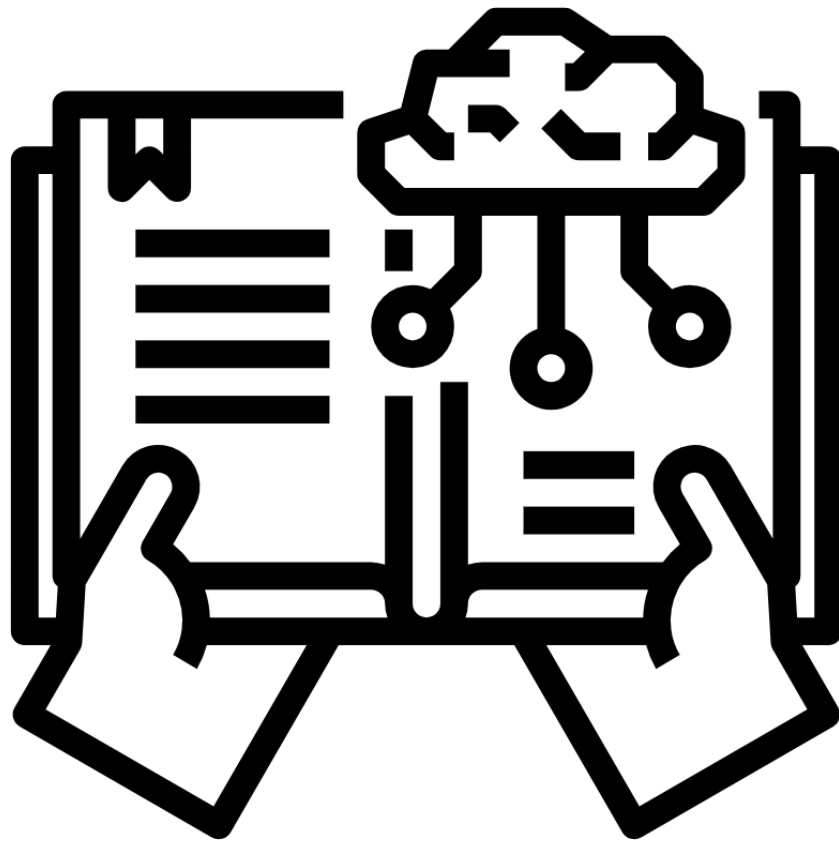


# Learning How to Learn



at The Camden School for Girls

*Compiled by Simon Flynn*

# Study Smarter, Not Harder

*Begin by asking yourself...*

**How do you study?**

*Then...*

**Why do you study this way?**

*And finally...*

**Does it work (and how do you know?)**

*Because...*

**If your study methods feel easy, then they're not working.**

*For example...*

**Simply reading notes is not an effective learning method**

*and...*

**Neither is highlighting or underlining.**

*This is because...*

**They don't require much effort.**

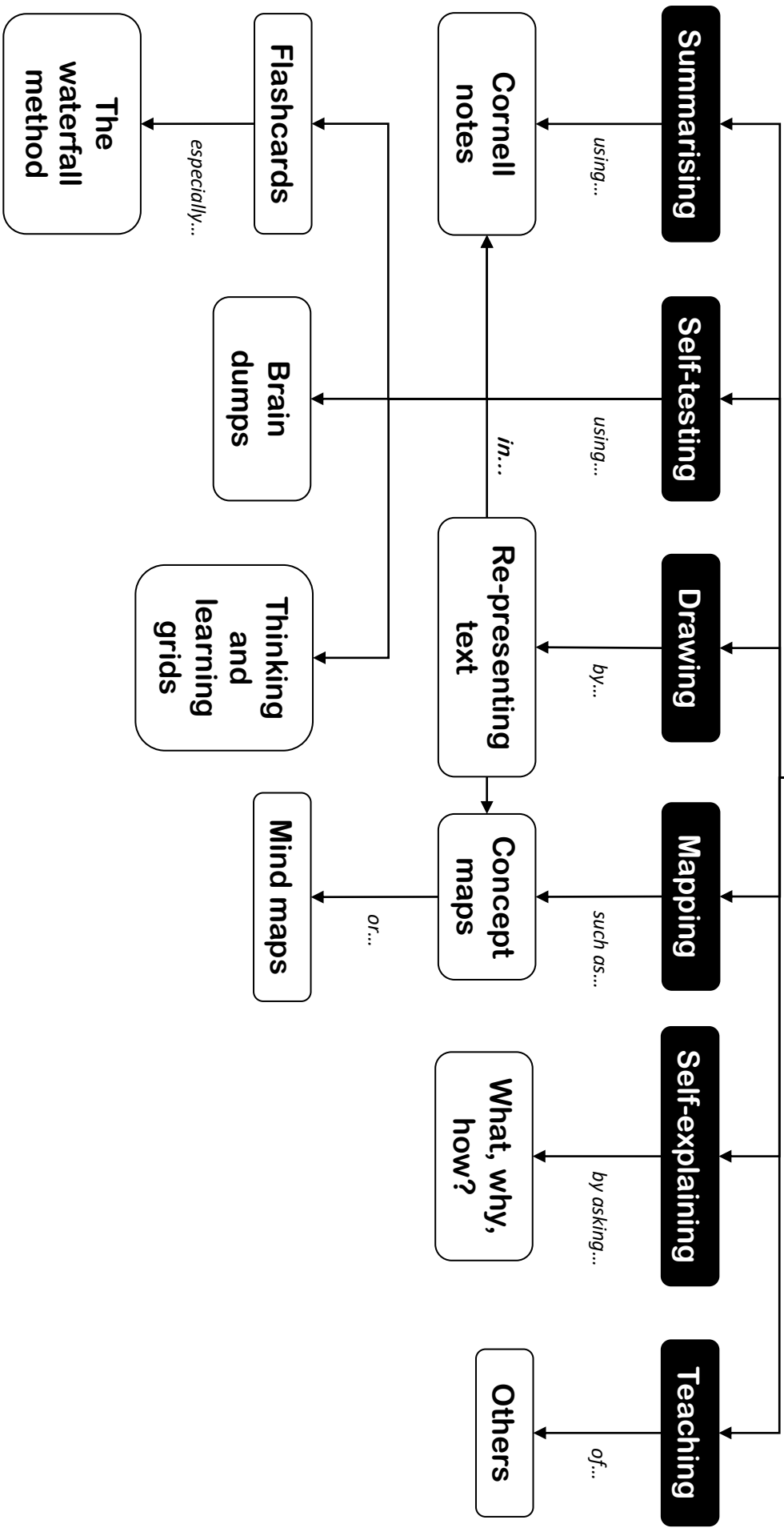
*Instead...*

**More effortful strategies, like the ones covered in this booklet, produce greater long-term learning gains.**

*It's important to realise that...*

**Difficulty is *desirable* even if it's not always *desired*.**

# Learning Strategies



## Summarising



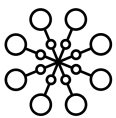
When asked a question such as ‘what have you done today?’, you’ll likely provide a summary. This involves you selecting, organising and integrating the key moments of your day. Taking a similar approach with your studies can have a very powerful effect on your learning. What is absolutely key is that you use your own words and don’t mindlessly copy your notes or revision guide.

## Self-testing



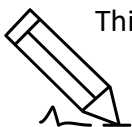
Research has shown that every time you bring a memory to mind, you strengthen it. And the more challenging you make this retrieval, the greater the benefit. Self-testing improves the recall of information, transfer of knowledge and making inferences between information. Equally, there are many indirect effects such as a greater appreciation of what you do and don’t know, which helps you plan your next steps.

