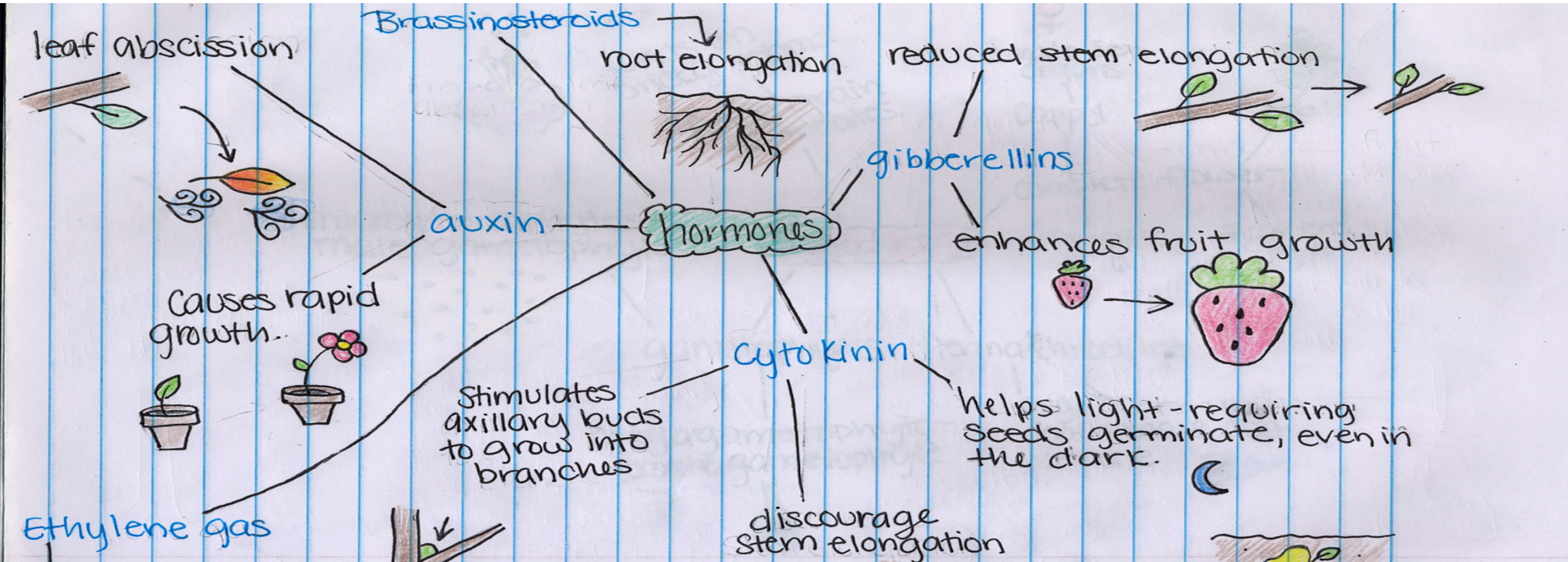


Using Concept Mapping as Note Taking Strategy in College-Level Science Courses



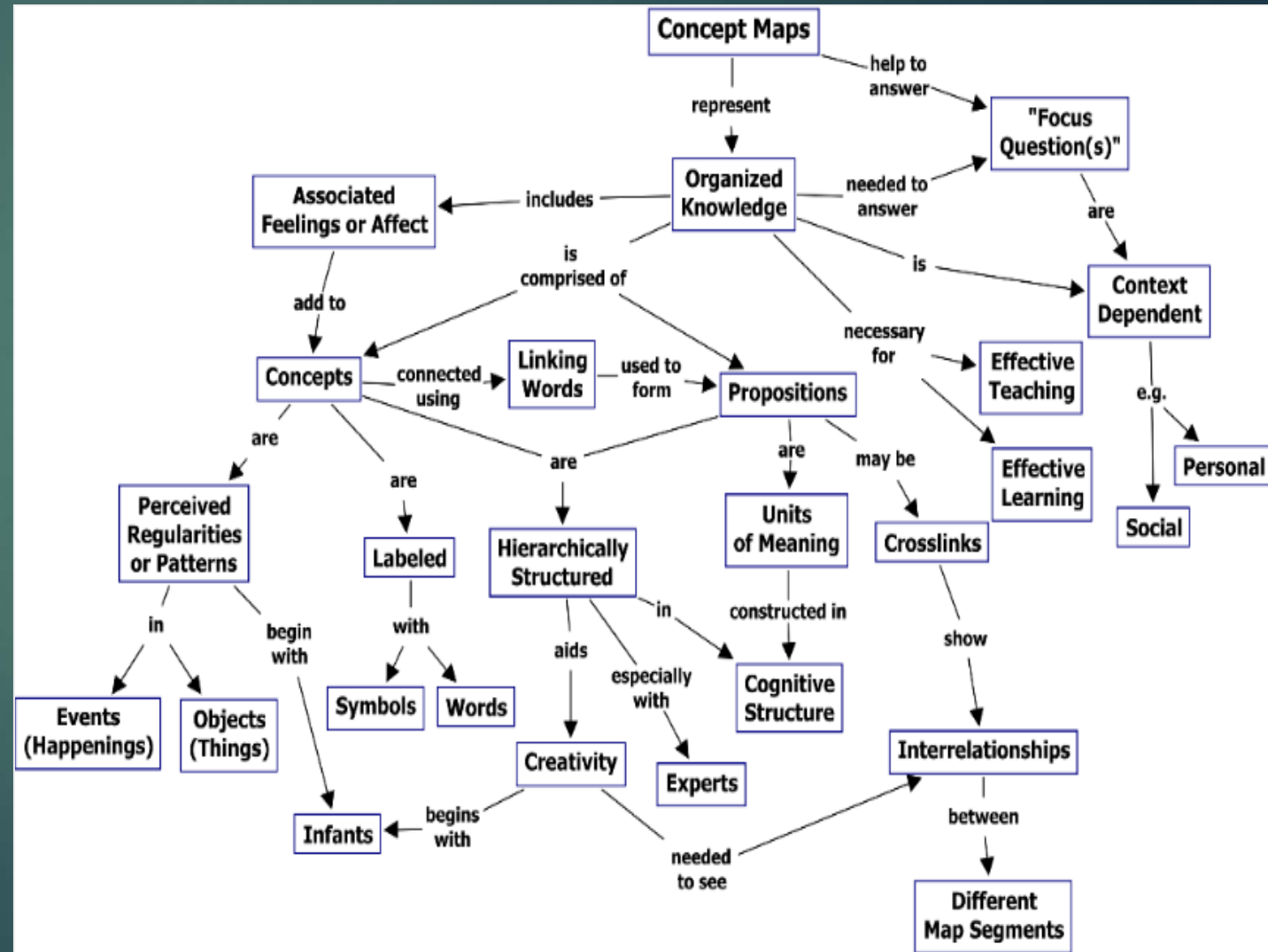
Danilo M. Baylen | Erin Duckett | Runeshia Parker

University of West Georgia

What are Concept Maps?

Concept Maps

- Graphical tools for organizing and representing knowledge (Novak)
- Concepts enclosed in circles or boxes
- Relationships between concepts demonstrated by connecting line/linking text

