PREPARING FOR AND TAKING TESTS AND EXAMS AT UNIVERSITY

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Writing tests and exams at university

Self-reflection questions
- How do I feel about taking tests and exams?
- Do tests and exams help or hinder my overall performance in a course? What are my past experiences with tests and exams?
- When have I done well?
- When have I struggled?

The aim of this module is to help you succeed in the world of formal testing. For most university students, taking a test or exam is not a sought-after event. Being assessed under strict time constraints while sitting with hundreds of your closest personal friends is awkward at best and frightening at worst. It is true that some anxiety can motivate and keep you focused; however, excessive and unmanageable test anxiety can cause poor performance. Some students ‘blank out’ or freeze during a test. Others try to avoid the test by not showing up at all or writing as quickly and minimally as possible in order to escape the testing environment.

Formal testing is by no means the best mode of assessment. However, tests and exams are deeply embedded in the university academic culture and will continue to be part of student life into the future. So, if you can’t beat them, why not learn to live with them!

Disarm tests! Remove misconceptions and take their power away
Grades don’t measure your intelligence. They measure how you scored on a test. That’s all!

Grades don’t measure creativity. Tests are the antithesis of the creative process as there is little time or encouragement for thinking ‘outside of the box.’ Being too creative may result in penalties.

Grades don’t measure your self-worth. Yet, we give tests the power to determine how we feel about ourselves (e.g. “If I fail a test, I’m a failure.” “If I do badly on a test, I’m a bad person.”)

If you do badly on a test, you are just a person who did badly on a test. That’s all!

Don’t exaggerate the pressure on yourself
Tests are not a matter of life and death. Even a low score on an important test is not the end of the world. It usually means only a delay.

Learn test-taking strategies
That’s what this module is all about – so read on!
Becoming self-aware

Before you start to crack the books, spend some time doing a self-assessment of

- Your expectations and goals for the course (including this test)
- Your study and learning skills
- Your mind and body
- Your external resources

<table>
<thead>
<tr>
<th>My set-up</th>
<th>My skills</th>
<th>My mind &amp; body</th>
<th>My external resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are my goals for this exam? How do they fit into my overall goals for the course?</td>
<td>What kind of student am I? e.g. need a long time to review; like to cram; studying in a group/alone ...</td>
<td>How is my attitude right now? In general? Specific to this course/exam?</td>
<td>Do I have all the necessary information and resources to succeed?</td>
</tr>
<tr>
<td>What is my entrance mark going into this exam? How much more do I need to meet my goal?</td>
<td>Do I know how to study? i.e. do I have good study skills and strategies?</td>
<td>How motivated do I feel right now? Will procrastination pose a problem?</td>
<td>Do I have the help I need to succeed? E.g. study group, TA/prof, family/friends, learning strategist</td>
</tr>
<tr>
<td>When should I start studying? Do any courses take priority?</td>
<td>What exam types are easier/harder for me e.g. multiple choice, short/long answer? Do I need to learn new skills to manage the test format?</td>
<td>Can I handle any test anxiety that might occur?</td>
<td>Do I have a quiet study space?</td>
</tr>
<tr>
<td>Do I have the necessary time management skills to plan and organize an exam study schedule?</td>
<td>How is my concentration right now? Do I have strategies to help keep focused? Am I physically prepared to handle stress?</td>
<td>Are my friends encouraging me to do my best?</td>
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</table>

Now that you are more aware of yourself as a test-taker, it’s time to consider strategies to help you do your best on tests and exams. The strategies are grouped around three timeframes:

I. Before – Preparing for the test
II. During – Taking the test
III. After – Debriefing and celebrating the test

We have also included extra information in a Tools section at the end.
I. Before: Preparing for the text/exam

**Self-reflection questions**

- Am I usually prepared for my tests and exams?
- How often do I end up cramming when I don’t want to?
- Do I have the necessary skills and strategies to help me prepare well? Do I know how to prepare a study plan? i.e.
  - select the central information?
  - organize my time?
- How good are my memory strategies?
- Do my memory strategies facilitate long term memory and recall?

**Issues**

If you are prepared for a test, you will do better than if you aren’t prepared*. Really knowing your stuff means that you have learned your material, i.e., you can apply and use it in a meaningful way.

*there are exceptions such as severe test anxiety brought on by non-academic factors.

It’s also important to recognize that different courses require different kinds of learning. The three most common types of learning used in university are:

1. Memorizing
2. Understanding concepts
3. Problem-solving

For information on the three types of learning, go to Different Kinds of Learning.

**Strategies**

The strategies in this section include how to:

- be informed about the exam
- select and organize central information organize a study schedule and follow it
- put regular review and self-testing into your study routine deal with cramming
- improve your memory strategies

Preparing for different test types such as multiple choice, short answer, and essay exams will be covered in the next section.
Steps in preparing for a test or exam

Step 1: Be informed about the exam

What do I know already?

- Do a “data dump.” Write down everything you know about the course. The goal is to jumpstart your brain and get you thinking about the subject matter.

What does the professor expect me to know?

- Look at the course objectives on your course outline or syllabus. Are any topics or sections given more emphasis? For example, a topic that has been covered for a number of weeks needs to be prioritized.
- Does my professor have special interests that might influence the topics, format, etc.?

What are the ‘logistics’ of this test?

- Format: test types; breakdown of questions e.g. 50 multiple choice, 5 short answer
- Weighting: What percentage of the final mark is the exam worth?
- Topics to be covered
- Emphasis on material not yet tested compared to previously tested materials

What can past assignments and tests tell me about this test?

- Look at old exams, assignments, and tests for questions types, topics, and key concepts.

What do I still need to complete?

- Compiling lecture notes
- Completing assigned readings (textbooks, articles)
- For math & science: having solutions to problems; finishing labs

What other study aids do I need?

- Past exams, study guides
- T.A. or prof., study group

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Step 2: Be strategic
Set targets: What content is to be reviewed by what date?

Begin with most difficult content.

Order the content: this depends on your professor’s instructions and your learning goals. Evaluate the quality of your review. If you don’t have time to study everything, focus on a selection of material and learn it really well.

Step 3: Select and organize key information
Here are four steps to help you select the right information to study.

1. Identify the key information (concepts, ideas, issues, sections)
   Preparing Summary Sheets for Studying – aim for one summary sheet per major topic in the course.

2. Understand the key information
   Research shows that students who generate their own test questions perform better than students who answer prepared questions or just read. Generating and answering your own questions helps you to elaborate on the key ideas, going beyond surface reading and rote memorization.

   For details of the research study, go to How Students Can Best Prepare for Test & Exams. For more information on elaborating, go to Understanding Key Information: Elaboration Helps.

3. Organize the key ideas with their supporting information
   How do the key concepts interrelate? What supporting information do I need to help me understand the main idea?

   Use a Cornell note and/or a concept or mind-map to connect and distinguish key ideas from supporting points. For information on how to make and use a mind map or Cornell notes as a study tool, go to our online Reading and Note-making module.

4. Remember key course information
   To remember and recall the material on the exam, you will need to review, review, review and then self-test. Continue to Step 4 on the next page for more information.
Step 4: Reviewing and self-testing

To facilitate understanding and learning, regular and systematic review during the term is necessary. Although students know the value of reviewing, due to such things as poor time management and procrastination, many students leave reviewing till just days before a test. Self-testing should also be applied during your review of materials so that you can gage the extent of your learning. Keeping up with readings, and regular review also greatly reduce stress!

What is Review?

Review is a two-way process of information gathering and information using.

Information Gathering ← Information Using

During the review process you switch back and forth between these two functions.

Information Gathering: Read through all the sources of information: lecture notes, books and articles, labs, old exams, handouts, workbooks, study guides, etc.

Information Using: Test your understanding of the information. Use a variety of strategies while you review. The strategies you choose will depend on the nature of the material, and your learning style.

Some popular review strategies:

- summary notes: tables, mind maps, headings with bullet points cue cards
- analyze types of questions and answer questions on old exams practice problems
- do a mock exam
- make up your own multiple choice questions
- use memory strategies e.g. make up mnemonics or visual stories to link words/ideas together
- rewrite
- recite out loud
- generate new examples to illustrate concepts
- apply a concept to your own life experience
- teach a friend


Tools: This Material Will Be On the Test! Ways to predict test questions and Self-Testing: Don’t Wait til Just Before the Test
Organizing a study schedule
With a well-conceived and realistic study schedule, it is very possible for a student to prepare for many exams at the same time and have time to take care of their other important needs, i.e. sleeping, eating well, and exercising. The Tools below will assist you in this task. Good luck!

- Rules for Organizing a Study Schedule
- The “5-Day” Study Plan
- Studying for Multiple Exams...Expanding the 5-day Study Plan

Cramming sucks but I still need to do it ... sometimes!
Dire consequences of cramming include:

- not having enough time to associate and integrate new information to prior learning
- not having time to recite and elaborate means you might not see important connections
- if you fail the exam or course or wish to continue in this field of study, you will have to study the same information again. And, that takes more time...
- if you’re very stressed, information can elude you during the test
- you’re probably exhausted from not sleeping enough, right? Lack of sleep causes cognitive impairment. In other words, you’re NOT THINKING CLEARLY.

Ok, but let’s get real. Most students have to cram sometimes. With this in mind, go to But What if I Have to Cram? for helpful hints to maximize your learning when cramming.

Memory strategies
With the large volume of information that university students must learn, there is no avoiding memorization. Students with good memory strategies find retaining and recalling information much easier. Memorization is a SKILL, not a talent, so you need to have good strategies and practise them regularly.

Luckily, we have a tool for that! Read Memory Strategies for Exam Prep.

For more excellent memory strategies, go to the Tools section of our online Reading and Note-making module.
II. During: Taking the test or exam

Self-reflection questions

- Do you have good test taking techniques?
- During an exam, what are the greatest challenges for you? e.g. time, distractions, certain test types, anxiety.
- Which question types do you prefer or perform better on? e.g. multiple choice, short/long answer, problems.
- Do you know how to study for the different question types?
- Do you ever freeze or ‘blank out’ during a test?
- Do you have effective calming techniques if and when you feel too anxious during a test?