## Mapping



Mapping is a brilliant way of organising and learning information as I hope is demonstrated on various pages in this booklet. It helps you break down complex information, memorise it, and see the connections between different ideas.

## Drawing



This is about turning text into some form of drawing. Doing so involves you selecting, organising and integrating the information that matters, which forces you to think. This approach can be incorporated into the three strategies above too.

## Self-explaining



Continually ask yourself ‘How?’ and ‘Why?’ when studying a topic and then try to provide answers to these questions. Doing so helps you to see connections and differences between ideas. Self-explaining can also involve you saying loud the steps you’re taking when solving a problem. A recent analysis of 64 research studies showed that ‘it is better to ask a student to see if they can explain something to themselves, than for a teacher or book to always explain it to them’.

## Teaching



Einstein is supposed to have said ‘if you can’t explain it simply, you don’t know it well enough’. This strategy works best when you know in advance that you will be teaching it. As with self-explaining, you’re forced to select and organise what’s important so that your teaching is as clear as possible. Having someone to interact with and ask you questions prompted by your teaching strengthens your own learning.



# Flashcards



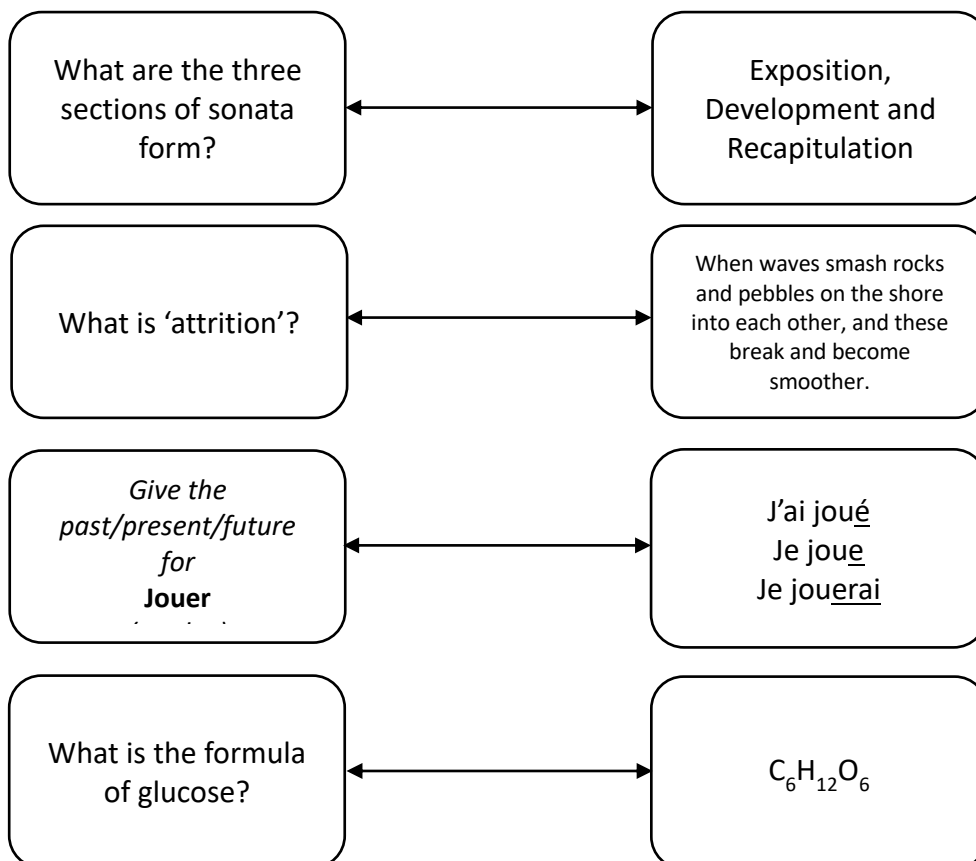
Flashcards have the potential to be a very powerful learning aid. However, how successful this is will depend on the thought you put into making them in the first place and then how they're used. It's important to remember that they're for testing not summarising.

