Science Exam Advice:

Trilogy Double Award combined science: You have 6 exams: You need to try to do well on all 6; as each one is worth 12.5% of your GCSE exam: they are all worth an equal amount and they are all 1hr 15 minutes. Your final grade is all 6 exams added together. You get 2 grades, e.g. 55 or 54. The grade boundaries are very close; 1 mark can change your grade.

Separate Science GCSEs (Triple): You have 2 exams for each GCSE

The 2 are added together to get 1 grade, each one is worth 50%. Each GCSE can have a totally different grade: so you need to do well on all 3 subjects!

Make sure you revise the right topics for the right exams! (See the exam check list)

Dealing with Exam Stress

- A big reason for feelings of stress is one of feeling 'out of control' because you haven't got a good routine, or just you don't know where to start, so get started with a revision plan.
- Remember you can speak to any one in school if it is stressful or email safe@rushey-tmet.uk
- Check your habits are stress busting ones:
    - Your sleep habits are healthy (8-10 hours is needed at age 16, no screen time in run-up to bed or blue light effect will prevent sleep despite tiredness. Phone turned OFF at night)
    - You are getting regular exercise.
    - You know how to breathe deeply to calm panicky feelings.
    - You have a positive mantra that you have chosen and are actively trying to use it to replace negative or panicky thoughts each time they pop in to your head.
    - You have investigated **Apps** that might help them to feel more in control or looked at **vlogs about coping with exam stress.**
    - You have looked at the books on anxiety that are available in KS4 office/library.
    - Look at the Student shared area on **Foldr under 'How to be Successful and Happy'**

Exam technique advice:

Answer EVERY question: if its blank, its wrong.

Read the instructions: if it says name ONE or Tick ONE: then only name / tick one, if you give more answers you WILL LOSE MARK, If it says tick two, THEN TICK TWO!

Several questions will have NO SPACE TO WRITE THE ANSWER, that is because you are expected to add something to a diagram or a graph, don't miss these questions out by just looking for dotted lines: **look for marks.**

Use the marks: if a question is worth several marks it is a clue that you will have to do several things / write more points: 2 marks means 2 clear points have to be made.

If you write your answer beyond the lines, make sure you indicate on the paper that you have done this: (eg Q7 cont. below)

Each question starts easy then gets hard. If you are stuck o Q4.6, don't spend too long on it….Q5.1 is easier: make sure you get all the easy marks, work through the paper, then go back through for the

harder marks. Pace yourself to make sure you finish the paper with time to check your answers: 1 minute, 1 mark.

Many questions will be problem solving or in different contexts, what this means is it might seem like it is about something we haven't studied, but that's just to make it harder. You will have studied the science behind the question, you have to figure it out: it is a test after all.

Looks for COMMANDS: and do every one. Some questions have 2 or 3 commands: make sure you do all of them (eg, Calculate …… Give the Units. Give your answer to 2 significant figures: 3 commands, 3 things you MUST do.)

Know what each command word means, for example what is the difference between describe and explain? What is the difference between Evaluate and Compare?

Maths Questions:

20% of your marks are for Maths skills: that's several grades in the bag if you can do them. Practice past questions. Follow the steps:

1. Write down the equation and units. You have to learn them all off by heart.
2. Substitute the numbers from the question into the equation (write it out again with the numbers instead of the words)
3. Convert any units that are wrong (g to kg, minutes to seconds)
4. Re-arrange the equation if needed (practice how)
5. Calculate the answer (BIDMAS!)
6. Give your answer to the correct Significant figures or Standard Form
7. Give the units (learn them off by heart!)

Required Practicals:

Every paper will have at least one required practical in it (see the check list). At least 15% of the marks will be for remembering the apparatus used and the technique (method) we did. Up to 50% of the marks can be about working scientifically skills, which are often about the required practicals too.

1. Can you recall the apparatus and method needed for each?
2. Can you identify the Variables?
3. Can you spot the causes of errors?
4. Do you know the difference between Reliable, Precise, Accurate and Valid?
5. Could you suggest improvements in a method?
6. Can you describe the results pattern and state whether or not it supports the hypothesis?
7. Can you explain the results scientifically?

Revision

"Nothing I revised came up" That just means you didn't revise everything! There won't be a question on everything, but there could be a question on **anything.**

We don't know exactly which topics or questions will come up, so you have to learn EVERYTHING from every topic off by heart: you have to memorise. That's a lot! Start revising early and have a plan, so that you don't miss out topic

Command words:

Calculate: Students should use numbers given in the question to work out the answer.

Choose: Select from a range of alternatives.

Compare: This requires the student to describe the similarities and/or differences between things, not just write about one.

Complete: Answers should be written in the space provided, for example on a diagram, in spaces in a sentence, or in a table.

Define: Specify the meaning of something.

Describe: Students may be asked to recall some facts, events or process in an accurate way.

Design: Set out how something will be done.

Determine: Use given data or information to obtain and answer.

