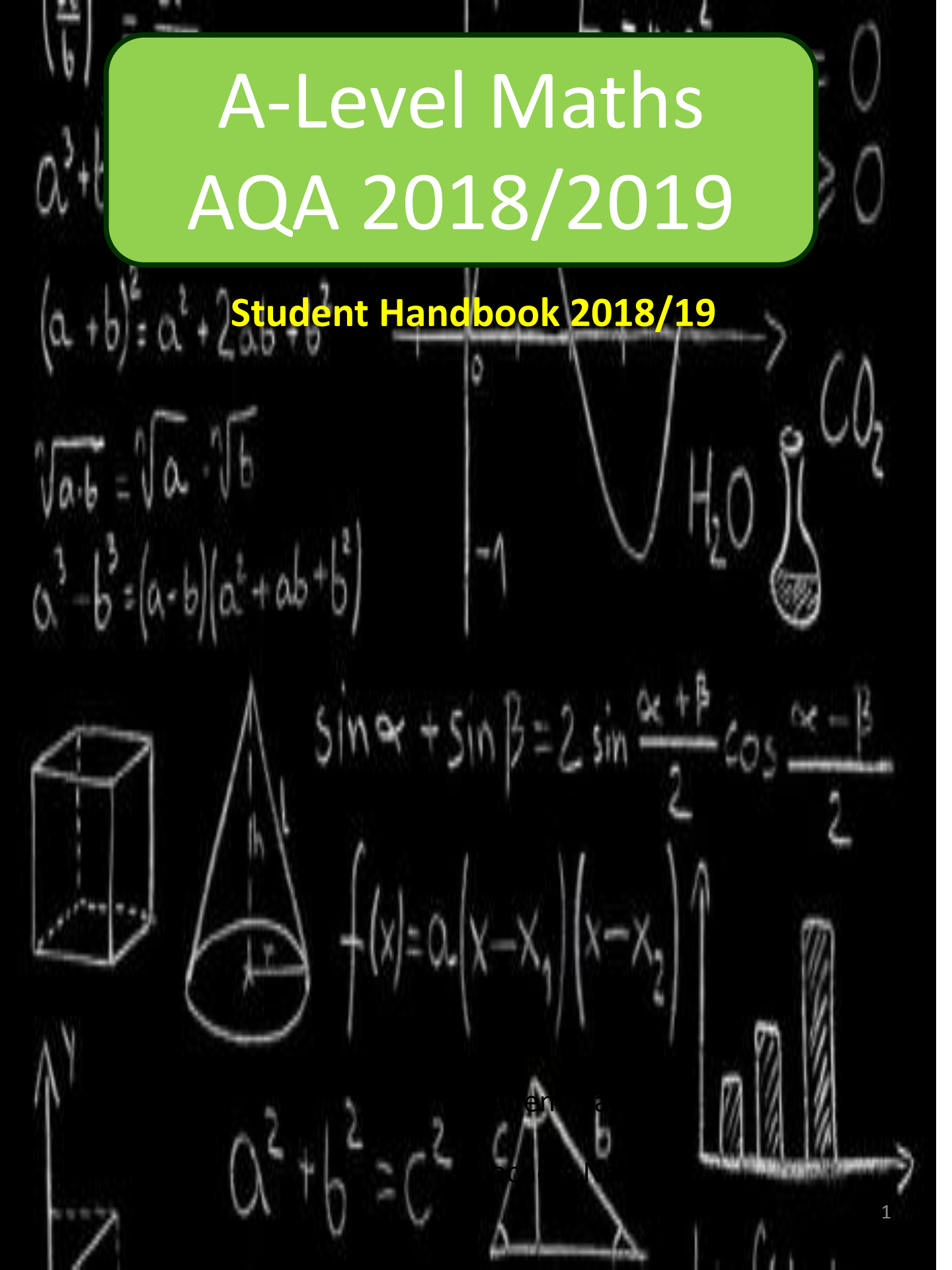
A-Level Maths AQA 2018/2019

Student Handbook 2018/19



Contents

Life is good for only two things, discovering mathematics and teaching mathematics.

