

Thinking about choosing to study Mathematics A level?

or

Already studying it and wondering what your next step might be?

This worksheet has been designed to help you consider how you can use what you learn from an A level in Mathematics in your future career planning.

+ What to study it with?

When choosing to study A level courses full time it is usual to study four subjects at AS level in the first year then three at A2 level in the second year. It is also possible to study some subjects via the vocationally related route (Applied A level double awards and BTEC Diplomas). The other subjects you choose to combine with Mathematics may have an influence upon what you can choose beyond Advanced level, so check out your choice. Although some Advanced level subjects require a good grade at GCSE as a foundation for study at the advanced level, others can be studied from scratch. It's a good idea to check this out before finalising your Advanced level course choices.

CAREER WARNING

* MATHEMATICS

Studying any Advanced level course will give you two main things, knowledge about the content of the subject (the science of numbers, measurements, shapes and probabilities, etc.) and skills in how to deal with that content. Although you may not need to remember the content for very much longer than your course, the skills you develop can be built on and used throughout the rest of your life.

MIX & MATCH +

Combining Mathematics with sciences provides entry to a wide variety of scientific and technological careers.

Mathematics, Physics and Chemistry provide the foundation for entry into the widest possible range of options including some career areas entered by Arts and Humanities students. Mathematics can be combined with business subjects such as Accountancy,

Business Studies and Economics to provide a vocationally focussed course leading to career options in business, finance and economics.

The higher education and employment scenes are continually changing due to social, economic and political pressures. This worksheet, therefore, is not a definitive guide to your future career but is more of a prompt to get you thinking about making connections between your choice of Advanced level courses and higher education and career opportunities.

<h1>Mathematics Skills</h1>		⊗ Ways in which you might learn these in the subject:
<i>Numerical skills:</i>	<ul style="list-style-type: none"> <input type="checkbox"/> collecting and analysing data and interpreting trends <input type="checkbox"/> estimating, measuring and calculating physical dimensions, proportions and timescales <input type="checkbox"/> calculating with fractions, percentages, decimals, powers, roots and formulae <input type="checkbox"/> calculating absolute and relative errors <input type="checkbox"/> organising, interpreting and presenting data in statistical tables <input type="checkbox"/> converting units of measurements using scales and tables <input type="checkbox"/> reading, understanding and interpreting data in a logical and systematic way <input type="checkbox"/> estimating, calculating and predicting sequences and outcomes using mathematical models and formulae <input type="checkbox"/> evaluating mathematical models <input type="checkbox"/> expressing mathematical relationships in a clear and relevant format <input type="checkbox"/> solving problems in 2D and 3D 	<ul style="list-style-type: none"> <input type="checkbox"/> gathering and analysing data eg. surveying local house prices, unemployment rates, mortality (death) rates and hence making future predictions <input type="checkbox"/> measuring and calculating a wide range of things like the effect of compound interest, trigonometric ratios, vertical motion under gravity, velocity and acceleration, etc. <input type="checkbox"/> setting up mathematical models using a technique called 'calculus' to solve problems such as finding a least cost or best return option for different financial strategies <input type="checkbox"/> calculating the volumes of shapes such as cylinders and spheres using 'integration'
<i>Research skills:</i>	<ul style="list-style-type: none"> <input type="checkbox"/> analysing written and statistical information and drawing out from it the key pieces of information needed <input type="checkbox"/> summarising mathematical findings in a suitable format 	<ul style="list-style-type: none"> <input type="checkbox"/> solving quadratic, cubic and simultaneous equations, obtaining all types of roots (solutions), both 'real' and 'imaginary' <input type="checkbox"/> describing sum and product laws
<i>Communication skills - written and visual:</i>	<ul style="list-style-type: none"> <input type="checkbox"/> putting across clear and relevant information when writing about a subject <input type="checkbox"/> using visual materials to illustrate straightforward and complex matters 	<ul style="list-style-type: none"> <input type="checkbox"/> producing graphs of trigonometric functions and transformations <input type="checkbox"/> outlining a solution to a probability question in a systematic and descriptive way
<i>Communication skills - verbal:</i>	<ul style="list-style-type: none"> <input type="checkbox"/> taking part in discussions and making relevant contributions <input type="checkbox"/> listening and responding to others 	<ul style="list-style-type: none"> <input type="checkbox"/> discussing such things as the concept of a function or a force <input type="checkbox"/> describing and explaining things like absolute and relative errors, Newton's law of motion, etc.

