Science

Exams

Both have

- 6 exams in total
- Higher and foundation to choose between

Triple

- 2 exams for each subject
- Each exam is 1hr 45mins long

Double

- 6 exams for the double option
- Each exam is 1hr 15mins long

What assessments are involved?

Focus on practical theory assessment in the exams

On average, 20% of content will be maths based

Biology – 10%

Chemistry – 20%

Physics – 30%

Questions are 'saw toothed'

- All questions start easier and then get harder
- Students must attempt the whole paper

Key dates

Exam	Date	Time
Biology 1	15/05/2018	pm
Biology 2	11/06/2018	am
Chemistry 1	17/05/2018	am
Chemistry 2	13/06/2018	am
Physics 1	23/05/2018	pm
Physics 2	15/06/2018	am

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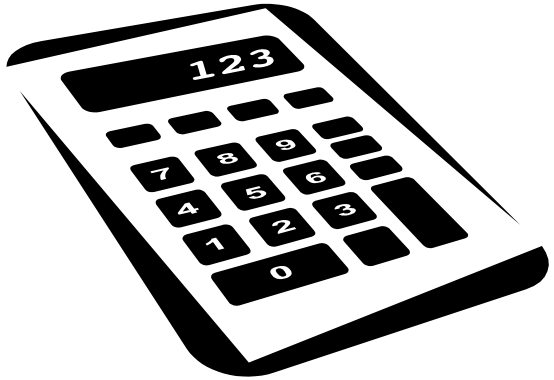
Correct equipment



- Black pens
- 30cm ruler
- Pencils
- Rubber
- Pencil sharpener
- Scientific Calculator
- Protractor

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Revising

- It is important that this is regular in smaller doses – a prolonged revision session does not always help
- One day should be taken off from revision/school work each week
- Plan out to cover all the areas that are in their exam
- Find a method that works

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REVISION TECHNIQUES

The Statistics

- 63% material is forgotten after 7 days.
- 88% material is forgotten after 6 weeks.
- Reading notes and text books leads to a mere 10% retention.

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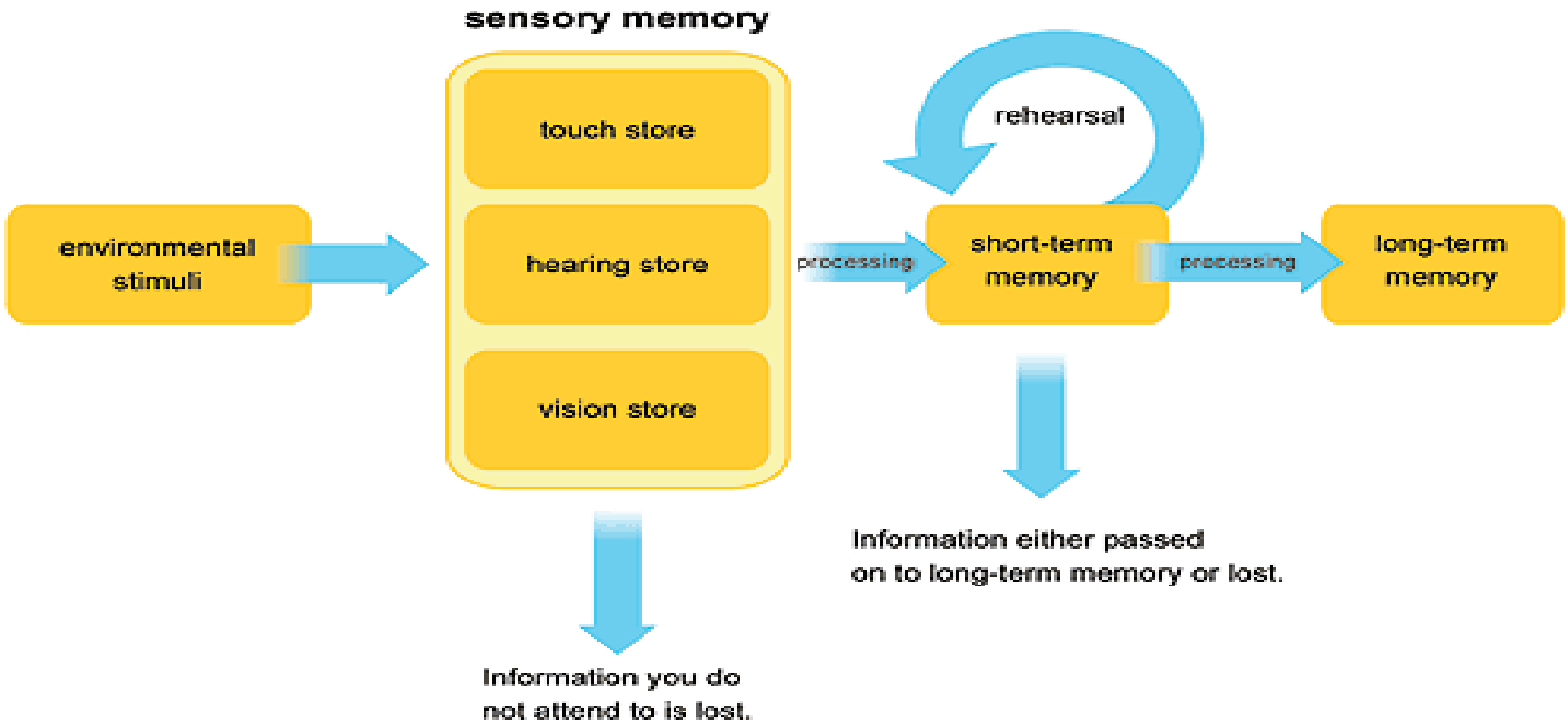