Maths – Code of Conduct

Code of Conduct

The aim of this contract is to inform you of the sort of behaviour that the Math's Department requires from you while you are studying with us. It will help you to understand the high standards of behaviour and attitude towards learning that we have come to expect from our students.

Whilst undertaking the study of Math's I _____ agree to the following ~

- To be on time for all lessons.
- To come to class fully prepared (i.e. to bring a pen, folder, paper and any required text books).
- To ensure my subject folder is kept up-to-date and tidy. (These will be checked half termly)
- Switch off all mobile phones, MP3 players and any other electronic equipment before I arrive in the classroom.
- To show respect for all members in the class and allow them to learn.
- To listen to the teacher when he/she is giving instructions.
- To listen to other students and not shout out when partaking in discussions and debates.
- To take responsibility, and not to blame others for my behaviour during lessons.
- To keep noise levels at a suitable level when learning independently.
- To complete all work set to the best of my ability.
- To meet all deadlines set for homework projects.
- To leave the classroom tidy for other students.
- To understand that all sugar based sweets and drinks are not permitted in lesson (water is acceptable)

.Signed

Print Name Today's Date

Introduction

First of all, welcome to AS and A Level Maths. This is always quite a hectic time for students & staff alike, so if you are feeling a bit lost, don't panic, Sixth Form life will settle down eventually (honest!).

Secondly, well done for selecting Maths as an area of study. Whatever the reasons for your choice I hope that you enjoy this course and you gain much knowledge and pleasure from it.

This document contains all the information that you need to know regarding your course. It contains (amongst other things) information on exam boards, syllabus areas, curriculum content, and a comprehensive reading list to support your lessons.

Please do keep this document safe, it will be a useful reference booklet in your progression through your course. If you have any questions regarding Maths, the course or Sixth Form issues in general we can be contacted during class time or via email.

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The Course

The exam board for your Maths course this year is AQA. You can find out some more information about this in detail by visiting the AQA website.

How the course is broken down is dependent upon whether you are studying the AS level or the full A Level.

All students will be starting the AS level. We will review your progress throughout the year and together decide which is the best route for you. You may decide you would like to sit the AS exams at the end of year 1 and see how you get on. Depending on your results you might choose to continue to year 2 and set the three A Level exams at the end of this year. We will also deliver Further Maths if we have a demand in 2018.

We will support you in whatever choice you make. Please come and discuss this with us if you need to.

AS level

You can sit these exams at the end of the first year of sixth form.

AS Level Paper 1

What's assessed

A: Proof

B: Algebra and functions

C: Coordinate geometry

D: Sequences and series

E: Trigonometry

F: Exponentials and logarithms

G: Differentiation

H: Integration

J: Vectors

P: Quantities and units in mechanics

Q: Kinematics

R: Forces and Newton's laws

How it's assessed

Written exam: 1 hour 30 minutes

80 marks

50% of AS

AS Level Paper 2

What's assessed

Content from the following sections: A: Proof

B: Algebra and functions

C: Coordinate geometry

D: Sequences and series

E: Trigonometry

F: Exponentials and logarithms

G: Differentiation

H: Integration

K: Statistical sampling

L: Data presentation and interpretation

M: Probability

N: Statistical distributions

O: Statistical hypothesis testing

How it's assessed

Written exam: 1 hour 30 minutes

80 marks

50% of AS

A Level

You can sit these exams at the end of the second year of sixth form

Paper 1
What's assessed
A: Proof
B: Algebra and functions
C: Coordinate geometry
D: Sequences and series
E: Trigonometry
F: Exponentials and logarithms
G: Differentiation
H: Integration
I: Numerical methods

Paper 2
What's assessed
Any content from Paper 1 and content from:
J: Vectors
P: Quantities and units in mechanics
Q: Kinematics
R: Forces and Newton's laws
S: Moments

Paper 3
What's assessed
Any content from Paper 1 and content from:K: Statistical sampling
L: Data presentation and Interpretation
M: Probability
N: Statistical distributions
O: Statistical hypothesis testing

All exams are 2 hours long and worth 33.333333% of your grade.