Issues

*If I know the content of my course, I should be able to do well on my test, right?* Well, not exactly! If you have prepared well and understand the material, you still need to do the following in order to perform well on your test:

- Stay calm and relaxed
- Budget your time wisely and keep close watch on the time
- Plan your approach
- Read the instructions and questions carefully
- Don’t let distractions (external and internal) disrupt you
- Know how to ‘attack’ different test types
- Keep a positive attitude

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Strategies
This section will cover the following topics and strategies:

1. Dealing with Content
2. Answering Different Question Types
3. Reducing Test Anxiety

1. Content
Do a memory dump. Write down everything you can remember about the topic before crafting any answer. This is helpful in the event you forget later on or anxiety is a problem.

Read directions carefully. Professors say that most marks are lost at this stage, i.e. students are in such a hurry to answer the question that they misread it.

Do the easiest questions first. Some students think you should do the hard questions first but doing the easiest ones first helps you build confidence as well as guaranteeing you marks!

Budget time wisely. See our tool on Timing Your Exam.

2. Answering different question types
The most common question types on undergraduate exams are multiple choice, short answer, essay, and problem-based.

Most students have a preference for certain styles. This is most often due to their personal cognitive and learning style. For example, a student who excels at multiple choice might prefer:

- seeing the answer
- having a finite list of possibilities having either a right or wrong answer

Conversely, a student who excels at an essay exam question might prefer:

- spending time creating the answer
- having freedom to choose content (e.g. what evidence to provide) thinking globally, conceptually (less interested in minute detail) grey areas and subjectivity

Unfortunately, students cannot choose their preferred question type and in some cases an exam might contain questions in only one type. Multiple choice tests, for instance, are very common in undergraduate courses with anywhere from 50-100% of the questions written in this format. Therefore, you will need to learn HOW to study for different types of test questions.
3. Reducing test anxiety

- Do you ever go blank or freeze up during a test?
- Do you ever feel like the room is closing in on you?
- Do you ever feel your heart racing or have difficulties breathing?
- Do you ever race out of the room before you are really finished writing the test?
- Do you ever tell yourself “I can’t do this,” “I’m gonna fail,” or “I’m stupid”?

If so, you might be experiencing test anxiety.

And you are NOT alone!

Test anxiety is super common among university students. Why?

Aside from real and growing external pressures (e.g. from universities and employers) for students to get high grades, test anxiety is also rooted in internal (i.e. self-imposed) pressures.

Some of these pressures are

- Lack of confidence
- Fear of failure
- Feeling unworthy of doing well
- Past experiences with poor performance
- Lack of preparation
- Perfectionism
- Unrealistic goals
The good news is that test anxiety can be beaten! With some effective strategies that you practice regularly before and during the test, you can learn to manage your anxiety.

Keep in mind that a bit of anxiety is necessary during an exam as it keeps you motivated and alert. However, once you go over your threshold for tolerance, it’s time to take control. The Tools below provided a number of strategies to help you reduce your test anxiety:

- **General:**
  - Overcoming Test Anxiety
  - Letting Go: 1. Dealing with Physical Sensation of Anxiety and 2. Dealing with Thoughts
  - Guided Imagery for Test Anxiety
- **For Math & Science Anxiety:**
  - Math and Science Anxiety: What’s behind it?
  - Overcoming Math & Science Anxiety. And you can!
III. After: Debriefing the test or exam

Self-reflection questions

- After your test or exam, do you take time to look over the results?
- After your test or exam, how do you often feel? e.g. relief, still anxious, upset, etc.

Issues

Analyzing the test results

Many students don’t review their exams. They figure once it’s over, it’s over. But what these students fail to realize is that the evaluation stage of the learning process is the most critical. It is here that the student can determine where he or she went wrong and what changes are needed in the future.

An additional problem relates to the common practice of not returning final exams. Some students don’t realize they have a right to see their exam paper. Faculty are also culpable when they don’t reinforce the notion that exam papers are available upon request.

Try reading Analyzing Your Returned Tests.

Celebrating our mistakes

Most of us fear making mistakes as often mistakes have dire consequences such as lost grades, jobs, money, or relationships. However, taking on a different attitude towards our mistakes at university—one of celebration rather than fear—has many positive outcomes.

Try reading Eight Reasons for Celebrating Mistakes.

“Celebration.” Photograph by bfick. Used under Creative Commons Attribution License 4.0.
Nurturing your mind and body

Self-reflection questions
When trying to study, do you have any of the following problems?

- Lack of focus?
- Poor concentration?
- Lack of motivation?

Are any of these problems directly related to

- Lack of sleep?
- Poor diet/nutrition?
- Lack of exercise?

Issues

Body

Sleep: Without sleep, you feel tired. When you feel tired, it’s more difficult to focus and concentration. If you can’t concentrate, you can’t study well. If you can’t study well...Ok, you get the picture!

Try Sleep and the Functioning Student.

Diet: You are what to eat. For a student, healthy food → healthy body → healthy mind. Eating a complete diet including lots of —brain foods— will enhance your physical and cognitive well-being. If you’d like information or advice on your diet, call Dial-a-Dietician at 613-549-1232 Extension 224. It’s FREE!

The Health Canada website allows you to create your own Food Guide based on your age and gender.

Exercise: Exercise improves blood circulation and the increased blood flow to the brain improves focus and concentration. As well, when exercising, your body produces endorphins, a ‘feel good‘ hormone. If you can’t get to the gym regularly, don’t despair. Try using your 5-10 minutes ‘power break’ during study sessions for a brisk walk around the block or go up and down the stairs in the library.

Free exercise consultations are also available at Queen’s. To make an appointment, visit Health Promotion.
Mind

Concentration and focus: For information on improving your concentration, go to our online Reading and Note-Making module.

Motivation: Motivate: 1) to cause a person to act in a particular way 2) concerned with movement. Many of us can feel a lack of persistence, self-discipline, or courage in facing a task. Sometimes we feel the pay-off will be worth the effort, and sometimes we aren’t sure. But we can help ourselves act, by considering our own intrinsic and extrinsic rewards.

See Manufacturing Motivation.

If procrastination is affecting your motivation, find anti-procrastination strategies in our online module Managing Your Time at University.

“Brain Anatomy Hoop Art. Hand Embroidered in Pink and Blue.” Photograph by Hey Paul Studios. Used under Creative Commons Attribution License 4.0.
TOOLS FOR PREPARING FOR AND TAKING TESTS AND EXAMS

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Different kinds of learning

Memorizing
A few courses require you to memorize specific facts or rules, e.g., language courses. Science course (Biology, Anatomy) also require a large amount of information, alongside understanding concepts.

How should I approach these courses?
Because memorizing is very intensive work for our brains and because brains can’t take in too much at one time, it’s better to spread learning out.

a) **Swiss Cheese Method:** nibble away to make holes in the material rather than gobbling it up all at once.
b) **Distributed Learning:** Spend a short time (20-30 minutes) learning one thing and then take a break. Come back later and review what you’ve learned in the previous session. Add something new. Remember: short sessions with lots of repetition.
c) **Chunking & Making Connections:** It’s important to make connections among all the details so that they are easier to remember. E.G. in Biology you might make a chart of all the hormones and proteins covered in the course with the main characteristics of each one. In French, you might make a chart of all the kinds of pronouns and their uses.

Understanding Concepts

Many courses, especially in social sciences, require you to understand concepts and are not about memorizing information to regurgitate on tests. Rather, they are about reaching a deep level of understanding of the concepts. To reach this level, you have to see the BIG PICTURE.

How should I approach these courses?
Think of your course as a giant jigsaw puzzle and each lecture, each reading is a new piece of the puzzle. Your job is to fit all the pieces together.

a) Integrate material from lectures with information from the text and additional readings.
b) Organizing information around major themes and concepts (identified by the instructor and/or in the textbook). Make mind-maps, charts and visual outlines showing how the ideas fit together. The visual needs to show how important details form a concept and how a concept fits with the course.
c) Test questions often ask you to **evaluate, compare, and apply** the concepts. So prepare study questions which reflect these ways of thinking. Use concrete examples to clarify.
Problem-solving

Many courses in Science, Engineering, and Commerce require problem-solving. Course material is best learned by doing problems. Spending time just reading your textbook is not the best use of your time. Working through the problem and then reading the theory often helps to clarify it.

How should I approach these courses?

a) Read your textbook backwards! Skim the chapter quickly, then start on the problems at the back of the chapter. When you get stuck, go back to read the pertinent parts of the text. By doing so, you get the problem done AND understand the theory.

b) Organize problems around concepts. Each problem is not unique but rather part of a family of problems where each procedure is a variation on the concept. To help you understand discreet differences amongst procedures, use maps or flow charts to show how the various procedures connect to the concept.

Also see Special Techniques for Math and Science Tests.

Source: Mary O’Malley, Concordia University
Preparing summary sheets for studying

Why use summaries?
- deepen your understanding of the material
- determine the key ideas (refer to the course outline for learning objectives)
- organize material into themes, or hierarchies
- look for connections among ideas, concepts, or problem sets
- use your ‘visual brain’
- reduce the volume of content for faster reviews

Summary formats
Choose a summary method that reflects the content plus your preferred way of learning. These methods highlight studying the overall concepts. Drilling information on cue cards focuses on isolated details and complements these conceptual summary methods.

Here are some useful formats (also see Academic Reading module):

1. Cornell
2. Mind-maps
3. Charts/Tables
4. Concept Summary
1. The Cornell method
When to use: To combine lecture notes or power points with text or course manuals

How to use:
1. Start with the topic or title at the top of the page.
2. Draw a 2-3 column down the left side. Have your lecture and text open together. Write point from the lecture in the larger space, and add structure from the text in the smaller column. For example, add subtitles, key terms, definitions or formula, pose questions.
3. Finish with a 4-6 sentence summary of the unit, topic or lecture.
4. Review by covering the larger column and asking questions based on the cues on the smaller column, or rehearsing final short summary.

2. Mind mapping
When to use: To see associations among relational material. This method is particularly helpful to visual learners, so use colour as an additional aid.

How to use:
1. Identify the main topic or concept in the web’s center. Structure sub-topics in the next layer.
2. Add information such as point, interpretation, explanation/evidence/example (PIE) for each detail.
3. Look for recurring ideas, to see connections among various sub-topics.
Mind maps can be as compressed or as comprehensive as you wish by adding additional subsections.

![Mind Map Image]

3. Chart
When to use: If there was a repeated pattern to the material you are summarizing; to facilitate comparative thinking.