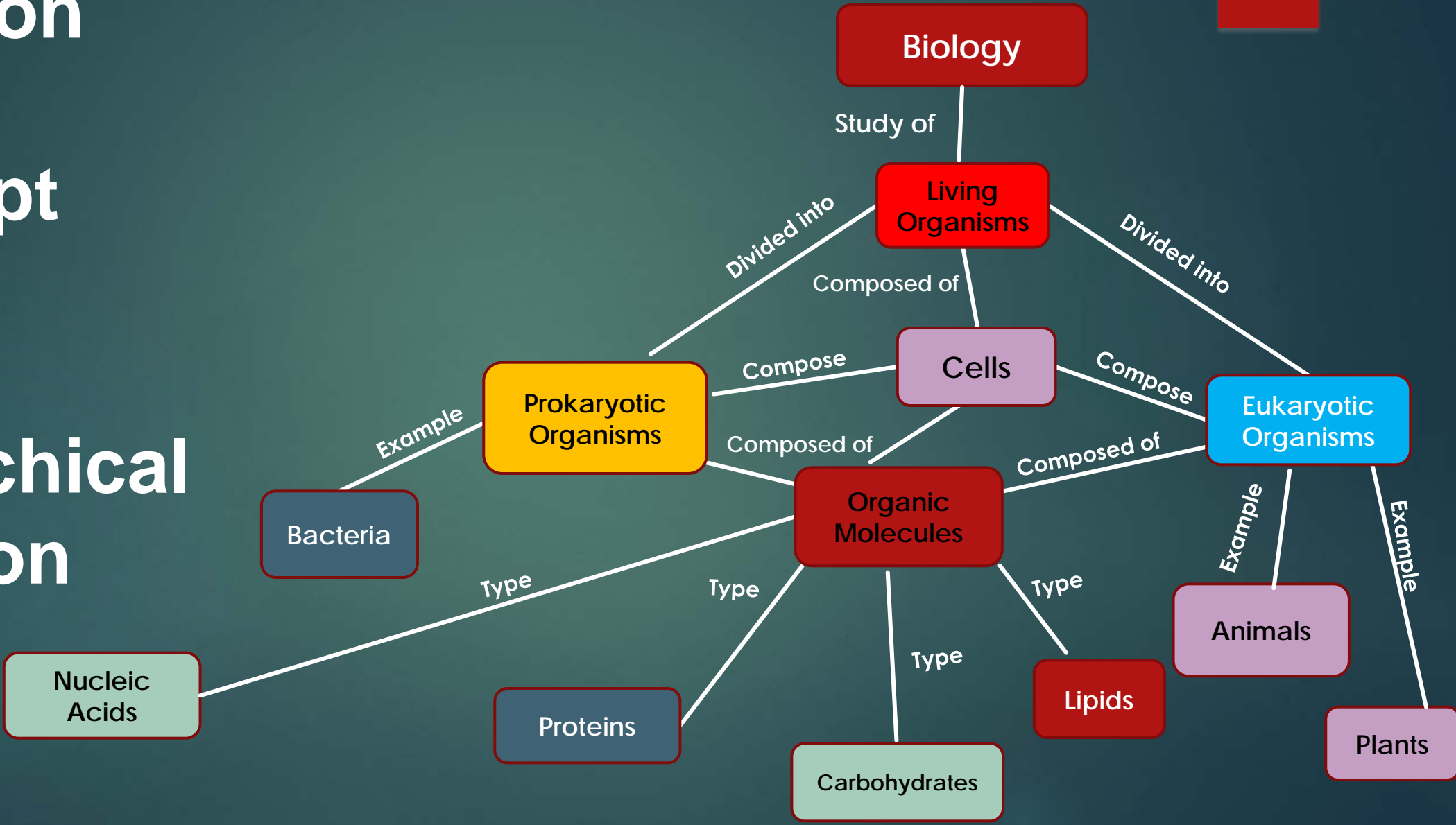


What is Biology?

Question

Concept List