Exam Questions and Assessment Objectives

You will be required to answer a range of exam questions both in lessons and for homework.

At AS Level exam questions include multiple choice, short answer, comprehension and extended answer questions.

At A Level exam questions include multiple choice, short answer , comprehension and extended answer questions. Questions can be based on a large data set, that will be given out at the start of the course.

How will I be assessed? What are the skills I will need?

You will be assessed using three key assessment objectives (AO's). These also detail the skills you will need to perfect whilst on the Maths course.

AO1: Demonstrate knowledge and understanding

AO2: Mathematical reasoning.

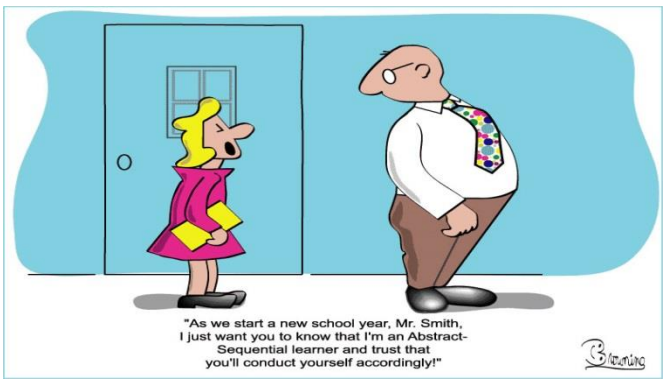
AO3: Problem solving

How do you learn?

Studying at A level is considerably different than studying at GCSE level. There will be a lot more information and knowledge to deal with, more complex information to understand and more learning skills for you to master. Your success at A level is directly linked to the amount of Independent Learning (IL) you put into your studies.
An important step in this process not only to understanding how you learn, (ie: what type of learner you are), but also to develop good learning strategies which will support your particular learning style(s).

In your own words define Independent Learning (i.e. Explain what it means to you)
Can you identify three things that you have done from Yr 7 – Yr 11 that you would consider to be Independent Learning? 1: 2: 3:

Once you have written your definition and examples, turn over and complete the VAK questionnaire.



VAK Learning Style(s) Self-Assessment Questionnaire

Tick the answer that most represents how you generally behave.

(It's best to complete the questionnaire before reading the accompanying explanation.)

1. When I operate new equipment I generally:
   a) read the instructions first
   b) listen to an explanation from someone who has used it before
   c) go ahead and have a go, I can figure it out as I use it

2. When I need directions for travelling I usually:
   a) look at a map
   b) ask for spoken directions
   c) follow my nose and maybe use a compass

3. When I cook a new dish, I like to:
   a) follow a written recipe
   b) call a friend for an explanation
   c) follow my instincts, testing as I cook

4. If I am teaching someone something new, I tend to:
   a) write instructions down for them
   b) give them a verbal explanation
   c) demonstrate first and then let them have a go

5. I tend to say:
   a) watch how I do it
   b) listen to me explain
   c) you have a go

6. During my free time I most enjoy:
   a) going to museums and galleries
   b) listening to music and talking to my friends
   c) playing sport or doing DIY

7. When I go shopping for clothes, I tend to:
    a) imagine what they would look like on
    b) discuss them with the shop staff
    c) try them on and test them out

8. When I am choosing a holiday I usually:
    a) read lots of brochures
    b) listen to recommendations from friends
    c) imagine what it would be like to be there

9. If I was buying a new car I would:
    a) read reviews in newspapers and magazines
    b) discuss what I need with my friends
    c) test drive lots of different types

10. When I am learning a new skill, I am most comfortable:
    a) watching what the teacher is doing
    b) talking through with the teacher exactly what I'm supposed to do
    c) giving it a try myself and work it out as I go

11. If I am choosing food off a menu, I tend to:
    a) imagine what the food will look like
    b) talk through the options in my head or with my partner
    c) imagine what the food will taste like