How to use:

1. Identify the topics covered along the top of the chart, and the pattern of sub-topics along the side. This is the more conceptual thinking, and filling in the details of each cell is a more factual focus.
2. Completing the matrix allows you to study all about a single theory (i.e. within a column) and compare details across theories (i.e. across rows).

Sample:

<table>
<thead>
<tr>
<th></th>
<th>Trait</th>
<th>Psychoanalytic</th>
<th>Behavioural</th>
<th>Humanistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Key ideas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Application of theory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Concept summary

When to use: If you are working with math or computational material (finance, physics, chemistry, etc.). It encourages conceptual thinking in addition to performing calculations.

How to use:

1. Identify the key concepts taught and the various applications related to those concepts.
2. Design a summary sheet what highlights key information such as: concept title, allowable key formula, definitions, other important information (sign conventions, exceptions, etc) simple example or explanation, list of relevant knowns and unknowns to help distinguish between problems or concepts.

For more information, go to our online module on Quantitative Problem-Solving.
How students can best prepare for tests and exams

In a 2005 study, 109 American university students participated in an experiment that involved reading a passage and responding to a 20-item multiple choice test. The students were randomly assigned to one of four groups. The four conditions involved:

- reading and copying (final test mark 64.50%)
- reading and highlighting (final test mark 77%)
- reading and taking notes (final test mark 79.50%)
- reading and generating questions (final test mark 89.10% - targeted* and non-targeted)

* targeted refers to items determined by the student to be important to study

STUDENTS WHO GENERATED QUESTIONS PERFORMED BEST!

The generation effect
The improved performance seen on the graph is due to generational learning and the generation effect.

The generation effect occurs when students retain information they have targeted and generated BETTER THAN study materials generated and targeted (given to them) by others. Mental operations in which the student engages while generating materials, such as more distinctive encoding, may produce these results.

(Begg et al., 1991 as cited in Foos et al., 1994; Crutcher & Healy, 1989 as cited in Foos et al., 1994).

Application for students: four levels of performance
😊 Lowest level — students are simply told what to study
😊 😊 Higher level — students are instructed to use the materials and are given some specific study materials or techniques ie professor generated materials
😊 😊 😊 Even higher level — students generated their own study outlines
😊 😊 😊 😊 Highest level — students generated their own question(s) or questions with answers.

Conclusion: Generating potential questions while preparing for exams is a very effective technique leading to the highest performance on materials targeted by those test questions.

Understanding key information: elaboration helps

What does elaboration mean? MANY THINGS!
- Going beyond rote memorization of information
- Adding details to ideas or concepts
- Clarifying the meaning of ideas
- Explaining the relationship between 2 or more concepts
- Making inferences
- Analyzing the idea/concept for its component parts
- Applying the concept to a new situation or creating an analogy
- Connecting/linking material being learned with information already known

Why don’t students elaborate?
- Time pressures
- Don’t know what to do

How to elaborate? Generate questions to help you elaborate.
- Use the generic questions stems below.
- Generate specific content questions (from lectures, texts, etc) using the sentence stems.
  Answer your questions, individually or in study groups. Check your answers.

Question Stems
- What is a new example of...? How would you use ...to...?
- What would happen if...?
- What are the strengths and weaknesses of...?
- What do we already know about...?
- How does...tie in with what we learned before? Explain why...?
- Explain how...? How does...affect?
- What is the meaning of...? Why is...important?
- What is the difference between ...and...? How are...and...similar?
- What is the best..., and why?
- What are some possible solutions for the problem of...?
- Compare...and...with regard to...?
- How does...effect or lead to...? What do you think causes...?
- Do you agree and disagree with this statement: ...? Support your answer.

“This will be on the test!”: Ways to predict test questions

Listen for cues in lectures

Verbal clues:
Professors often give clues to what will be on the exam so observe and listen carefully. Sometimes professors give direct instructions for the test while other clues are subtler. For example, if your instructor repeats an idea several times, writes it on the board, and/or return to it in a subsequent lecture, you can be sure that it’s important enough to appear on an exam.

Non-verbal clues:
Don’t forget that non-verbal cues such as gestures showing a critical point, pauses, and looking at notes indicate something is important. If a professor reads a section out loud, take note.

Questions:
Pay close attention to questions the prof asks in lecture.

Outside readings:
When your required readings are covered extensively in a lecture, you can bet they are important.

Study smarter, not harder

Put yourself into the professor’s head—what kind of questions would you ask? Refer to the learning objectives in the course outline or syllabus.

Save and review all graded materials: quizzes, lab sheets, essays. Quiz questions often reappear on final exam in an altered form.

Get organized: have a separate folder, file, or section in your notes labelled ‘Test Questions’.

Add questions after each lecture and assignment.

Ask the person who knows
The format to the test can help you predict questions. Ask the professor how long the test will be and what kinds of questions to expect (e.g. multiple choice). Do this early in the term so that you can listen carefully in lectures from the beginning.

Practice problem-solving
For math and science courses, practice working out problems using different variables.

**Self-testing: don’t wait ‘til before your test!**

Here’s a list of effective self-testing attributes. Check the ones that apply to you:

___ I review lecture notes as soon as possible after each class.

___ I identify what I know from what is not clearly understood.

___ I combine lecture and reading assignment notes into understandable summaries. I review regularly instead of cramming.

If you didn’t check off all of the above, continue reading to find out why self-testing is important to academic success.

**When should you apply self-testing?**

**DURING EACH STUDY SESSION!**

Specifically...

**1. After lectures/tutorials**
Lecture or tutorial notes need to be reviewed soon after each class. Test your knowledge and understanding using the notes containing examples and applications of concepts presented. Relate new knowledge to previous topics covered. Linking old to new information helps you understand the old information better, remember all material covered, and make predictions about what may occur next. Moreover, any notes that are not well understood are the basis of questions that need to be answered at the next class.

**2. After reading/note-making**
At the end of each reading (e.g. chapter, journal article), set aside a part of your study session just to review your notes.

Students often postpone self-testing until just before a scheduled test when it’s too late for full effectiveness.

Rules for organizing your study schedule

Get organized: use organizing tools such as monthly and weekly calendars, “to-do” lists. Organizing tools can be found in our online module Managing Your Time At University.

Start studying EARLY. Decide how many days before the exam you need in order to gather and use information (see Review & Self-testing). Extend your study over as many days as you can manage. The longer you extend this period, the more time you have to review and self-test rather than cramming vast amounts of information into several long, exhausting days.

Let’s see how it works...

Imagine you have 12 hours to “study” for a particular exam.

With the cramming approach: you spend 2 days at 6 hours, totalling 12 hours of study. You have little time to review or self-test because you are busy just preparing the material. Everything is in short-term memory i.e. easily dumped out of your brain.

With the non-cramming approach: you spread the 12 hours over 6 days at 2 hours per day. This allows for preparing, reviewing (gather and use), and SLEEPING ON IT! While you sleep, you are still thinking but at a different level of consciousness. You are now learning the materials versus temporarily housing them.

So...

- Set aside study blocks of approximately 2.5 hours per subject area per day.
- Add regular, daily review and self-testing to the schedule. Ideally start with reviewing information covered the day before and end with a self-test.
- Include other requisite tasks: sleeping, eating, exercising, relaxing, self-care. Now more than ever, it is important for you to take very good care of your health. Getting a full nights sleep, eating balanced meals and doing daily cardio activity will stimulate your brain and help you think and focus better.
- Make the schedule as routine as you can. E.g. go to bed at the same time every night, especially during exam study period.

Finally...

Follow your schedule! Do not let time bandits (including your friends!) sway you.
**The 5-Day Study Plan**

**Why should I start studying early?**
Did you know that the human brain learns academic material faster and better if done in brief blocks of time spread over longer periods, rather than in a few lengthy sessions?

For example, you will perform better on an exam if you spend one hour studying each day for 20 days than if you spend 10 hours studying for two days before an exam. Which means that CRAMMING is BAD NEWS!

**What if I have to cram?**
Ok, so sometimes life gets crazy and we end up having to cram, right? If you have to cram, try to focus on remembering the information you know already rather than trying to learn new information. And here’s the kicker: you will typically NOT remember what you tried to learn the night before the exam, so it’s best to make sure you really know some of the information well. If you do have a few days, try to spread the studying out so you are not doing it all in one day.

**How should I plan my exam preparation?**

**The 5-Day Study Plan**
If you plan ahead, many students have found the “5 Day Study Plan” gets good results. However, five days is really the minimal and we recommend a much longer study plan, if possible. For example, if you have not read any of your BIOL 101 textbook and a multiple choice quiz of over 100 test questions is looming, 5 days will probably not suffice.

**Components of the 5-Day Study Plan:**
- Space out your learning over a minimum of 5 days.
- Divide your material into workable ‘chunks,’ e.g. a chapter, a set of lecture notes.
- During each day, prepare a new chunk. Preparing might be reading and note-taking, amalgamating lecture and textbook information, reorganizing lecture notes.
- Review previous material.
- Use active learning strategies such as questioning, reciting, cue cards, study groups, etc.
- Use self-testing techniques to monitor your learning.

**How much time should I set aside to study?**
You might need a minimum of 8-10 hours of studying to get a good mark on an exam. However, the time you need to spend really depends on many things such as:

- the difficulty of the course
- to what extent you have kept up with the materials during the term
- how important this exam is to you

Learning Strategies, Student Academic Success Services, Queen's University, Kingston, ON
http://sass.queensu.ca/learningstrategies
How to make a 5-Day Study Plan

1. Break your material into chunks. If it can be divided by chapter, article, theme or topic, then use that. If not, divide the material in a way that is manageable to you. For example, if one chapter is very long and/or complex, break the chapter into sections.

2. Plan to spend 2.5-3 hours studying on each of the five (or more) days.

3. Each day start by reviewing the previous day’s work, focusing on what you did not know on the self-test, and then preparing a new section. End with a self-test.