Hierarchical Skeleton



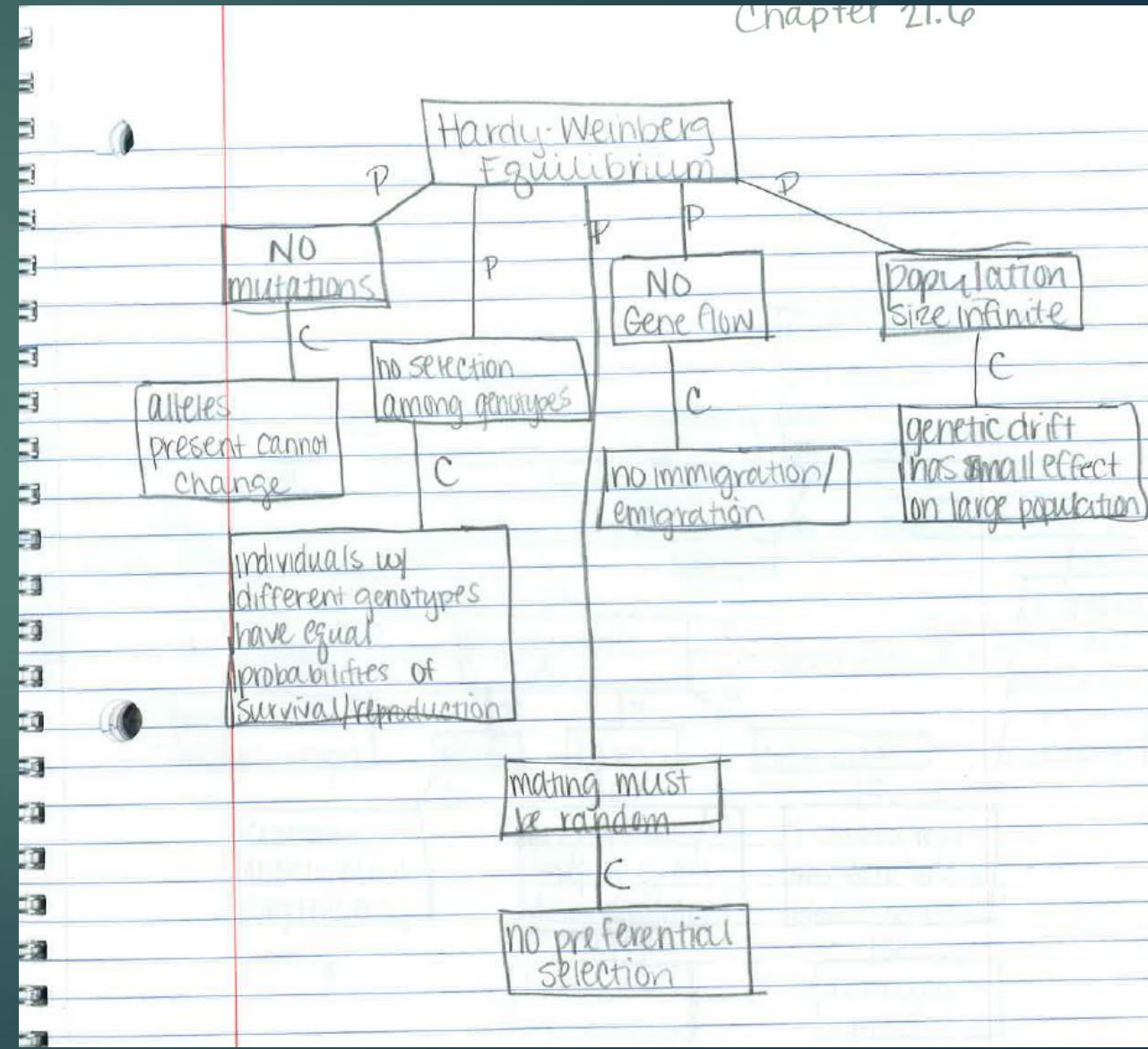
Why Concept Mapping?