Draw: To produce, or add to, a diagram.

Estimate: Assign an approximate value.

Evaluate: Students should use the information supplied, as well as their knowledge and understanding, to consider evidence for and against.

Explain: Students should make something clear, or state the reasons for something happening.

Give/ Name / Write: Only a short answer is required, not an explanation or a description.

Identify: Name or otherwise characterise.

Justify: Use evidence from the information supplied to support an answer.

Label: Provide appropriate names on a diagram.

Measure: Find an item of data for a given quantity.

Plan: Write a method.

Plot: Mark on a graph using data given.

Predict: Give a plausible outcome.

Show: Provide structured evidence to reach a conclusion.

Sketch: Draw approximately.

Suggest: This term is used in questions where students need to apply their knowledge and understanding to a new situation.

Use: The answer must be based on the information given in the question. Unless the information given in the question is used, no marks can be given. In some cases students might be asked to use their own knowledge and understanding.

Key Working scientifically / Required practical words:

Accuracy: A measurement result is considered accurate if it is judged to be close to the true value.

Calibration: Marking a scale on a measuring instrument. This involves establishing the relationship between indications of a measuring instrument and standard or reference quantity values, which must be applied. For example, placing a thermometer in melting ice to see whether it reads zero, in order to check if it has been calibrated correctly.

Data: Information, either qualitative or quantitative, that has been collected.

Errors:

Measurement error: The difference between a measured value and the true value.

Anomalies: These are values in a set of results which are judged not to be part of the variation caused by random uncertainty.

Random error: These cause readings to be spread about the true value, due to results varying in an unpredictable way from one measurement to the next. Random errors are present when any measurement is made, and cannot be corrected. The effect of random errors can be reduced by making more measurements and calculating a new mean.

Systematic error: These cause readings to differ from the true value by a consistent amount each time a measurement is made. Sources of systematic error can include the environment, methods of observation or instruments used. Systematic errors cannot be dealt with by simple repeats. If a systematic error is suspected, the data collection should be repeated using a different technique or a different set of equipment, and the results compared.

Zero error: Any indication that a measuring system gives a false reading when the true value of a measured quantity is zero, eg the needle on an ammeter failing to return to zero when no current flows. A zero error may result in a systematic uncertainty. Evidence Data which has been shown to be valid.

Fair test: A fair test is one in which only the independent variable has been allowed to affect the dependent variable.

Hypothesis: A proposal intended to explain certain facts or observations.

Interval: The quantity between readings, eg a set of 11 readings equally spaced over a distance of 1 metre would give an interval of 10 centimetres.

Precision: Precise measurements are ones in which there is very little spread about the mean value. Precision depends only on the extent of random errors – it gives no indication of how close results are to the true value.

Prediction: A prediction is a statement suggesting what will happen in the future, based on observation, experience or a hypothesis.

Range: The maximum and minimum values of the independent or dependent variables; important in ensuring that any pattern is detected. For example a range of distances may be quoted as either: 'From 10 cm to 50 cm' or 'From 50 cm to 10 cm'.

Repeatable: A measurement is repeatable if the original experimenter repeats the investigation using same method and equipment and obtains the same results.

Reproducible: A measurement is reproducible if the investigation is repeated by another person, or by using different equipment or techniques, and the same results are obtained.

Resolution: This is the smallest change in the quantity being measured (input) of a measuring instrument that gives a perceptible change in the reading.

Sketch graph: A line graph, not necessarily on a grid, that shows the general shape of the relationship between two variables. It will not have any points plotted and although the axes should be labelled they may not be scaled.

True value: This is the value that would be obtained in an ideal measurement.

Uncertainty: The interval within which the true value can be expected to lie. Whenever a measurement is made, there will always be some uncertainty or doubt about the result obtained. Uncertainty can be expressed in terms of spread of values obtained. For example, a length of 56 cm ±2 cm would mean the true value could be anywhere between 54 cm and 58 cm. Calculate by finding the difference between the lowest and highest values and dividing by 2.

Validity: Suitability of the investigative procedure to answer the question being asked. For example, an investigation to find out if the rate of a chemical reaction depended upon the concentration of one of the reactants would not be a valid procedure if the temperature of the reactants was not controlled.

Valid conclusion: A conclusion supported by valid data, obtained from an appropriate experimental design and based on sound reasoning.

Variables: These are physical, chemical or biological quantities or characteristics.

Categoric: Categoric variables have values that are labels, eg names of plants or types of material.

Continuous: Continuous variables can have values (called a quantity) that can be given a magnitude either by counting (as in the case of the number of shrimp) or by measurement (eg light intensity, flow rate etc).

Control: Control variable is one which may, in addition to the independent variable, affect the outcome of the investigation and therefore has to be kept constant or at least monitored.

Dependent: Dependent variable is the variable of which the value is measured for each and every change in the independent variable.

Independent: Independent variable is the variable for which values are changed or selected by the investigator.