Example time frame:

<table>
<thead>
<tr>
<th>Date</th>
<th>What to do</th>
<th>What to study</th>
<th>Length of time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Prepare</td>
<td>1st section/chunk (e.g. a chapter)</td>
<td>2 hours 20 minutes</td>
</tr>
<tr>
<td></td>
<td>Self-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 2</td>
<td>Review</td>
<td>1st section</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Prepare</td>
<td>2nd section</td>
<td>2 hours 20 minutes</td>
</tr>
<tr>
<td></td>
<td>Self-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 3</td>
<td>Review</td>
<td>1st section</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>2nd section</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Prepare</td>
<td>3rd section</td>
<td>2 hours 20 minutes</td>
</tr>
<tr>
<td></td>
<td>Self-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 4</td>
<td>Review</td>
<td>1st section</td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>2nd section</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>3rd section</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Prepare</td>
<td>4th section</td>
<td>2 hours 20 minutes</td>
</tr>
<tr>
<td></td>
<td>Self-test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day 5</td>
<td>Review</td>
<td>1st section</td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>2nd section</td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>3rd section</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Review</td>
<td>4th section</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Self-test</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You may need to extend the preparation time depending on the information and to match your own learning pace. However, studying for more than 3-4 hours at one session is not as helpful as several shorter ones.

Also, don’t forget to take short breaks throughout!
**Studying for multiple exams: Expanding the 5-day study plan**

Frequently, several exams are scheduled in a short period of time, and it is very helpful to develop a study plan that allows you to consider how much time you may need for different courses, distribute your review time, and ensure that all courses get some attention. A study plan reduces your stress, as it helps you keep on track over the short but intense period of exams, and places a priority on health-balancing activities.

**Steps in building the study schedule:**

1. Read about the 5-Day Study Plan. (In the Preparing for and Taking Tests module.)

2. Create a calendar starting with 1-2 weeks before class ends. Use 8.5x11 inch paper.

3. Starting with the first free day after classes are over, draw 2 horizontal lines within each day on the blank study calendar. These spaces will become 3 study times, e.g. morning, afternoon, and evening or whatever fits your best learning times.

4. Write in your exam schedule, using the appropriate time slot. For example: 9am exams would go in the first third of the day, 2pm in the middle slot and 7pm in the last slot. Include the value or percentage of the final mark for each exam. Consider colour-coding the different exams, or highlight all exam times, for easy identification.

5. Assign times to the 3 blocks of time during which you will totally commit to studying. The blocks should be about 3 hours each, and not longer than 4 hours. The study blocks must be separated by 2 hours, to allow for memory consolidation and down time. Enter those times on the right hand side of the calendar. e.g. 10am-1pm; 3-6 pm; 8-11pm.

6. Look realistically at the amount of work due during the last weeks of term. An ideal goal is to have all term work (readings, assignments) completed by the end of classes. Start exam studying as soon as you can.

   **If you are behind in term work (which is not unusual, so don’t get distressed!) try to stay in pace and current with the lectures, and catch up later. This suggestion is less useful for sequentially taught courses, however, like physics and math.**

7. Consider how many hours of study you may need for each exam. This will depend on many factors such as
   - Value of the exam and your goals for the course
   - Difficulty of the material and how up-to-date you are
   - Significance of the course, e.g. a core course or required mark for Honours
8. Starting with your most difficult course, work backwards from the exam date and assign study sessions. Use a pencil as this part is very flexible and you’ll probably change it a couple of times. Your memory for the material will be greatly improved if you distribute 15 hours of study over 5 sessions covering 4 or 5 days, rather than doing a blitz of two 8 hour days. Count the number of study sessions or hours...does this reach your target?

9. Assign study periods that coincide with the time of each exam, so that your mind is able to function well under the exam conditions. Eg. study in the morning for 9am exams. Also, schedule your peak learning time for your most challenging studying.

10. Repeat the ‘backwards planning’ method for each course. There is no ‘perfect’ plan: just try to distribute the study sessions for each course across several days, and reach your targeted number of study hours.

11. Be efficient in your studying during each session: work 50 min. with a 10 minute break; be strategic in focusing on key content (refer to the course’s learning objectives); focus on what you do not know; make summary sheets of major concepts and their applications; repeat to move information into your long-term memory. Studying focuses on accuracy + speed of accessing your memory or performing calculations.

12. Use the 2-hour breaks to allow your brain to relax, consolidate information, and get food or exercise. Exams are like a marathon – you need a balanced training schedule!

13. A good schedule lets you study 2 or 3 courses in a day. It has the targeted amount of time for each course, or close to it. It contains unscheduled or empty study sessions. Exams are stressful, so take advantage of the more unstructured part of term and see a movie, hang out with friends, cook tasty and nutritious food, gets lots of exercise and SLEEP. It allows for a whole day off, unless your exams are too compressed. And it can be sustained over the entire course of your exams.

14. Stick to your plan! Typical problems include
   - losing motivation. Try studying with a friend, doing something FUN at the end of your day, exercising during breaks, and remembering your goals.
   - feeling overwhelmed/tired. Try: seeing when exams end...take heart!, and SLEEP.
   - miscalculating how much studying is needed for a course. Try: redistributing study sessions, filling in some blank periods on your calendar with added study sessions, or reducing expectations. Keep a positive attitude: “I CAN DO IT!”

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http://sass.queensu.ca/learningstrategies
**But what if I have to cram?**

Even with good planning, there are times when you have to cram. Here are some helpful hints.

**Make choices**

Pick out the most important points and learn them really well. Use 75% of your cramming time to drill key points and 25% on the rest.

**Make a plan**

Time is short. Choose what you want to study; determine how much time you have; and set strict timelines.

**Use mind map review sheets and cue cards**

Condense the material you have chosen to learn into mind maps. Practice by redrawing the mind maps. Put each separate key point from your mind map onto cue cards and drill yourself regularly.

**Recite, Recite, Recite**

No time to move information into long term storage so repetitive recitation is the order of the day! Recitation will ‘burn’ the facts into your brain. One way to do this is to tape-record yourself and then play back the tape before you sleep and again when you awake.

**Relax**

When you cram, you are not learning the information well. Therefore, if you experience anxiety during the exam, you may forget what you have studied. Use relaxation techniques to reduce anxiety.

**Don’t ‘should’ yourself**

If you start your cramming session beating yourself up with statements like, “I should have studied earlier,” by the time you get to studying you might feel too guilty and depressed to continue. Instead, accept the truth, i.e. you would be in a better position if you had started earlier, and then tell yourself you will do so next time. Remind yourself that you are human and will learn from your mistakes.

Memories strategies for exam prep

So how do we remember? Attention → Encoding

1. **Attention:** Think about it then...

2. **Encoding**
   Translate incoming information into a mental representation by
   
   Picture – visualizing it
   
   Sound – saying it
   
   Meaning – putting it into your own words

   **Think “GULP”**
   
   GET it
   
   USE it
   
   LINK it
   
   PICTURE it

**Strategies**

- Chunking/organization
- Recite: preferably out loud
- Distributed practice: study in small chunks over a period of time
- Mind-maps
- Mnemonics /Acronyms: e.g. S.A.S.S. = Student Academic Success Services!
- Rhymes and songs
- Pegging: link new information to something to know
- USE BOTH SIDES OF YOUR BRAIN!

See our online module on [Memory Strategies](http://sass.queensu.ca/learningstrategies) for more information.
Timing your exam

Before you begin to write...
Scan the entire test. Note the value and style of each question and how many of each style there are (e.g. 50 multiple choice). Highlight instruction words in short and long answer questions (e.g. “discuss,” “compare”).

Budget your time
You need adequate time for reading each question carefully. Professors say most marks are lost at this stage, i.e. students are in such a hurry to answer the question that they misread it.

Budgeting time for multiple choice!
Poor reading of the question or ‘stem’ is particularly problematic with multiple choice exams. Because there are many questions, students may feel pressured to get through them. In their haste, they miss critical words in the stem such as qualifiers (e.g. “some,” “in most cases,” etc.) Therefore, you must budget exact time to reread and paraphrase each question.

A rule of thumb: Take 1 minute to read the question and an additional 30 seconds to answer it. However, if multiple choice style is difficult for you, you’ll have to allot even more time.

Sample time budget: For a 3-hour (180 minute) exam, there are 50 multiple choice, 4 short answers, and 1 essay.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Time allotment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read over entire exam</td>
<td>10 minutes</td>
</tr>
<tr>
<td>50 multiple choice @ 1.5 minutes</td>
<td>75 minutes</td>
</tr>
<tr>
<td>4 short answers worth 5 marks</td>
<td>40 minutes</td>
</tr>
<tr>
<td>1 essay worth 20 marks</td>
<td>40 minutes</td>
</tr>
<tr>
<td>Proofread entire exam</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Total:</td>
<td>180 minutes (3-hour exam)</td>
</tr>
</tbody>
</table>

While you’re writing...
Stick to your planned budget as much as possible. Keep a watch on the desk. If you finish a question faster than expected, adjust the plan and spend more time on difficult ones.

After you’ve finished... Proofread!
Proofreading your exam before handing it in will probably glean you more marks. You might find, upon reflection, that you’ve missed a point, or you now remember more, or a sentence simply doesn’t make sense. Change it! But what about the old adage that you should never change an answer because your first instincts are usually correct?

Research has shown this is NOT true. If you see your answer is clearly wrong, then change it!
Matching your studying to your exam question types

Multiple choice exams

What to study?
For explicit comprehension questions, focus on memorizing terms, definitions, facts, and concepts that can be stated in a succinct way.

For application questions, practice applying the concepts and/or procedures to new situations. Think deeper and focus on the Big Picture (this takes longer than basic comprehension questions).

How to study?
Study in short blocks (20-30 minutes with a 5-10 minute break) over many days. Review daily. Answer the study guide.

Essay exams

What to study?
Focus on the major themes of the course to get the Big Picture: think deeply to understand how the main ideas and details are related. Elaborate, compare, evaluate the materials. Generate possible exam questions and answer them in writing (or if you don’t have time, make a detailed outline for each).

How to study?
Use mindmaps and graphic organizers which organize around the central theme. Study in longer blocks (e.g. 2.5 hours: 50 minutes, 10 minutes break, 50 more minutes). Start far enough ahead of the exam for the information to ‘percolate’ in your mind.

Problem-type exams

What to study?
Focus on solving problems and identifying the underlying concepts. Try to see a pattern, i.e. look for problems that cluster around the same theme, in order to reduce the number of problems you will need to do. Practice by answering old exams, test, labs, and homework questions.

How to study?
Allow for long study sessions and breaks (2 hours with a 30 minute break).
Essay exams: plan before you answer

1. Read the exam directions carefully
   Do you need to answer all the questions? Can you choose between questions?
   Are there any time limits?