⊗ Ways in which you might use these in a job:

- solving complex problems using advanced mathematics, logical and scientific thinking eg. solving traffic problems, planning timetables
- using mathematics to understand new languages such as computer programming code, encryption software, etc.
- using and interpreting statistical information to calculate probability and with the aid of tree diagrams, value the expected returns from capital projects
- using mathematical formulae to measure change and predict future trends in areas like population size and shifts, and hence cost of state provisions for the elderly

- using logical thinking and a knowledge of mathematics to analyse and solve problems in industry, information technology, communications, engineering and space

- producing accounts, financial predictions, risk assessments and investment appraisals
- producing written and illustrated results for mathematical problems

- working as part of a team
- advising clients on financial matters
- teaching and explaining mathematics to others

maths

other skills

In addition to the specific skills you will develop whilst studying Mathematics at Advanced level, you may also develop a number of other skills which will be extremely important, whether you go on to higher education or into employment.

>Improving own learning and performance:

- dealing with complex subjects
- checking understanding of work set and seeking clarification if unsure
- agreeing and setting targets and planning action
- following a plan to meet targets and making revisions to the plan as necessary
- checking progress with an appropriate person
- identifying any support needed and using it effectively

>Working with others:

- planning activities with others
- identifying and agreeing targets with others and checking understanding
- identifying and confirming responsibilities within the group
- agreeing working arrangements with those involved

>Working with Information Technology:

- deciding what, when and whether to use information technology
- selecting and using appropriate technological hardware and software to process data, prepare and present information
- identifying support needed and using it effectively

Mathematics

CAREER c-o-n-n-e-c-t-i-o-n-s

There are a number of careers where having an Advanced level qualification in Mathematics, and all the skills that you develop through studying it, will be very useful. You can find out more about these careers by looking up information in your careers library under the Connexions Resources Classification Index (CRCI) codes listed here.

CRCI code	Title
T	Statistician
Q	Scientific Careers
I	Financial Services
IA	Accountancy
IH	Actuarial Work
IE	Banking
IH	Insurance Work
D	Computer and IT Work
IF	Economist
TC	Operational Research
BC	Surveying
BC	Quantity Surveying
F	Teaching

However, being able to understand and use numbers and mathematical concepts will be a very useful asset in many jobs, so you need not be restricted by this list.

Although it is possible to enter some of these jobs after Advanced level studies, many of these areas recruit people with higher qualifications so you may need to seriously consider going on to higher education.

6 ways to check it out

Look at the 2 Skills pages.

- ① Put a cross against those skills you already have.
- ② Tick those skills you would like to gain or develop further.

- ③ Could you see yourself studying this subject at:

	Yes	No
Advanced level	<input type="radio"/>	<input type="radio"/>
Degree level	<input type="radio"/>	<input type="radio"/>

- ④ Look at the Career Connections section which lists careers related to Mathematics. Do any of these appeal to you? Why?

- ⑤ Look at the 'Thinking of doing a degree' section which lists degree programmes that are popular with Mathematics students. Tick those that appeal to you. Pick out your top 3 and explain why.

- ⑥ So what do you think?
Are you interested in studying Mathematics further? Give 3 reasons for your answer:

1

2

3

Remember: Advanced level course grades can be converted into UCAS points which count towards admission to university so it is important to choose subjects which reflect your interests and abilities.

A = 120 points
B = 100 points
C = 80 points
D = 60 points
E = 40 points

Thinking of * doing a degree?