- Students do not know *how* to take notes
 - Do not know how to recognize key ideas/concepts
- Students do not know *how* to study
 - Easily overwhelmed by **amount** of information covered
- **Students lack critical thinking skills**

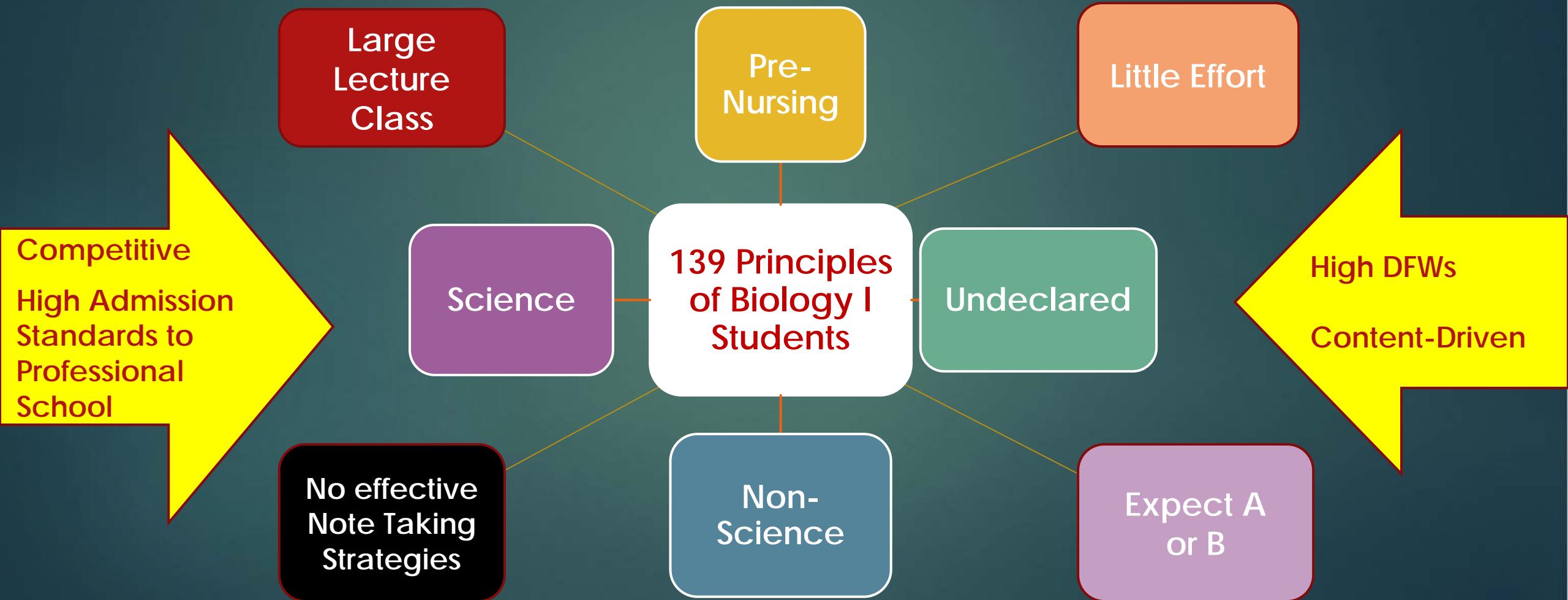


Why is the Concept Mapping Strategy Successful?