2. Make summary notes on the back of the exam sheet.
   Before reading any exam questions, unburden your mind by quickly jotting down on the back of your exam booklet ideas, details, formulae, sequences, etc. that you have memorized but think you might forget. This is almost like making a summary of your summary sheets! Aside from getting down your ideas, this is a positive action that gets you involved in the exam and, thereby, builds self-confidence.

3. Plan your time.
   How much time should you allot to each question?
   Plan the number of minutes per question and stick to it.

4. Read all the questions.
   Before you start writing anything, read ALL the questions. If you can choose between questions, select those for which you are best prepared. As you read the instructions to the question, underline or circle key words or ‘instruction’ words. For a list of instruction words, go to Instruction Words for Essays & Examination Questions.

5. Jot cues alongside each question.
   While reading each question, quickly note a few words or phrases that immediately come to your mind. Later, when you begin writing, use these jottings and those on the back of the exam sheet to organize your answer.

6. Start with the easiest questions.
   Starting with something you know at the beginning will inspire self-confidence, help you relax, and think clearly. Success begets success!

7. Leave time at end.
   Leave about 10-20 minutes at the end to read over your exam. Correct any glaring errors and misplaced ideas or words which would hamper comprehension of your answer and potentially lose you marks.

More on essay exams

Overview
1. Generate possible essay topics
2. Write thesis statements
3. Write 3-4 main points
4. Organize evidence for each main point
5. Write a few mock essay exams

1. Generate topics
Look at topics given for the course. Look at old exams questions. Look over your lecture notes and predict possible topics. Focus on areas that were given emphasis and/or repeated themes.

2. Write thesis statements
The thesis statement is your purpose, aim or ‘argument’ in the paper. Identify the instruction word first, e.g. analyze, compare, etc. This will help focus your thesis statement, e.g.

Topic: Effects of globalization on the Canadian textile industry
Instruction Word: Discuss (argue pros/cons)
Thesis: Due to globalization, Canadians can now buy cheap clothing, mostly produced in developing countries. However, buying cheap clothing does not mitigate the dire consequences [Argument- Against] of globalization to our local textile industry.

3. Add main points to each thesis statement
Identify 3-4 main points which defend the thesis statement. Using the example above, 3 negative effects might be: 1. Canadian job losses  2. local manufacturers must keep costs down 3. export market suffers

Write these main points into topic sentences. A topic sentence has two parts: topic and purpose. Usually a topic sentence appears at the beginning of a paragraph.

Determine the order for each main point.

a) Random order: any order will do.
b) Chronological order: there is a time line. Used for describing a process, history, etc.
c) Logical order: one idea needs to be explained before the next can be understood.
d) Concession order: argument or strongest points go at the end where the reader is more likely to remember them.

An example of a topic sentence on ‘Canadian job losses’: Our textile industries’ closure led to massive job loss [TOPIC], with workers now facing poor employment prospects [PURPOSE].
4. Organize evidence for each main point

After stating your topic sentence, add evidence/facts to your main idea. Go over your lecture notes, readings, research on the topic as if you were doing research for a term paper.

Under each topic sentence list your evidence. Listing allows you to memorize your evidence in chunks. Use memory devices to assist in retaining this information.

Types of evidence include statistics, examples, case studies, anecdotal information (use sparingly), observational notes, expert quotes, illustrations, graphs.

Here’s some evidence for our example on job loss:

- In Ontario 82% factories closed since 1980’s
- 0,000+ jobs lost
- only half have full-time jobs
- Bob Owens, CTWA representative—many long-term unemployed; not retrained

5. Write a ‘mock’ essay exam

See how long it takes you to put it all together. Time yourself.

Spend most of your time on the BODY. That’s where the majority of the marks lie. Therefore, do NOT write the conclusion first (as some would argue). Leave 5-10 minutes to proofread your writing for careless mistakes.

When finished the mock exam, self-assess the essay. Do you think it would pass?

The job losses example: Putting it all together

Due to globalization, Canadians can now buy cheap clothing, mostly manufactured in developing countries. However, buying cheap clothing does not mitigate the dire consequences of globalization to our local textile industry. Globalization has produced three significant negative effects on our Canadian economy: massive job losses; struggling local manufacturers with poor bottom lines; and poor export sales due to high costs of Canadian made goods.

Firstly, the closing of our textile industries has created massive job loss with many workers now facing poor employment prospects: unemployment, casual, or part time work. In Ontario since the early 1980s, 72% of textile factories have closed representing over 50,000 job losses. Moreover, of these 50,000 workers, only half have found full-time, permanent jobs. Bob Owens, CTWA representative, reported that many of these workers face long-term unemployment with little hope of retraining due to age, language, and education issues. Without jobs, a cheap sweater from China is meaningless.

Secondly, in order to compete globally our remaining Canadian textile business...
**Instruction words in essay and short answer questions**

**Analyze:** Examine the statement or subject in a critical manner. This involves breaking the subject into separate parts and discussing and interpreting each part, e.g. cases, key factors, results, and then demonstrating how each part fits together to form the whole.

**Assess:** Briefly describe the subject, analyze the positive and negative characteristics, state results or consequences. Using these points to support your answer, offer an opinion or judgment on the value or the character of the subject.

**Cite:** Make mention of, bring forward as proof, e.g., Cite the reasons the philosopher Hobbes gives for saying that humans are inherently selfish and competitive.

**Compare:** Present similarities or resemblances between two things. Emphasize these similarities but also present differences, e.g., compare the British and Canadian parliamentary systems.

**Contrast:** State the ways in which the subjects are not similar, e.g., Contrast the Canadian parliamentary system with the American system of government.

**Criticize:** Make your own judgment about a subject, defining its merits and shortcomings. Give evidence for what you say, e.g., Criticize the conservative argument that NATO countries must maintain troops in Afghanistan for global security. Say what you think, why, and support your judgment with evidence.

**Define:** Tell the meaning or significance of the term, e.g., Define and state the significance of ‘gerrymandering’ as it applies to the Canadian electorate system.

**Describe:** Mention the chief characteristics of a situation or retell the central features of a story, e.g., Describe Dante’s *The Inferno*.

**Discuss:** Give a complete and detailed presentation of the topic. Describe the subject, provide reasons on both sides of the argument or for various views held about the subject, e.g., Discuss the implications of a separate Palestinian state.

**Distinguish between:** Define each term to show the main differences between them, e.g., Distinguish between the following film genres: mystery and horror.

**Elaborate on:** Provide more specific details regarding the subject. Note the connection with or the impact of this subject on other related areas of thought.

**Evaluate:** Appraise the issue giving both advantages and disadvantages. Quote other sources if possible and include your opinion. Always support your opinions with evidence.
Explain: Give an interpretation of the subject which clarifies it. This may mean analyzing the causes or reasons for an event or situation, e.g., Explain the Communist Chinese government’s shift from a closed economy to a market economy.

Illustrate: Give specific examples of something which demonstrates the meaning or situation, e.g., Illustrate what is meant by —the middle way— in Buddhism.

Interpret: State the meaning in simpler terms, using your own judgement, e.g., Interpret George Bernard Shaw’s ideas of heaven and hell in Man and Superman.

Outline: Organize your answer into main points and subordinate points. Make a short summary using headings and subheadings, e.g., Outline the wave particle duality of light.

Relate: Show the connection between the ideas mentioned in the question; how one influences the other. This does not mean compare and contrast. E.g. Relate the American and the French Revolutions.

State: Explain precisely, e.g., State the three dimensions involved in Weber’s model of power.

Trace: Show the main points from the beginning to the end of an event, e.g., Trace the rise of Islamic fundamentalism at the end of the 20th century.
Other types of exams

Short-answer exams
Beware of two potential dangers!

1. Writing TOO little: too general; not enough evidence. Outcome: don’t get full marks.

How to prepare

- Review lecture notes and readings.
- Make a list of important terms and their definitions. Cue cards are useful here.
- Relate each term to the general ideas of the course. Mind-maps help. Add supporting evidence.

How to write

Short-answer questions are organized like a main idea paragraph in the essay exam:

1. Identify the direction word.
2. Main idea — translate into a strong, focused topic sentence.
3. Evidence—check how many points are assigned to guide you. 3-4 sentences with evidence should suffice.
4. Summary Sentence—recap the gist of the paragraph.

Take-home essay exams
Purpose: to test understanding and expression, not retention of information.

How to prepare

- Know the prof’s expectations.
- Anticipate possible questions.
- Know where you can find resources e.g. library materials, websites. Ensure all your notes are organized.
- Organize a work schedule. Leave yourself lots of time for finishing the take-home.
- Write a polished paper: well organized, argued, and clearly written.

Science Exams

- Translate the problem into your own words. This will help you understand what the question requires.
- Perform opposite operations
- Analyze the problem before you begin to solve it.
- Draw a picture or diagram to help you visualize the problem.
Multiple choice: Revered or feared?

Do you like multiple choice tests or fear them?

Although some students like having the possible answer given to them, many students find multiple choice questions very difficult. Why?

Interestingly, it’s not the content that is difficult but the structure.

Why is the structure so difficult?

1. There are many questions to answer and the topics are often scrambled and shuffled.
2. Ideas from lectures and/or readings may be reworded in different/unfamiliar ways.
3. Very often the question is not asking for simple recognition of ideas but asking you to go beyond straight memorization and apply knowledge from the course, make an analogy, solve a novel problem. Professors assume you are capable of memorizing details.

What are the different question types?

Type 1: Explicit knowledge question
Tests knowledge taught in lectures and texts (about 1/3 of the questions!)

Study Strategy: can simply memorize

Level of Difficulty: easiest

Type 2: Finer detail question
Asks you go to beyond straight memorization of concepts and see how the details relate to the concept.

E.G.

Which of the following is not related to the process of elaborative rehearsal?

a) adding details to ideas and concepts
b) analyzing component parts of an idea
c) restating knowledge in your own words
d) practicing remembering the information
e) none of the above

Study Strategies: elaborate and draw connections between the concept and its evidence.

Level of Difficulty: more difficult than Type 1
**Type 3: “Thinker” question**
Tests your ability to understand the relationship between a theory and its evidence and then apply this understanding to — cope with — a hypothetical relationship.