## Making good flashcards

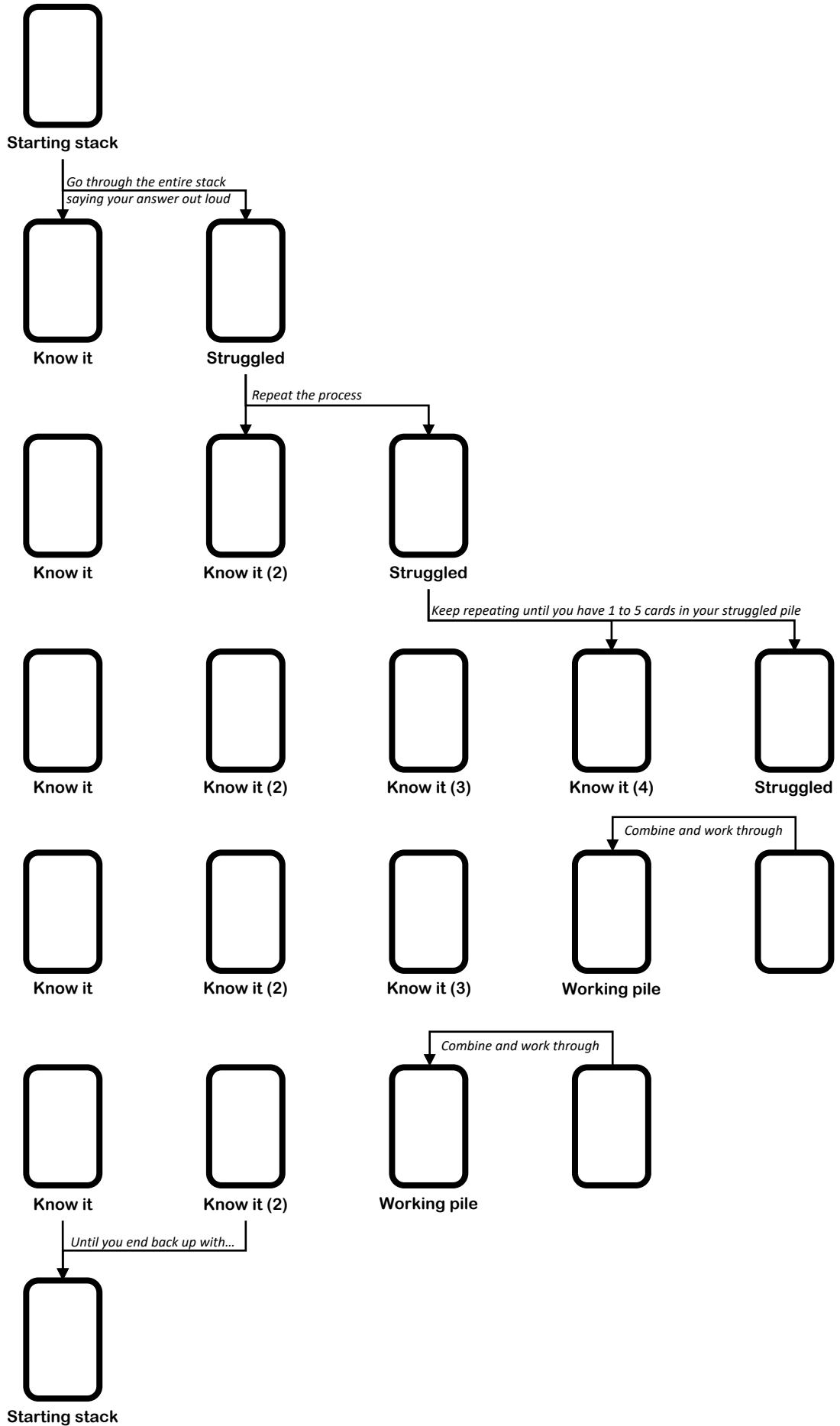
- One side of the flashcard should be a single question and its answer on the reverse
- Select the most important information to go on each flashcard. You could use topic checklists or bolded terms in your study guide to help you choose.
- Break complex concepts down so that they cover multiple cards.
- Use drawings to illustrate answers.