- High emphasis on connecting new knowledge *with* prior knowledge (Brinkerhoff & Booth, 2013; Novak)
- Personal
 - Make connections among concepts that make sense to learner
- Physically writing concepts
 - Reinforces major concepts
 - Reiterates major connections
- Visual representation of material

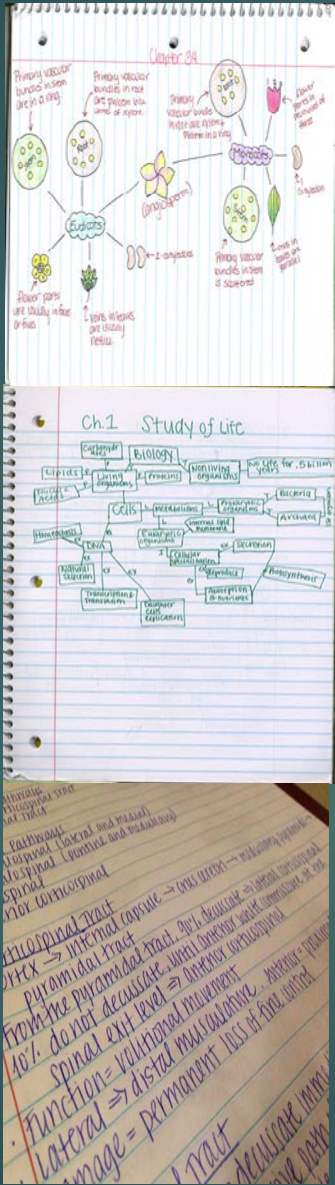


Introductory Biology



Procedures Fall 2015

139 Students



4 Unit Exams



Comp Final Exam

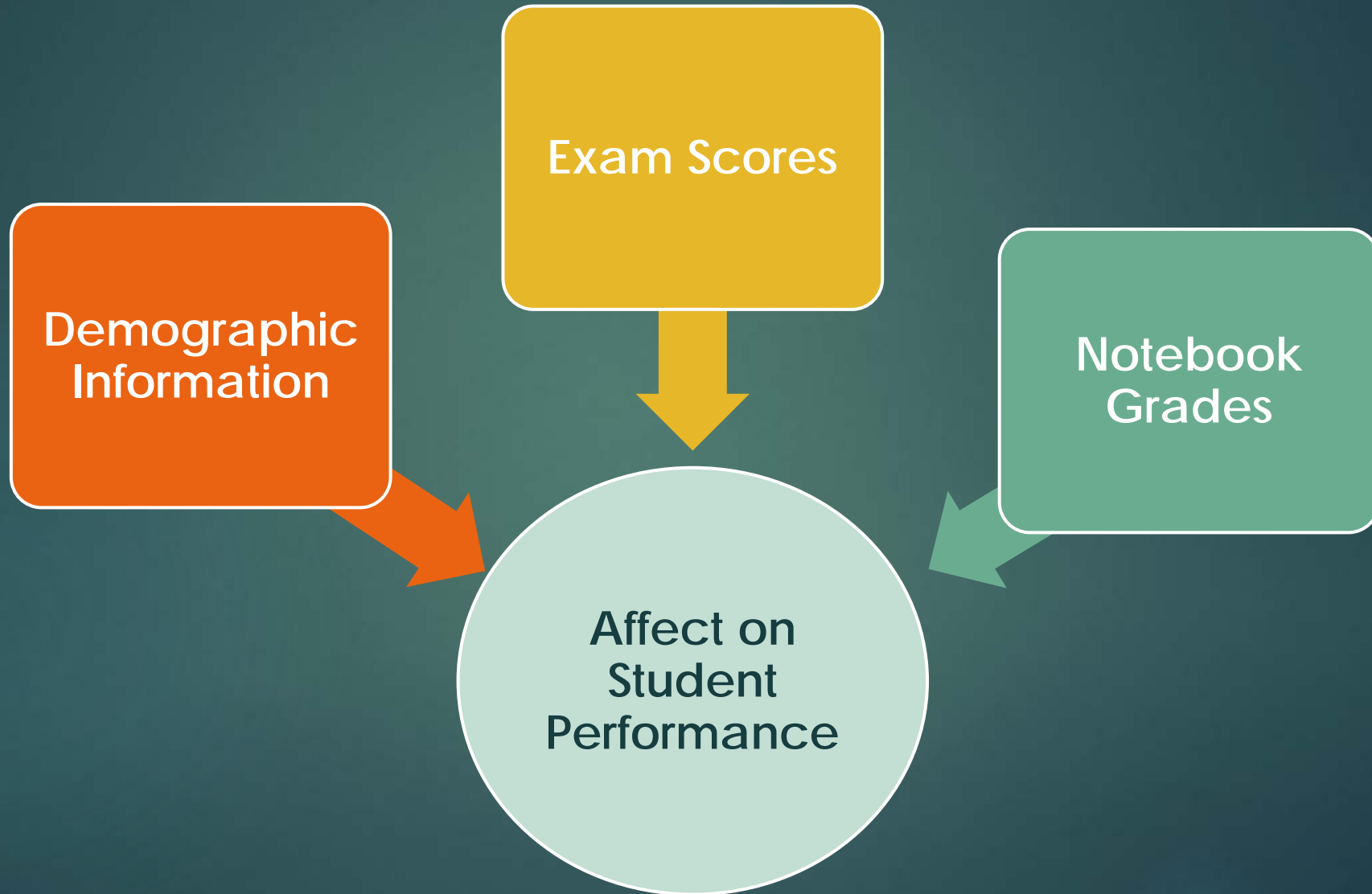


Student Performance

Notebooks Collected and Graded



Data Collection Fall 2015



Significant Relationships?