Be Organised

- Where?
  - Sit at a desk – somewhere designed for study
- What?
  - Make task specific & realistic
- How?
  - Like > Less favoured > Like
- When?
  - Alert – times of the day…
- Why?
  - Review
- Filling System
- Notes
  - Less is more
  - Concise

Make a timetable

- Know your topics and subtopics - use of the specification/ road maps
- Plan when you are going to study – timetable – fit it around your hobbies etc
- Use short bursts and rewards (TV, chocolate etc)

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Revision Activities

- Thinking maps
- Key words – **bare necessities**
- Flash Cards
- Podcasts
- Family and Friends Test
- VAK – Learner
- Highlight
- Chant/Rap
- **Exam Questions and Mark Scheme**
- Write your own Q's
- Mnemonics
- **Big questions**

CUE CARDS….

What makes a GREAT cue card?

Enzymes key words

- Enzyme
- Substrate (key)
- Lock and key
- Denature
- Specific active site (lock)
- Active site – changes shape
- Rate of reaction
- optimum

Diffusion

High concentration to low – requires no energy

Examples

Oxygen into blood, Carbon dioxide out of blood

Osmosis

Move of water from high to low concentration across semi permeable membrane

Example

Water moving to a potato – increases size/ mass

Active Transport

Move of ion from an area of low concentration to an area of high concentration – process requires energy

Energy from respiration (aerobic = more energy)

Anaerobic in water logged soil

Nitrate ions use for amino acid

Photosynthesis

Structure	Plant Cell	Animal Cell
Cell membrane	yes	yes
Cell wall	yes	no
Mitochondrion	yes	yes
Chloroplast	yes	no
Nucleus	yes	yes
Vacuole	yes	no

Light energy (sunlight)

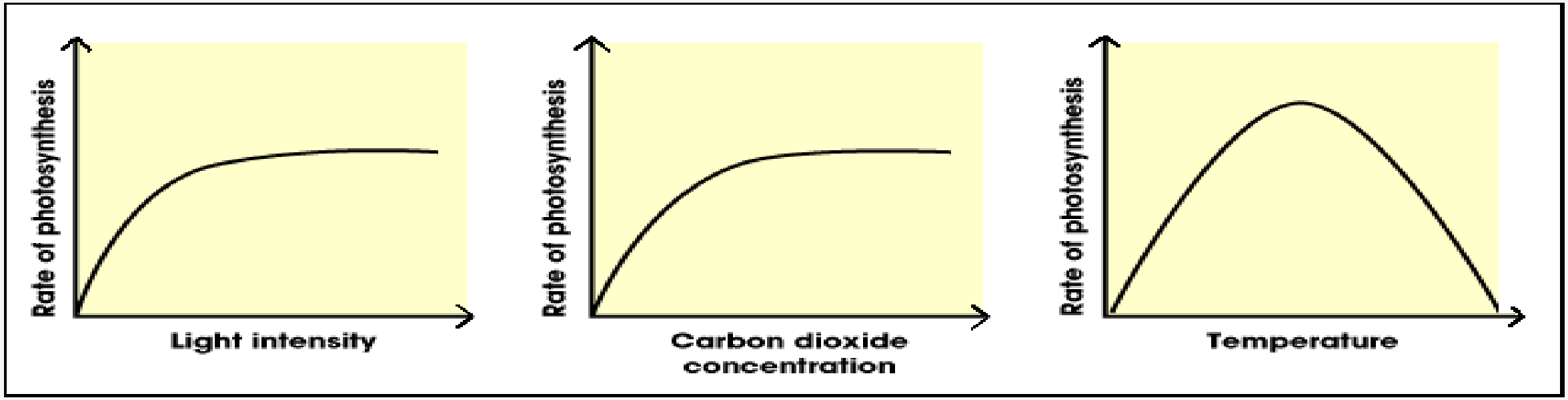
- ***Photosynthesis*** is a chemical reaction that happens in the chloroplasts of plant cells.
- It produces glucose for use by the plant, and oxygen as a waste product.