## Using flashcards

- Say your answer out loud and not just in your head. It's very important you are fully committed to your answer. Even better would be to write your answer out as this is what you would have to do in an exam.
- Use them both ways – look at the answers and say what the question is.

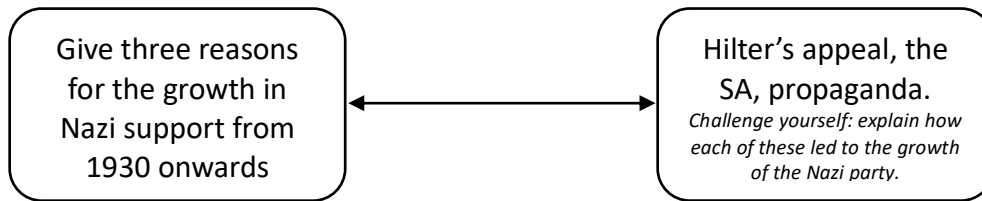


# Flashcards – The Waterfall Method



## Taking things further: making meaning with flashcards

- Ask yourself questions about individual cards. Once you can remember the information on the back associated with the prompt on the front, raise questions such as, 'What else is this related to?', 'Why is this important?' and 'How would I apply this information?'



- Group cards together in themes. Taking this additional step forces you to ask yourself 'Which cards have something in common with others?'. Also, this serves as a form of chunking, which helps you to remember information together instead of separately.
- Create a mind map with the cards. Explain all the connections you see between individual cards and between groups of cards. A related strategy is to use yarn or string to literally connect cards together.

## Brain dumps



This is so simple and so effective. Spend, say, fifteen minutes with a blank piece of paper and write down everything you know about a topic. Once finished, look at your class notes, textbook and/or revision guide and check that what you wrote is correct. Then look at what you forgot and focus on this. Date the sheet and store it away. At a later date, do the exercise again and compare the sheets – hopefully, you remember more the second (third, fourth etc.) time and will be able to see the improvement you've made visibly.

### Brain dumps made easier

Brain dumping can be a terrifying exercise. To create a gentler, if less effective, version, compile a list of key words, terms, people, countries etc. connected with a topic and write uninterrupted for fifteen minutes using these as prompts. For example. If your brain dump was on the 'Energy' topic in Physics, your prompts could be:

=  $\frac{1}{2}mv^2$  =  $wd/time$  =  $F \times d$  =  $mc\Delta T$  =  $mgh$  biofuel **chemical** conduction  
**conservation of energy** dissipate **distance** efficiency **elastic potential** electricity  
**electrostatic** force **fossil fuels** friction **geothermal** gravitational potential **heating**  
hydroelectric **insulation** Joule (J) **Kilogram (kg)** kinetic **lubricant** magnetic **metre**  
**(m)** Newton (N) **non-renewable** nuclear **power** renewable **Sankey diagram** solar  
**specific heat capacity** store **thermal** tidal **transfer** useful energy **wasted energy**  
water waves **Watt (W)** waves **wind** work done

# Cornell Note Taking Method

Topic:	Sub-topic:	Date:
<b>Recall cues</b>  Questions and tasks based on the notes opposite	<b>Notes</b>  Tips <ul style="list-style-type: none"><li>• Bullet points</li><li>• Symbols and abbreviations</li><li>• Write in your own words (don't mindlessly copy)</li><li>• Make sure it makes sense to you</li></ul> What to write <ul style="list-style-type: none"><li>• Keywords and ideas</li><li>• Important dates / people / places</li><li>• Diagrams / charts</li><li>• Formulas</li><li>• Examples / case studies</li><li>• Critical analysis e.g. strengths / weaknesses</li></ul>	
<b>Summary</b>  Summarise the main points in the notes above. Think about: <ul style="list-style-type: none"><li>• Why is this info important?</li><li>• What conclusions can I draw?</li></ul>		

# Topic: Weimar Republic (WR) in 1923 - Stresemann

## Recall cues

What crisis did the WR suffer in 1923?

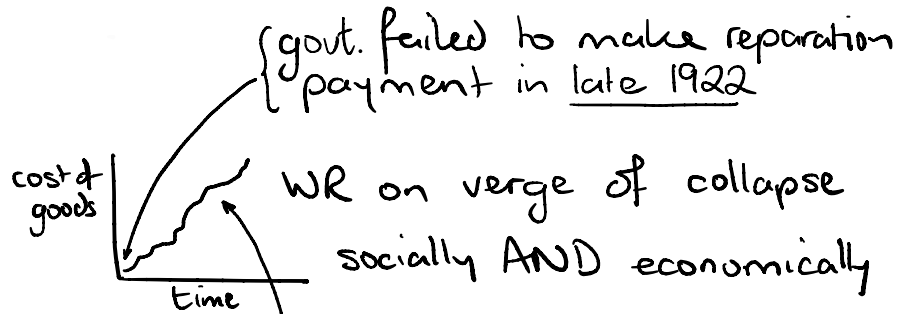
What did this mean to the average citizen?

What prompted this crisis?