- Significant relationship between GPA earned and note taking strategy – **specifically traditional note taking strategy** to impact performance
 - **Students with GPA below B are not benefitting from traditional note taking strategy**
 - Traditional note taking strategy will not help students with prior GPA of less than B to perform better in the course

Prior GPA and Note Taking Strategies

Prior GPA	Note Taking Strategies			95% Confidence Interval	
		Mean	Std Error	Lower Bound	Upper Bound
Freshmen, first semester	Concept Mapping	83.894	1.678	80.573	87.214
	Visual Mapping	81.617	2.056	77.550	85.684
	Traditional Note Taking	86.902	1.625	83.687	90.117
Prior GPA Below B	Concept Mapping	83.490	3.064	77.428	89.552
	Visual Mapping	80.802	3.064	74.740	86.864
	Traditional Note Taking	70.811	2.772	65.327	76.294
Prior GPA Above B	Concept Mapping	83.687	3.475	76.813	90.561
	Visual Mapping	87.066	3.475	80.192	93.940
	Traditional Note Taking	86.959	2.457	82.098	91.819

Challenges



- 21st century learner
 - Procrastination
 - No effort made in submitting quality work
 - **Sloppy work -- Not** adhering to instructions
 - Obvious evidence student did **not learn** the material

- **Plagiarism**

- Google images of someone else's completed concept/visual map

Adjustments Made to the Fall 2016 Semester

- Provide students with a better understanding of what is expected from the
 - Provide a rubric
 - Discuss how submissions will be assessed
- Do check for plagiarism
- Remove traditional note taking & visual mapping as submission options
 - **Only** allowed for concept mapping

Assessment Rubric	Yes	No
The content used in concept maps is accurate/makes sense and can be found in each chapter covered. There is an appropriate # of concept maps submitted for each chapter covered. * 4 points		
There are at least 8 hand-drawn geometric figures with key words/phrases descending from main idea in each concept map (see example below). 2 points		
Each word/representation (e.g., circle, box, etc.) is linked to another by lines/arrows in each concept map. The lines/arrows in each concept map are paired with a text that identifies the linking relationship between the linked concepts. 2 points		
There is a major emphasis on important concepts/ideas in each concept map (i.e. underlining/bold print). 1 point		
Did not use Google images for completed concept maps for given chapters – this will be checked! 1 point		

Prior GPA and Final Exam Score Concept Mapping, Fall 2016

Prior GPA	N			95% Confidence Interval	
		Mean	Std Error	Lower Bound	Upper Bound
Freshmen, first semester	47	84.287	17.764	79.072	89.503
Prior GPA Below B	33	71.560	31.822	60.277	82.844
Prior GPA B & Above	31	86.728	24.341	77.428	95.657
Total	111	81.185	25.073	76.469	85.902

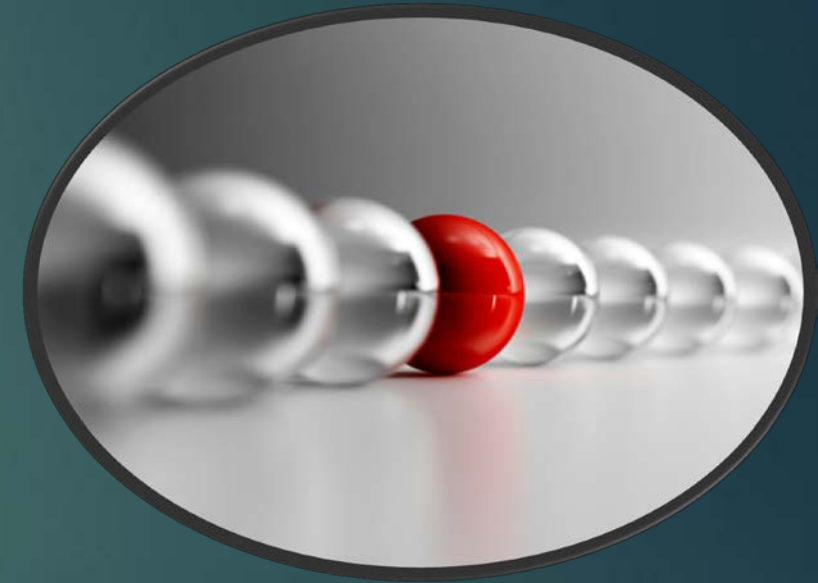
Our Statistician Said Yes!

