PALM BEACH
CURRUMBIN
STATE HIGH

Avoiding academic mistakes

Most common assessment preparation mistakes

1. Not enough time to prepare
2. Doing the wrong work (not enough time on practice)/not enough practice papers
3. Not correcting past mistakes
4. No plan
5. No goal

Things to start doing

- Develop/ use study notes
- Schedule
- Use different types of study that work for you (low vs high yield)
- Correct mistakes/ misunderstandings immediately

Study notes vs class notes

Q: Why is using class notes only not an effective study strategy?

Answer:

- Re-reading notes taken throughout the year is not effective
- Notes need to effectively summarise all content with no missing pieces in a manner that makes sense.
- Notes need to be usable – clear, concise & complete

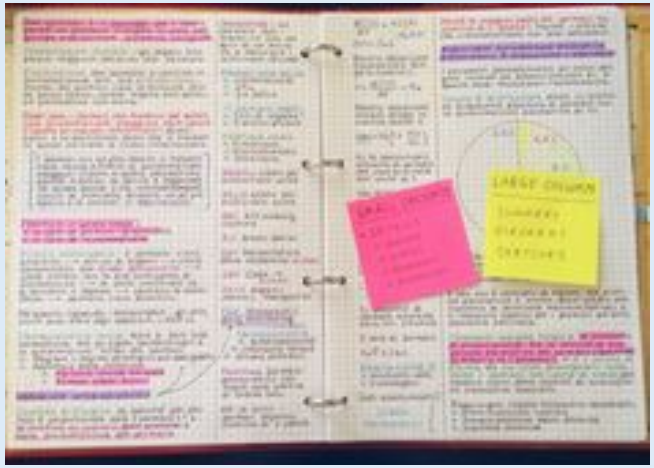
Study note examples

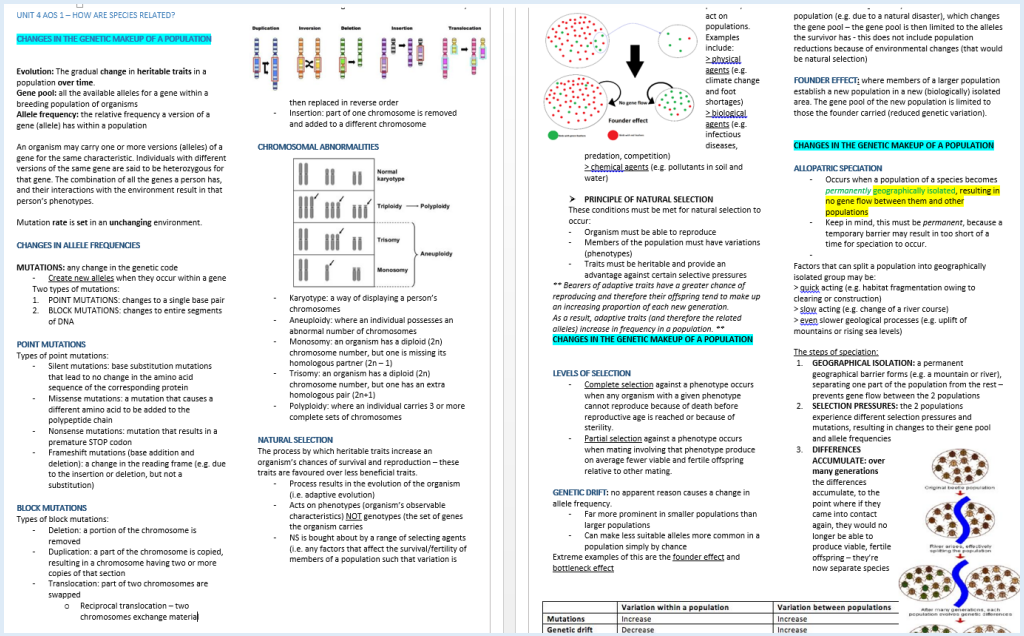
Can be built based on:

- Topic
- Unit objectives
- Cognitions
- Subject matter
- Key terms

Can look like:

- Typed/handwritten
- Visuals, text, summaries
- Mind maps, flowcharts or mnemonics
- Colour coded





UNIT 4 AOS 1 – HOW ARE SPECIES RELATED?

CHANGES IN THE GENETIC MAKEUP OF A POPULATION

Evolution: The gradual **change** in **heritable traits** in a population **over time**.
Gene pool: all the available alleles for a gene within a breeding population of organisms
Allele frequency: the relative frequency a version of a gene (allele) has within a population

An organism may carry one or more versions (alleles) of a gene for the same characteristic. Individuals with different versions of the same gene are said to be heterozygous for that gene. The combination of all the genes a person has, and their interactions with the environment result in that person's phenotypes.

