If you use a journal for theory of knowledge you will probably appreciate how much help it is when writing your essays. In the same way, keeping a journal for your exploration will be a great assistance in focusing your efforts.

- Make notes of any books or websites you use, as you go along, so you can include them in your bibliography.
- There are different ways of referencing books, websites, etc. Make sure that you use the style advised by your school and be consistent.
- Keep a record of your actions so that you can show your teacher how much time you are spending on your exploration. Include any meetings you may have with your teacher about your exploration.
- Remember to follow your teacher’s advice and meet the school’s deadlines.
- The teacher is there to help you – so do not be afraid to ask for guidance. The more focused your questions are, the better guidance your teacher can give you.

### 13.6 Choosing a topic

You need to choose a topic that interests you, because then you will enjoy working on your exploration, you will put more effort into the exploration, and you will be able to demonstrate authentic personal engagement more effectively. You should discuss the topic with your teacher before you put too much time and effort into writing your exploration.

<table>
<thead>
<tr>
<th>These questions may help you to find a topic for your exploration:</th>
</tr>
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<tbody>
<tr>
<td>• What areas of the syllabus am I enjoying the most?</td>
</tr>
<tr>
<td>• What areas of the syllabus am I performing best in?</td>
</tr>
<tr>
<td>• Which mathematical skills are my strengths?</td>
</tr>
<tr>
<td>• Do I prefer pure mathematics, or applied problems and modeling?</td>
</tr>
<tr>
<td>• Have I discovered, either through reading or the media, mathematical areas outside the syllabus that I find interesting?</td>
</tr>
<tr>
<td>• What career do I eventually want to enter, and what mathematics is important in this field?</td>
</tr>
<tr>
<td>• What are my own special interests or hobbies? Where is the mathematics in these areas?</td>
</tr>
</tbody>
</table>

Your teacher might give your class a set of stimuli – general areas from which you could choose a topic. Alternatively they might encourage you to find your own topic based on your interests and level of mathematical competence.

Each chapter of this book suggests some ideas for explorations, which could be starting points for you to choose a topic.

Mind mapping may help you choose a topic. See pages 670–671.
13.7 Getting started

Once you have chosen your topic, the next step is to do some research. The purpose of the research is to determine the suitability of your topic.

These questions will help you to decide if your chosen topic is suitable.
- What areas of mathematics are contained in my topic?
- Which of these areas are accessible to me or are part of the syllabus?
- Is there mathematics outside the syllabus that I would have to learn in order to complete the exploration successfully? Am I capable of doing this?
- Can I show personal engagement in my topic, and how?
- Can I limit my work to the recommended length of 6 to 12 pages if I choose this topic?

Once you think you have a workable topic, write a brief outline covering:
- why you chose this topic
- how your topic relates to mathematics
- the mathematical areas in your topic, e.g. algebra, geometry, trigonometry, calculus, probability and statistics, etc.
- the key mathematical concepts in your topic, e.g. areas of irregular shapes, curve fitting, modeling data, etc.
- the mathematical skills you will need, e.g. writing formal proofs, integration, operations with complex numbers, graphing piecewise functions, etc.
- any mathematics outside the syllabus that you will need
- possible technology and software that can help in the design of your exploration and in doing the mathematics
- key mathematical terminology and notation required in your topic.

Now you are ready to start writing the topic in detail.

Remember that your fellow students (your peers) should be able to read and understand your exploration. You could ask one of your classmates to read your work and comment on any parts which are unclear, so you can improve them.