12. When I listen to a band, I can't help:
    a) watching the band members and other people in the audience
    b) listening to the lyrics and the beats
    c) moving in time with the music

13. When I concentrate, I most often:
    a) focus on the words or the pictures in front of me
    b) discuss the problem and the possible solutions in my head
    c) move around a lot, fiddle with pens and pencils and touch things

14. I choose household furnishings because I like:
    a) their colours and how they look
    b) the descriptions the sales-people give me
    c) their textures and what it feels like to touch them

15. My first memory is of:
    a) looking at something
    b) being spoken to
    c) doing something

16. When I am anxious, I:
    a) visualise the worst-case scenarios
    b) talk over in my head what worries me most
    c) can't sit still, fiddle and move around constantly

17. I feel especially connected to other people because of:
    a) how they look
    b) what they say to me
    c) how they make me feel

18. When I have to revise for an exam, I generally:
    a) write lots of revision notes and diagrams
    b) talk over my notes, alone or with other people
    c) imaging making the movement or creating the formula

19. If I am explaining to someone I tend to:
    a) show them what I mean
    b) explain to them in different ways until they understand
    c) encourage them to try and talk them through my idea as they do it

20. I really love:
    a) watching films, photography, looking at art or people watching
    b) listening to music, the radio or talking to friends
    c) taking part in sporting activities, eating fine foods and wines or dancing

21. Most of my free time is spent:
    a) watching television
    b) talking to friends
    c) doing physical activity or making things

22. When I first contact a new person, I usually:
    a) arrange a face to face meeting
    b) talk to them on the telephone
    c) try to get together whilst doing something else, such as an activity or a meal

23. I first notice how people:
    a) look and dress
    b) sound and speak
    c) stand and move

24. If I am angry, I tend to:
    a) keep replaying in my mind what it is that has upset me
    b) raise my voice and tell people how I feel
    c) stamp about, slam doors and physically demonstrate my anger

25. I find it easiest to remember:
    a) faces
    b) names
    c) things I have done

26. I think that you can tell if someone is lying if:
    a) they avoid looking at you
    b) their voices changes
    c) they give me funny vibes

27. When I meet an old friend:
    a) I say “it’s great to see you!”
    b) I say “it’s great to hear from you!”
    c) I give them a hug or a handshake

28. I remember things best by:
    a) writing notes or keeping printed details
    b) saying them aloud or repeating words and key points in my head
    c) doing and practising the activity or imagining it being done

29. If I have to complain about faulty goods, I am most comfortable:
    a) writing a letter
    b) complaining over the phone
    c) taking the item back to the store or posting it to head office

30. I tend to say:
    a) I see what you mean
    b) I hear what you are saying
    c) I know how you feel

Now add up how many A's, B's and C's you selected		
A's	**B's**	**C's**

If you chose mostly A's you have a VISUAL learning style.
If you chose mostly B's you have an AUDITORY learning style.
If you chose mostly C's you have a KINAESTHETIC learning style.

Some people find that their learning style may be a blend of two or three styles, in this case read about the styles that apply to you in the explanation below.

When you have identified your learning style(s), read the learning styles explanations and consider how this might help you to identify learning and development that best meets your preference(s).

Now see the VAK Learning Styles Explanation.

V**AK Learning Styles Explanation - What's my learning style?**

The VAK learning styles model suggests that most people can be divided into one of three preferred styles of learning. These three styles are as follows, (and there is no right or wrong learning style):

Someone with an **Auditory** learning style has a preference for the transfer of information through listening: to the spoken word, of self or others, of sounds and noises. These people will use phrases such as 'tell me', 'let's talk it over' and will be best able to perform a new task after listening to instructions from an expert. These are the people who are happy being given spoken instructions over the telephone, and can remember all the words to songs that they hear!

Someone with a **Visual** learning style has a preference for seen or observed things, including pictures, diagrams, demonstrations, displays, hand outs, films, flip-chart, etc. These people will use phrases such as 'show me', 'let's have a look at that' and will be best able to perform a new task after reading the instructions or watching someone else do it first. These are the people who will work from lists and written directions and instructions.