Mutation **rate** is **set** in an **unchanging** environment.

CHANGES IN ALLELE FREQUENCIES

MUTATIONS: any change in the genetic code
- Create new alleles when they occur within a gene

Two types of mutations:
1. POINT MUTATIONS: changes to a single base pair
2. BLOCK MUTATIONS: changes to entire segments of DNA

POINT MUTATIONS
Types of point mutations:
- Silent mutations: base substitution mutations that lead to no change in the amino acid sequence of the corresponding protein
- Missense mutations: a mutation that causes a different amino acid to be added to the polypeptide chain
- Nonsense mutations: mutation that results in a premature STOP codon
- Frameshift mutations (base addition and deletion): a change in the reading frame (e.g. due to the insertion or deletion, but not a substitution)

BLOCK MUTATIONS
Types of block mutations:
- Deletion: a portion of the chromosome is removed
- Duplication: a part of the chromosome is copied, resulting in a chromosome having two or more copies of that section
- Translocation: part of two chromosomes are swapped
  - Reciprocal translocation – two chromosomes exchange material

Duplication Inversion Deletion Insertion Translocation

then replaced in reverse order
- Insertion: part of one chromosome is removed and added to a different chromosome

CHROMOSOMAL ABNORMALITIES

Normal karyotype
Triploidy — Polyploidy
Trisomy
Monosomy
Aneuploidy

- Karyotype: a way of displaying a person's chromosomes
- Aneuploidy: where an individual possesses an abnormal number of chromosomes
- Monosomy: an organism has a diploid (2n) chromosome number, but one is missing its homologous partner (2n – 1)
- Trisomy: an organism has a diploid (2n) chromosome number, but one has an extra homologous pair (2n+1)
- Polyploidy: where an individual carries 3 or more complete sets of chromosomes

NATURAL SELECTION
The process by which heritable traits increase an organism's chances of survival and reproduction – these traits are favoured over less beneficial traits.
- Process results in the evolution of the organism (i.e. adaptive evolution)
- Acts on phenotypes (organism's observable characteristics) NOT genotypes (the set of genes the organism carries
- NS is bought about by a range of selecting agents (i.e. any factors that affect the survival/fertility of members of a population such that variation is

act on populations. Examples include:
> physical agents (e.g. climate change and foot shortages)
> biological agents (e.g. infectious diseases, predation, competition)
> chemical agents (e.g. pollutants in soil and water)

➢ **PRINCIPLE OF NATURAL SELECTION**
These conditions must be met for natural selection to occur:
- Organism must be able to reproduce
- Members of the population must have variations (phenotypes)
- Traits must be heritable and provide an advantage against certain selective pressures

*** Bearers of adaptive traits have a greater chance of reproducing and therefore their offspring tend to make up an increasing proportion of each new generation. As a result, adaptive traits (and therefore the related alleles) increase in frequency in a population. ****

CHANGES IN THE GENETIC MAKEUP OF A POPULATION

LEVELS OF SELECTION
- Complete selection against a phenotype occurs when any organism with a given phenotype cannot reproduce because of death before reproductive age is reached or because of sterility.
- Partial selection against a phenotype occurs when mating involving that phenotype produce on average fewer viable and fertile offspring relative to other mating.

GENETIC DRIFT: no apparent reason causes a change in allele frequency.
- Far more prominent in smaller populations than larger populations
- Can make less suitable alleles more common in a population simply by chance

Extreme examples of this are the founder effect and bottleneck effect

population (e.g. due to a natural disaster), which changes the gene pool – the gene pool is then limited to the alleles the survivor has - this does not include population reductions because of environmental changes (that would be natural selection)

FOUNDER EFFECT: where members of a larger population establish a new population in a new (biologically) isolated area. The gene pool of the new population is limited to those the founder carried (reduced genetic variation).

CHANGES IN THE GENETIC MAKEUP OF A POPULATION

ALLOPATRIC SPECIATION
- Occurs when a population of a species becomes *permanently* geographically isolated, resulting in no gene flow between them and other populations
- Keep in mind, this must be *permanent*, because a temporary barrier may result in too short of a time for speciation to occur.

