



***Enhanced Learning
Educational Services***
"the study skills specialist"

MATHEMATICAL SKILLS



Developing your Mathematical skills will help you not just with Mathematics as a subject for school but also your life and problem solving skills.

- You should read each point and **highlight the key phrases** in that point.
- Discuss with a friend or parent as you read through the handout.
- You may like to work through this over a number of sessions.



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Enhanced Learning Educational Services Profile

Our Organisation:

Enhanced Learning Educational Services (ELES) is the leading provider of study skills resources in Australia. Since 2001 over 500,000 students across Australia have benefited from our study skills worksheets and workbooks. An Australian business based in Sydney, our clients extend throughout Australia and to international schools overseas. We are committed to helping all students improve their ability to learn and study by providing study skills seminars and resources on the topics students need.

Our Mission:

To provide a worthwhile and effective service to teachers, students and parents, enhancing students' learning skills and abilities through dynamic programs, resources and strategies to unlock the power of the mind and enable greater success at school and in life.

Our Commitment:

As part of ELES' commitment to education, 5% of all gross income is donated to charities that help and assist children.

For further information about ELES or our products or contact details:

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1. HABITS TO DEVELOP

- **BRING ALL EQUIPMENT TO CLASS:** Textbook, exercise book, workbook or paper, calculator (if your class is currently using calculators), computer, ruler, pen, pencil and eraser, geometric equipment (protractor, compass etc.) if relevant to the topic.
- **GET READY TO START WORK STRAIGHT AWAY:** This means as soon as you sit down even if the teacher has not arrived yet, take out your books and equipment, open to the right page and have everything ready to start work when they arrive.
- **LISTEN CAREFULLY TO YOUR TEACHER:** The way to keep your mind focused and prevent day-dreaming is to keep it occupied. You do this by asking yourself questions as opposed to just letting your mind roam free. Develop the habit of questioning as you listen:
 - 'What equipment will I need?'
 - 'Do I understand what we are expected to do?'
 - 'Do I understand this explanation?'
 - 'Do I need to ask any questions?'
- **USE CLASSTIME EFFECTIVELY:**
 - Don't sit next to someone who talks all the time.
 - Don't sit next to someone who you talk to all the time.
 - Get as much of the work done in class as you can so you have less to do at home.
 - Ask questions about anything you can't do or don't understand.
- **ASK LOTS AND LOTS OF QUESTIONS:** Students who get good marks ASK questions if they don't understand something. 'The only truly stupid question is the question not asked'. If you don't have time in class to get your questions answered, ask your teacher when you could see them outside of class.
- **USE CLEAR AND LOGICAL SETTING OUT SHOWING ALL WORKING:** Space problems out rather than crowd them up close. Use any guidelines your teacher provides. Look at the work of your friends and see which style is clearest and easiest to follow. In an exam it is essential to show all working as often marks are allocated not just to the solution but to the steps along the way. You need to practise doing this properly at all times and it is essential you do it with every single question in order to improve your speed and accuracy for a test situation.
- **USE THE ANSWERS TO CHECK YOUR WORK:** The best way to use the answers is to complete the questions first, then check that section, correct your work and redo the questions you got wrong.



- Two poor ways of using answers are checking your work ages after you completed it so you are not getting immediate feedback, or looking at the answers too early (or even copying the answers) without giving yourself a real chance to think about the question and have a proper go at it.
- The purpose of correcting your work or checking the answers is not to find out which questions you got right – those ones don't really matter because if you know how to do them then you'll probably be fine with them in a test situation. The purpose of correcting your work is to locate the questions you got wrong so you can learn how to do these types of questions properly. If you just tick and pretend you have checked you have learnt nothing.

○ **COMPLETE ALL HOMEWORK:**

In Mathematics, there are a number of reasons as to why you might be given homework:

- there wasn't time to finish everything in class
- you need extra practice to help you understand the work or you have a test approaching and you need to revise
- to help you consolidate what you learnt in class – coming back to the work later that day, and by yourself, helps you reinforce the new concepts learnt and also tests your understanding.

To make the most of homework:

- complete it on time
- then correct it if possible
- try and redo or understand any questions that were incorrect
- on a post-it note write a list of the questions you need to ask your teacher about next lesson and stick it in your workbook or textbook.