Someone with a **Kinaesthetic** learning style has a preference for physical experience - touching, feeling, holding, doing, practical hands-on experiences. These people will use phrases such as 'let me try', 'how do you feel?' and will be best able to perform a new task by going ahead and trying it out, learning as they go. These are the people who like to experiment, hands-on, and never look at the instructions first!

People commonly have a main preferred learning style, but this will be part of a blend of all three. Some people have a very strong preference; other people have a more even mixture of two or less commonly, three styles.

When you know your preferred learning style(s) you understand the type of learning that best suits you. This enables you to choose the types of learning that work best for you.

There is no right or wrong learning style. The point is that there are types of learning that are right for your own preferred learning style.

5 Golden Rules
How to improve my grade.

1. Start your course with an organised Maths folder and keep it this way. You will be surprised just how important this organisation is. A level is as much about organisation as they are about hard work.

2. Produce a vocabulary book and always update this at the end of each week. Ask your teacher for definitions if you are not clear.

3. Do not just collect key words. Use them in homework and in class to make sure you understand them and can use them in the right context.

4. Make flash cards for key concepts, perspectives and research, keep them in your folder.

5. At the end of each topic spend some time making revision notes. This requires good discipline and organisation, but it will pay dividends when the course ends and you approach the final exams.

Study Tips

Resources

Make sure you have:

- Access to the internet, preferably on a portable device you can bring to lessons.
- Textbooks, revision guides and workbooks that match the course content.
- Revision applications for mobile devices.
- Stationery for note-taking and writing up work.

Independent study

To access higher grades, you will need to:

- Write your lesson notes up formally and in more detail after every lesson.
- Read around the subject and go beyond the content taught in lessons.
- Have a reading list of recommended websites and books.

Study Tips

Revision

You should:

- Draw up a revision schedule for the course.
- Revise constantly throughout the course, not just in the build up to exams.
- Prepare revision materials such as flash cards and mind maps.
- Analyse the course content to identify strengths and areas for development.
- Make a record of areas for development and talk to teachers about them.
- Listen to revision e-books whilst doing other tasks like washing-up.

Past Papers

You will always benefit from:

- Accessing past papers and mark schemes online.
- Completing and marking past papers yourself.
- Completing past papers and asking a teacher to mark them.
- Recreating exam conditions (silence, no revision materials and time limits) when completing papers.
- Reading the reports on the examinations so they know what AQA are looking for in their answers.
- Analysing the reports for common exam mistakes to avoid.

Study Tips

Assessment

You will have an Open Academy assessment every half-term, internal mock exams around Easter and national end-of-year exams in AS and A2. Prepare for assessments by:

- Organising a calm, quiet and comfortable space for revision.
- Making sure you are well hydrated and have healthy foods to eat.
- Get enough sleep.
- Take regular breaks and avoid long, late-night revision sessions.
- Manage and prioritise their revision workload around paid jobs.

Deadlines

You should take the following approach to deadlines:

- Make a clear record of deadlines in a diary or planner.
- Monitor homework deadlines on Sims Learning Gateway (if you do not have a login, contact the Academy). There is a link on our website.
- Start homework as soon as it is set rather than waiting until the day before.
- Always hand work in early – if there are any issues, they can be dealt with before a deadline is missed.
- Discuss any difficulties with teaching staff before the deadline passes.
- Don't fall into the trap of excuse-making. Be persistent, get the work done despite difficulties.

Study Tips

Keep in contact

Above all, talk to your teachers and parents/carers about your progress.

- Take note of feedback from your teachers and praise yourself for your successes.
- Talk to teachers and parents/carers about your difficulties and try to help find solutions.
- Talk to people about some of the things that have most interested you about the course.
- Teach other people. This is a great revision tool and we are sure your friends and family have always wanted to know how photosynthesis works at the molecular level.
- Talk to your teachers about any issues, no matter how small or large.