Equations for photosynthesis:

- Carbon dioxide + Water → Glucose + Oxygen (word equation)
- $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ (Balanced Symbol equation – A*)
- Light energy is absorbed by chlorophyll in the ***chloroplasts*** for photosynthesis to happen.
- Plants use light energy to make food (glucose – stored as starch)
- Chlorophyll is use to absorb sun light
- Large surface area = more photosynthesis

Factors limiting photosynthesis

Three factors can limit the speed of photosynthesis - light intensity, carbon dioxide concentration and temperature. Water is NOT a limiting factor



Limiting factor is either – CO_2 or Temperature

Limiting factor either – Light or Temperature

Limiting factor is temperature – see enzymes – denature…

AEROBIC RESPIRATION

Uses oxygen – releases more energy

glucose + oxygen → carbon dioxide + water (+ energy) (word equation)

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

(Balanced Symbol equation)

Energy is shown in brackets because it is not a substance. Notice that:

Energy is used to growth and repair (including fruit formation in plants)

Glucose and oxygen are used up

Energy use for growth and repair

Takes place in mitochondria

ANAEROBIC RESPIRATION

Anaerobic respiration involves the **incomplete breakdown of glucose**.
The waste product is ***lactic acid*** rather than carbon dioxide and water:

glucose → lactic acid (+ little energy)

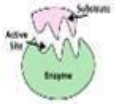
Fermentation
Fermentation is the production of **ethanol**. It occurs when **yeast** breaks down sugars in the absence of oxygen.
Fermentation is used to make alcoholic drinks, such as beer and wine.
Carbon dioxide gas is also produced during fermentation:
glucose (sugar) → ethanol (alcohol) + carbon dioxide

Fermentation is an example of **anaerobic respiration** in yeast.

Enzymes

- Biological Catalysts
  - Needed in Small Amounts
  - Specific Only act on one substrate
  - Increase reaction rate
  - Unchanged after reaction
- Characteristics
  - Protein
  - 3 D
  - Folded
  - Globular

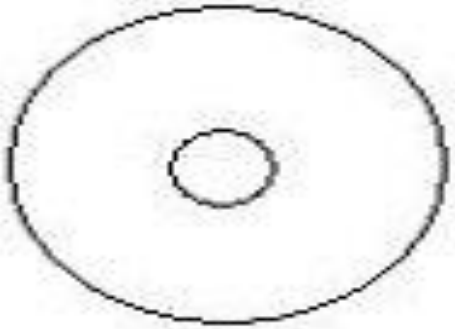
- Induced Fit



  - Enzyme
  - Active Site
  - Substrate
  - Product
- Speed up Reactions
  - Anabolic Enzymes
    - Photosynthesis
    - DNA Polymerase
      - Repairing DNA
    - DNA Ligase
      - Genetic Engineering
  - Catabolic Enzymes
    - Digestion
      - Enzyme = Amylase
      - Substrate= Starch
      - Product = Maltose
- Affected by
  - Temperature
    - Optimum Temperature
      - Humans 37
      - Plants 20-30
      - Small changes to optimum
        - Reduced Activity
      - Extreme Temperatures
        - Denaturation
  - pH
    - Optimum pH
      - Catalase =7
      - Amylase = 7
      - Peptase= 2
      - Small changes to optimum
        - Reduced activity
      - Extreme Changes to pH
        - Denaturation
  - Enzyme/Substrate concentration
    - beyond saturation point
      - Reaction Rate Unchanged

