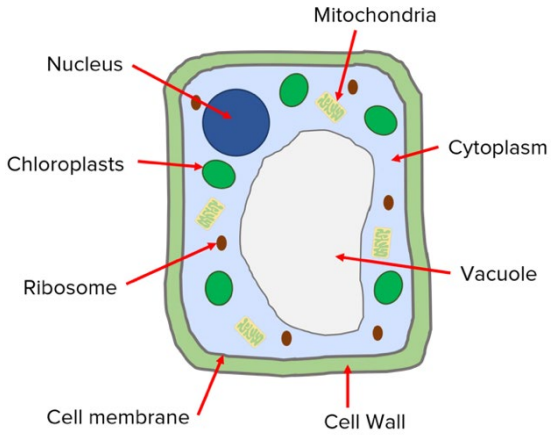
Topic	Subtopic	Completed
Cell Structure	Structure of plant and animal cells	
	Prokaryotic and eukaryotic cells	
	Specialised plant and animal cells	
	Diffusion	
	Osmosis	
	Active transport	
	Exchange surfaces	
	Culturing microorganisms	
Cell Division	The cell cycle and cell division	
	Stem cells	
	Bacterial Growth	
Digestive System	Tissues and organs	
	The digestive system	
	Enzymes	
Circulatory System	The blood	
	The blood vessels	
	The heart	
	Problems with the heart	
	Gas exchange and the respiratory system	
Plant Tissues	Structure of the leaf	
	Transport in plants – xylem and phloem	
	Transpiration	
Communicable Disease	Health	
	Communicable disease and pathogens	
	Types of disease – HIV, Measles, TMV, Salmonella, Gonorrhoea, Rose Black Spot Malaria	
	Defence Mechanisms	
	Vaccination	
	Antibiotics, Painkillers and Drugs (Aspirin, Digitalis, Penicillin)	
	Developing Drugs – Drug trials	
	Monoclonal antibodies	
	Plant Disease	
Non-communicable Disease	Risk factors, correlations and causal mechanisms.	
	Impact of smoking, alcohol, diet, exercise and carcinogens	
Photosynthesis	Photosynthesis	
	Rate of photosynthesis	
	How plants use glucose	
	HT – Making photosynthesis efficient	
Respiration	Aerobic respiration and anaerobic respiration	
	Metabolism and the liver	
Required Practical's	Microscopes - Use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included.	
	Osmosis - Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.	
	Bacterial growth – Investigating impact of antiseptic on bacterial growth	
	Food Tests - Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein	
	Impact of pH and temperature on enzyme activity Investigate the effect of pH on the rate of reaction of amylase enzyme	
	Photosynthesis - Investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.	

Biology - Cell Structure

1. Sketch out the diagram of an animal cell and label the parts.



2. Sketch out the diagram of a plant cell and label the parts.



3. What type of organisms are prokaryotic cells?

Bacteria

4. What type of organisms have eukaryotic cells?

Plants and animals (& fungi)

5. What is the function (job) of the nucleus in a cell?

To control the cell. Contains DNA.

6. What is the function (job) of the cell membrane?

To control what substances can enter or leave the cell.

7. What is the function of the mitochondria?

To release energy in respiration

8. What process takes place at the ribosomes?

Protein synthesis / making proteins.

9. What is the role of chloroplasts?

Absorb sunlight for photosynthesis. Contain chlorophyll.

10. Name three cell parts (organelles) found in plant cells but not animal cells.

Cell wall, permanent vacuole, chloroplasts

Biology – Cell Transport

1. Define diffusion.

Spreading out of particles from an area of high to low concentration.

2. What 3 factors can increase the rate of diffusion?

Temperature, surface area and concentration gradient

3. Define osmosis.

Movement of water from a dilute to concentrated solution through a partially permeable membrane.

4. If a potato cylinder is placed in a more dilute solution what would happen to its mass?

Increase as the water has moved into the potato cells by osmosis.

5. If a potato cylinder is placed in a more concentrated solution what would happen to its mass?

Decrease as the water has move from the potato cells by osmosis.

6. If a potato cylinder is placed in a solution of the same concentration what would happen to its mass?

It would stay the same as water would move into and out of the potato cells at an equal rate.

7. Define active transport.

Movement of substances from a low to high concentration. This requires energy from respiration.

8. Where does active transport happen in animals?

Small intestine – glucose.

9. Where does active transport happen in plants?

Root hair cells – mineral ions

10. Cells that carry out active transport have more of which subcellular structure?

Mitochondria.

11. What are the general adaptations of an exchange surface?

Large surface area, thin walls - one cell thick, in animals a good blood supply.

Biology – Cell Division

1. Why do cells divide by the cell cycle.

Growth, development, repair of tissues

2. What happens in each of the 3 stages of the cell cycle?

Stage 1: Chromosomes duplicate and the number of subcellular structures (ribosomes and mitochondria) increase.
Stage 2: Mitosis – One set of each chromosome pulled to opposite ends of cell and the nucleus divides.
Stage 3: Cell membrane and cytoplasm split to produce 2 genetically identical daughter cells.

3. What is a stem cell?

Undifferentiated cell

4. What do embryonic stem cell differentiate into?

Any type of cell

5. What can embryonic stem cell be used to treat?

Diabetes and paralysis

6. Give a disadvantage of embryonic stem cells.

Destroying a potential human life

7. Where are adult stem cells located?

Bone marrow

8. What can adult stem cells differentiate into?

Blood cells

9. What can adult stem cell be used to treat?

Leukaemia

10. Give a disadvantage of adult stem cells.

Can transfer viral infections.

11. What is therapeutic cloning used for?

Reduce chance of rejection

12. Where are plant stem cells located?

Meristem tissue (tips of roots and shoots)

13. How are plant stem cells different to human stem cell?

They can differentiate into any type of cell throughout the whole life of the plant.

14. Give a use of plant stem cells.

Clone plants quickly and cheaply to prevent extinction of rare species, produce plants with desired characteristics e.g. disease resistance.

Biology – Digestive system

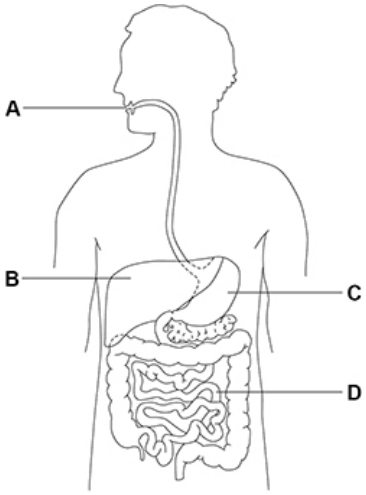
1. Put the structures in order from smallest to largest: organism, tissue, organ system, cell, organ.

Cell □ tissue □ organ □ organ system □ organism

2. Define cell.

The basic building blocks of all living things

3. Label the organs A, B, C and D.



A = mouth

B = liver

C = stomach

D = small intestine

4. What organ system are organs A, B, C and D part of?

Digestive system

5. Why does food need to be digested?

It needs to be small enough to be absorbed into blood.

6. What is an enzyme?

A biological catalyst

7. What does denatured mean?

The active site of the enzyme is destroyed, so the enzyme cannot work.

8. What can cause an enzyme to denature?

Temperature or pH

9. Where is bile made?

Liver

10. Where is bile stored?

Gall bladder

11. How does bile help to digest fat?

Emulsifies fat (makes the surface area larger) and also created the pH conditions so lipase can work.

Biology – Cardiovascular System

1. Define tissue.

Cells with similar structure and function.

2. How are the lungs adapted for gas exchange?

Cells with similar structure and function.

3. What is the function of red blood cells?

Transport oxygen.

4. What is the function of white blood cells?

Defend against pathogens.

5. What is the function of platelets?

Help blood to clot.

6. What is the function of blood plasma?

Transport dissolved substances e.g. carbon dioxide and water…

7. What is the function of an artery?

Carry blood away from the heart

8. What is the function of a vein?

Carry blood into the heart

9. How is the structure of an artery different to a vein?

Arteries have thicker elastic walls (to stretch and spring back) and thicker muscular walls (to withstand high pressure)

10. Which blood vessel contains valves?

Veins (to prevent backflow of blood under lower pressure)

11. Where are the pacemaker cells located.

Right atrium

12. Why is the circulatory system known as a double circulatory system?

Right side pumps blood to lungs and left side pumps blood to the rest of the body (so blood passes through the heart twice for every circulation)

Biology – Health

1) What is health?
State of physical and mental wellbeing

2) Name the blood vessel that carries blood to the heart muscle.
Coronary arteries

3) What is coronary heart disease (CHD) caused by?
Build-up of fatty material in the coronary arteries that restricts blood flow reducing oxygen to heart muscle cells

4) How do stents treat CHD?
Wire mesh placed in coronary artery to widen blocked vessel.

5) How do statins treat CHD?
Drugs used to lower build-up of fatty material (cholesterol).

6) Diseases can interact. What can defects in the immune system lead to?
more likely to suffer from infectious diseases

7) Give a risk factor for each of the following:
Cardiovascular disease -poor diet, lack of exercise, smoking

Type 2 diabetes – poor diet

Impacted brain and liver function - alcohol

Lung disease and lung cancer - smoking

Impact on unborn babies - alcohol and smoking

Cancer - carcinogens like ionising radiation

8) What are tumours?
Changes in cells that lead to uncontrolled cell growth and division

9) How are malignant tumours different to benign tumours?
Malignant invade neighbouring tissues that cause secondary tumours. Benign do not. Malignant are made of cancer cells benign are like normal cells. Malignant grow faster.

10) How can cancer spread?
Bloodstream

Biology – Communicable Disease

1. What is a pathogen? Microorganism which causes infectious disease
2. What is are the three ways pathogens can infect plants or animals? Direct contact; Water; Air
3. How do viruses make us ill? Reproduce inside of cells and damage cells
4. How do bacteria make us ill? Reproduce and produce toxins

Measles

5. What causes it? Virus
6. Two symptoms? Fever; Red skin rash. (Complications from measles can be fatal)
7. How is it spread? Droplets from sneezes
8. How do we control it? Vaccination

HIV

9. What causes it? Virus
10. Two ways it is spread? Sexual contact; Exchange of body fluids (e.g. drug users sharing needles)
11. Which cells does it attack? White Blood Cells
12. How do we treat it? Antiretroviral drugs
13. If we don't control it what happens? AIDS

TMV

14. Name a species which is affected? Tomato
15. Obvious symptom? Mosaic pattern on leaves
16. Why is growth affected? Lack of photosynthesis

Salmonella

17. What causes it (from what)? Bacteria (from contaminated food)
18. Four symptoms? Fever, abdominal cramps, vomiting, diarrhoea
19. What causes the symptoms? Bacteria and toxins
20. How do we control it? Vaccinating poultry (and food hygiene)

Gonorrhoea

21. Is an example of what group of diseases? STDs
22. What causes it? Bacteria
23. Two symptoms? Yellow or green discharge from vagina or penis; pain on urinating
24. How do we treat it? Antibiotics (penicillin)
25. Will we always be able to treat it like this? No (the bacteria are becoming resistant)
26. How do we avoid it? Condoms or other barrier methods of contraception

Rose Black Spot

27. What causes it? Fungus
28. Three symptoms? Black or purple spots on leaves; leaves turn yellow; leaves drop early
29. Why is growth affected? Lack of photosynthesis
30. How is it treated (two ways)? Fungicide, remove and destroy (burn) affected leaves
31. How is it spread (two ways)? Water or wind

Malaria

32. What causes it? Protist
33. How is it spread? Vector – mosquito
34. What are the symptoms? Recurrent fever
35. Two ways of controlling the spread? Stop mosquitoes breeding by removing standing water. Avoid being bitten – use insect repellent or mosquito nets.

Biology – Defence Against Disease

1) How does the body prevent pathogens from entering?
Skin acts as a physical barrier, stomach acid kills bacteria, mucus in trachea and bronchi catch pathogens, cilia brush mucus away from the lungs.

2) What are the three ways white blood cells defend against pathogens?
Phagocytosis – engulf the pathogen, release enzymes that breakdown the pathogens.
Produce antibodies that are a complimentary shape to the antigens on the surface of the pathogen
Produce antitoxins that neutralise toxins

3) What is in a vaccine?
Dead or weakened version of the pathogen

4) How do vaccines lead to immunity?
White blood cells detect the pathogen. Produce antibodies specific to the antigen son the surface. Some WBC's become memory cells. These will multiply and produce antibodies more quickly when the live pathogen enters the body.

5) What is herd immunity?
When a proportion of the population is vaccinated/immune to a disease and the spread of the disease is reduced.