Again, there is a significant relationship between GPA Prior and the final exam scores.

Freshmen, with **no college experience**, performed better on the final exam compared to those that have taken college courses previously and have GPAs equivalent a C or lower.

Students, with **GPAs of B or better** prior to taking BIO 1107, performed better on the final exam compared to those who had GPAs of C or lower.

NOTEBOOK AVERAGE POINTS and **FINAL EXAM SCORE** are highly correlated. $r = 0.731, p < .001$



Qualitative Data Fall 2016

N = 111	Positive	Negative	NRR	Total (%)
Concept Mapping as a Note Taking Strategy Helps Learn the Course Content	74 66.7	31 27.9	6 5.4	100
Concept Mapping as a Note Taking Strategy Helps in Reviewing for the Exams	70 63.06	34 30.63	7 6.31	100
Overall Opinion on the Use of Concept Mapping as a Note Taking Strategy	69 62.2	30 27.0	12 10.8	100

Midterm Qualitative Data Fall 2016

I do feel like the note taking strategy is helping me learn the material. However, I feel like if I would do it sooner rather than later it would help more. It would benefit me more if I did the note taking assignments as we went along with the chapters.

Yes, being in lecture is the first step in learning the material, but that alone will not force you to review your notes. Having to do concept maps make it impossible to not review the material multiple times.

Do you feel that the note taking strategy you are following is helping you learn the material?



Midterm Qualitative Data Fall 2016

Yes, I always go back over my concept maps. It makes it easier to see the way things flow. It also helps break my notes into sections.

Yes it actually does. By constructing the maps I can sometimes see the maps in my head and actually trace my way through it to come up with the answer I need.

Do you feel that the note taking strategy you are following is helping you review for the exams?



Midterm Qualitative Data Fall 2016

In my opinion I believe that the note taking assignment is very beneficial. I am doing much better on exams with it than without it.

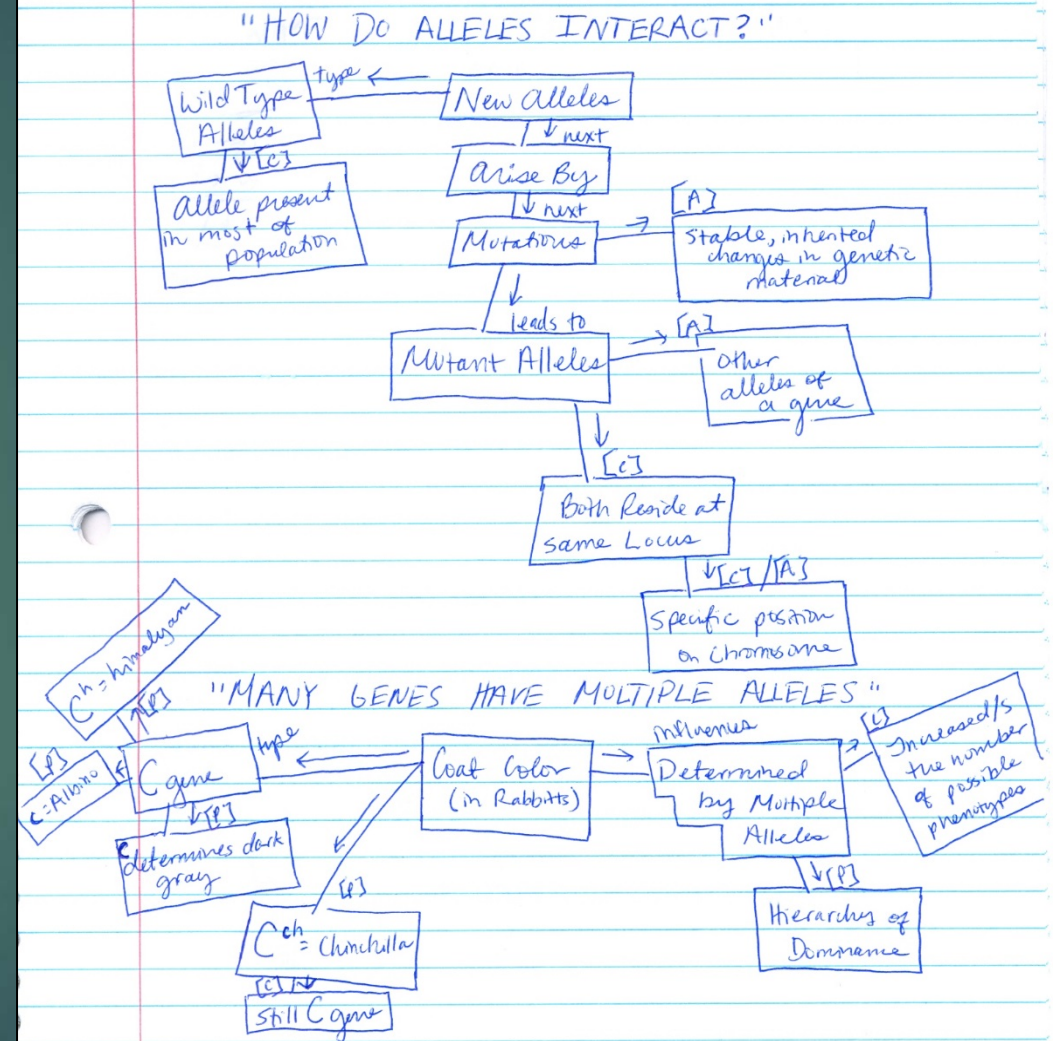
I like it, although it is time consuming it helps me study and remember material so I like it.