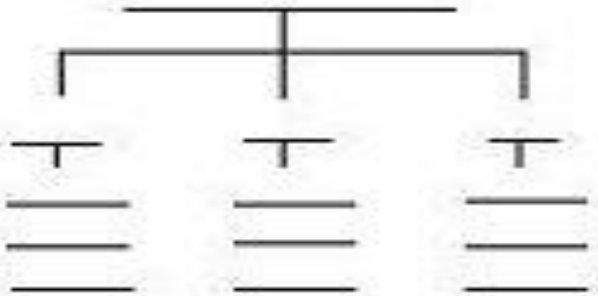
R. Cummins

Circle Map



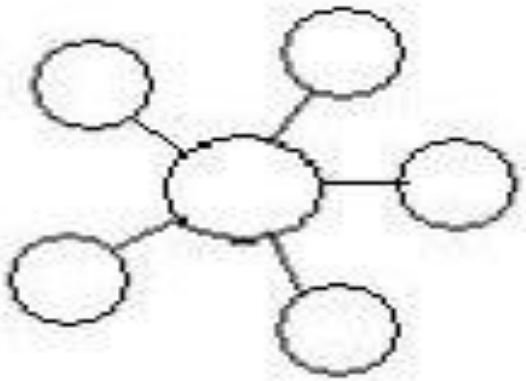
FOR DEFINING

Tree Map



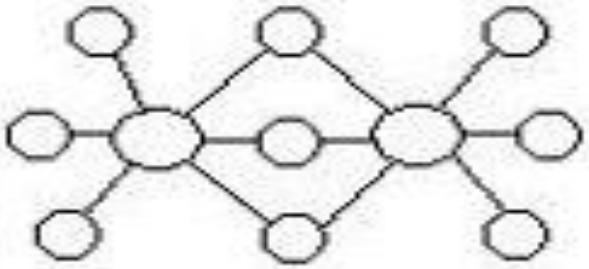
FOR CLASSIFYING

Bubble Map



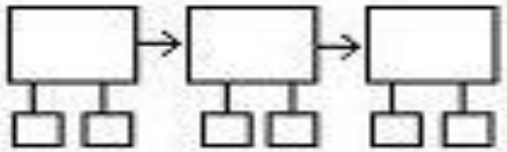
FOR DESCRIBING

Double Bubble Map



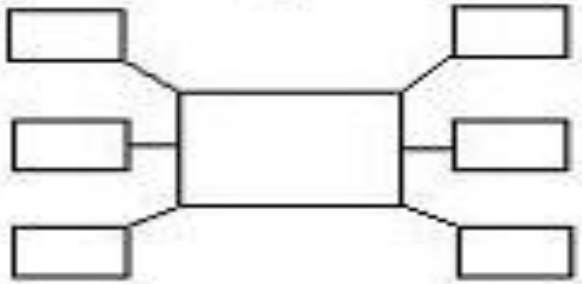
FOR COMPARING

Flow Map



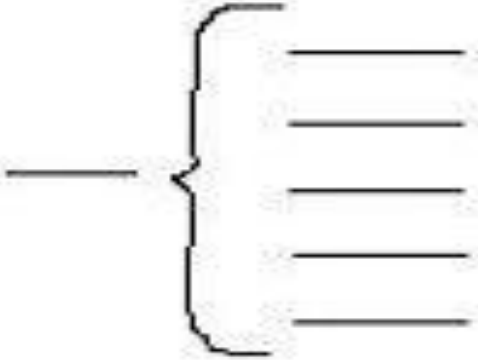
FOR SEQUENCING

Multi-Flow Map



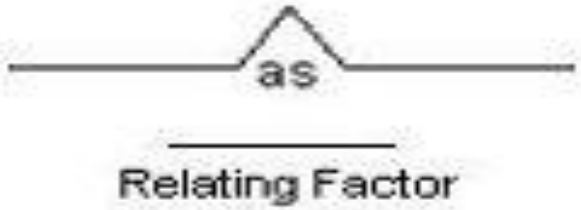
FOR CAUSE AND EFFECT

Brace Map



WHOLE TO PARTS

Bridge Map



FOR ANALOGIES

After a one hour memorising session:

- 10 minutes later revise the topic for 10 minutes
- 1 day later revise the topic for 5 minutes
- 1 week later revise the topic for 2-5 minutes
- 1 month later revise the topic for 2-5 minutes
- Before exams revise the topic as required.
- **Each time knowledge is reinforced; it enters deeper into the long-term memory and becomes more stable.**

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TEST

- What percentage of material is forgotten after 7 days?

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63%

Key Messages

- Encourage 45mins revision each evening
- Make sure students have the equipment they need
- Make sure that students are in for their exams!

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Kerboodle

- Students can login and see the online textbook at www.kerboodle.com
- Students will be given their passwords after half term
- The organisation code is qv1

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