- **KEEP A SUMMARY BOOK:** Your summary book can be an exercise book or a separate section in your folder or loose leaf paper that you put in a display folder. On a regular basis, look through the work you have done so far for Mathematics and in your summary book write down the main rules and formulas, and include examples of different types of questions. Studying Mathematics has two parts – learning the rules and content and practising the skills of the subject. A summary book helps you do the first stage most efficiently.
- **KEEP ALL SHEETS, PAST TESTS, ASSIGNMENTS:** In addition to your exercise books or folders for class, have a folder at home that you use to file sheets for Mathematics. Keep absolutely everything and use dividers to separate the different topics (label these clearly). When you next have a test that includes that topic, go back and redo any questions from your sheets that you got wrong in the past.
- **WORK ON AREAS YOU FIND DIFFICULT:** You have to expect that you will find some topics more difficult than others and so may need to do extra work for particular topics. If you find a particular section difficult, ask your teacher for some extra worksheets on this topic or see if you can borrow a different textbook in order to have some more questions to attempt on this

topic. The best way to tackle an area you find difficult is to attempt some extra questions and try and work out where the point is that you get stuck. Then go and ask your teacher for some help, then go back and try again. Keep repeating this pattern: doing questions and asking for help until you have mastered it all.



a. Tick which of the habits you already do on a regular basis. What are the habits you should really try to implement to make the most impact on your results?

2. SETTING OUT YOUR WORK

Good setting out in Mathematics is essential to ensure:

- Your teacher can read and understand your working.
- You can read and understand your working.
- Your work is easy to correct.
- Mistakes can be located and corrected.
- You show all working necessary to get all the marks available.
- That you can still be given marks for the working even if you make a mistake.

You need to practise good setting out all the time. It is not enough to intend to do proper setting out in an examination situation either.

Many students justify their laziness in class by saying that showing all working out and setting work out clearly isn't important in class and when they are in a test then they will set the work out properly. There are a number of problems with this:

- By not practising correct setting out you don't learn what you are doing wrong and can't improve the way you set your work out.
- Unless you have done it so often that it has become an automatic habit, you often forget to set work out correctly when it is really needed.
- The more often you set your work out properly, the easier it becomes to do and you become faster and more efficient at doing it.
- It just doesn't make sense not to do it all the time – if you are not convinced go back and read the reasons at the top of the page again!

Guidelines to improve setting out:

Student A

2c) Weekly wage
 $= \$6 \times 40$
 $= \$240$ ✓

Income
 $= \$240 \times 50$ (circled 50)
 $= \$12000$

∴ Each person receives
 $= \$12000 \div 2$
 $= \$6000$ ✓

(2 marks)

mistake here (pointing to the 50)
x 52 weeks in the year!

Student B

2c) Each person gets \$6000
 \times
 (0 marks)

- **SPACE OUT YOUR WORK:** Don't try and save the environment in Mathematics classes by squishing your work up all tightly together. Space your work out so it is clear where one question starts and the next begins. Leave at least one blank line between questions.
- **AVOID ZIGZAGGING:** If you are using columns, you are better to work straight down one column and then straight down the other column rather than going back and forth between the columns.
- **PENCIL ONLY FOR DIAGRAMS:** Unless otherwise directed by your teacher, get in the habit of using pencil for diagrams and blue or black pen for everything else. Try and stick to the same type of pen as well so your book does not become a mass of multi-colours! And while it might be fun in junior years to write question numbers in red each time then working in blue, clear setting out can be achieved without wasting the time doing this. Remember, speed in Maths can be really important!
- **ONE EQUAL SIGN PER LINE:** The Golden Rule of equal signs is only one per line.
- **LINE THROUGH MISTAKES:** Avoid using liquid paper/white-out. It wastes time, can be messy, you might forget to go back and write in the correct answer and even worse, you may have been correct and your teacher may be generous enough to give you some marks if you had left it. Don't do a great big scribble over the incorrect working either, instead just draw a neat line through the incorrect working and move on.
- **IT'S NOT ALL NUMBERS:** Use words to explain what you are doing where necessary – particularly in topics like Consumer Arithmetic. Using words like 'Weekly Pay =' or 'Interest Owing =' makes the solution so much clearer.
- **SHOW ALL STEPS:** Don't leave out any steps when you are writing your answers down. Often something which is very clear in your head will not be clear to the marker. Imagine you have to explain how you got your answer to someone who isn't very clever and so you need to explain every single step as clearly as possible. Don't skip things that you think are obvious: this step might be where you make a simple calculation error that gives you the wrong answer.
- **WRITE NEATLY:** Write legibly so your writing is easy to read and ensure there is no confusion between the different numbers.



b. Tick which of the guidelines you already implement on a regular basis. What are the habits you should really try to implement to make the most impact on your results?