6) What is an antibiotic?
A drug that kills bacteria

7) Where are the following drugs found naturally and what do they treat?
Digitalis – Foxgloves to treat heart disease
Aspirin – Willow – pain killer
Penicillin – Mould – treat bacterial infections

8) What drugs tested on during preclinical trials?
Cells, tissues, mammals

9) What are drugs tested for in preclinical trials?
Toxicity and side effects

10) What are drugs tested on in the first round of clinical trials?
Healthy volunteers

11) What are they tested for?
Side effects and dosage

12) What are drugs tested for in the second stage of clinical trials?
Efficacy – how effective the drugs is

13) What is a placebo?
A fake drug

14) What is a double-blind trial?
Where neither the doctor or patient know who is getting the drug or placebo

15) What is a peer review?
When another scientist checks the scientific research to ensure false claims are not being made

Biology – Photosynthesis

1) What is the word equation for photosynthesis?

Carbon dioxide + Water → Glucose + Oxygen

2) What is the symbol equation for photosynthesis? +

$6\ CO_2 + 6\ H_2O \rightarrow C_6H_{12}O_6 + 6\ O_2$

3) Thinking about energy changes, what sort of reaction is photosynthesis?
Endothermic

4) Where has the energy come from?
Light

5) Where is chlorophyll found?
Chloroplasts

6) Which three types of leaf cell can photosynthesise (most to least)?
Palisade; Spongy; Guard

7) What structure do these cells have?
Chloroplasts

8) List three main factors which can limit the rate of photosynthesis. (Hint: If you say 'amount of' it will always be wrong – use a better word)
Temperature; Concentration of carbon dioxide; Light intensity

9) What property of starch makes it useful for storage?
Insoluble

10) What other molecules are used for storage?
Fats and oils

11) What is cellulose used for?
Cell walls

12) What are amino acids turned into
Proteins

13) What mineral ion is needed to make amino acids from glucose?
Nitrates

14) Where does this mineral ion come from?
Soil / root hair cells

15) How is energy released from glucose?
Respiration

Biology - Respiration and exercise

1) What is the word equation for aerobic respiration?

Glucose + Oxygen → Carbon dioxide + Water

2) What is the symbol equation for aerobic respiration?

$C_6H_{12}O_6 + 6\ O_2 \rightarrow 6\ CO_2 + 6\ H_2O$

3) Thinking about energy changes, what sort of reaction is respiration?

Exothermic

4) Give three differences between aerobic and anaerobic respiration in humans

- Aerobic = oxygen Anaerobic = no oxygen
- Aerobic = More energy Anaerobic = Less energy
- Aerobic = carbon dioxide + water Anaerobic = Lactic acid

5) Which three processes use the energy from respiration?

- Chemical reactions to build bigger molecules
- Movement
- Keeping warm

6) Where has the energy come from?

Glucose

7) What is the word equation for anaerobic respiration in muscles?

Glucose → Lactic acid

8) What is the word equation for anaerobic respiration in plant and yeast cells?

Glucose → Ethanol + carbon dioxide

9) Which two manufacturing processes rely on anaerobic respiration in yeast?

Bread making; Brewing

10) What is another word for anaerobic respiration?

Fermentation

11) Which three processes increase when we exercise to increase the supply of oxygen to muscles?

- Heart rate
- Breathing rate
- Breath volume

12) What builds up in active muscles if they don't get enough oxygen?

Lactic acid

13) What does it react with to convert it back to glucose?

Oxygen

14) Where does this happen?

Liver

15) What do we call the need for extra oxygen?

Oxygen debt

16) What can't muscles do efficiently when they are fatigued?

Contract

Biology Microscope RP

1. Compare the resolution and magnification of an electron and light microscope.

Electron microscopes have a higher magnification and resolution

2. Why can't ribosomes be seen through a light microscope?

They are too small

3. How do you convert millimetres to micrometres?

Multiply by 1000

4. Cells are viewed with the ×10 objective lens. The total magnification is ×50. What was the power of the eyepiece lens used?

Total magnification = eye piece magnification x objective lens magnification
50 = ? X 10
5 = 5 x 10

5. How do you calculate real size?

Image size / Magnification

6. How do you calculate magnification?

Image size / real size

7. How do you calculate image size?

Real size x magnification

8. What is the reason for adding iodine to onion tissue?

To allow sub-cellular structures to be seen

9. To focus the image the objective lens should be moved away from the stage.
Give one reason why the objective lens should not be moved towards the stage.

It could damage the lens or slide.

10. It is easier It is easier to view the cells using the low power objective lens first. Give a reason why.

Gives a wider field of view.

Biology Food Test Required Practical

1) Give one use for each of the following nutrients in the body:
   a. Carbohydrates – to provide energy

   b. Protein – growth and repair

   c. Lipids – to make cell membranes

2) How do you make a solution of the food samples?
Grind food using a pestle and mortar. Add water, mix and filter the solution.

3) Starch (complex carbohydrate)
   a. Name of reagent
   Iodine Solution
   b. Negative result
   Orange/brown
   c. Positive result
   Blue / Black

4) Protein
   a. Name of reagent
   Biuret
   b. Negative result
   Blue
   c. Positive result
   Purple

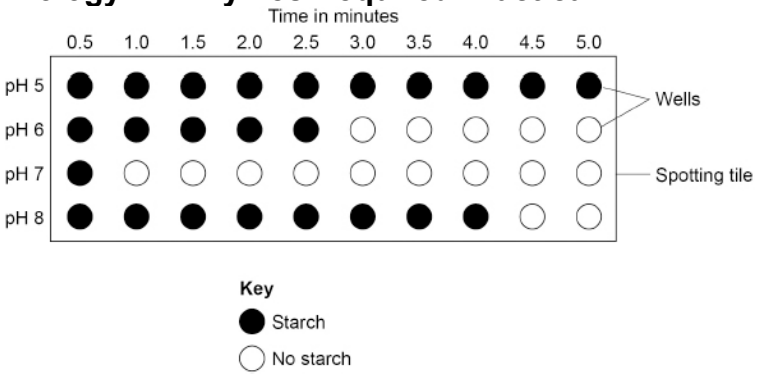
5) Lipids
   a. Name of reagent
   SUDAN III
   b. Negative result
   No red layer
   c. Positive result
   Red layer on surface of solution

6) Simple sugars (simple carbohydrate)
   a. Name of reagent
   Benedicts
   b. Negative result
   Blue
   c. Positive result
   Green / Yellow / Orange / Red

7) Which reagent needs heating? How?
Benedict's – use a water bath.

8) Give a safety precaution for the food tests.
Wear safety glasses
Avoid contact with skin and eyes

Biology – Enzymes Required Practical



1) Why does starch need to be digested?
So it can be absorbed and transported by the blood

2) Which enzyme digests starch?
Amylase

3) Which organs produce this enzyme?
Salivary gland, pancreas, small intestine

4) Describe the test for starch.
Iodine – Negative = orange/brown, Positive = blue/black

5) What is the independent variable?
PH

6) What is the dependent variable?
Time taken for starch to be broken down

7) Give two control variables.
Volume of starch solution/ enzymes
Temperature

8) Give a risk associated with the investigation and a safety precaution.
Iodine is an irritant – wear safety glasses to prevent any getting in eyes and avoid contact with skin

9) Why are solutions kept in a water bath for 10 minutes before the investigation?
To allow them to reach the correct temperature

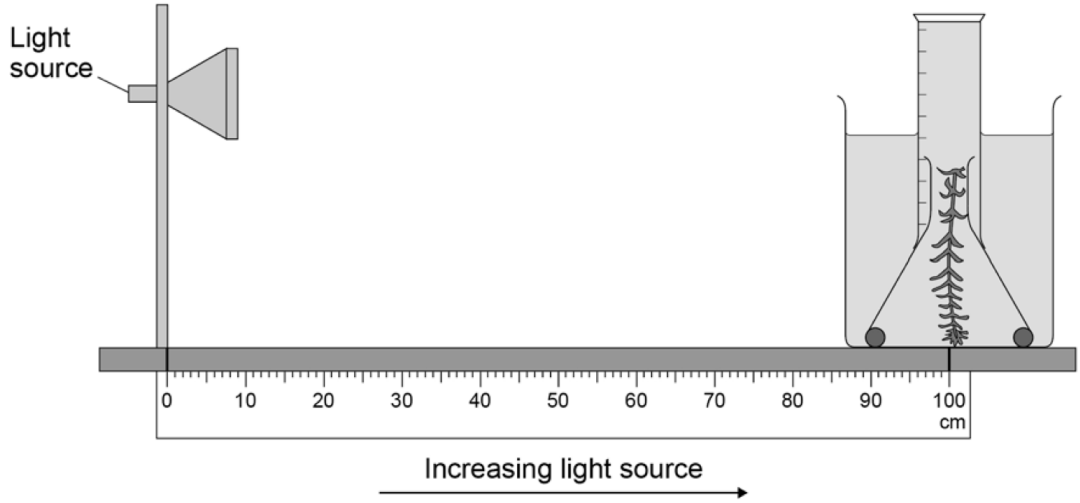
10) Describe how you would know all the starch had been digested.
When the iodine remains orange./brown

11) Would the fastest or slowest time show the optimum pH?
Fastest – the enzyme is most effective when it breaks down the starch more quickly

12) How could the investigation be improved to get more accurate results?
Remove a drop of the solution every 10 seconds instead of 30 to obtain a more accurate time.

13) What may happen to the enzyme if it is not the optimum pH?
The enzymes will denature meaning the active site will change shape and the starch will not long fit meaning the reaction will slow or stop.

Biology – Photosynthesis Required Practical



1) What is the independent variable?
The distance between the light and the pondweed (light intensity)

2) What is the dependent variable?
The number of bubbles produced per minute (rate of photosynthesis)

3) Give two control variables.
Length of pondweed, type of pondweed, concentration of sodium hydrogen carbonate solution, temperature

4) How can oxygen production be used to measure the rate of photosynthesis?
Number of bubbles produced/ time

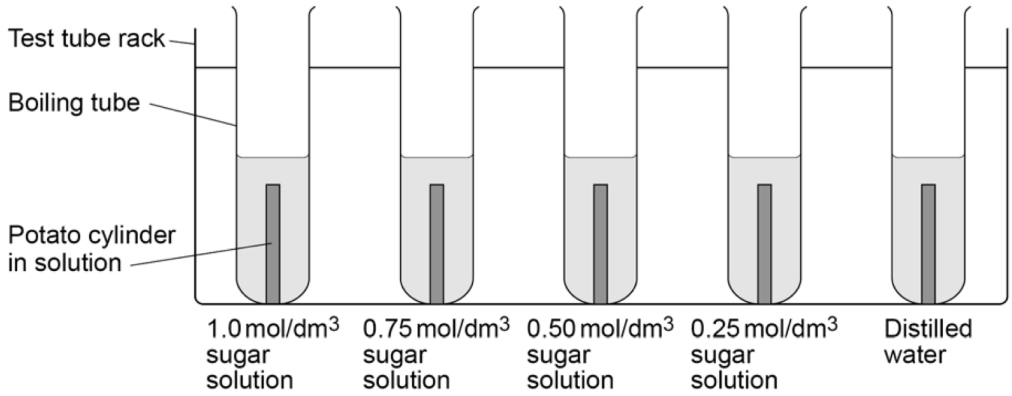
5) The LED light source does not get hot. Explain why it is important that the pondweed remains at a constant temperature.
Temperature can impact the rate of photosynthesis.

6) How can accuracy be improved?
Measure the volume of water rather than number of bubbles. Use a gas syringe to do this.

7) How can validity be improved?
Repeat the experiment 3 times, remove any anomalies and calculate a mean.

8) Give one source of error.
Temperature not being controlled. Number of bubbles not counted correctly

Biology – Osmosis RP



1. What is the independent variable?

Concentration of solution

2. What is the dependent variable?

Change in mass of potato

3. Give two control variables.

Variety of potato, length and diameter of potato, volume of solution, temperature

4. Why dry each piece of tissue before weighing it?

Remove excess water from outside potato (that could cause an increase in mass) Remove excess water from outside potato (that could cause an increase in mass)

5. Why calculate percentage change?

Not all tissues have the same starting mass

6. How do you calculate percentage change?

(change in mass / mass of potato at start) x100(change in mass / mass of potato at start) x100

7. How can the validity be improved?

Ensure all variables are controlled (see answer to Q3) Ensure all variables are controlled (see answer to Q3)

8. How can the accuracy be improved?

Use Vernier callipers to measure length of potato, use scales with higher resolution to measure mass of potato, repeat at least 3 times to identify anomalies and calculate a mean. Use Vernier callipers to measure length of potato, use scales with higher resolution to measure mass of potato, repeat at least 3 times to identify anomalies and calculate a mean.