Factors that can split a population into geographically isolated group may be:
> quick acting (e.g. habitat fragmentation owing to clearing or construction)
> slow acting (e.g. change of a river course)
> even slower geological processes (e.g. uplift of mountains or rising sea levels)

The steps of speciation:
1. **GEOGRAPHICAL ISOLATION:** a permanent geographical barrier forms (e.g. a mountain or river), separating one part of the population from the rest – prevents gene flow between the 2 populations
2. **SELECTION PRESSURES:** the 2 populations experience different selection pressures and mutations, resulting in changes to their gene pool and allele frequencies
3. **DIFFERENCES ACCUMULATE: over many generations** the differences accumulate, to the point where if they came into contact again, they would no longer be able to produce viable, fertile offspring – they're now separate species

	Variation within a population	Variation between populations
Mutations	Increase	Increase
Genetic drift	Decrease	Increase

Not enough time to prepare

How much Hw/study should I be doing?

Rough guide 2.5 hours per subject per week (15 hours a week minimum)

eg. 4:30-6:30pm each weeknight; 2pm-7pm Sunday's

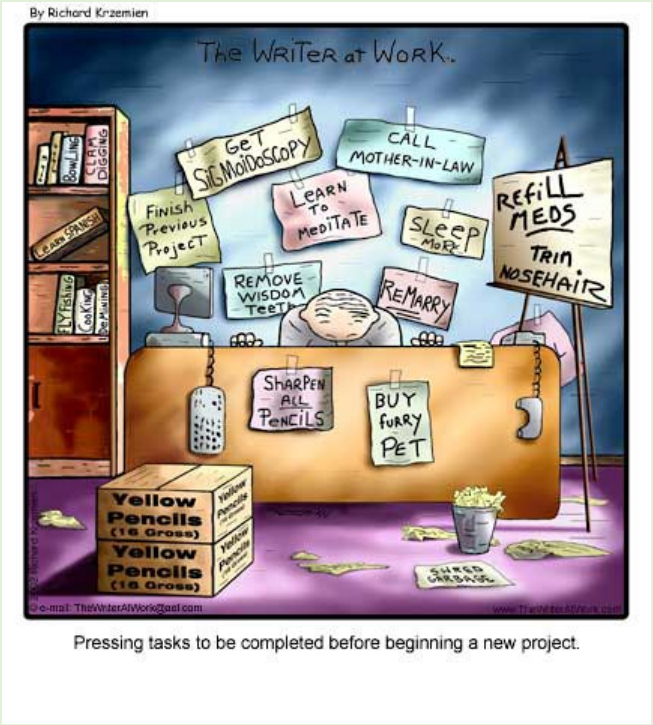
- Year 11: develop/ trial study strategies that suit you & assessment
- Year 11 term 4 → Yr 12 term 2: 75/25 assessment v long term exam prep
- Year 12 term 2 on: 50/50 assessment v long term exam prep

Not enough time to prepare

Not enough time to prepare

Set your study routine…..

1. Create a study timetable and refer to it regularly
2. Facilitate a space conducive to study (quiet, removed from younger siblings, no television, good for posture)
3. Have short intermittent breaks with healthy snacks and water
4. Turn off your phone/social media
5. Start somewhere. Anywhere. Summary video, write a to-do list, open the textbook.
6. Stop and reset; get enough sleep



Pressing tasks to be completed before beginning a new project.

No plan

So much assessment so little time

There is a big difference between being busy, and being productive

- This is a large body of subject-specific knowledge and skills you need to learn, understand, recall and apply successfully in the external assessment

- Need to learn how to transfer new information into long-term memory to reduce cognitive load

No plan & Doing the wrong work

Types of study

Low/medium yield practice

- Exercise the memory: Quick, regular, low-stakes questions and quizzes
  - flash cards (digital/written), quizzes (online, textbook, resources), discussion points (peers, family)
- Practice problems and writing prompts deliberately have you engage with information
  - writing questions from notes, practice tests, practice handwriting over a variety of topics

Optional resources

- study stack https://www.studystack.com/
- quizlet, https://quizlet.com/en-gb
- Studiosity https://www.studiosity.com/student-resources
- student quizziz https://quizizz.com/join/
- ATAR Notes https://atarnotes.com/
- Past exams https://www.qcaa.qld.edu.au/senior/see/subject-resources AND
- https://tutorsfield.com.au/articles/past-exam-papers/

No plan & Doing the wrong work

Engage with Practice questions

High yield practice

- External exams: 23 Oct – 14 Nov 2023:

Year 12's Practice questions should be completed every week from ***now***

*Identify the types to practice:

- MC - Humanities, Science, maths, HPE
- Short response
- Extended response –all subjects: know the subject specifications of the items

Not correcting past mistakes

Debrief exam prep/assessment completion

"If we embrace and even study errors….. students may actually learn more"—Dr. Amy L. Eva

How productive was your study/time spent on the assignment?