**E.G.**

In the study by Bahrick and Hall (1991) we find that graduates of college mathematics courses recall high school math knowledge for many years after. According to Bahrick and Hall, which of the following would you expect to be true of a group of university graduates who did not take math courses at university:

a) they would recall their math from high school to essentially the same extent as those who took math courses in university

b) most would recall little or none of their high school math 50 years after

c) they would recall best those things which they learned more about in their university course

d) both b) and c)

e) all of the above

**Study Strategies:** practise recalling the theory, elaborative review, and some creative thinking, i.e., what might change in a variety of slightly different circumstances from those presented in the theory.

**In-test Strategy:** read the question twice to ensure you understand it correctly. The question stem is made up of two parts: 1) the context reference for the question (tells you to think back to something you’ve studied) and 2) the question part. Pause after the first part and recall the theory or research study. Next, because the alternatives in this question are usually quite long, try reading the question part of the stem followed by each alternative, to keep clear on what you are being asked.

Level of Difficulty: hardest. These questions are appearing more and more on multiple choice tests, so don’t avoid preparing for them!

(Answers: 2. e; 3. d)

**MORAL OF STORY:**

Multiple choice tests are NOT simple. They require a rigorous approach to study.
Multiple choice exam strategies

Key concepts for multiple choice exam preparation
Memorization/recall and recognition of details are not enough. Focus on complex levels of thinking: understanding, connecting, applying, analysis. Practice: Use old exams, study guides.

Strategic approaches to writing multiple choice exams
Breathe, focus and perhaps — dump information you are worried about forgetting Check timing – how many questions? average time per question?

1. How to approach the exam overall: The 3 Pass Method
Pass # 1: Begin by answering the questions you know, in the exam booklet, then transfer the answers on to the Scantron sheet, in groups of 10 questions.

Code the answers you don’t know – e.g. use a “?” for the ones you have some idea about but need more time to think about, and an “X” for the ones that you have no idea about at all.
Move on to questions you feel more confident about. Feel good! You’ve just earned marks 😊

Pass # 2: Next, return to the questions marked with the “?”, answer these directly on the Scantron, so you don’t misrecord any questions.

Pass # 3: Checking the time left, begin guessing the ones marked “X” on the Scantron.

2. How to approach individual questions
1. Read the stem SLOWLY
2. Process it by underlining key words
3. Cover the answers
4. Predict answer. Not there? Then process the options - e.g. Is this the most correct?
5. Eliminate wrong answers, and select the best option

3. Strategies for guessing (a LAST resort)
- Avoid answers with extreme values – either numbers or statements
- Choose inclusive answers e.g. all or none of the above
- Choose the longest answer
- Choose b or c

If there is no penalty for incorrect responses, and no time left, when all else fails, randomly fill in the Scantron.

Writing the multiple choice exam: Ready, set, go!

READY...
1. Breathe and calm yourself
2. Survey the exam
   - give yourself a bit of time to go back to hard ones
   - mark where you should be done halfway
3. Determine the ground rules
   - read directions
   - is there a penalty for guessing? If not GUESS!

SET...
1. Read questions carefully, slowly, start from the beginning
2. Cover up the options. Do you already know the answer?
3. Underline key words to focus your attention

GO!
1. Read all the options. Choose the BEST answer – there may be multiple correct ones!
2. Eliminate options if you know it’s definitely wrong
3. Watch for qualifiers (e.g. all, usually, almost, good, best, normally, etc.)
   - think about how they define or limit the stem or options. Be alert to unstated qualifiers which define an option e.g. “Birds fly south in winter” means ALL birds.
4. Watch for negatives
   - two negatives make a positive (e.g. “It is atypical for children NOT to go through the following stages” = “it IS is typical for children to go through...”)

If after all that, you still don’t know ...
5. Use Educated Guessing
   - for compound options (e.g. “all of the above”), select the compound including simple options about which you are certain
   - avoid extreme values, either numbers or statements
   - change answers only if you have a good reason to do so
   - check for lookalike options. One of them is usually OK.
   - “all of the above” can be a good guess
   - options looking foolish, incongruous or unfamiliar or usually incorrect

What to do if you hit a WALL?
1. Mark difficult questions and come back to them – don’t let yourself get stuck
2. Keep your process active (re-read question, make marks, write notes...you can do this!)
Special techniques for math and science tests

1. Translate problems into English.
Putting problems into words aids your understanding. When you study equations and formulas, put those into words, too. The words help you see a variety of applications for each formula. For example, \( c^2 = a^2 + b^2 \) can be translated as “the square of the hypotenuse of a right triangle is equal to the sum of the squares of the other 2 sides.”

2. Perform opposite operations.
If the problem involves multiplication, check your work by dividing; add, then subtract; factor, multiply; square root, square; differentiate, integrate.

3. Use time drills.
Practice working problems quickly. Time yourself. Exchange problems with a friend and time each other. You can also do this in a study group.

4. Analyze before you compute.
Set up the problem before you begin to solve it. When a problem is worth a lot of points, read it twice, slowly. When you take time to analyze a problem, you may see computational shortcuts.

5. Make a picture.
Colour an elaborate picture or diagram if you are stuck. Sometimes a visual will clear the mind.

Estimation is a good way to double-check your work. Doing this first can help you notice if your computations go awry, and then you can correct the error quickly.

7. Check your work systematically.
When you check your work, ask yourself: Did I read the problem correctly? Did I use the correct formula or equation? Is my arithmetic correct? Is my answer in the proper form?

Avoid the temptation to change an answer in the last few minutes—unless you’re sure the answer is wrong. In a last-minute rush to finish, it’s easier to choose the wrong answer. If you redo a solution, do not erase the original answer—just draw a line through it.

8. Review formulas.
Right before the test, review any formulas you’ll need to use. Then write them on the margin of the tests or on the back of the test paper.

**Overcoming test anxiety**

Instructions: Read through each of the strategies below. Check off the strategies for overcoming test anxiety that you use now. Then highlight the ones you would like to start using.

**In the weeks before**
- Put exam into perspective
- Determine the value of the text/exam in terms of the course grade
- Calculate your existing grade and determine what grade you need to reach your goal
- Calculate how much work is required to get the grade you really want
- Know your stuff. Don’t Cram!
- Manage your time well and organize a study schedule. Stick to it as much as possible.
- Ask for help from T.A., senior students, the prof, your friends – join a study group!
- Self-testing: review, do old exam, take a mock exam
- Try doing a ‘mock’ exam under strict time limitations.

**Practice relaxation daily**
- Do deep breathing and muscle relaxation
- Imagine success and coping

**Use positive self-talk and affirmations**
- Tell yourself you can do it!
- Sleep and eat and exercise WELL

**Day/night before**
- Review your material. Do NOT add any new information. It’s too late to learn it now.
- Continue all the same relaxation and imagery practices as above and add MORE!
- Imagine yourself coping before, during (handling it well and any possible negative effects), and after.

**Just before!**
- Do 5-10 minutes deep, abdominal breathing.
- Do 5-10 minutes of stretching and moderate exercise (e.g. walk to your exam venue).
- Drink water. Avoid coffee, cigarettes, drugs, alcohol, unhealthy food (sugars and fats).
- Avoid highly stressed people/situations.
- Listen to calming music.
- Do a guided visualization e.g. a safe place.
- Repeat your positive affirmations.
During the exam

- Breathe!
- Examine the marking scheme and plan to divide your time evenly among the available marks (i.e. 10 minutes of your time on 10% of the marks). Following timelines gives you a sense of progress and feedback on how you are doing. It’s better to write a 75% answer on all questions than having a perfect answer on 50% of the exam.
- Build Confidence: Peruse the whole exam and then do the easiest stuff first.
- Close your eyes for a minute and visualize success.
- Walk yourself through it using calming and coping statements and affirmations.
- Set mini-breaks at specified points e.g. close your eyes, relax your hands, take a deep breath.
- Accept that you are anxious and that some stress is necessary/good.

After the exam

- Celebrate!
- Affirm your strengths and successes.
- Evaluate what strategies worked the best.

Other things I do to help with my text/exam anxiety:

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

ACTION PLAN for overcoming test anxiety

What things will I try in the future?

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Letting go, part 1: Physical sensations of anxiety

1. **Breathe.**
   You can calm the body by focusing on breath. Concentrate on the air going in and out of your lungs. Experience air passing through your nose. If your breaths are short and in your chest, imagine a balloon in your stomach and begin to take longer, deeper breaths. Imagine the balloon expanding as you fill your abdomen with air and the balloon deflating as you exhale.

2. **Scan your body.**
   Sit or lie comfortably and close your eyes. Slowly scan your body starting with the top of the head to the tips of your toes. As you focus on each muscle group, notice if they are relaxed or tense. Gently massage tense areas with your mind and tell the muscles to relax.

3. **Tense and relax.**
   You can use this before or after a body scan to relax tense muscles. Find a muscle that is tense and increase the tension by contracting the muscle for up to 5 seconds. Then release for 5 seconds. Notice the difference between tension and relaxation. Repeat up to 3 times. With each repetition, you might notice the tense muscle getting more relaxed. You may wish to tense an individual muscle, e.g. your left hand, or muscle groups, e.g. hands and arms together.

4. **Use guided imagery**
   Once you’re relaxed, take a quick fantasy trip to a place where you feel totally safe—a place you know or a place created in your imagination. Close your eyes and get comfortable in your chair or on the floor. Spend several minutes imagining yourself in this beautiful, peaceful setting. Use all your senses. Be specific. For example, if you are walking on a beach, hear the waves lapping onto the shore; feel the warm sun on your skin, smell the fresh breeze, etc.

5. **Describe it.**
   Instead of placing it aside, focus directly on your anxiety. If you are feeling nauseated, dizzy, etc., concentrate on that feeling. Describe it: size, colour, shape, location, weight/volume, etc.

6. **Accept and be with it.**
   As you describe your anxiety in detail, don’t resist. Accept that it is there right now and just be with it. If you can completely experience the sensation, often it will disappear. This technique has been used successfully for people suffering from acute and chronic pain.

7. **Exercise aerobically.**
   Before your test or exam, do some exercise that gets the heart pumping. You’ll need about 15-20 minutes of aerobic exercise. Why don’t you consider riding your bike or jogging to the exam venue? This is an excellent way to reduce body tension just before sitting down to write.