9. Give one possible source of error?

Zero error on scales

10. How can the concentration of the tissue be determined?

Plot percentage change on mass and identify where line of best fit intercepts 0% change. Plot percentage change on mass and identify where line of best fit intercepts 0% change.

Chemistry Revision list – Paper 1

Topic	Subtopic	Completed
Atoms	Atoms elements and compounds	
	Mixtures	
	The development of the nuclear model of the atom	
	Subatomic particles and their properties	
	Size and mass of atoms	
	Relative atomic mass	
	Electronic structure	
	The Periodic table and its development	
	Metals and Non metals	
	Group 1,7 and 0	
	Transition metals	
Structure & Bonding	Chemical bonds and the states of matter and symbols	
	Ionic – bonds, compounds and properties	
	Covalent – bonds (simple and giant), compounds and properties, polymers	
	Structures and bonding of carbon – graphite, diamond, graphene and fullerenes	
	Nano particles	
	Metallic – bonds, compounds and properties. Alloys	
Quantitative chemistry	Conservation of mass and balanced symbol equations	
	Relative formula mass	
	Mass changes	
	Moles and balancing equations	
	Amounts of substances (reacting masses), limiting reactants	
	Concentration of solutions	
	Yield and atom economy	
	Volumes of gases	
Chemical changes	Reactivity of metals and metal oxides	
	Extraction of metals and reduction	
	Oxidation and reduction (oil rig)	
	Reaction of acids with metals	
	Neutralisation of acids and salt production	
	Soluble salts	
	Titrations	
	pH scale and neutralization	
	Strong and weak acids	
	Electrolysis – the process	
	Electrolysis of molten and aqueous ionic compounds	
	Using electrolysis to extract metals – aluminium	
	Half equations	
Energy changes	Exothermic and endothermic reactions	
	Reaction profiles – energy level diagrams	
	Energy change during a reaction (bond breaking and making) – calculations	
	Chemical cells and fuel cells	
Required practical's	Electrolysis - Investigate what happens when aqueous solutions are electrolysed using inert electrodes	
	Titration - determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.	
	Making a pure, dry soluble salt - Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate.	
	Exothermic and endothermic reactions – measuring energy change.	

Chemistry – Atomic Structure

1. What is the charge on an electron?

Negative (e-)

2. If an atom has 12 protons, how many electrons does it have?

12 (the number of protons and electrons in an atom are equal, which is why an atom has no overall charge)

P = 13
E = 13
N = 14 (top number – bottom number)

4. Complete the table.

Particle	Location	Charge	Mass
Proton	Nucleus	+	1
Electron	Shells	-	Negligible/0
Neutron	Nucleus	No charge	1

5. What is an isotope?

Some atoms have different 'versions.' An atom is defined by its proton number, so all isotopes have the same number of protons (and therefore electrons), however, their mass is different (they have a different number of neutrons)

6. What is the difference between an atom and an ion?

An atom is uncharged (listed on the Periodic Table)
An ion has a full shell and is charged [+ if a metal, lost electrons] [- if a non-metal, gained electrons]

7. Draw the electron arrangement for chlorine (atomic number 17)

2,8,7

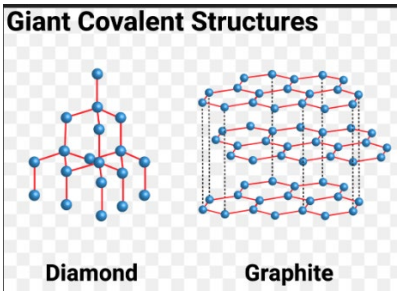
8. Explain why magnesium forms 2+ ions (Magnesium atom has 12 electrons)

Magnesium – 2,8,2. Losses outer 2 electrons to form a positive ion.

9. Explain why ionic compounds conduct electricity when molten or in solution.

Ions (charged particles), move and carry the charge through the material.

10. What are the similarities and differences between diamond and graphite… (say what you see)



Diamond	Graphite
• 4 strong covalent bonds □ hard and high MP and BP • Tetrahedral structure • there are no free electrons □ cannot conduct. • High melting point and boiling point	16) 3 strong covalent bonds 17) layers of hexagonal rings 18) there are no covalent bonds between the layers (weak forces between layers) – soft, layers can slide. 19) there is one non-bonded - or delocalised - electron from each atom – can conduct.

Chemistry – Periodic Table

1. How are elements in the periodic table arranged?

In order of atomic number.

2. Why do elements in the same group have similar properties?

Same number of electrons in the outer shell

3. How were elements arranged in the past?

In order of atomic weight

4. What were the problems with the early periodic table?

Not all of the elements had been discovered and when elements were placed in order of atomic weight they ended up in the same group.

5. How did Mendeleev overcome the problems of the early periodic table?

He left gaps for undiscovered elements and he the changed the order of some elements.

6. What type of ions do metals form?

Positive

7. What type of ions do non-metals form?

Negative

8. Where are metals found on the periodic table?

Left and towards the bottom – (See picture)

9. Where are non-metals found on the periodic table?

Right and towards the top (see picture)

10. What are the elements in group 0 known as?

Nobel gases

11. Why are elements in group 0 unreactive?

They have a full outer shell.

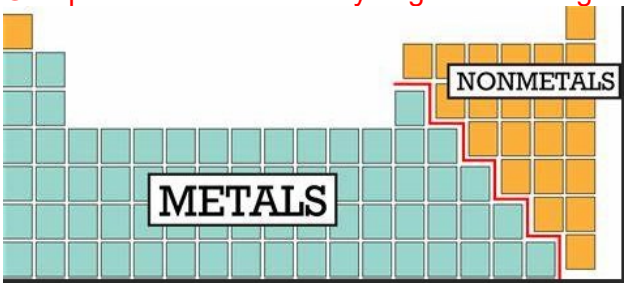
12. What is group 7 called?

Halogens

13. Patterns of reactivity in group 1 and 7

Group 1 = more reactive as you go down the group

Group 7 = less reactive as you go down the group



Chemistry – Bonds

1. What are the three types of chemical bonds?
Ionic, covalent, and metallic

2.What is an ionic bond?
A bond between a metal (positive ion – loses electrons) and non-metal (negative ion, gains electrons), electrons exchanged, electrostatic attraction.

3.What is a covalent bond?
Between non-metals – electrons are shared. Simple or giant

4.What is a metallic bond?
Within metals, positive ions and delocalised electrons

5.What is the charge of an ion from group 1?
1+ (lost outer electron)

6.What is the charge of an ion from group 2?
2+ (lost outer 2 electrons)

7.What is the charge of an ion from group 6?
2- (gained 2 electrons into the outer shell)

8.What is the charge of an ion from group 7?
-1 (gained 1 electron into the outer shell)

9.What is an ionic compound?
A giant 3D structure of ions with strong electrostatics forces operating in all directions.

10.What are the properties of ionic compounds?
High melting and boiling points, solids, crystalline and non-conductor when solid

11.Why do ionic compounds have high melting and boiling points?
Lots of strong electrostatic forces operating in all directions would need a lot of energy to overcome.

12.Why can't ionic compounds conduct electricity when solid?
Ions can't move in a solid

13.Why can ionic compounds conduct electricity when molten or dissolved?
Ions can move and carry the charge through the material.

14.What are the properties of simple molecules?
Low melting and boiling points, non-conductor

15.Why do simple molecules have low melting and boiling points?
Weak intermolecular forces between the molecules (remember covalent bonds are always strong)

16.What are examples of giant covalent structures?
Diamond and graphite

17.What is the structure of diamond?
4 strong covalent bonds, in a giant tetrahedral structure

18.What is the structure of graphite?
3 strong covalent bonds, in a giant layered structure

19.Why can graphite conduct electricity?
The unbonded (delocalized electrons) can move and carry the charge through the material.

20.Why do diamond and graphite have high melting and boiling points?
Giant molecule (macro molecule) with many strong covalent bonds, lots of energy would be needed to overcome this.

21.What is graphene?
A layer of graphite (remember it then has all the same properties as graphite) ... so an excellent conductor.

22.What are fullerenes? Graphene made into a hallow sphere (it is therefore an excellent lubricant or can carry substances within it)

Chemistry – Chemical Reactions (Acids)

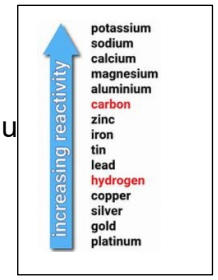
1. How do metal oxides form?
When a metal reacts with oxygen

2. What is reduction?
Removal of oxygen and RIG – Reduction Is Gain (of electrons)

3. What is oxidation?
Addition of oxygen and OIL – Oxidation Is Loss (of electrons)

4. What happens to metals when they react with other substances?
Metals lose outer electrons

5. What is the reactivity of a metal determined by?
The easy at which electrons are lost (more easily lost = more reactive)



6. List metals in order of reactivity. (the first letter is the letter of the metal e.g. Pop = potassiu
Pop Stars Can Make Absolutely Zillions If Little Children Spend Gold Pennies

7. Which two non-metals are often included in the reactivity series?
Carbon and Hydrogen

8. How can metals less reactive than carbon be extracted from their oxides?
Displacement by carbon (a more reactive element will take the place of a less reactive element)

9. What is typically made when an acid reacts with some metals?
Salt (metal and a non-metal)

10. How can acids be neutralised?
Acid (H^+) reacts with a base (OH^-) = water (H_2O)

11. What is an example of a base?
Metal oxide, metal hydroxide or metal carbonate (e.g. sodium oxide)

12. What is an example of an alkali?
A soluble base (e.g. sodium hydroxide)

13. What is the general word equation for a metal hydroxide or oxide reacting with an acid?
Metal hydroxide (metal oxide) + acid salt + water

14. What is the general word equation for a metal carbonate reacting with an acid?
Metal carbonate + acid salt + water +carbon dioxide

15. What type of salt does hydrochloric acid produce?
Chloride

16. What type of salt does sulphuric acid produce?
Sulphate

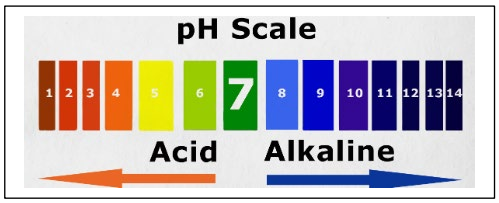
17. What type of salt does nitric acid produce?
Nitrate

18. How can a soluble salt be made?
Mix acid and base (in excess), filter, crystallise until dry

19. What type of ions do acids produce in solution?
H^+ (hydrogen ion)

20. What type of ions do alkalis produce in solution?
OH^- (hydroxide ion)

21. What is the pH scale? (pH = potential for Hydrogen)
A scale from 0-14, Universal indicator or pH meter



22. What is a pH of 7?
Neutral

23. What is a pH value less than 7?
Acidic - (H^+) – strongest pH 1

24. What is a pH value more than 7?
Alkali - (OH^-) – strongest pH 14

25. What happens during a neutralisation reaction? (use an equation)
Acid (H^+) + alkali (OH^-) = water (H_2O)

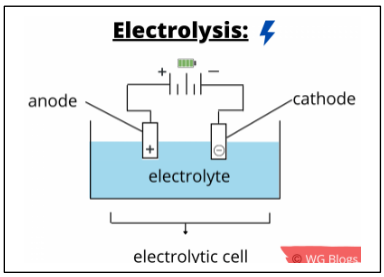
Chemistry - Electrolysis

1) When can an ionic compound conduct electricity?
If its a liquid (molten or solution/aqueous) - ions can move and carry the charge

2) What is an electrolyte?
The liquid

3) What happens when an electric current is passed through an electrolyte?
Ions move and carry the charge through the substance (opposites attract the positive ion goes to the neative electrode)

4) What is the cathode?
Negative electrode



5) What is the anode?
Positive electrode

6) Which electrode are positive ions attracted to?
Cathode (negative electrode)

7) Which electrode are negative ions attracted to?
Anode (positive electrode)

8) What happens at the electrode?
Ions discharge as atoms

9) What happens when a simple molten ionic compound is electrolysed?
Metals (positive ions) go to the cathode and non-metal (negative ions) go to the anode

10) When is electrolysis used to extract metals?
When the metals are more reactive. Displacement can't be used.

11) What are the problems of extracting metals using electrolysis?
High energy costs

12) How is aluminium extracted using electrolysis?
Molten aluminium oxide, cryolite added to lower the melting point, graphite (carbon) electrodes, aluminium and oxygen form. The oxygen then reacts with the graphite electrodes forming carbon dioxide. This electrode then needs to be replaced.