What is your overall opinion of the note taking assignment this far in the semester?



Reflections

- Never alone during this process
 - Undergraduate research assistant
 - Biology major
 - Extremely valuable - Could not have done this without her!
- Will need strong support from team/colleagues
 - There will be push back from students
- Definitely worth it!



References

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- Patrick, A. O. (2011). Concept Mapping as a Study Skill: Effects on Students Achievement in Biology. *International Journal of Education*, 3(1), 49-57.
- Sakiyo, J. & Waziri, K. (2015) Concept Mapping Strategy: An Effective Tool for Improving Students' Academic Achievement in Biology. *Journal of Education in Science, Environment and Health (JESEH)*, 1(1), 56-62.



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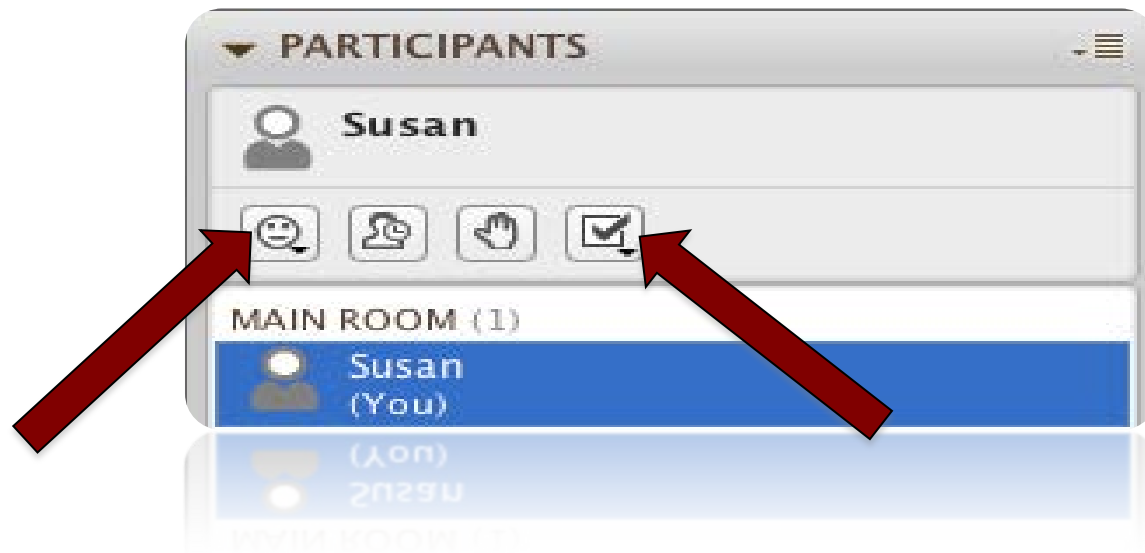
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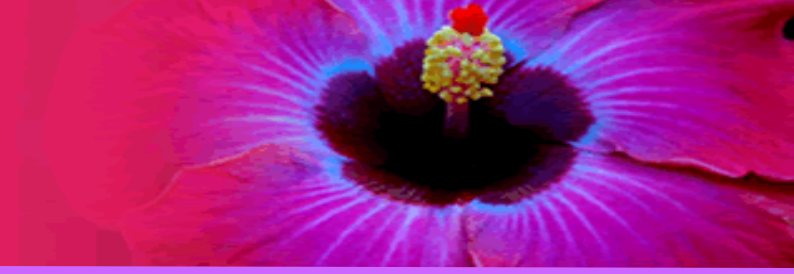


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Polls, smiles and handraising





You have a voice!

Audio Setup Wizard



Click on the Talk button. We won't be using Video.