Degree level programmes normally require a minimum of 2 A2 levels, or the equivalent, plus supporting GCSE passes. There are a wide variety of courses where Advanced level Mathematics will be of direct relevance.

Degree programmes in Mathematics

A wide range of courses exist in universities and colleges.

These include the full range of single subject degrees and a wide range of courses which combine Mathematics with other subjects ranging from Agriculture to Women's Studies. Course titles include:

- Mathematic,
- Statistics and Computing
- Applied Mathematics
- Pure Mathematics
- Computing & Mathematics
- Mathematical Sciences
- Financial Mathematics
- Statistics
- Actuarial Mathematics/Actuarial Science
- Operational Research & Statistics
- Mathematics with Theoretical Physics
- Engineering Mathematics
- European Mathematics

Mathematics related degree courses

Related degrees where Advanced level Mathematics may be required for entry (other sciences may also be required, particularly Physics for Engineering degrees):

- Accountancy
- Architecture
- Business/Management Studies
- Business Decision Analysis
- Building Engineering
- Computer Science
- Cybernetics & Virtual Worlds
- Economics
- Engineering (all branches)
- Business & Finance
- Information Systems Engineering
- Mathematical Linguistics
- Manufacturing Modelling
- Mathematics Education (Primary & Secondary)

There are many degrees where having an Advanced level qualification in Mathematics may not be of direct relevance but will be useful, however, so you need not be restricted by this list.

Details of all the degrees available in these areas, and more, can be found on the University Central Admissions System website at www.ucas.com

Mathematics FACTFILE

Opportunities for Graduates

Recent statistics show the following trends for graduates from Mathematics degrees:

- nearly 50% entered full-time employment after completing their degrees
- of these, just under 30% entered financial services and business related careers (jobs included accountancy, insurance & actuarial work, statisticians, and management consultancy)
- significant numbers also entered jobs in commerce, including management, administrative and clerical occupations
- around 5% entered computing and I.T. jobs
- 12% entered teaching without taking a teaching qualification
- around 23% of graduates went on to further full-time education or training with nearly half of these taking higher degrees
- nearly 8% of all Mathematics graduates entered teacher training.

...jobs ✖

These are some of the jobs that Maths graduates have gone into in recent years ...

- Statistician
- Trainee Pensions Consultant
- Business Analyst
- Investment Manager
- Trainee Tax Inspector
- Trainee Management Consultant
- Trainee Pilot
- Bank Management Trainee
- Systems Analyst
- Administrative Assistant



need to find out more?

You might find these publications useful. Check to see if your Careers Library or local library have copies.

- > GET: Finance 2007
published by Hobsons
- > Questions & Answers - Accountancy
published by Trotman
- > Questions & Answers - Architecture
published by Trotman
- > CRAC Degree Course Guide - Mathematics, Statistics and Computer Science
published by Trotman

Free information is available from the following organisations. If writing please send a stamped addressed envelope to cover postage:

- ▷ Institute of Actuaries
Napier House
4 Worcester Street
Oxford, OX1 2AW
01865 268200
Email: institute@actuaries.org.uk
www.actuaries.org.uk
- ▷ Institute of Chartered Accountants in England and Wales
Gloucester House
399 Silbury Boulevard
Central Milton Keynes
Buckinghamshire MK9 2HL
01908 248040
www.icaew.co.uk/careers
- ▷ Institute of Mathematics and its Applications
Catherine Richards House
16 Nelson Street
Southend-on-Sea
Essex SS1 1EF
01702 354020
Email: post@ima.org.uk
www.ima.org.uk
- ▷ The Mathematical Association
259 London Road
Leicester LE2 3BE
0116 221 0013
Email: office@m-a.org.uk
www.m-a.org.uk
- ▷ Operational Research Society
Seymour House
12 Edward Street
Birmingham B1 2RX
0121 233 9300
www.theorsociety.com
- ▷ The Royal Statistical Society
12 Errol Street
London EC1Y 8LX
020 7638 8998
Email: rss@rss.org.uk
www.rss.org.uk