13) Why must the aluminium oxide be molten?
So, the ions can move and separate

14) What ions are present in an aqueous solution?
Hydrogen (H+) and hydroxide (OH-)

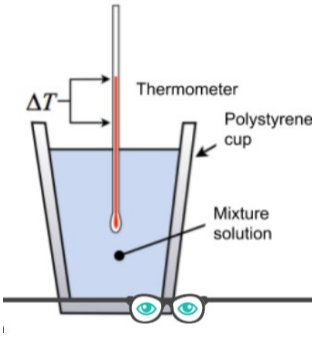
15) During the electrolysis of an aqueous solution what does the ion discharged at the electrode depend on?
The least reactive ion is discharged at the electrode

16) What is formed on the negative electrode if the metal is more reactive than hydrogen?
Hydrogen (the least reactive positive ion discharges)

17) When is oxygen made at the positive electrode?
If it is less reactive than the other negative ions

Chemistry – Required practical – Exothermic and Endothermic reactions

1. What equipment do you need to determine the energy change within a chemical reaction?



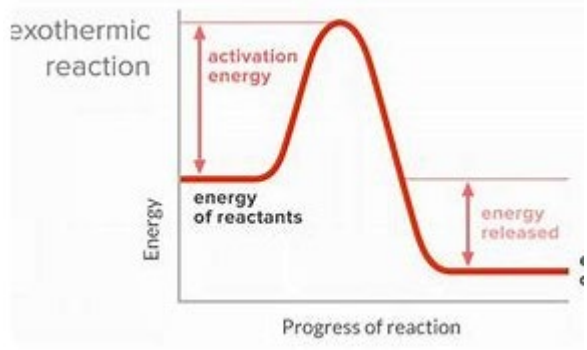
2. Describe the method needed?

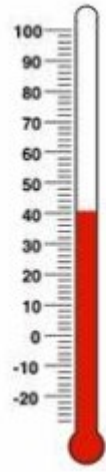
- Measure out the chemicals (g) and or (cm^3)
- Take the initial temperature using a thermometer in ^oC
- Record the temperature every minute
- The reaction is over when the temperature stops changing – record the final temperature
- Calculate the temperature change

3. If the temperature rises what type of reaction is it?
4. Exothermic

5. If the temperature falls what type of reaction is it?
6. Endothermic

7. Draw and describe a reaction profile for an exothermic reaction





8. What type of error could be introduced when reading the thermometer?

Random

9. What is the resolution of this thermometer? 2^oC

10. How could the resolution be improved?

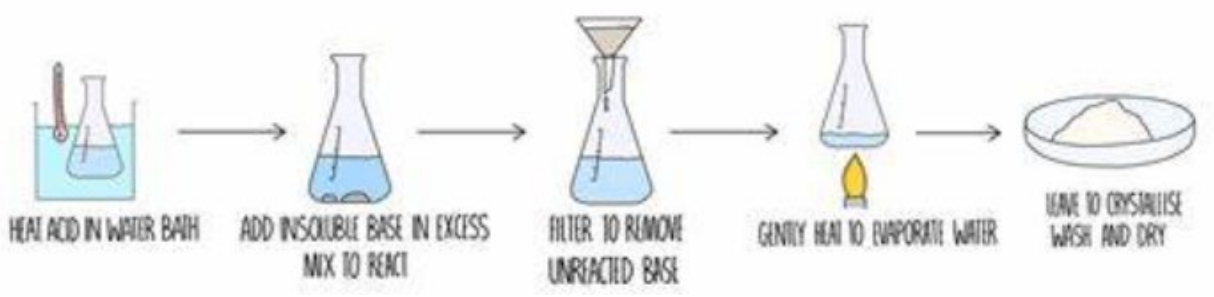
Use a thermometer that measures to a smaller scale (e.g. 0.1^oC)

11. How can the accuracy of the energy change be increased?

Repeat reaction 3 times, check for anomalous results and then take the mean value

Chemistry – Required Practical (Making a pure, dry salt)

1. List the equipment needed to make a pure, dry salt



2. List the three step method

- **Add base to excess**
- **Filter**
- **Evaporate until dry**

3. Why is the base (the solid) added to excess?

To make sure all the acid is fully reacted

4. Why is the reaction then filtered?

Remove the excess base (to make the salt formed pure)

5.

What two chemicals are in the evaporating basin?

Salt and water

6. What is evaporation?

When a liquid turns to a gas

7. Why does the water 'disappear' over time?

It evaporates, from the surface of the liquid. The rate of evaporation is faster at a higher temperature

8. What salts do the following acids create?

- Hydrochloric acid – **chloride salt**
- Sulphuric acid – **sulphate salt**
- Nitric acid – **nitrate salt**

9. What is the state symbol for a soluble salt?

Aq (aqueous – dissolved in water), it can also be called a solution

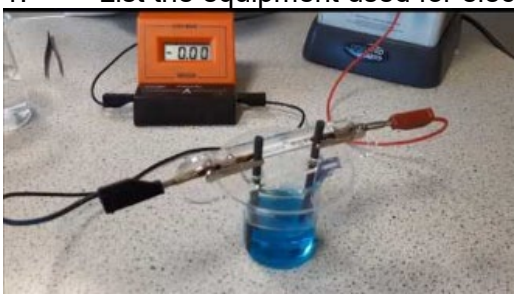
10. What is the state symbol for an insoluble salt?

S (solid), also called a precipitate

REMEMBER – add into your method 'evaporate until DRY'

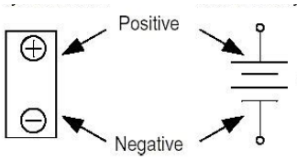
Chemistry – required practical 'Electrolysis of an aqueous solution using inert electrodes'

1. List the equipment used for electrolysis



2. Which electrode is the cathode (negative electrode?).. the other is the positive (anode)

The cathode (negative electrode) is the one connected to the negative terminal of the power source
the short side is the negative



3. What does aqueous mean?

Dissolved in water

4. Why must the electrodes be inert?

So, they don't affect the reactions taking place (unreactive)

5. What ions are present in water?

$H_2O = H^+ + OH^-$ **Hydrogen and hydroxide ions are present**

6. Why would electrolysis not work with a solid?

Ions can not move, they are fixed in place

7. Which ion goes to the negative electrode? Why?

Positive ions move there, as opposites attract

8. What ions would be present in sodium chloride?

Sodium (Na^+) and Chloride(Cl^-)

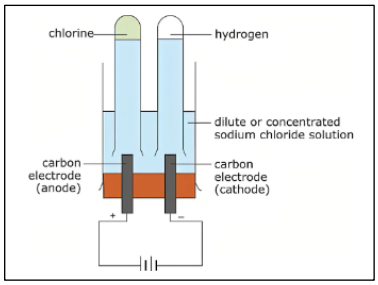
9. What ions would be present in sodium chloride solution? **H^+** **OH^-** **Na^+** **Cl^-**

10. What 'rule' is used to determine which positive/negative ion discharge (goes to the electrode and changes into an atom)?

Reactivity – the least reactive discharges
(remember the reactivity of metals) … non metals, the least reactive are halides then, hydroxides

11. What are the products of electrolysis of NaCl (aq)?

Hydrogen and Chlorine are the least reactive – so they form atoms at the electrodes.
What is left is sodium hydroxide in the solution.



12. What happens to the pH as the solution is electrolysed (from a salt to sodium hydroxide solution)?

The pH changes from neutral to alkaline, 7 à 14, as hydroxide is an alkali

Physics Revision list – Paper 1

Topic	Subtopic	Completed
Energy	Energy stores and transfers	
	Conservation of energy	
	Work done	
	Gravitational potential energy	
	Kinetic energy	
	Elastic potential energy	
	Efficiency	
	Power	
	Energy transfers by heating	
	Heating and insulating buildings	
	Specific heat capacity	
	Renewable and non-renewable energy resources	
	Energy trends and issues	
Electricity	Current and potential difference	
	Charge	
	Resistance	
	Series and parallel circuits	
	ACDC	
	Cables and plugs	
	Electrical power	
	Electrical energy and efficiency	
	National grid	
	Static and electric fields	
Particle model of matter	Density	
	States of matter and changes of state	
	Internal energy	
	Specific latent heat	
	Gas pressure	
Atomic structure	Atomic structure and atomic model development	
	Nuclear decay – alpha, beta and gamma	
	Activity and half-life	
	Hazards and uses	
	Fission and fusion	
Required practical's	Specific heat capacity - An investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored.	
	Thermal insulators - Investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.	
	Resistance - Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits: • the length of a wire at constant temperature • combinations of resistors in series and parallel.	
	Component characteristics - Use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of variety of circuit elements including a filament lamp, a diode and a resistor at constant temperature	
	Density - Use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Volume should be determined from the dimensions of regularly shaped objects and by a displacement technique for irregularly shaped objects.	

Physics – Energy

1. What is the unit of energy?
Joules

2. What is the store of energy in food?
Chemical

3. What is work done?
Energy transferred.

4. What is power?
Rate of energy transfer

5. What is kinetic energy?
Movement energy

6. What is closed system?
A system is an object or group of objects. A closed system cannot allow energy into or out of it.

7. What is the law of conservation of energy?
Energy cannot be created or destroyed. It can be stored or transferred usefully or dissipated.

8. What does it mean if something is more efficient?
A greater proportion of the energy is transferred to the useful store.

9. Jade calculated efficiency and got 12.4J. Is she right or wrong? Explain.
Wrong, she cannot have a number greater than 1 and it does not have a unit, unless it has been turned into %.

10. What happens to the elastic energy when a spring is compressed?
The elastic energy increases.

11. What are the multiplying factors for MJ and GJ?
$x10^6$ and $x10^9$

Physics – Energy 2

1. What is thermal energy?

Heat energy.

2. What materials are good conductors?

Metals

3. What do we call materials that are not good conductors and give an example? Insulators. Plastic, cotton wool, paper, (anything that is not metal).

4.

5. What do metals have that make them good thermal conductors?

Free or delocalised electrons

6. If a material has a high thermal conductivity, does it the rate of thermal transfer is higher or lower?

Higher rate of transfer. The thermal energy transfers at a greater rate.

7. If a house is in a cold country, would we want the building materials to be thicker or thinner?

Thicker, better insulation. The thermal energy stays inside more.

8. In an experiment to see how different types of metals conduct thermal energy what would be the independent variable?

The different types of metals as the independent variable is the one you change.

9. If there is categoric data, what type of graph do you plot, bar chart or line graph?

Bar chart, categoric data is a word, name or label.

10. What is a system?

An object or group of objects.

11. What are control variables?

The things you keep the same in an experiment. Without these you cannot compare your results.

Physics- Electricity

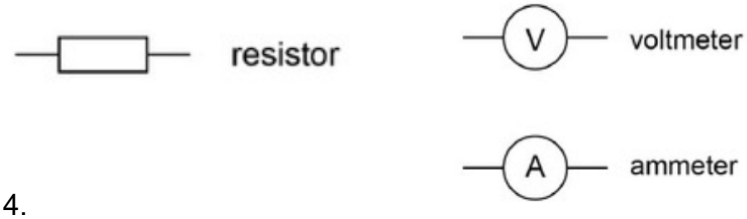
1. Finish the sentence: electrical current is the flow of...

Charge

2. What does an ammeter measure and how do you attach it?

Current and attached in series

3. What do the symbols look like for an ammeter, voltmeter and a fixed resistor? (describe them) A capital A in a circle, a capital V in a circle and a rectangle.



4.

5. What does a voltmeter measure and how is it attached?

Voltage or potential difference and it is attached in parallel across the component.

6. Describe a series circuit.

One continuous loop.

7. Describe a parallel circuit.

A circuit with branches (remember like a tree)

8. What happens to current in a series circuit?

Stays the same.

9. What happens to voltage in a series circuit?

Shared across the components.

10. What happens to current in a parallel circuit?

Shared across the branches.

11. What happens to voltage in a parallel circuit?

Stays the same.

12. If the temperature of a wire increases does the resistance increase or decrease? Increase.

13. If the length of a wire is longer does the resistance increase or decrease? Increase.

14. How do you convert mA into A? ÷ 1,000

15. If you have a 5 Ohm resistor in series with a 5 Ohm resistor, what is the total resistance? 10 Ohms

16. If you have a 5 Ohm resistor in parallel with a 10 Ohms resistor, say what you know about the total resistance.

Less than 5 Ohms as the resistance is smaller than the smallest resistor in a parallel circuit.

17. What is the voltage and frequency of the UK mains supply? 230V and 50Hz.

18. What are the colours of the Earth wire, live wire and neutral wire?

Earth is yellow and green stripe. Live is brown and neutral is blue.