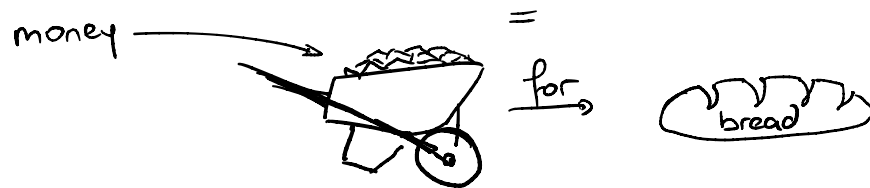
Name 4 things Chancellor Stresemann did that helped overcome this crisis?

What effect did each of these have?

## Notes



## HYPERINFLATION CRISIS



• Aug 1923 - STRESEMANN becomes Chancellor and over 3 months... ~~HYPERINFLATION CRISIS~~

↓ How?

- ① calls off passive resistance of workers in Ruhr ⇒ goods produced again; ends printing of (£) for workers
- ② Promises to restart reparations (Belgium & France leave Ruhr by 1925). See also: The Dawes Plan (1924) and The Young Plan (1929).
- ③ New currency, Rentenmark, introduced. Limited printing ⇒ (£) ↑ value ⇒ economic confidence ↑
- ④ Reduces government spending ⇒ budget deficit ↓

## Summary

Germany fails to pay France & Belgium → invade Ruhr and seize goods

Germans go on strike = passive resistance  
Govt. prints lots more money → CRISIS

Stresemann elected Chancellor

- solves crisis by
- ① Ends strikes
  - ② Promises to restart reparations
  - ③ New currency
  - ④ Reduces govt. spending

HYPERINFLATION	Jan '22: £1 = 764 marks
	Jan '23: £1 = 71,888 marks
	July '23: £1 = 1,413,648 marks
	Sept '23: £1 = 3,954,408,000

Topic:

# Covalent Bonding

Recall cues

In covalent bonding, electrons are .... ?

This results in each atom involved achieving a ....

Between what elements are covalent bonds formed?

What is a covalent bond?

How do you work out how many covalent bonds an atom has?

Draw dot-and-cross diagrams for:

- NH<sub>3</sub>
- N<sub>2</sub>
- CO<sub>2</sub>
- H<sub>2</sub>O
- CH<sub>4</sub>

Notes

• Covalent bonding involves the sharing of electrons → each atom involved ends up with a FULL OUTER SHELL.

• Occurs between non-metals only

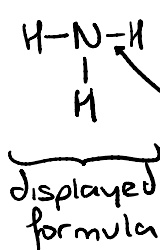
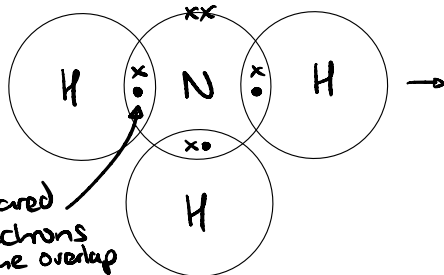
• A covalent bond is a shared pair of electrons

• 8 - group no.\* = the no. of covalent bonds

E.g. nitrogen has 8 - 5 = 3 covalent bonds.

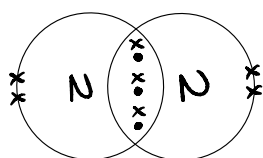
5 x's as nitrogen is in group 5

shared electrons in the overlap

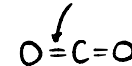
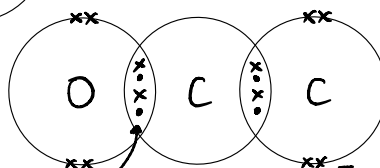


\* Hydrogen always has 1 covalent bond

triple bond



double bond

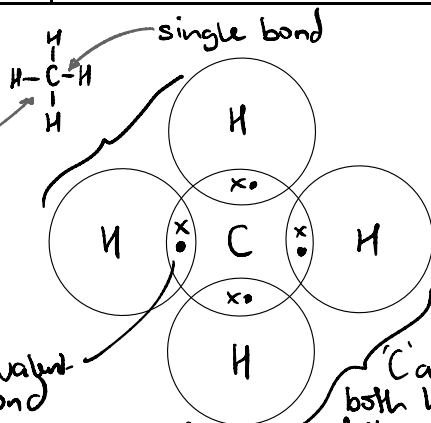


4 e's as C is in grp 4

6 x's as O in grp 6

Summary

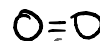
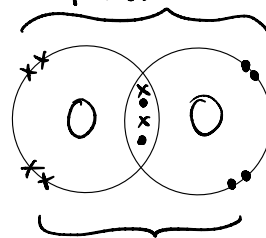
C in grp 4 = 8 - 4 covalent bonds



covalent bond 'shared electrons'

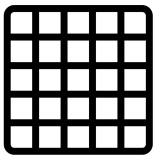
'C and H' both have full outer shells

both 'O's have a full outer shell



double bond

# Thinking and Linking Grids



These force you to think deeply about an area of a subject you've studied. Below is an example grid for Macbeth along with the instructions. It's possible for you and your friends to make grids of your own. Create a 6 x 6 grid and look through your class notes and study guides to identify key people, ideas, themes, countries etc. to populate the grid with. Ask your teacher to double-check them and share with your classmates.

