Tips for Learning Science

Focus on Processes

It will make your life easier if you understand how things work rather than trying to memorize a lot of details.

CHEMISTRY
You might find it difficult to memorize every chemical reaction. So learn general mechanisms to predict reactions for different types of compounds.

BIOLOGY
Understand how some system functions BEFORE learning details and names.

PHYSICS
Don’t just memorize a bunch of formulas; understand what principles are being applied.

How?
1. Overview ideas
2. Make a mental picture
3. Draw a picture/map/chart/graph
4. Look for main ideas or general principles
5. Understand relationships and relate each new concept to previous ones
   - relate course information to REAL life - heart burn, food groups, bungee jumping
   - think about similarities and differences
6. Learn from general to specific
   - make an outline and THEN add specifics
   - don’t memorize ANYTHING unless you understand what it relates to
   - use categories, headings, labels, numbers; anything to organize information in a logical way
Learning Terminology

Often a single word represents a complex idea and words can be "translated" to help understanding.

How?

1. Observe and analyze words
   - break them into parts
   - look for repeating word parts
   - listen for (or ask!) word meanings

2. Start a vocabulary sheet
   - identify and define IN YOUR OWN WORDS any unfamiliar terms
   - use a system to test yourself to see if you know terms:
     - gastritis = inflammation of stomach;
     - cover up the definition and see if you can recall it and then cover up the term and see if you can recall it!

3. Remember words = concepts
   - understand terms - remember that words represent ideas and relationships (examples: voltage, negative feedback)
   - focus on new concepts and their labels
   - use common sense and your own experiences to help you understand new ideas!

Use Effective Memory Strategies

Many science courses have a lot of content. You need to have a strategy for learning and remembering large volumes of information.

How?

1. Organize information
   - learn a general framework and THEN add specifics
   - make information meaningful by relating or associating it to something familiar
   - use headings/charts/maps/numbers to organize information and show relationships
   - plan a strategy of attack for each course - you may need to study biology differently than chemistry

2. Use your body - learn actively
sit up, sit forward, pace, sing, use your hands, feet, torso - anything to senses - say it, write it, draw it, touch it - the more senses you use, the better your chances of remembering
use your OWN words, make your own overviews, maps, charts, cartoons
read, write, speak, listen, apply, teach

3. Use your BRAIN

• notice your distractors - learn how to focus and recognize when you are distracted
• OVERLEARN - repeat, repeat, repeat - use short frequent study sessions - this will increase your accuracy, speed and confidence
• have lots of short breaks and frequent rewards - be aware of your attention span
• review information within 24 hours to access long term memory
• focus on your attitudes - be positive - you CAN do this!
• choose what NOT to store - you can't learn it all - selectively choose NOT to remember
• make study notes in a way you can test yourself to keep yourself active

4. Use mnemonics

• try visual images of concepts
• use rhymes and songs
• acronyms (ie: IPMAT for stages of mitosis)
• creative sentences (Every good boy deserves fudge - E,G,B,D,F - musical notes)
• use any association or connection to help information "stick"
• (be careful not to spend too much time and energy on mnemonics - use them for information you find difficult to remember)