19. Which wire is: a) the safety wire? b) completes the circuit? c) brings the voltage?

a) is the Earth wire b) is the neutral wire and c) is the live wire.

20. How does a fuse work? Make 2 points. Too much current flows and the fuse blows.

21.

22. Which appliances only need a 2 core- cable and why?

A fully plastic/ wooden/ ceramic appliance would have a two-core cable. The earth wire is not needed as the appliance is doubly insulated.

Physics - Electricity

1. Finish the sentence: electrical current is the flow of...
Charge

2. What does an ammeter measure and how do you attach it?
Current and attached in series

3. What do the symbols look like for an ammeter, voltmeter and a fixed resistor? (describe them)
A capital A in a circle, a capital V in a circle and a rectangle.

4. What does a voltmeter measure and how is it attached?
Voltage or potential difference and it is attached in parallel across the component.

5. Describe a series circuit.
One continuous loop.

6. Describe a parallel circuit.
A circuit with branches (remember like a tree)

7. What happens to current in a series circuit?
Stays the same.

8. What happens to voltage in a series circuit?
Shared across the components.

9. What happens to current in a parallel circuit?
Shared across the branches.

10. What happens to voltage in a parallel circuit?
Stays the same.

11. If the temperature of a wire increases does the resistance increase or decrease?
Increase.

12. If the length of a wire is longer does the resistance increase or decrease?
Increase.

13. How do you convert mA into A? ÷ 1,000

14. If you have a 5 Ohm resistor in series with a 5 Ohm resistor, what is the total resistance?
10 Ohms

15. If you have a 5 Ohm resistor in parallel with a 10 Ohms resistor, say what you know about the total resistance.
Less than 5 Ohms as the resistance is smaller than the smallest resistor in a parallel circuit.

16. What is the voltage and frequency of the UK mains supply?
230V and 50Hz.

17. What are the colours of the Earth wire, live wire and neutral wire?
Earth is yellow and green stripe. Live is brown and neutral is blue.

18. Which wire is: a) the safety wire? b) completes the circuit? c) brings the voltage?
a) is the Earth wire b) is the neutral wire and c) is the live wire.

19. How does a fuse work? Make 2 points. Too much current flows and the fuse blows.

20. Which appliances only need a 2 core- cable and why? A fully plastic/ wooden/ ceramic appliance would have a two-core cable. The earth wire is not needed as the appliance is doubly insulated.

Physics - Molecules and matter

1. Which state of matter has particles in a regular pattern? Solid

2. Which state of matter has particles that fill the entire container? Gas

3. Which state of matter is the least dense? Gas

4. Which state of matter has particles that vibrate about a fixed position? Solid

5. Which states of matter has particles that can flow? Liquid and gas.

6. Which state of matter takes the shape of the container? Liquid

7. Which two states of matter cannot be compressed? Solid and liquid

8. Explain why a gas can be compressed.
A gas can be compressed as there are spaces between the particles.

9. Fill in the missing spaces: density is the _____ per unit volume. Mass.
10.
11. When you find the density of an object you must find the mass. What do you use to find the mass of an object?
A balance or scales.

12. When you find the density of an object you must find the volume. How do you find the volume of a) a regular shaped object?
A ruler, then multiple the height, width and length b) an irregular shaped object? Fill a displacement can to the spout with water. Add the object. Catch he displaced water with a measuring cylinder.

13. Is a change of state a chemical or a physical change? Physical change.

14. What happens to the mass during a change of state? Stays the same.

15. What two forms of energy make up internal energy? Kinetic and potential.

16. What happens to the internal energy if the temperature increases? Increases.

17. What happens to the temperature during a change of state? Stays the same.

18. What do you call it if a liquid becomes a solid? Does energy increase or decrease? Freezing. Energy decreases.

19. What do you call it if a solid becomes a liquid? Does energy increase or decrease? Melting. Energy increases.

20. How do you convert g into kg? ÷ 1,000

21. What are the missing words: Specific latent heat is the amount of _____to change the _____ of 1kg of a material. Energy, state.

Physics - Radioactivity

1. What causes an atom to be radioactive? Unstable nucleus
2. What is the diameter of an atom? $1x10^{-10}m$
3. How many times smaller is the nucleus than the atom? 10,000 times smaller
4. What is the charge of a proton, neutron, and an electron? Positive, neutral, and negative.
5. Why is the atom neutral? Equal numbers of positive protons and negative electrons.
6. Why is the nucleus positive? As there are positive protons and neutral neutrons in it.
7. What is an isotope? Atoms of the same element with different numbers of neutrons.
8. What does the atomic number of an element tell you? The number of protons.
9. What does the mass number of an element tell you? Protons and neutrons added together.
10. What type of radioactive particle is made of two protons and two neutrons? An alpha particle.
11. What type of radioactive particle is a high energy electron from the nucleus? A beta particle.
12. What type of radiation is a high energy, high frequency EM wave? Gamma waves.
13. List radiation from most to least ionising. Alpha, beta then gamma.
14. List radiation from most to least penetrating. Gamma, beta then alpha.
15. What two things happen to the cells in your body if they are ionised? They become cancerous or die.

Physics RP Resistance

1. If there is a greater resistance will there be a more or less current flowing? Less current

2. How do you attach an ammeter? In series.

3. If there is a reading on the ammeter before the circuit is switched on, what type of error is this? Zero.

4. How do you attach a voltmeter? In parallel.

5. During the length of wire and resistance RP, what is the independent variable? The length of the wire.

6. During the length of wire and resistance RP, what is the dependent variable? The resistance, which you get from doing voltage ÷current

7. During the length of wire and resistance RP, what are the control variables? The type of wire, the thickness of the wire and the temperature of the wire.

8. During the length of wire and resistance RP, there is a variable resistor that needs to be adjusted each time measurements are taken. Why? Make 3 points. Varies the resistance, keeps the current the same, so the wire does not heat up.

9. In between taking readings the circuit must be turned off, why? So that the wire does not get hot, this would increase resistance.

10. What type of data will you have from this experiment, categoric or continuous? Continuous.

11. What type of graph will you plot? Line.

12. What is the relationship between length of wire and resistance? Directly proportional.

Density RP

1. What is the equation to calculate density? Density = mass / volume
2.
3. What do you use to measure the mass of an object? Balance
4.
5. What do you use to measure the volume of a regular object? And how do you work it out? A ruler
6.
7. What do you use to measure the volume of an irregular shaped object? A displacement can
8.
9. Explain how you would find the density of an irregular shaped object.

Fill the displacement can with water to the spout, place the object in the can and catch the displaced water with a measuring cylinder. This gives you the volume.

Specific heat capacity RP:

1. What is the equation to find Specific heat capacity? Use your equation sheet to find it.

Energy mass x specific heat capacity x temperature change.

2. How do you find the mass of an object? Use a balance

3. How do you find the temperature of an object? Thermometer.

4. What equipment do we use to heat an object? A heater.

5. What is the unit of energy? Use your answer to help you remember the answer the next question. J

6. What equipment (a type of meter), do you use to measure the energy supplied? Joulemeter.

7. How long will you heat for? (Pick a reasonable time).
Anything more than 5 minutes and that seems reasonable. They need to have a temperature increase.

8. How do you work out a temperature change? The final temperature – the starting temperature.

9. What do you wrap around the equipment and why do you do this?
Insulation. To reduce the thermal energy going into the surroundings.

Biology

Paper 2 – Revision questions

Homeostasis, Nervous System and Reflex Arc

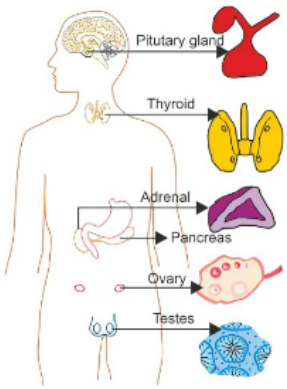
1. What is homeostasis?
   Regulation of the internal conditions of a cell or organism to maintain optimum conditions for function in response to internal and external changes.
2. Which three factors need to be controlled?
   - blood glucose concentration
   - body temperature
   - water levels.
3. What is the function of the nervous system?
   Enables humans to react to their surroundings and to coordinate their behaviour.
4. What are the two parts of the central nervous system?
   Brain and Spinal Cord
5. What is a stimulus?
   A change in the environment
6. What is a receptor?
   A cell that detects a stimulus
7. What is an effector – give two examples and how they act?
   Muscles or glands, which bring about responses which restore optimum levels. Muscles contract and glands release chemicals.
8. What do co-ordination centres do?
   That receive and process information from receptors
9. What is a reflex?
   Automatic and rapid; they do not involve the conscious part of the brain.
10. Why are reflex actions important?
    Prevent harm
11. What is the pathway of a reflex arc?
    Stimulus, receptor, sensory neurone, relay neurone, motor neurone, effector response.

Reaction Time Required Practical

1. What is reaction time?
   The time taken to respond to a stimulus
2. What are the factors that can impact reaction?
   Age, sex, time of day, tiredness, amount of caffeine drunk
3. Describe how to carry out the ruler drop test
   1. Work with a partner.
   2. Person A holds out their hand with a gap between their thumb and first finger.
   3. Person B holds the ruler with the zero at the top of person A's thumb
   4. Person B drops the ruler without telling Person A and they must catch it.
   5. The number level with the top of person A's thumb is recorded in a suitable table. Repeat this ten times.
   6. Swap places and record another ten attempts.
   7. You can use the conversion table to help convert your ruler measurements into reaction time or just record the catch distance in cm.
4. How can the measurement of reaction time be made more accurate?
   Use a computer program to measure reaction time
5. What factors can impact the validity of the experiment?
   Experiment not repeated, too few participants, ruler dropped from different heights.
6. If investigating the effect of caffeine, why leave 15 mins between drinking the caffeinated drink and carrying out the test?
   To allow the caffeine to work/ reach the brain.
7. When investigating caffeine levels water is sometimes given to some participants. Why?
   As a control – to compare the effect of no caffeine.
8. Why does the ruler test not involve a reflex action?
   Not automatic, involves the brain.
9. Why does repeating the experiment give more valid results?
   Allows anomalous results to be identified.

Human Endocrine System

1. What is the endocrine system made up of?
   Glands
2. What are hormones?
   Chemical Messengers
3. How do hormones travel around the body?
   In the bloodstream
4. What do hormones act upon?
   Target organs
5. Which gland is known as the master gland?
   Pituitary gland
6. Name each gland, state the hormone it secretes and the action of that hormone.



Glands	Hormones	Functions
Pituitary	Growth hormone	• Regulates growth • Controls the functioning of endocrine glands
Thyroid	Thyroxine	• Controls the metabolism rate • It also brings about balanced growth
Parathyroid	Parathormone	• Controls calcium balance of the body
Adrenal	Adrenaline	• Prepares body for emergency
Pancreas	Insulin	• Controls glucose level of the blood
Testes	Testosterone	• Controls growth and development of male reproductive system
Ovaries	Oestrogen, progesterone	• Controls growth and development of female reproductive system

7. Which gland monitors and controls blood glucose?
   Pancreas
8. Which hormone is released by the pancreas when blood glucose is too high? How does the hormone reduce glucose levels?
   Insulin – acts on muscle and liver cells causing them to take in more glucose and convert to glycogen for storage
9. HT Only - Which hormone is released by the pancreas when blood glucose is too low? How does the hormone increase glucose levels?
   Glucagon – acts on muscle and liver cells causing them to convert glycogen into glucose – this diffuses into the blood.
10. In each type of diabetes why does the level of glucose remain high? How can they be treated?
    Type 1 – The pancreas cells do not release enough insulin. Treated using insulin injections
    Type 2 – The cells do not respond to insulin. Treated using a carbohydrate-controlled diet and exercise.
11. What is a risk factor of type 2 diabetes?
    Obesity

Hormones in Human Reproduction

1. Which hormones cause secondary sex characteristics to develop in males? Females?
   Males – Testosterone, Females – oestrogen
2. What changes does each of these hormones cause?
   Testosterone – causes sperm production, Oestrogen – causes eggs to mature and be released every 28 days.
3. How long does the average menstrual cycle last?
   28 days
4. What is ovulation and on what day of the menstrual cycle does it occur?
   When an egg is released from the ovary – 28 days
5. What are the names of each hormones involved in the menstrual cycle and what do they cause?
6. HT Only – How do FSH, oestrogen, LH and progesterone interact?
7. How does each type of contraception prevent pregnancy?

