you only rote learn it, you may forget whether to add or subtract some item in the formula. If you understand the theory behind the formula, it's more likely you can work out whether to add or subtract.

Secondly, it's less likely you can apply a topic in a slightly different way if you only rote learn it. If you learn the details behind a topic, you have more opportunity to work out what you need to change to apply the topic differently. For example, understanding some details behind aircraft navigation makes it easier to apply the same knowledge to maritime navigation.

You can explore at many levels. When you first start your training, you explore the overall course content and understand how each lower level module contributes to the overall objectives. As you progress, you then explore each part in more detail. Both the high and low-level details form part of your understanding of a topic.

Many techniques and tools can help you explore your content. In this section, we first look at some general techniques you can apply to any exploration activity. Then I present more techniques grouped (roughly) into the most relevant Memletic Style. We are yet to cover these styles in detail, so you may want to review the basics of each style in the Overview chapter. In summary, the styles are Visual, Aural, Verbal, Physical, Logical, Social and Solitary learning styles.

Here is a summary of the exploration techniques described in this section:

General exploration

- High altitude view
- Deeper level
- Branch wider
- Abstractions
- Bottom up
- Questions[3]

Visual exploration

- Diagrams, graphs, and sketches
- Mind maps
- Systems diagrams
- Visualization

Aural exploration

- Sound focus
- Record sounds

Verbal exploration

- Lectures and discussions
- Dramatic reading
- Express and summarize aloud
- Write and rewrite
- Write articles
- Write summaries
- Record

Physical exploration

- Walk about
- Get hands-on
- Role-playing
- Index cards & Post-It notes
- Tick it off

Logical exploration

- Logic analysis—OSAID
- Logic trees
- Play with numbers

Social exploration

- Group learning
- Study buddy
- Opposite view
- Role-play
- Involve others

Solitary exploration

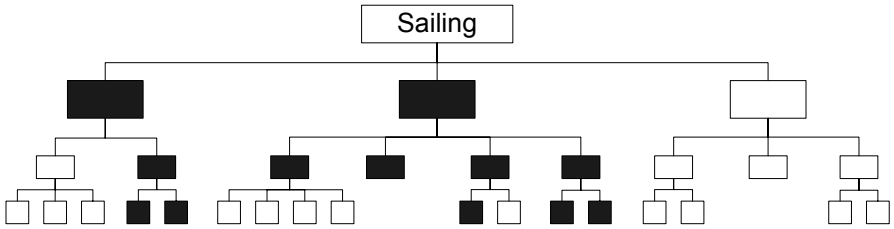
- Reaction notes
- Learning journal or log
- People exploration
- Make up your own mind

How far should you go when exploring your material? It depends on your objectives. If you want to know a particular topic well, you may want to explore it in more detail than a course mandates. Don't go too far though. If you find yourself analyzing the behavior of electrons in water molecules, and

how that contributes to a landscape photograph, you have probably gone too far!

General exploration techniques

I use a topic pyramid to help me understand general exploration techniques. Let me expand on this idea. Think of the knowledge you need for your course or topic as a pyramid, with the goal at the top. Branching down and out from there are major topics, subtopics, sub-sub-topics (and so on) that you need to know. Look at the example in this diagram:



Each of the dark boxes shows a compulsory topic for a beginners sailing course. The white boxes show topics that you don't need to know to complete that sailing course. You can imagine each of the lower level boxes continuing to break down into more and more detail. This pyramid goes right down to basic chunks of knowledge, such as individual facts, skills and behaviors. We'll use this example as we go through the general exploration techniques.

General techniques that can help you explore a wide range of content include high-level views, going a level deeper, going wider, abstracting, and a bottom up approach. In addition, you can use the Five Ws technique to help you with these techniques. Let's look at these in more detail.

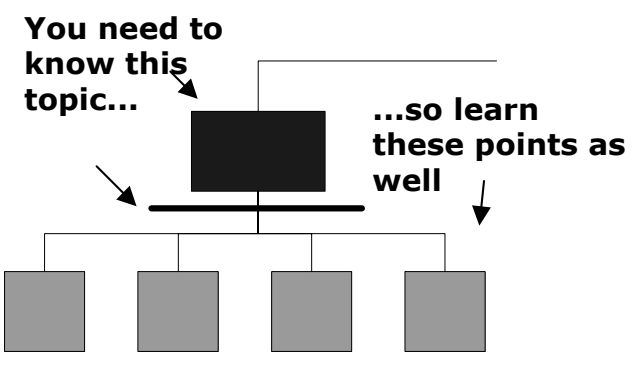
Get a high altitude view

Before you start a topic or lesson, begin by getting a high-level view of where it fits into your current learning objective. This is "getting the big picture" or the "forty thousand foot view." Using the topic pyramid above, this technique involves looking at the whole pyramid from a high level. Also, look at the topic of focus for your current lesson. This helps you decide what to concentrate on during the lesson, and it helps you discard what you don't need to know.

You can get this view before beginning a book or training manual. Flip through the major sections. Review the chapter titles. Read each chapter's introduction. Think about which chapters are more relevant, and which chapters contain secondary information. If your course lacks this organization, you may want to consider creating your own topic pyramid.