Resources

1) Textbooks

In class we will use hard copy of the reccommended course text, as well as additional maths books we have in the department. If at any point you loan out a textbook, you should fill out and sign a loan agreement form. If you fail to return the book or return it in an unusable condition, you are giving your consent to replace the book or repay the cost of the book to the department.

2) Folders

You are required to keep an organised set of notes. Due to the amount of notes and resources you will use during the year you are required to use a lever arch file and dividers to organise your studies. This should be brought to every Maths lesson you have. Once per half term we will be performing spot checks on your folders. If they are not up to standard you will receive a sanction decided upon by your teacher. The list below is a suggested order for your folder, and a guide to what should be contained within it:

1) Student handbook
2) Folder monitoring form
3) Checklists at the front of each topic (ask your teacher for these) Topic notes separated by dividers and notes in order.
4) DNA forms (in separate section if applicable)
5) Past Papers

Core Maths

- **Subject content**
- Mathematics is, inherently, a sequential subject. There is a progression of material through all levels at which the subject is studied. It is assumed that students will already have confidence and competence in the content presented in standard type within the GCSE mathematics criteria. Students will make use of elements of this content when addressing problems within this Level 3 Certificate Mathematical Studies specification but this is not explicitly set out in subject content. This Level 3 Certificate Mathematical Studies specification aims to build on the knowledge, understanding and skills established in GCSE mathematics.
- Subject content that is expected to be used throughout this specification is listed below:
- Knowledge and use of the formula y=mx+c . It is also expected that students will be able to find the gradient of a straight line connecting two different points.
- It is expected that spreadsheets and tables will be used throughout the teaching of this Level 3 Certificate Mathematical Studies specification. Spreadsheet formulae will include:
  - "=A1+A2+A3" to sum values in cells
  - "=2*B3" to multiply a value in a given cell
  - "=SUM(A1:A10)"
- Knowledge and use of the formulae for the circumference and the area of circle.
- Knowledge and use of the formulae for the perimeter of 2-D shapes, their areas and for calculating fractional areas of circles and composite shapes.
- Knowledge and use of the mathematical content of analysis of data and maths for personal finance elements.
- The ability to calculate surface areas of spheres, cones, pyramids and composite solids, including the application of the concepts of similarity including lengths in similar figures and Pythagoras' theorem applied to 2-D and 3-D figures

Assessments

Paper 1

Assessed: written exam: 1 hour 30 minutes
60 marks
scientific calculator or graphics calculator allowed (see section 5.9 for more information on calculators)

Questions:
copy of Preliminary Material available in advance on eAQA and clean copy of Preliminary Material to be provided in examination room

formulae sheet available

no optional questions

Paper 2A: Statistical Techniques

Students will be expected to draw on the mathematical content of paper 1.

Students will be expected to develop and demonstrate confidence and competence in the understanding and application of mathematical modelling in the solution of problems related to the use of statistical techniques.

Assessed: written exam: 1 hour 30 minutes
60 marks
scientific calculator or graphics calculator allowed (see section 5.9 for more information on calculators)

Questions:
copy of Preliminary Material available in advance on eAQA and clean copy of Preliminary Material to be provided in examination room

formulae sheet available

statistical tables available

no optional questions

OR

Paper 2B: Critical Path and Risk Analysis

Students will be expected to draw on the mathematical content of paper 1.

Students will be expected to develop and demonstrate confidence and competence in the understanding and application of mathematical modelling in the solution of problems related to decision making and the planning of projects.

Assessed: written exam: 1 hour 30 minutes
60 marks
scientific calculator or graphics calculator allowed
(see section 5.9 for more information on calculators)

OR

Paper 2C: Graphical Techniques

Students will be expected to draw on the mathematical content of paper 1.

Students will be expected to develop and demonstrate confidence and competence in the understanding and application of mathematical modelling in the solution of problems related to simple polynomial and exponential functions.

Assessed: written exam: 1 hour 30 minutes
60 marks
scientific calculator or graphics calculator