- oral contraceptives that contain hormones to inhibit FSH production so that no eggs mature
- injection, implant or skin patch of slow release progesterone to inhibit the maturation and release of eggs for a number of months or years
- barrier methods such as condoms and diaphragms which prevent the sperm reaching an egg
- intrauterine devices which prevent the implantation of an embryo or release a hormone
- spermicidal agents which kill or disable sperm
- abstaining from intercourse when an egg may be in the oviduct
- surgical methods of male and female sterilisation.

8. HT Only – Which hormones are used as a fertility drug?
   FSH and LH
9. HT Only – Describe the process of IVF?

- IVF involves giving a mother FSH and LH to stimulate the maturation of several eggs.
- The eggs are collected from the mother and fertilised by sperm from the father in the laboratory.
- The fertilised eggs develop into embryos.
- At the stage when they are tiny balls of cells, one or two embryos are inserted into the mother's uterus (womb).

10. Evaluate the use of IVF

- it is very emotionally and physically stressful
- the success rates are not high
- it can lead to multiple births which are a risk to both the babies and the mother

Negative Feedback – HT Only

1. What is the role of thyroxine?
   Controls metabolic rate
2. What is the role of adrenaline?
   Increases heart rate – boosts the delivery of oxygen and glucose to the brain and muscle, preparing the body for fight or flight.
3. What is TSH?
   Thyroid stimulating hormone
4. Which gland releases it?
   Pituitary gland
5. What is its action?
   Causes the thyroid to release more thyroxine
6. The release of which hormone is controlled by negative feedback?
   Thyroxine
7. What is a negative feedback system?
   A negative feedback control system responds when conditions change from the ideal or set point and returns conditions to this set point.

Reproduction

1. Which type of cell division makes gametes?
   Meiosis
2. How many cells are made during cell division?
   4
3. What are the male and female gametes in animals?
   Egg and sperm cells
4. What are the male and female gametes in plants?
   Pollen and egg cells
5. What happens to gametes during sexual reproduction?
   They fuse – this is fertilisation
6. How many parents are involved in sexual and asexual?
   Sexual – 1 Asexual – 2
7. Are offspring genetically identical or unidentical in sexual and asexual?
   Sexual – unidentical Asexual – identical

Inheritance

1. Describe the structure of DNA?
   Double helix, polymer
2. What are chromosomes?
   Long strand of DNA
3. What is a gene?
   A small section of DNA that codes for a particular sequence of amino acids, to make a specific protein.
4. What is a genome?
   The entire genetic material of an organism
5. What is the importance of knowing about the human genome?

- search for genes linked to different types of disease
- understanding and treatment of inherited disorders
- use in tracing human migration patterns from the past

6. Define the following keywords:
   allele – a different version of a gene
   dominant – an allele that is always expressed
   recessive - only expressed if two copies are present
   homozygous - two alleles present are the same
   heterozygous - alleles are different
   genotype – the alleles an organisms has
   phenotype – physical characteristics
7. What type of allele causes?

a) Polydactyly? Dominant
b) Cystic Fibrosis? Recessive

8. What sex chromosomes do males and females have?
   Males – XY Females – XX

Variation and Evolution

1. What is variation?
   Differences in the characteristics of individuals in a population
2. Variation can be caused by?

- the genes they have inherited (genetic causes)
- the conditions in which they have developed (environmental causes)
- a combination of genes and the environment

3. What is a mutation?
   A change in DNA
4. What is evolution?
   A change in the inherited characteristics of a population over time
5. Which scientists developed the theory of Natural Selection?
   Charles Darwin.
6. What does the theory suggest?
   There is variation in a population due to mutations. Some organisms are better suited to the environment. They are more likely to survive, reproduce and pass on the gene to offspring. If two populations of two species become so different in phenotype, they can no longer interbreed to produce fertile offspring they have formed two new species.
7. What are fossils?
   The 'remains' of organisms from millions of years ago, which are found in rocks.
8. How can fossils be formed?

- from parts of organisms that have not decayed because one or more of the conditions needed for decay are absent
- when parts of the organism are replaced by minerals as they decay
- as preserved traces of organisms, such as footprints, burrows and rootlet traces.

9. Why is the fossil record incomplete?

- Many early forms of life were soft-bodied, which means that they have left few traces behind.
- What traces there were have been mainly destroyed by geological activity.
- Some are too deep underground and have not been found.

10. What is extinction?
    When there are no remaining individuals of a species still alive.
11. What can lead to a species becoming extinct?

- New competitors
- New disease
- New predators
- Catastrophic event

12. How can the rate of development of antibiotics resistant bacteria be reduced?

- doctors should not prescribe antibiotics inappropriately, such as treating non-serious or viral infections
- patients should complete their course of antibiotics, so all bacteria are killed, and none survive to mutate and form resistant strains
- the agricultural use of antibiotics should be restricted.

13. Which scientist developed the first classification system?
    Carl Linnaeus
14. What did Linnaeus classify living things into?
    Kingdom, phylum, class, order, family, genus and species

15. Which two taxa are the binomial names based upon?
    Genus and species
16. Which scientist developed the three-domain system of organisms?
    Carl Woese
17. What are the three domains?

- Archaea (primitive bacteria usually living in extreme environments)
- Bacteria (true bacteria)
- Eukaryota (which includes protists, fungi, plants and animals).

Ecology

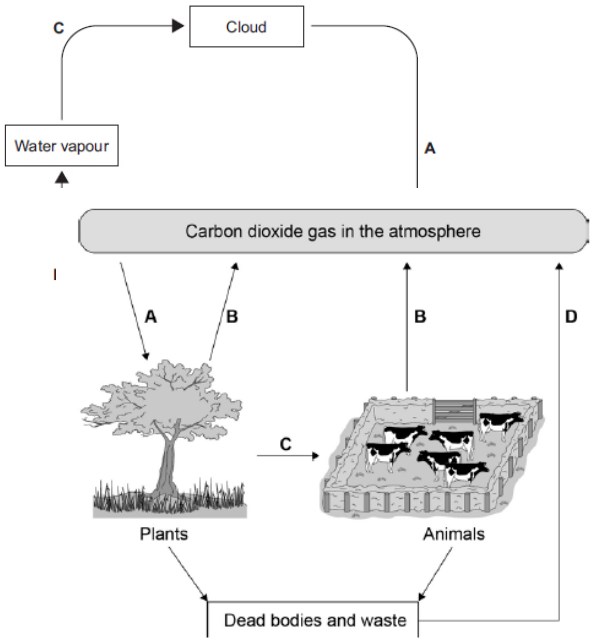
1. What is an ecosystem?
   The interaction of a community of living organisms (biotic) with the non-living (abiotic) parts of their environment.
2. What are biotic factors and give examples?
   Living factors – pathogens, competitors, predators
3. What are abiotic factors?
   Non – living factors – light intensity, temperature, oxygen levels, carbon dioxide levels, water levels
4. What do animals compete for?
   Food, mates and territory
5. What do plants compete for?
   Light, water, mineral ions and space
6. What is a stable community?
   One where all the species and environmental factors are in balance so that population sizes remain fairly constant
7. What are adaptations?
   Features that enable them to survive
8. What are the three types of adaptation?
   Structural, behavioural or functional
9. What is an extremophile?
   Organisms that live in environments that are very extreme such as a high temperature, pressure, or salt concentration

Distribution and Abundance Required Practical

1. What is a quadrat?
   A square
2. How can they be placed randomly?
   Use a random number generator to identify locations to place quadrats.
3. How can do you calculate the area of a rectangle?
   Base x height
4. How do you calculate a mean?
   Add number together and divide by the numbers of numbers
5. How do you calculate range?
   Largest number – smallest number
6. What equation would be used to estimate the number of organisms in an area?
   Area of habitat / area of quadrat x mean number of organisms per quadrat
7. Why is the result from the abundance practical only an estimate?
   Only a sample of data is collected
8. What is a transect?
   A line created by string / tape measure
9. How can a transect be used to measure the impact of a factor on distribution of organisms?
   Place quadrat at regular intervals along the transect. Count the number of organisms in the transect and measure the abiotic factor at that location. Repeat at different locations.
10. What piece of equipment would you use to measure the following abiotic factors?
    Light intensity – Light meter
    Ph of soil – pH meter
    Temperature – Thermometer
    Wind speed – anemometer
11. Why do less plants grow near a building?
    Shaded so less light for photosynthesis
12. Which biotic and abiotic factors can impact plant growth?
    Biotic – herbivores, competition, trampling, disease
    Abiotic – light intensity, temperature, water in soil, pH of soil

Organisation of an ecosystem

1. What are producers?
   Green plants or algae that make biomass through photosynthesis
2. What are primary consumers?
   Organisms that eat producers
3. What are secondary consumers?
   Organisms that eat primary consumers
4. What is a predator?
   Organisms that kill and eat other animals
5. What is a prey?
   Organisms that are eaten by predators
6. Label the processes involved in the water cycle
   A – Precipitation
   B – Evaporation
   C - Condensation



7. Label the processes involved in the carbon cycle
   A – Photosynthesis
   B – Respiration
   C – Feeding
   D – Decay

8. What type of organism carries out decay?
   Bacteria

Biodiversity

1. What is biodiversity?
   The variety of all different species of organisms on earth or within an ecosystem
2. Why are humans producing more waste?
   Increased human population and standard of living
3. What are the three types of pollution?

- Air – from smoke and acidic gases
- Water – from sewage, fertiliser or toxic chemicals
- Land – from landfill and from toxic chemicals

4. How does pollution impact biodiversity?
   Decreases it as pollution kills plants and animals.
5. Why do humans use land?
   Building, quarrying, farming and land fill.
6. How does the destruction of peat bogs impact biodiversity?
   Reduces the habitat for different plant, animal and microorganism species that live there. The decay or burning of peat releases carbon dioxide into the atmosphere. This is a greenhouse gas that will add to global warming.
7. Why is large scale deforestation carried out?
   To provide land for cattle, crop farming and to grow crops for biofuels.
8. How does deforestation impact biodiversity?
   Levels of carbon dioxide increase as there are less trees taking it in for photosynthesis and the trees are often burnt or decay. This contributes to global warming.
9. How can biodiversity be maintained?
   - Breeding programmes for endangered species
   - Protection and regeneration of rare habitats
   - Reintroduction of field margins and hedgerows
   - Reduction of deforestation and carbon dioxide emissions by some governments
   - Recycling resources rather than dumping waste in landfill

Chemistry

Chemistry - Rates of Reaction

1. What does rate mean?

The speed of the reaction, how quickly the reactants change to the products

2. What 2 things must happen if particles are going to react?

Collide, with enough energy (activation energy)

3. List the factors that can affect the rate of a chemical reaction

Temperature
Catalyst
Surface area (if the reactant is a solid)
Concentration (if the reactant is a liquid)
Pressure (if the reactant is a gas)

4. How can the rate be measured?

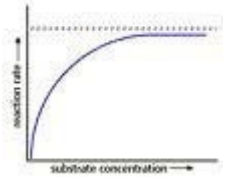
How quickly the reacts disappears, or how quickly the products form
e.g. a fall in mass, collection of gas, the speed of a color change

5. Explain how the following effect the rate of a reaction

Link it to either or both – FREQUENCY of collisions and how hard they collide, the energy involved

1. Temperature – move faster so collide more frequently and harder
2. Surface area – more exposed particles so increases the frequency of collisions
3. Concentration – more particles so increases the frequency of collisions
4. Catalyst – lowers the activation energy by finding an alternative pathway

6. Copy this sketch and add how a it would be different for



1. Increase in temperature, but not changing anything else – the line would be steeper but level off at the same point

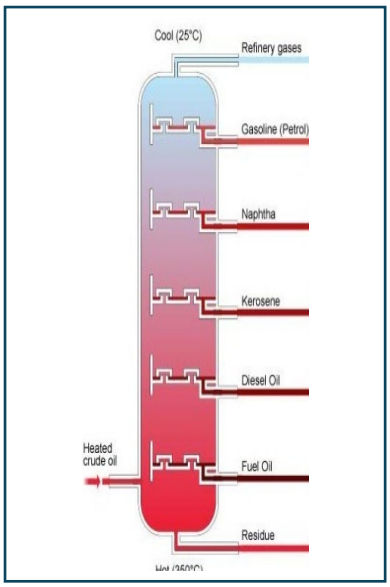
2. Using double the amount of initial reactants, but keeping all other factors the same – the steepness(gradient) would be the same but there would be more products, so it would be higher

Crude oil

1. What is a hydrocarbon? Contains only carbon and hydrogen atoms
2. What is a mixture? Two or more substances that are not chemically joined
3. How is crude oil formed? Remains of ancient sea life, deposited in mud, subjected to high temperature and pressure over millions of years
4. How is crude oil separated? Fractional distillation – say what you see in the diagram
5. How do the following properties relate to increasing the hydrocarbon chain?