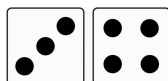
## 'Macbeth' Thinking and Linking Grid (created by @SPryke2)

	1	2	3	4	5	6
1	Macduff	Guilt	Infanticide	Power	Murder	Tyranny
2	The Supernatural	Light	Prophecy	Visions and Hallucinations	Hamartia	Animal Imagery
3	Lennox	Equivocation	Witches	Macbeth	Morality	Lady Macbeth
4	Hubris	Masculinity	Kingship	Appearance vs Reality	Violence	Children
5	Sleep	Banquo	Loyalty	Hands	King Duncan	Time
6	Blood	Regicide	Lady Macduff	Ambition	The porter	Darkness

## Instructions

You need a pair of dice.

1. Roll your dice to get the co-ordinates of your first box and find the word/phrase in it. Start with the numbers along the side first. For example:

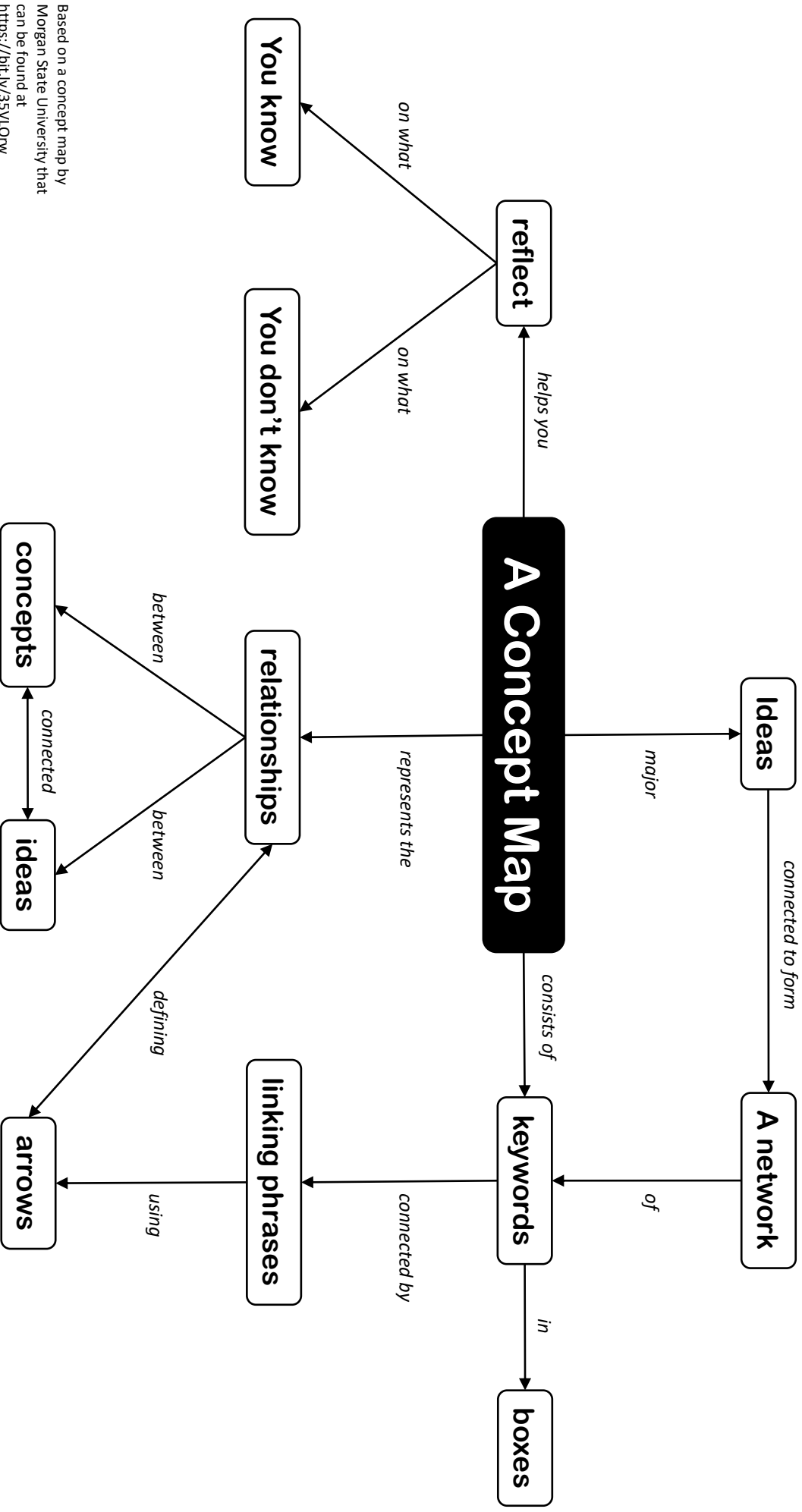


would equal 'Macbeth'.