Learning Strategies, Student Academic Success Services, Queen's University, Kingston, ON
http://sass.queensu.ca/learningstrategies
Letting go, part 2: Dealing with thoughts of anxiety

1. **Visualize success.**
   Our bodies react to our thoughts. So, if you are having thoughts of failure, you increase your chances of doing poorly. Counteract negative thoughts by seeing yourself succeeding. To create a powerfully positive visualization, engage all your senses. Imagine what you will do, see, hear, and say. Mentally walk yourself through the imagery seeing yourself succeed at each stage. Repeat this visualization daily up to and including the day of the test.

2. **Praise yourself.**
   When you talk to yourself positively, your anxiety decreases and increases your chances of success. Build a list of positive but realistic affirmations and repeat them daily. Say, “I am very relaxed. I am doing a great job on this test.” As a reminder, hang them up in a visible place.

3. **Replace doom with pleasure.**
   You can’t be anxious and relaxed at the same time. So, try replacing thoughts of doom and gloom with pleasant thoughts. When you notice yourself worrying, substitute the thought with images of things you love to do and/or people you like to be with. Prepare a bank: brainstorm a list of 20 ideas then pick several activities that seem especially pleasant and elaborate on them.

4. **Use humour to overtake catastrophic thinking**
   Rather than trying to force yourself to stop worrying, have some fun with your fears. Take the fear to the most absurd limits. For example, you might say to yourself, “If I fail this test, I will fail the course. If I fail the course, I will get kicked out of school. If I get kicked out, I’ll never get a good job. If I never get a good job, I’ll be poor. If I’m poor, I’ll be eating out of a dumpster. If I have to eat out of a dumpster, etc.” Continue catastrophizing until it becomes so ridiculous that you find yourself chuckling. Then, go backwards through your list to find a reasonable level of concern.

4. **Focusing.**
   This technique helps to discipline your mind and take you away from worries. Focus your attention on a specific object, something you find interesting. Examine each detail of it: its colour, shape, smell, taste, temperature, weight, etc. During the exam, take a few minutes to listen to the soundscape in the exam venue. Perhaps you would like to listen to the hum of the lights overhead. Another focusing practice you can try is the “3 feelings at 5 times” technique where you see, hear, and feel 5 things and name them. In the exam room, you see 5 things (e.g. I see a green sock); then you hear 5 things (e.g. I hear a cough), finally, you feel 5 things (e.g. I feel cool air on my face). You don’t judge or evaluate, just name. When you are done, repeat the cycle. Accept and be with it.
As you describe your anxiety in detail, don’t resist. Accept that it is there right now and just be with it. If you can completely experience the sensation, often it will disappear. This technique has been used successfully for people suffering from acute and chronic pain.

5. Zoom out.
When you are in the middle of the test or exam, zoom out. Imagine you are a film director dollying a camera out and away from the object. The point of this is for you to imagine yourself floating away and viewing your situation as a detached outside observer. If you are extremely distressed, zoom yourself out even further. See yourself rising above and beyond the exam venue to encompass your city, country, the planet, etc. From this big picture vantage point, ask yourself if the test/exam is worth worrying about. An alternative is zooming out in time. Imagine yourself one week, one month, one year, one decade from now. Assess how much the current situation will matter when that time comes.

Guided imagery for test anxiety
Use the following imagery before AND during your tests and exams.

Imagine Success—seeing yourself doing it well
Imagine yourself in an exam room. It’s the day of the test. You see yourself sitting in your chair. You notice your surroundings. You hear the other students shuffle in their seats. You feel the desk. You feel the pen in your hand. You see the test being handed out. Now, the exam is in front of you. You are looking over the exam calmly and confidently. You discover that you know all the answers. You feel relaxed, happy. Now, you are writing quickly. The ideas are flowing from your pen with ease. You are now finished and you close the exam and calmly put away your writing tools. Finally, you are handing in the test with a big smile on your face. The proctor smiles back. Savour this feeling.


Imagine coping with your stress
1. Relax: deep breathing, muscle relaxation, safe-place imagery
2. Imagine yourself before, during, and after the test/exam
3. Add coping statements (see attached sheet with examples of coping statements)

Before/Preparing for a stressor
You imagine walking into the exam venue. “When I get to my seat, just think about the situation, not my anxiety... When I get the exam, I will calmly look over the question and then start to organize my time... I will think rationally and not allow my anxiety to take over... I’ve done well on exams before so there’s no reason I can’t today... Breathe and relax... I am ready to meet this challenge.”

During the exam/stressor
You imagine seeing the test/exam paper in front of you. You open to the first page and look over the questions...

a) Confronting and handling a stressor
“I am feeling my anxiety rise... I have a lot of coping strategies I can call on... This is a reminder to use my coping exercises: Take a slow deep breath. Ahhhh. I can meet this challenge.”

b) Coping with Feelings of Being Overwhelmed
You imagine that you look through the exam and don’t know some or quite a few of the answers. “This is very upsetting... My heart is starting to pound... I should expect my stress to rise sometimes... What if I blank out!... My stress is a signal. Take a deep breath and slow things
down... I can be anxious and still deal with this situation ... Time for problem-solving. Find a question I know and start there... Breathe into my belly and feel deep relaxation ... Ok, let’s start with this one first... Good…”

**After the exam/stressor**

You imagine that you did ok on the exam/test.

“It worked. I got through it without blanking out! I did feel stress but I managed it. Good for me!”

You imagine that you didn’t do very well on the exam/test.

“I didn’t do well. That’s okay. I handled my stress better than ever before. I’m proud of myself for trying my best.”

Math & science anxiety: What’s behind it?

Outdated mental pictures
People who like math and science are really smart. Labs are full of nerdy looking guys.

Faulty assumptions
Math is about logic, not imagination.
There’s only one correct way to do a math problem or science experiment.

Negative self-talk
I’ll never be good at math. I just don’t understand numbers.
I can’t function in a science lab.
I’m a ‘word person, not a ‘numbers’ person. I’m not smart enough.

Poor reading skills
Math and science courses follow the format of the text very closely. So, mastering the text and staying current with the assigned readings will go a long way to reducing your anxiety.

Doing it alone
Trying to learn math and science alone can lead to confusion and frustration. To do well in these subjects requires active involvement with others.

Inadequate current knowledge and/or learning strategies
Math and science are cumulative and, therefore, not having an adequate base of knowledge or skill in the subject may lead to a fear of failure. Also, not knowing how to learn, i.e. the best learning strategies, may also lead to anxiety.

Not being prepared for homework or assigned readings for class labs

**Overcoming math & science anxiety ... And you can!**

First off, you have to deal with the negative self-talk. Try these 3 steps:

1. Be aware of the negative statements. Write them down.
2. Determine the veracity of the statement: Is this really true or just your fears talking?
3. Create a new statement that affirms your ability to succeed.

E.g. “When learning math, I proceed with patience.” “I’m a good learner, even if I make errors.”

**Learn how to learn**

**Learn from specific to general**

Many subjects require you move from an overview of concepts to detail. However, jumping to conclusions in math or science is dangerous. Instead, try to comprehend one specific concept before moving on to gradually build up a picture of the whole. Sometimes you may feel you’re going backward! Math and science principles often contain exceptions and conflicting evidence.

**Focus on the big picture questions**

Pause regularly to ask: “What is this all about?” “What basic problem am I trying to solve?” “How is this applied in daily life?”

**Read slowly and actively**

Slowly: Math and science call for attention to detail which requires you to read slowly and carefully. A single paragraph might need to be read several times. You also need to read the sections as they are laid out in the text, as concepts build upon each other in a sequential order. Regardless, start by previewing headings, diagrams, and sample problems to get an overview.

Actively: Math and science are not just knowledge, but also activities. When you read, you should also DO. Active reading includes studying visuals (e.g. diagrams, charts); copying (e.g. diagrams, equations); and working out examples. Sometimes examples are the main points.

**Use cooperative learning**

Speak up in class: ask questions, have homework prepared, voice your thoughts. Get extra help from your T.A. and professor. Join a study group. Work with a good ‘problem solver’. Ask them to speak their steps and thoughts out loud, and then compare to your method.

**Use lab sessions to your advantage**

Lab work is often critical. Be prepared: know what the procedure will be and what materials you’ll need. Bring your notebook to record and summarize your findings.

Analyzing your returned tests

For each exam question missed, analyze why you missed the question and record the number of the question beside the reason. Look for PATTERNS of errors so that you can prepare more efficiently for the next test.

Course: ____________________ Test: ______________________ Date of test: ______________

Errors related to test questions

1. Failed to understand the questions: ____________________________
2. Read question incorrectly: ________________________________
3. Read question incompletely: ______________________________
4. Did not understand vocabulary: _____________________________
5. Others: ____________________________________________

Errors related to answers

6. Incompletely answered the question: ____________________________
7. Vaguely answered the question: ______________________________
8. Provided incorrect information: ______________________________
9. Others: ____________________________________________

Errors related to subject

10. Did not understand material: ________________________________
11. Did not study sufficiently: ________________________________
12. Lacked basic background knowledge: _________________________
13. Others: ____________________________________________

Errors related to test-taking procedures

14. Did not manage time well in test: _____________________________
15. Blocked self due to anxiety: ________________________________
16. Did not follow directions: ________________________________
17. Others: ____________________________________________

Eight Reasons to Celebrate Mistakes

In his book *Becoming a Master Student*, David Ellis outlines 8 reasons for celebrating mistakes.

1. Celebration allows us to notice the mistake.
2. Mistakes are valuable feedback.
3. Mistakes demonstrate that we’re talking risks.
4. Celebrating mistakes reminds us that it’s OK to make them.
5. Celebrating mistakes includes everyone.
6. Mistakes occur only when we aim at a clear goal.
7. Mistakes happen only when we’re committed to making things work.
8. Celebrating mistakes cuts the problem down to size.

So – celebrate!

Manufacturing motivation

Motivate: to cause a person to act in a particular way. Concerned with movement.

Many of us can feel a lack of persistence, self-discipline, or courage in facing a task. Sometimes we feel the pay-off will be worth the effort...and sometimes we aren't sure! But we can help ourselves act, which is what motivation is all about!

What makes us want to do something?
We usually act because of a reward that we'll receive. Rewards are either intrinsic or extrinsic.

Intrinsic rewards are thoughts or feelings within ourselves: we may feel proud, satisfied, delighted, relieved, exhilarated, confident, encouraged, amazed, stimulated, secure, intelligent, ambitious, intrigued, pleasantly surprised. Intrinsic rewards are very powerful motivators as they are under our own control, and they lead to increased self-esteem. —I said I’d do it ...and I did!