- It is important to complete tasks such as note-taking, memorisation or planning as soon as possible and move on quickly to high-end gains such as practice papers, revision questions or writing the assignment.
- You need to debrief after the results have been received to reflect on your preparation, to consider areas for improvement and then to set goals or actions to achieve this.

Use feedback to correct mistakes

Upon receiving an exam or assignment back many don't adequately engage with any feedback offered- particularly with lower results or if unhappy with results

Top performing students seek to maximise any feedback they receive, especially negative or constructive feedback through:

- Identifying mistakes
- Understanding where marks were lost
- Completing any incorrect questions for a second time
- Pursuing further feedback on those questions.

Not correcting past mistakes

Debrief exam prep/assessment completion

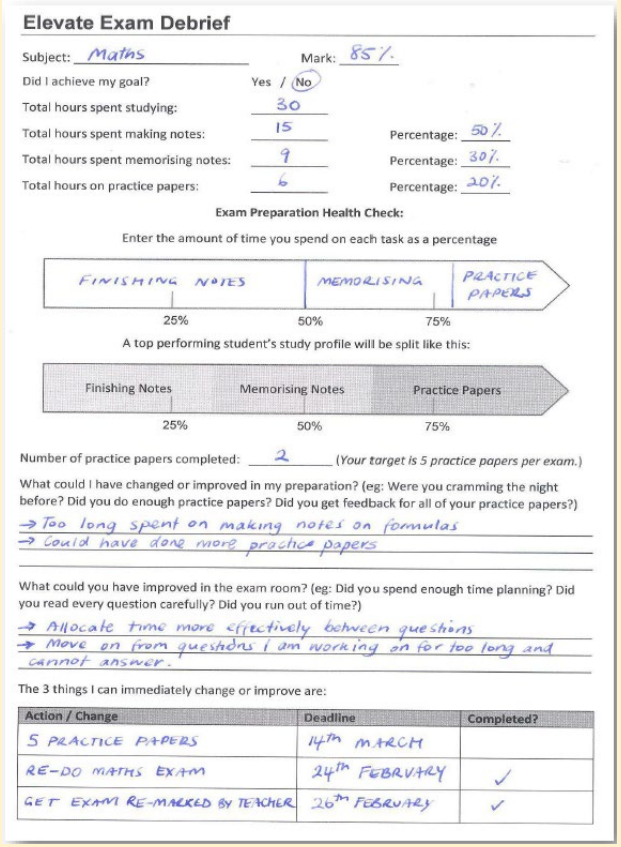
Spend time to consider & reflect

Your debrief should include:

- Your goal & whether you achieved it
- How long you spent on certain aspects (exams: 3 phases/ assignment: planning and writing or different parts/sections)

Reflect:

- What could you have changed/improved in your preparation
- Identify the 3 most important things you could immediately implement



Elevate Exam Debrief

Subject: Maths Mark: 85%

Did I achieve my goal? Yes / (No)

Total hours spent studying: 30

Total hours spent making notes: 15 Percentage: 50%

Total hours spent memorising notes: 9 Percentage: 30%

Total hours on practice papers: 6 Percentage: 20%

Exam Preparation Health Check:

Enter the amount of time you spend on each task as a percentage

FINISHING NOTES | MEMORISING | PRACTICE PAPERS

25% 50% 75%

A top performing student's study profile will be split like this:

Finishing Notes | Memorising Notes | Practice Papers

25% 50% 75%

Number of practice papers completed: 2 *(Your target is 5 practice papers per exam.)*

What could I have changed or improved in my preparation? (eg: Were you cramming the night before? Did you do enough practice papers? Did you get feedback for all of your practice papers?)

→ Too long spent on making notes on formulas
→ Could have done more practice papers

What could you have improved in the exam room? (eg: Did you spend enough time planning? Did you read every question carefully? Did you run out of time?)

→ Allocate time more effectively between questions
→ Move on from questions I am working on for too long and cannot answer.

The 3 things I can immediately change or improve are:

Action / Change	Deadline	Completed?
5 PRACTICE PAPERS	14th MARCH	
RE-DO MATHS EXAM	24th FEBRUARY	✓
GET EXAM RE-MARKED BY TEACHER	26th FEBRUARY	✓

Overall Tips and Tricks

- Decide how you will organise **study** notes
- Know when assessment is due and plan work accordingly
- Incorporate different strategies
- Schedule time for practice
- Complete practice questions (multiple times)
- Correct mistakes

- Practice handwriting! You will need to handwrite!