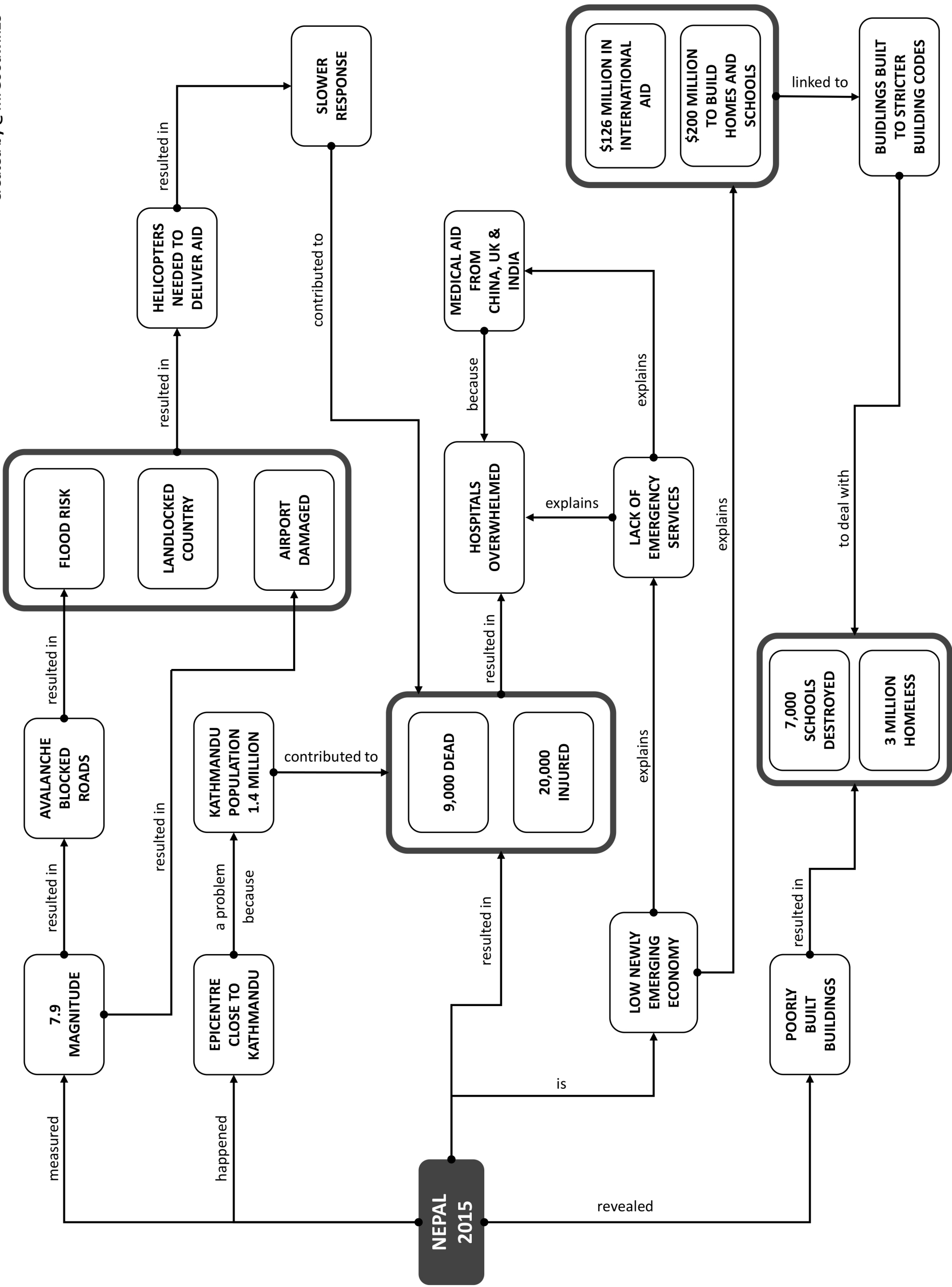
2. Write how your word/phrase links to the play. For example, for 'Macbeth' you could talk about how he is a loyal soldier at the beginning of the play who is corrupted by ambition and falls into a cyclical nature of violence in order to preserve the power that he has pursued.



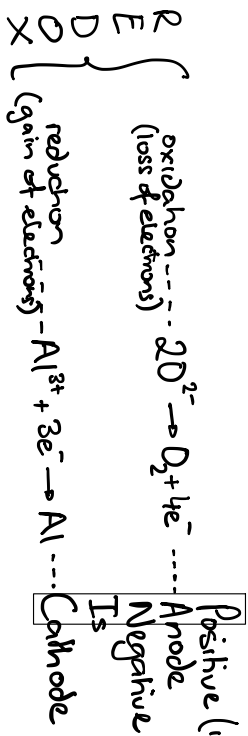




Based on a concept map by  
 Morgan State University that  
 can be found at  
<https://bit.ly/35VLOw>



# A Mind Map



aluminium is higher than carbon in the reactivity series

a relative measure of how readily a metal will become an ion (or even remain one)

most reactive: group 1  
 group 2  
 group 3  
 carbon  
 transition metals  
 least reactive

e.g. → potassium, sodium, lithium  
 most reactive

electron lost further from nucleus ∴ weaker electrostatic attraction

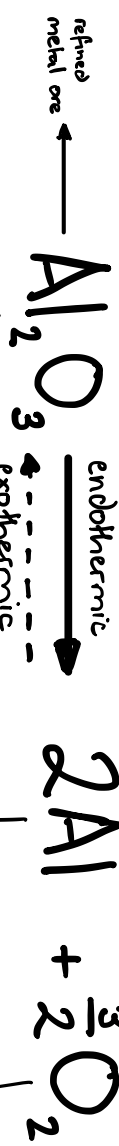
breaking down into simpler substances — decomposition by electrolysis

molal mass	51g	102 g/mol	1.0 moles	21g	0.75 moles
Mr	51	102	21	21	21
Moles	0.5	0.5	1.0	0.5	0.75
Mass	25.5g	51g	21g	10.5g	15.75g