Extrinsic rewards are responses from the world around us: we may be paid, win the prize, achieve an award, graduate, take a holiday, be voted Most Valuable Player, have our photo in the newspaper, etc. Extrinsic rewards are also powerful motivators, as they make us feel valued and recognized by others. However, they are much less under our control (eg. who is the competition? what factors will I be compared on? how many prizes will be given out?).

Highly motivated people cultivate an intrinsic reward system. The prizes, pay cheques, etc are the bonus!

What are some strategies to build motivation?
1. Make a promise and keep your word
   a. Set a specific long-range goal (read Anatomy text by end of week 13) and break it into smaller steps or goals (read 1 chapter every 6 days). Be clear in your intentions.
   b. Tell someone, and ask them to follow your progress. Be accountable.
   c. Keep a log or journal of your goals and achievements. Praise yourself.

2. The journey of a thousand miles begins with a single step (Lao Tzu). Begin with a small step, and make a plan for the next step.

3. Develop a routine. Link a new activity with one that you do routinely.
   a. eg. do your sit-ups (new activity) before drinking your morning coffee (old habit).
4. Include the words “goal, persistence, self-discipline, effort and intrinsic reward” in your vocabulary. Explicitly use these words in relation to your activities.

5. Observe when you are becoming uncomfortable thinking or doing particular tasks.
   a. Discomfort is a signal: Am I unsure, bored, scared, and out of my depth? Ask yourself: What is appealing about this activity? What is fearful? Then, experience the discomfort (just sit with it) and soon it will have less power over you.

6. Think positive: “this will feel great when it’s done” or “I can!” vs “I can’t stand this!”

7. Act like the person you wish to become. Picture yourself as already having reached your goal, or being successful. What do you look like? What are you doing? Where are you? Bring this image to mind as you start challenging activities.

8. BELIEVE in yourself. Reflect on times you were motivated. Is anything similar between then and now? Could a small change make this situation more like those times?

9. Adopt a hero. Ask yourself “what would ____ be doing now?” JUST DO IT ✓


11. Guard your health so you have strength, energy and enthusiasm.

12. Watch for the downward spiral: falling behind in readings or assignments→ feeling ‘stupid’ in class→ not attending class→ not understanding the next readings→ losing touch with classmates→ feeling ashamed → falling further behind→ feeling discouraged→ not wanting to open the books....TALK to someone who can help.

13. Use time management and organizational tools such as term or monthly calendars, weekly schedules, To Do lists, prioritizing activities.

14. Turn up the pressure. Move a deadline forward 2 weeks if you like pressure.

15. Turn down the pressure. Eliminate extra responsibilities, and plan small steps if you don’t like working under a lot of pressure. Focus on “must” not “should” activities.

16. Ask for help when you start to see a pattern of poor motivation, rather than waiting. A teacher, parent, friend, your ‘hero’, or counsellor will try to encourage and support you.
Sleep and the functioning student

How much sleep should I try to get?

According to sleep researcher, William Dement (1999) children and teens need about 10 hours sleep per night. Most adults need between 7 and 8 hours per night.

What do we mean by ‘circadian rhythm’ or ‘biological clock’?

Our ‘biological’ clock regulates sleeping and waking. The human brain possesses a process that is active 24 hours a day. One function is to induce and maintain sleep. It is a homeostatic process which means when an individual obtains less sleep than the needed amount, the homeostatic process increases the tendency to fall asleep; conversely, when extra sleep is obtained, the homeostatic process decreases the tendency to fall asleep. This ensures that an individual has the same average amount of sleep each day. It keeps a record of accumulated sleep debt. Body temperature, caloric intake, and sleep are all regulated homeostatically.

Another brain process is ‘clock-dependent alerting’ which induces and maintains alert wakefulness. This process is active during the day, inactive at night, with lowered activity in the early afternoon. These opposing processes allow us to stay up all day and sleep at night. To sleep through the night we need to accumulate sufficient sleep debt during the day, so having those long naps during the day is a no-no!

What is “sleep debt”?

If you don’t get as much sleep as your body needs, the partial sleep loss is carried over and accumulated as sleep debt, which eventually must be paid back. As your debt grows, your energy, mood, and cognition will be undermined (Dement, 1999).

Effects of sleep loss (or sleep debt)

1. Mood and Energy

Do you sometimes feel like everything is an effort? Is every task overwhelming? Are you frequently stressed and exhausted?

Sleep research at the University of Pennsylvania showed that subjects who were allowed to sleep only 4 ½ hours per night for one week felt:

- significantly less happy
- more stressed
- more physically frail
- more mentally and physically exhausted

But, when the volunteers were allowed to get more sleep again, their mood bounced back.
2. Motivation
Have you ever complained to your friends that you just don’t feel motivated to do your work? That you can’t think clearly or even get started on an assignment?

Motivation is one of the first things to go when sleep is short changed. The effort of staying awake often seems monumental, and there is little energy left for anything else. In Dement’s sleep studies, once subjects were allowed to get adequate sleep, their motivation levels rose and people felt more interested in the things around them and challenges didn’t seem so overwhelming.

3. Productivity
Do you fall asleep in class? Do you find yourself nodding over your books and taking excessively long periods of time to complete tasks? Do you have trouble concentrating?

Sleep is the first thing most students sacrifice when they are faced with numerous tasks and deadlines. How often have you pulled an ‘all-nighter’ to finish an assignment? Maybe once in a while you can do this and still function. However, “during chronic sleep deprivation performance deteriorates dramatically. Sleepy people are likely to make little mistakes they would never make when well rested. The mind is prone to wander and concentration apt to flag” (Dement, 1999). Deep sleep enables us to move information from short term to long term memory. Without it, we lose what we learn.

4. Immune system and health
Do you find you tend to cut back on sleep when deadlines approach and end up getting sick? What happens to health over the long term when you don’t get enough sleep?

Carol Everson, a physiologist at the National Institute of Health in Bethesda, Maryland, studied the effects of total sleep deprivation on rats who died after 40 days without sleep. She discovered that their lymph nodes were enlarged and they had a massive amount of bacteria living in the blood. From this, she concluded that their immune systems must have broken down as a result of extreme sleep deprivation.

What can I do to improve my sleep habits?
- Keep a Sleep Diary for one week. Monitor your daily cycles of sleep and wakefulness. Try to identify what time of day you are performing most efficiently.
- Establish regular sleep patterns: same bedtime and waking time each day.
- Develop a healthy bedtime routine that includes stopping work at least half an hour before bedtime; making a To Do or ‘Worry’ list for the next day; doing some relaxation and stretching exercises; and practicing abdominal breathing to release tension.

Twelve rules for better sleep hygiene

1. Sleep as much as needed to feel refreshed and healthy during the following day, but not more. Curtailing the time in bed seems to solidify sleep; excessively long times in bed seem related to fragmented and shallow sleep.

2. Getting up at a regular time in the morning strengthens circadian cycling and finally, leads to regular times of sleep onset.

3. A steady daily amount of exercise probably deepens sleep; occasional exercise does not necessarily improve sleep the following night.

4. Occasional loud noises (eg. aircraft flyovers) disturb sleep even in people who are not awakened by noises and cannot remember them in the morning. A fan to provide background (white noise) may help those who must sleep close to noise.

5. Keep room temperature a little cool. Excessively warm rooms disturb sleep but so can very cold rooms.

6. Hunger may disturb sleep; a light snack may help sleep. Try low fat, non-spicy snacks.

7. An occasional sleeping pill may be of some benefit, but their chronic use is ineffective in most insomniacs.

8. Progressive muscle relaxation and abdominal breathing exercises help divert the mind from list making and anxious thoughts which interfere with falling asleep.

9. Caffeine in the evening disturbs sleep, even in those who feel it does not. So avoid coffee, tea, chocolate and pop in the evening.

10. Alcohol helps tense people fall asleep more easily, but the ensuing sleep is then fragmented.

11. People who feel angry and frustrated because they cannot sleep should not try harder and harder to fall asleep but should turn on the light and do something different.

12. Reduce the number of cigarettes smoked; the chronic use of tobacco disturbs sleep.

# Sleep diary template

Date: _________________

**Complete after awakening:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Fill in your information below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time you went to bed</td>
<td></td>
</tr>
<tr>
<td>Time you fell asleep</td>
<td></td>
</tr>
<tr>
<td>Time you woke up</td>
<td></td>
</tr>
<tr>
<td>Number of times you awakened during the night</td>
<td></td>
</tr>
<tr>
<td>Amount of time you were awake during the night</td>
<td></td>
</tr>
<tr>
<td><strong>Total night-time sleep</strong></td>
<td></td>
</tr>
</tbody>
</table>

Comments on quality of night’s sleep:

Did you feel groggy after getting up in the morning?

If yes, for how long?

**Complete at the end of the day:**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Fill in your information below</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of naps</td>
<td></td>
</tr>
<tr>
<td>Time you fell asleep</td>
<td></td>
</tr>
<tr>
<td>Time you woke up</td>
<td></td>
</tr>
<tr>
<td><strong>Total nap-time</strong></td>
<td></td>
</tr>
</tbody>
</table>

Comments on quality of naps:
Using the **Stanford Sleepiness scale** below, note your alertness during the day:

1. Feeling active, vital, alert, wide awake
2. Functioning at a high level, not at peak
3. Relaxed, not full alertness, responsive
4. A little foggy, not at peak, let down
5. Fogginess, losing interest, slowed down
6. Sleepiness, prefer to be lying down
7. Almost in a reverie, hard to stay awake

<table>
<thead>
<tr>
<th>Time</th>
<th>Sleep rank</th>
<th>Time</th>
<th>Sleep rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>6AM</td>
<td></td>
<td>4PM</td>
<td></td>
</tr>
<tr>
<td>8AM</td>
<td></td>
<td>6PM</td>
<td></td>
</tr>
<tr>
<td>10AM</td>
<td></td>
<td>8PM</td>
<td></td>
</tr>
<tr>
<td>NOON</td>
<td></td>
<td>10PM</td>
<td></td>
</tr>
<tr>
<td>2PM</td>
<td></td>
<td>MIDNIGHT</td>
<td></td>
</tr>
</tbody>
</table>

How was your overall sleepiness / alertness today (1-7)?

Other comments on mental and physical alertness: