SIX STRATEGIES FOR EFFECTIVE LEARNING

INTERLEAVING
Switch between topics while you study

RETRIEVAL
Practice bringing information to mind using different methods

SPACING
Space out your studying

CONCRETE EXAMPLES
Use specific examples to reinforce your understanding of abstract ideas

DUAL CODING
Connect class topics to visuals

ELABORATION
Explain and describe ideas with many details

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Created by R. Somera, H. Bram, D. Karunathilake, R. Kumar, K. Yang, & C. Zhu.
STUDYING WITH INTERLEAVING

SWITCH BETWEEN TOPICS WHILE YOU STUDY

HOW TO DO IT

In one study session, switch topics. Don't stay on one idea!

The next time that you study this set of topics, go over them again in a different order.

Find connections between the different ideas/concepts as you switch between them.

Avoid

Switching between ideas too fast!

Understand a topic before you move on.

If the information is not sticking with you, take a short break from the screen, then try again.
Always refer back to class notes to ensure that you are retrieving the correct information.

Use different methods to support the information you have learned during lecture. There are several ways to do this. Try creating mind maps, making flashcards, or writing practice quizzes that can be exchanged with classmates.

Re-reading, highlighting, and repeatedly going over the same notes. Retrieval methods can be challenging. However, they allow information to be retained in your long term memory.

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STUDYING WITH
CONCRETE EXAMPLES
USE SPECIFIC EXAMPLES TO REINFORCE YOUR UNDERSTANDING OF ABSTRACT IDEAS

HOW TO DO IT

Identify the concept that re-appears in course examples.
Make connections between this main concept that you are studying and each example.

E.g. 1 - length conversions
5 cm \times \frac{1 \text{ m}}{100 \text{ cm}} = 0.05 \text{ m}
as \ 1 \text{ m} = 100 \text{ cm}

E.g. 2 - mass conversions
10 \text{ g} \times \frac{1 \text{ kg}}{1000 \text{ g}} = 0.01 \text{ kg}
as \ 1 \text{ kg} = 1000 \text{ g}

Ask yourself...
• Why is this example relevant?
• What theories or principles are used here?

PRINCIPLE = UNIT CONVERSION
starting unit \times \frac{desired \ unit}{starting \ unit} = desired \ unit

AVOID

Memorizing every detail for each example.
Learn how the examples used in class actually apply to the main principle.

$g \rightarrow kg : \text{multiply by 1000}$
$kg \rightarrow g : \text{divide by 1000}$
STUDYING WITH SPACING
SPACE OUT YOUR STUDYING OVER TIME

**HOW TO DO IT**

Review information from each class, but not immediately after class.

Schedule study sessions ahead of time and stick to it. This helps you manage your time for all of your classes.

Always return to relevant, older information to help keep it fresh in your mind too.

**PHYS 124 Study Schedule**

- **DAY 1**: Study 15 min
- **DAY 2**: Study 20 min
- **DAY 5**: Study 30 min
- **DAY 6**: Review 1 hour
- **DAY 7**: Final 9:00 am

**AVOID**

Cramming info in all at once.

You will not be able to retain any information if you force yourself to learn it all in a short period of time.

Go through little bits over time. It will add up!

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ELABORATION
EXPLAIN AND DESCRIBE IDEAS WITH DETAILS

HOW TO DO IT

Make connections within the material that you are learning to solidify your understanding.

While attempting to learn new information, make connections with previously known ideas or experiences.

Old Knowledge
- photosynthesis
- sun’s energy

New Knowledge
6 CO₂ + 5 H₂O + Solar energy → C₆H₁₂O₆ + 6 O₂

Ask yourself:
- How do they work together?
- How are they similar or different?
Discuss answers with classmates.

AVOID

Assuming information and making false connections.

Make sure to double check with your course notes to ensure that the connections that you are making are accurate.

"Hmm... this explains it well!"

www.biologyanswersonlinewiki.ca

Photosynthesis:
- humans can conduct photosynthesis!
STUDYING WITH
DUAL CODING
CONNECT CLASS TOPICS TO VISUALS

HOW TO DO IT

Look at class materials and create suitable visuals to describe what you are learning.

Visuals can include infographics, timelines, cartoon strips, diagrams, graphic organizers, and more.

Afterwards, take a look at your visuals, and explain in your own words what they mean.

AVOID

Relying solely on another's visual from the Internet.

Visualize it in a way that works for you.
Otherwise, you may have trouble explaining it!

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Diagram

Timeline

Precambrian

Paleozoic

Mesozoic

Cenozoic

Today!

Igneous

Sedimentary

Metamorphic

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