$2Al_2O_3 \rightarrow 4Al + 3O_2$   
 Conservation of mass

electrolysis can take place at a lower temperature because  $Al_2O_3$  can dissolve in cryolite (m.p. ~ 1000°C) cheaper running costs.

very high melting point ~ 2100°C

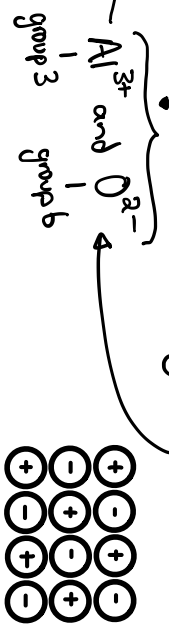


white solid at room temperature

ionic compound

giant lattice (regular, repeating)

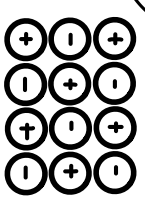
made up of oppositely charged ions



strong electrostatic force of attraction

strength of force is  $\propto \frac{1}{r^2}$

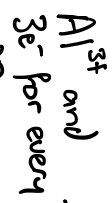
numerator is large due to high charge on ions



of particles of model solid diagram

giant lattice

strong electrostatic force of attraction between metal ions and delocalised electrons



very strong attraction

high melting point ~ 2100°C

strong electrostatic attraction between positive nuclei and shared electrons

elements ending in 'gen' or halogens:  $H_2, N_2, O_2, F_2, Cl_2, Br_2, I_2$

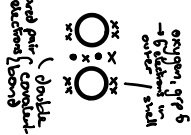
simple molecule

diatomic element

shared pair (double bond) of electrons

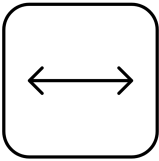
weak electrostatic force of attraction between molecules

low boiling point

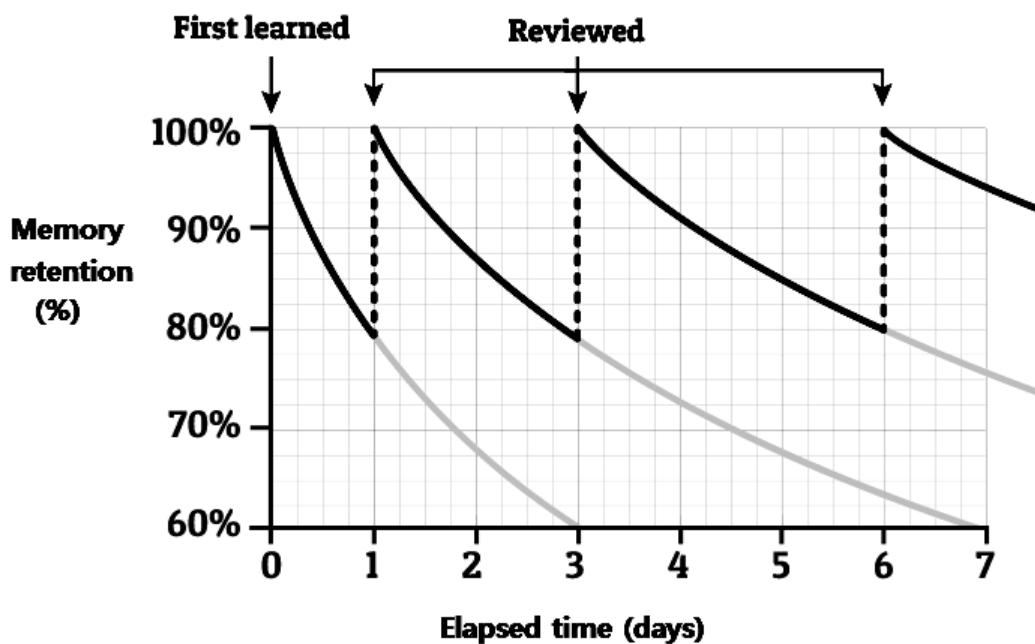


# Final learning tips

## Space out your learning on a subject



Spacing out your learning over time is far more effective than last minute cramming. This is based on research into how we forget and how we remember. The speed at which we forget something will depend on many factors such as the difficulty of the material, how meaningful it was to us, how we learned it and how frequently we relearn or remember it. What the last factor tells us is that when we learn something for the first time, we need to review it quickly afterwards. The more times we force ourselves to remember something, the longer the gap can be between reviews, which the diagram below illustrates nicely.



## Don't study one topic at a time – mix it up!



It's better to jumble up your learning within a subject instead of focussing solely on one topic at a time and block studying that. So, rather than studying AAA BBB CCC (each letter represents a topic within a subject), there is a significant benefit in approaching it as, say, ABC BCA CAB because you're more likely to see connections between topics, which will result in a better grade.

## A final self-testing and self-explaining tip – 'Just a Minute'



Based on the Radio 4 show, you must talk for a minute on the given concept or topic without pause, hesitation or repetition. You'll discover very quickly how well you know the topic while also consolidating the knowledge and understanding you retrieve from your memory.