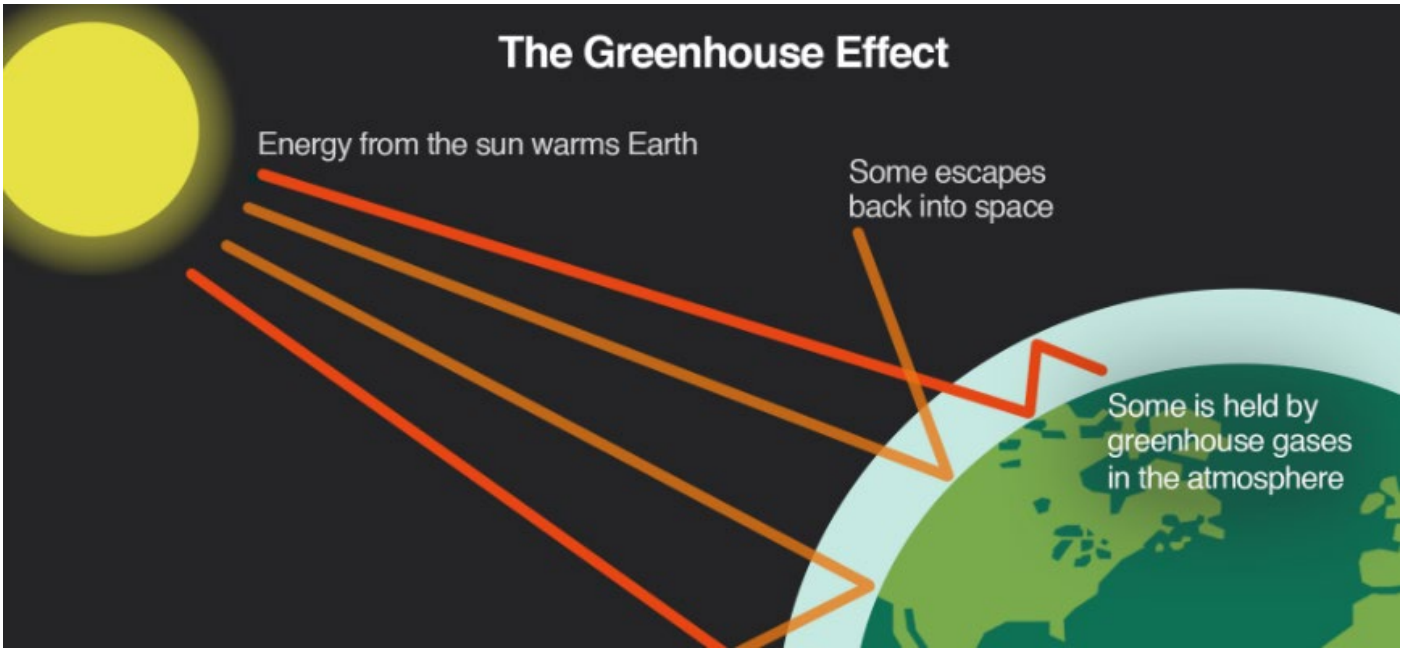
- Viscosity (thickness) – increases, entanglement when the chains are longer
- Melting and boiling point – increases
- Flammability – decreases

6. What is an alkane? A hydrocarbon that has single covalent bonds between the carbon atoms
7. What is the general formula for an alkane? CnH2n+2
8. Which fractions are in the highest demand and why? The shorter chains that are more flammable as they are better fuels (e.g. petrol)
9. How do we get more of these fractions from crude oil? Cracking (snapping) longer chains hydrocarbons
10. What is cracking? Snapping longer chain hydrocarbons into shorter chains
11. How are longer chain alkanes cracked? Heat (thermal decomposition) and a ceramic catalyst
12. What are the products of cracking? Shorter chain hydrocarbon and an alkene (e.g. ethene)
13. What is an alkene? A hydrocarbon that has a double covalent bond between the carbon atoms
14. What is the general formula for alkenes? CnH2n
15. How do you test for an alkene? Bromine water – turns from orange brown transparent to COLOURLESS
16. How are alkanes and alkenes named? 1 carbon = met, 2 carbon = eth, 3 carbon = prop, 4 carbon – but…. ane (if all single bonds) or … ene (if there is a double bond)
17. How many bonds does carbon have? 4
18. Name C_4H_8 and C_4H_{10} – butene and butane



Atmosphere

1. What time frame did the evolution of the atmosphere start? 4.6 billion years ago
2. What gases where in the early atmosphere (5) carbon dioxide, water vapour, methane, nitrogen and ammonia
3. What created the gases? Volcanoes
4. What happened to the average temperature like? Very hot and cooled over time
5. As the earth cooled, what gas came out of the atmosphere first and why? Water vapour condensed as the Earth cooled
6. What did the water vapour form? Oceans
7. What gas dissolved into the oceans? Carbon dioxide
8. When did the first photosynthesis algae evolve? 2.6 billion years ago
9. With carbon dioxide and water present, what process started? Photosynthesis
10. Write the process for photosynthesis carbon dioxide+ water glucose + oxygen
11. Oxygen is produced by plants, what percentage is this in the current atmosphere? Roughly 20%
12. How did carbon dioxide get further reduced in amount from the early atmosphere to now (4)? Photosynthesis, trapped in fossil fuels and sedimentary rocks
13. What is the percentage of nitrogen in the current atmosphere? Roughly 80%
14. Why does the amount of nitrogen not change over time? Nitrogen is unreactive
15. What are fossil fuels? Coal (remains of ancient forests), crude oil and gas (remains of ancient sea life)
16. Complete the equation for combustion (burning of a fossil fuel in oxygen) Hydrocarbon + oxygen carbon dioxide + water
17. What environmental issue do carbon dioxide and water cause? Greenhouse effect
18. Explain the Greenhouse effect – using the picture
19. What is the other main Greenhouse gas and how is it produced? Methane, intensive farming and rice production
20. What are the consequences of the enhanced Greenhouse effect? Polar ice caps melt, rising sea levels, average sea temperature rises, more extreme weather, increasing desertification



Identifying Substances

1. What is a formulation? A useful mixture with a specific formula
2. What is a pure substance? Contains only 1 type of atom/compound
3. How can you test for purity? Specific boiling and melting point
4. How to you test and what is the positive result for

Substance	Test	Positive result
Oxygen	Glowing splint	Re-lights
Carbon dioxide	Limewater	Cloudy
Chlorine	Damp litmus paper	Bleaches
Double covalent carbon bond (alkene)	Bromine water	Colourless
Hydrogen	Lit splint	Pops

Useful Resources

1. What are the 3 R's? Reuse, recycle, reduce
2. What is a LCA? Life cycle assessment, assessing the impact on the environment of the product
3. What is a carbon footprint? The amount of carbon produced in the life time of the object
4. What is potable water? Water safe to drink
5. What is pure water? Only H_2O
6. List the stages for treating waste water
   Waste water (sewage, industry or agriculture)
   Screening (filtering through a metal screen)
   Sedimentation (left to separate into effluent and sludge)
   Effluent (liquid) cleaned by aerobic bacteria and released into the fresh water system
   Sludge (solid), cleaned by anaerobic bacteria and used as fertiliser
7. List the stages for treating drinking water

- Fresh water source
- Filtered
- Sterilised

8. How can water be sterilised and why is this important? Sterilisation kills bacteria, chlorinated, UV light or ozone
9. Why can we not drink sea water? Too much salt
10. What is desalination? Removal of salt
11. How is sea water desalinated? Distillation or reverse osmosis
12. What does finite mean in relation to resources? Only a limited amount
13. What does renewable mean? Can be replenished or not used up
14. Metals are usually mined, however sources of these are now scare so alternative methods are used to mine low grade metal. Explain the following;

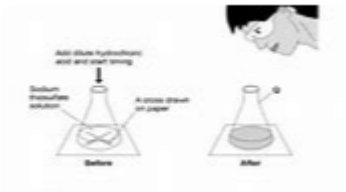
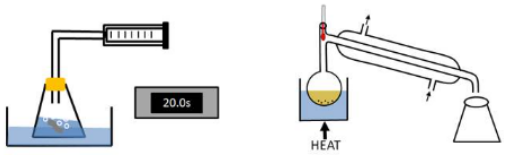
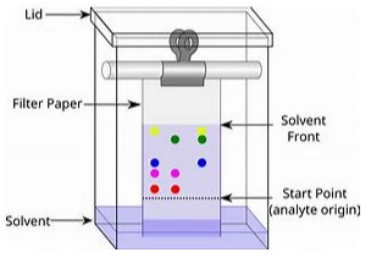
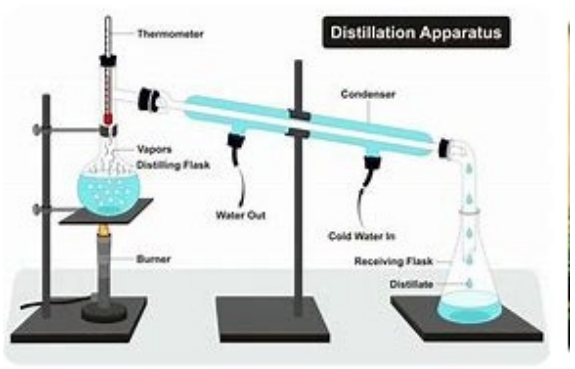
- Phytomining – using plants to harvest the metal, burn the plant, clean the ash is acid and then electrolyse the solution
- Bioleaching – use bacteria to harvest the metal from water

Chemistry required practical's

List the equipment
describe the picture and method

Other things to remember

DO NOT SAY AMOUNT – if its VOLUME of a liquid (cm^3) using measuring cylinder OR MASS (g) of a solid using a balance

<table>
<tr><td colspan="2">Rates of reaction</td><td>Chromatography</td><td>Analysis of water</td></tr>
<tr><td>If the product is a solid (s) – also known as a precipitate</td><td>If the product is a gas (s)</td><td></td><td></td></tr>
<tr><td>  </td><td> 
</td><td> 
</td><td> 
</td></tr>
<tr><td>Disappearing cross
Product is a solid
Time</td><td>Collect the gas</td><td>Allow time to run
Dry
Compare</td><td>Boil until dry
Pure water – boils at 100°C</td></tr>
</table>

Physics

Forces in balance

1. What is a vector quantity? A quantity with magnitude and direction.
2. What is a scalar quantity? A quantity with magnitude only.
3. Are the following contact or non- contact forces:

- Air resistance? Contact.
- Magnetism? Non- contact
- Friction? Contact.
- Gravity? Non- contact.
- Static? Non- contact.
- Tension? Contact.
- Normal contact force? Contact.

4. Define velocity. Velocity is speed in a direction.
5. Define displacement. Distance in a direction.
6. Are the following vector or scalar quantity:

- Velocity? Vector.
- Speed? Scalar.
- Distance? Scalar.
- Mass? Scalar.
- Displacement? Vector.
- Acceleration? Vector.

7. What is the unit of weight? N
8. What are the missing words? A resultant force is a _____ force that has the same effect as all of the _____ acting. Single, forces.
9. If the resultant force is 0N what are the two possible options for motion? Constant speed or stationary.
10. Work done = _____ _____ energy transferred.
11. What are balanced forces? Forces that are the same size and in opposite direction.
12. What is the centre of mass? A point through which the weight of an object can be considered to act
13. How can the centre of mass of a regular object, such as a square, rectangle or circle be found? Include a diagram. Lines of symmetry – point of intersection
14. How can the centre of mass of an irregular object be found? Include a diagram. Take object and hang it from an optical pin on a clamp stand. Suspend plumb line in front of the object. Draw a line along the plumb line. Move the object and suspend from another point in the object. Suspend plumb line in front of the object. Draw a line along the plumb line. The point of intersection should be the centre of mass. Check by balancing on your finger.

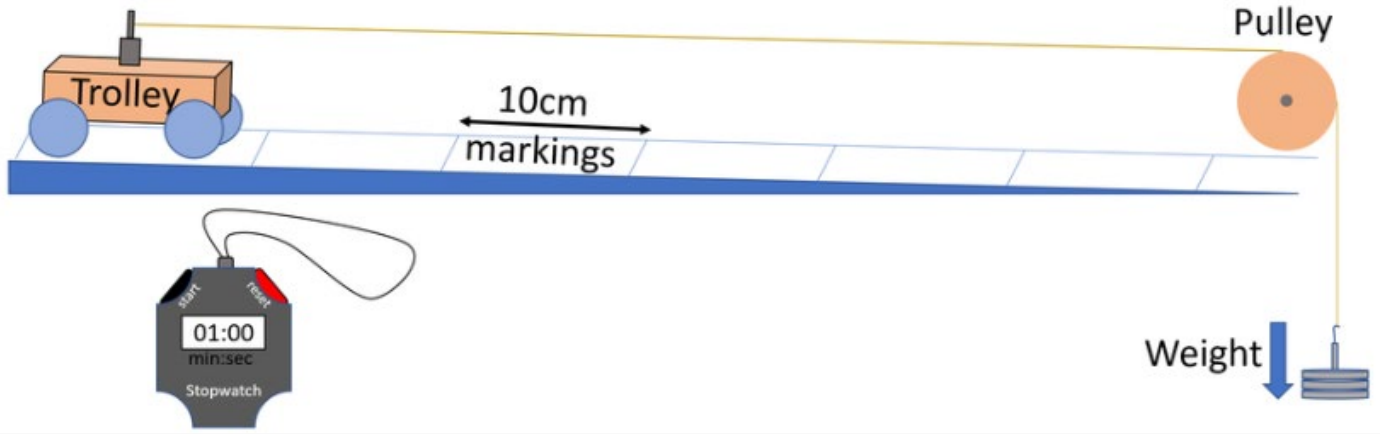
Motion

1. How do you convert km into m? x1,000.
2. What the approximate speed of someone walking? 1.5m/s
3. What the approximate speed of someone running? 3m/s
4. What the approximate speed of someone cycling? 6m/s
5. What factors can affect the speed at which someone walks, runs or cycles? age, fitness, terrain, and distance travelled
6. What the approximate speed of sound in air? 330m/s
7. How do you convert minutes into seconds? Multiply by 60s
8. On a distance- time graph, what does a straight diagonal line represent? Constant speed
9. On a distance- time graph, what does a horizontal line represent? Stationary
10. On a velocity- time graph, what does a straight diagonal line represent? Constant acceleration.
11. On a velocity- time graph, what does a horizontal line that is NOT along the x axis? Constant speed.
12. On a velocity- time graph, what does a horizontal line that IS along the x axis? Stationary.
13. If an object is travelling at a constant speed is the resultant force zero or not zero? Zero.
14. If an object is accelerating is the resultant force zero or not zero? Not zero.
15. If a car is travelling at a constant speed are the forces balanced or unbalanced? Balanced.
16. What is the difference between distance and displacement? distance is a scalar quantity and only has a magnitude (size), displacement is a vector quantity and has both magnitude and direction
17. What is the difference between speed and velocity? speed is a scalar quantity and only has a magnitude (size), velocity is a vector quantity and has both magnitude and direction
18. What is the name for the steady speed a falling object reaches when the resistive force is equal to its weight? Terminal velocity

Forces and motion

1. How do you convert km into m? x1,000.

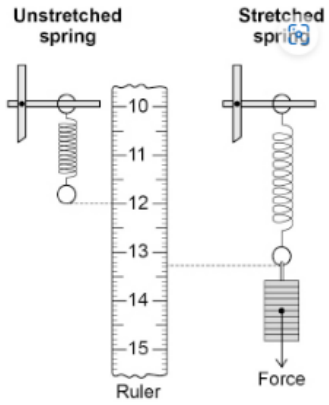
Physics RP Newton's second law of motion.



2. What is the equation that links F, m and a?
   F=m x a
3. When investigating Newton's second law of motion, you need to find the acceleration. You need to find the speed and then the acceleration. What is the equation to find the speed? What is the equation to find acceleration?
   Speed= distance÷ time and acceleration =change in velocity ÷time
4. What is the point of the pulley in the set up above?
   To reduce friction between the desk and the string.
5. How do you measure distance?
   With a ruler.
6. How do you measure time?
   With a stopwatch.
7. How can you change the force?
   Change the slotted masses attached to the string and the trolley/ car.
8. If you change the slope height to find out the change the acceleration, which is the independent variable? Which is the dependent variable?
   IV= The change of the slope gradient (height). DV= The acceleration.
9. What do we mean by inertia?
   The tendency of an object to remain in a steady state (at rest or in uniform motion)
10. What is the name for the force acting on an object due to gravity?
    Weight
11. What instrument can be used to measure the weight of an object?
    Newtonmeter
12. What is stopping distance?
    Stopping distance = thinking distance + braking distance
13. What is thinking distance?
    the distance vehicle travels during driver's reaction time
14. What is braking distance?
    the distance vehicle travels once brakes have been applied
15. What are three factors that can affect the braking distance of a vehicle?

16. What are three factors that can affect the thinking distance of a vehicle?
    Distractions, medicines, alcohol, drugs, tiredness and speed

Physics RP Hooke's law.

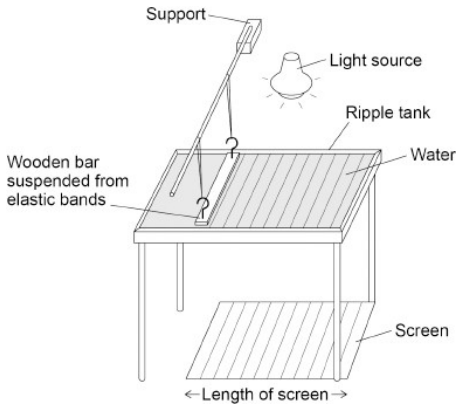


16. What is Hooke's law?
    Force = spring constant x extension
17. What is elastic deformation?
    an object can go back to its original shape and size when deforming forces are removed
18. What is inelastic deformation?
    an object does not go back to its original shape and size when deforming forces are removed
19. What is the spring constant a measure of?
    The elasticity of the spring – how stiff or stretchy the spring

Waves

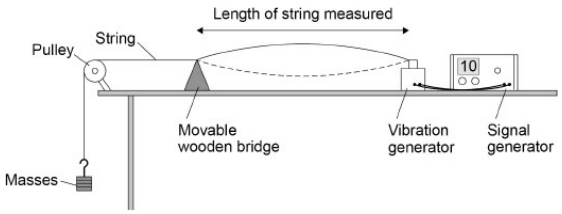
1. What do all waves transfer?
   Energy
2. What is a transverse wave?
   oscillations/vibrations are perpendicular (at right angles) to the direction of energy transfer
3. What is a longitudinal wave?
   oscillations/vibrations are parallel to the direction of energy transfer
4. Give an example of a transverse wave
   electromagnetic waves or Water waves
5. Give an example of a longitudinal wave.
   Sound waves
6. What is a mechanical wave?
   One which needs a medium or substance to travel through
7. What is a compression?
   area in longitudinal waves where the particles are squashed closer together
8. What is rarefaction?
   area in longitudinal waves where the particles are pulled further apart
9. What is the amplitude of a wave?
   Maximum height of the wave from the baseline
10. What is the wavelength of a wave?
    distance from a point on one wave to the equivalent point on the adjacent wave
11. What is the frequency of a wave?
    Number of waves that pass a point in a second?
12. What are the units of frequency?
    Hz
13. What is the difference between specular and diffuse reflection?
    specular = reflection from smooth surface. diffuse = reflection from rough surface
14. What is refraction?
    Waves change speed and direction as they cross the boundary from one substance to another due to the change in velocity

Physics RP Wave speed in a liquid.



1. What is the equation that links wave speed, frequency and wavelength?
   Wave speed = frequency x wavelength
2. What are the units of wave speed?
   m/s
3. What are the units of wavelength?
   M
4. What are the units of frequency?
   Hz
5. What equipment is needed to measure frequency?
   Video camera and stopwatch
6. What equipment is needed to measure wavelength?
   Camera and ruler

Physics RP Wave speed in a solid.

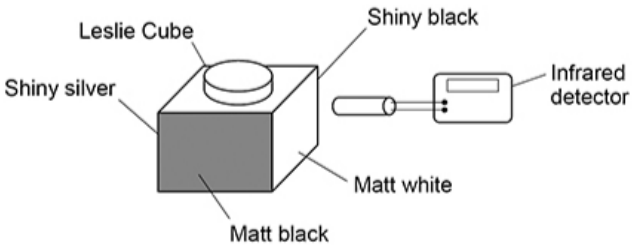


1. What equipment is needed to measure frequency? Signal generator
2. What equipment is needed to measure wavelength? Ruler

Electromagnetic Waves

1. List the different types of waves in the EM spectrum in order of decreasing wavelength (increasing frequency).
   Radio, Microwaves, Infrared, Visible light, ultra-violet, X-rays and Gamma rays
2. Which part of the EM spectrum can humans see?
   Visible light
3. What is the order of visible light from low frequency to high frequency?
   Red, orange, yellow, green, blue, indigo and violet
4. What properties do all EM waves of the same colour share?
   same range of wavelengths and frequencies
5. What four things can happen to visible light when it hits an object?
   transmitted, absorbed, reflected, or refracted
6. How are gamma rays produced?
   changes in the nucleus of an atom, for example during radioactive decay
7. How can radio waves be produced?
   oscillations in an electrical circuit
8. How can we detect radio waves?
   waves are absorbed and create an alternating current with the same frequency as the radio wave
9. What are radio waves used for?
   Communications – TV, mobile phones and Bluetooth signals
10. What are microwaves used for?
    Satellite communications and cooking food
11. What is infrared radiation used for?
    Heating, remote controls, infrared cameras and cooking food
12. Which types of EM waves are most harmful to the human body?
    Ultraviolet, X-rays and gamma rays
13. What is visible light used for?
    Photography and fibre optic communications
14. What is UV used for?
    Suntanning and checking forgeries
15. What are the dangers of being exposed to UV?
    Sunburn, increase risk of skin cancer, premature aging and eye damage
16. Why are X-rays used for medical imaging?
    Are trasnmitted through soft tissue and absorbed by the denser bone
17. Why are gamma rays used for treating cancer and sterilising medical equipment?
    high doses kill cells and bacteria
18. What speed do EM waves travel in a vacuum?
    $3x10^8$ m/s

Physics RP Infrared radiation – measuring rate of IR emission from different coloured surfaces



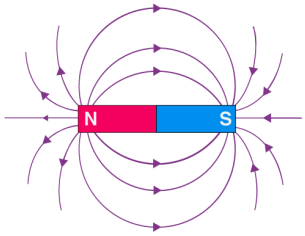
1. What is the independent variable?
   Colour of surface
2. What is the dependent variable?
   IR emissions
3. What are the control variables?
   Distance between IR detector and surface
4. Why do we have control variables?
   To ensure that the test is valid
5. What other equipment may you need that isn't shown in the picture?
   Ruler, measuring cylinder and kettle
6. Write a 4-step method for the practical above?

1. Fill cube with hot water
2. Use infrared detector one side of cube to take reading of temperature
3. Repeat for each side of the cube
4. Use a ruler to measure the same distance of detector from surface

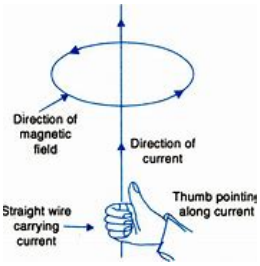
7. Why is it better to use a Leslie's cube rather than a black and a white can?
   Same volume, same starting temperature and same material of can used

Electromagnetism

1. Name the 4 magnetic materials.
   Cobalt, nickel, iron and steel
2. What is a magnetic field?
   the region of space around a magnet where a magnetic material will experience a force
3. What are the 2 poles of a magnet?
   North and south
4. What happens when like and unlike poles are brought together?
   like = repel, unlike = attract
5. What happens to the strength of the magnetic field as you get further away from the magnet?
   Decreases
6. Where is the magnetic field of a magnet strongest?
   At the poles
7. In which direction do magnetic field lines always point?
   N --> S
8. What does the distance between magnetic field lines indicate?
   strength of the field, closer together = stronger field
9. What is a permanent magnet?
   material that produces its own magnetic field
10. What is an induced magnet?
    magnetisable material that becomes magnetic when it is put in a magnetic field
11. Draw the shape of the magnetic field around a rectangular bar magnet.



12. What does a magnetic compass contain?
    Small bar magnet
13. What is produced around a wire when an electric current flows through it?
    Magnetic field
14. What factors does the strength of the magnetic field around a straight wire depend upon?
    size of current, distance from wire
15. What is the shape of the magnetic field around a current carrying wire?
    Concentric circles perpendicular to the current



16. What is a solenoid?
    Coil of current carrying wire
17. What effect does shaping the wire into a solenoid have on the magnetic field strength?
    increases strength of magnetic field
18. How can the strength of the magnetic field inside a solenoid be increased? put an iron core inside, increase the number of turns in the coil or increase the current flowing in the coil
19. What is the motor effect? when a conductor placed in a magnetic field experiences a force
20. What causes the motor effect? interaction between the magnetic field created by current in a wire and the magnetic field in which the wire is placed