Go a level deeper

At some point down each branch of the pyramid, imagine a line drawn across. This marks the minimum needed knowledge for your course or topic. I suggest you go one pyramid level lower than this line. For example, understand and learn a few key points underneath a compulsory topic, even if

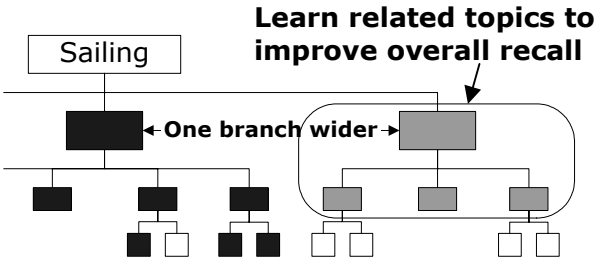


these are not compulsory.

Let's look at our pyramid example. The black box is a compulsory topic. The shaded boxes are topics you don't *need* to know. If you learn the key points from these grey boxes, you will remember the compulsory topic better.

While this may initially take longer, it usually needs less overall time and results in better recall. For example, you could spend thirty minutes trying to rote-learn a particular topic or chunk of content. Alternatively, you could spend fifteen minutes finding a few key points underneath that topic, and ten minutes summarizing those. Not only do you improve your understanding, you also remember it better as well. Over the following weeks you would likely spend less time reviewing that topic, compared to if you just tried to rote learn it.

Go one branch wider

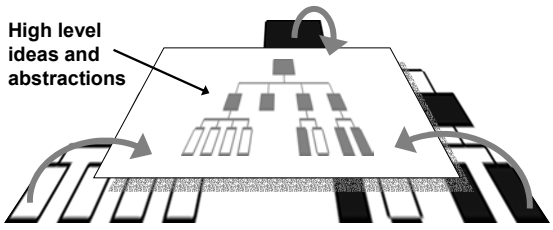


Continuing the pyramid analogy above, widen out your pyramid by understanding topics related to your course but not compulsory. Looking again at our pyramid example, we see the main branch to the right of the core sailing topics is not compulsory. If you spend some time learning some key points from this branch, you will likely improve your overall understanding and retention of the compulsory topics.

For example, one particular branch may be the history of your topic. What impact has your topic of focus had on society? Who were some of the early pioneers, and what did they contribute to where you are today? You could also look up related jobs or industries.

While this information may not be compulsory to complete a course, it aids your learning and understanding of core topics.

Understand higher level abstractions



Abstraction involves looking at some facts or ideas and drawing out some higher-level observations from those. You may note that you can apply a particular technique or approach in a different context or area. For example, you could abstract the general principle of asking questions while selling, and then apply those same principles to increase your persuasion in other areas.

At the end of each lesson, see if you can abstract the top three ideas from that lesson. See if you can apply those ideas to other subjects or topics.

Bottom up approach

Sometimes a particular idea is difficult to grasp fully until you understand the lower level details. You need to learn those lower level details first, before bringing together that understanding into a coherent picture.

Some people may prefer this bottom up approach rather than top down. Issues can arise when an instructor or author teaches one way while you prefer the other. If this is the case, you may need to restructure your material to suit your preference. Alternatively, you could try accepting that both ways can be effective in learning a topic. If you typically prefer a top down approach, try resisting that preference and start at the bottom. If you prefer a bottom up approach, make an effort to understand the high-level organization first.

Questions questions questions—how to expand your pyramid

If you are not sure how to expand your pyramid, try the Five Ws technique. Later in this chapter I discuss the Five Whys technique. This involves asking "why" five times in a row to help discover underlying causes of problems. The Five W's technique uses a similar approach to help you expand your pyramid.

To use the technique, state a fact, idea or principle from your topic. Now ask a question about that statement beginning with one of the W words. The five W words are Who, What, Why, Where and When. If you know the answer, keep going with more questions. When you hit questions you don't know the answer to, write them down for further research. Ask another question starting with 'W', and repeat this until you have at least five new questions you can research.

For example, pilots study meteorology as part of their training. Five questions you could ask about weather forecasting are: "Who does the forecasts?" "Why are they sometimes wrong?" "What do they do to prepare forecasts?" "Where do they do it?" "When (how often) do they do it?" Answering these questions broadens your understanding of the forecast. You may then understand, for example, why the forecast is sometimes different to the weather on the day.

A way to remember these words is the phrase "A hen wearing a hat said 'Hi-di-ho I'm here!' " Add a W to the front of each of the words starting with H and you get the five W's.

Visual style exploration

Most learning materials rely on printed text to provide information. As a visual learner, find ways to represent information visually. Here are some ways you can do this:

- **Use diagrams, graphs and sketches.** If you can't find good diagrams, graphs and sketches that represent the key messages in your topics, create them yourself. Just start drawing, even if you don't think you draw well. In addition, easily accessible spreadsheet programs now allow you to create graphs for all kinds of data.
- **Use Mind Maps®.** Organize topics and ideas using a drawing technique called mind mapping. This helps you visualize and understand the hierarchy and linkages between topics. Tony Buzan, in some of his books, describes this technique in detail. In addition, some software programs can help you easily create mind maps. The software I use is "Mind Manager" from MindJet. Rather than describe mind maps in detail, I'll let my mind map below do it for me.