

# Tips for Success in AP Biology from an AP Reader & Question Writer

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# Welcome...

[apbiopenguins.weebly.com](http://apbiopenguins.weebly.com)

- 7 Years of Classroom Experience
- 3 Years of AP Reading Experience
- 1 Year AP Question Writer
- 1 Year AP Mentor
- Last Year: 92% Pass Rate



# Agenda

- Advice
- Resources for Materials
- AP Reading Information
- AP Question Writing Information
- Strategies in the Classroom
- Contact Information



# Advice

- Implement one thing at a time
- Do what feels right
- You are only one person!



# Resources for Materials

- Facebook: National AP Biology Teachers
- AP Central – Info + Released FRQs
- HHMI Biointeractive
  - StickleBack Fish – Gene Regulation
  - Rock Pocket Mouse – Hardy-Weinberg Equilibrium
- Learn.Genetics
  - Mouse Party



# AP Reading Experience

- Collaboration with other teachers
- Insight to scoring guidelines  
(what is acceptable or not acceptable)
- 2018 AP Reading (Biology)  
Kansas City June 11 – 18

The logo consists of the letters 'A' and 'P' in a bold, sans-serif font. The 'A' is blue and the 'P' is green. They are positioned above a blue rounded rectangular box containing the website address.

[collegeboard.org/readAP](https://collegeboard.org/readAP)

# AP Reading Past

(b) The genetic composition of daughter cells produced by mitosis differs from that of the daughter cells produced by meiosis. **Describe** TWO features of the cell division processes that lead to these differences.

Feature	Description (1 point each row; 2 points maximum)	
	Mitosis	Meiosis
Number of divisions/ number of resulting cells	1 division/ 2 cells result	2 divisions/ 4 cells result
Ploidy of daughter cells	<ul style="list-style-type: none"><li>• Same as parent cell</li><li>• Diploid</li><li>• (<math>2n \rightarrow 2n</math> or <math>n \rightarrow n</math>)</li></ul>	<ul style="list-style-type: none"><li>• Half of parent cell</li><li>• Haploid</li><li>• (<math>4n \rightarrow 2n</math>; <math>2n \rightarrow n</math>)</li></ul>
Chromatids separate	Occurs	Not in meiosis I/only in meiosis II
Crossing over	Does not occur	Occurs
Homologous chromosomes separate/independently assort	Does not occur	Occurs

○ Issues:

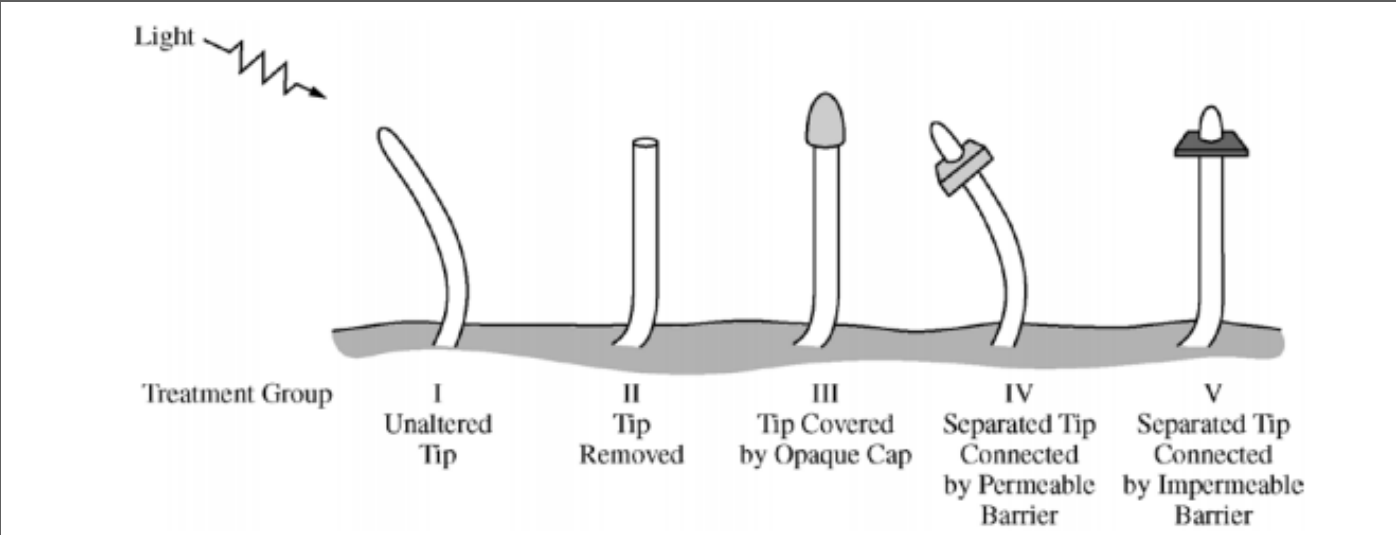
○ Contrast using BOTH processes

○ Vague Descriptions

# AP Reading Past

- Issues:

- Not using diagram to assist with support
- Not comparing to treatment group I



The diagram illustrates five experimental treatments for phototropism in plant shoots. A light source is shown in the upper left corner, emitting light rays towards the right. The treatments are labeled as follows:

- I Unaltered Tip:** The shoot is intact and bends towards the light.
- II Tip Removed:** The shoot is cut at the tip and grows straight up.
- III Tip Covered by Opaque Cap:** The shoot has a dark cap on its tip and grows straight up.
- IV Separated Tip Connected by Permeable Barrier:** The tip is cut and placed on a permeable barrier; the shoot bends towards the light.
- V Separated Tip Connected by Impermeable Barrier:** The tip is cut and placed on an impermeable barrier; the shoot grows straight up.

Phototropism in plants is a response in which a plant shoot grows toward a light source. The results of five different experimental treatments from classic investigations of phototropism are shown above.

(a) **Give support** for the claim that the cells located in the tip of the plant shoot detect the light by comparing the results from treatment group I with the results from treatment group II and treatment group III.

**Support (2 points maximum)**

- In treatment II the tip is removed and the plant no longer bends toward light.
- In treatment III the cap blocks the light to the tip and the plant no longer bends toward light.



# AP Reading Past

In a certain species of plant, the diploid number of chromosomes is 4 ( $2n = 4$ ). Flower color is controlled by a single gene in which the green allele ( $G$ ) is dominant to the purple allele ( $g$ ). Plant height is controlled by a different gene in which the dwarf allele ( $D$ ) is dominant to the tall allele ( $d$ ). Individuals of the parental (P) generation with the genotypes  $GGDD$  and  $ggdd$  were crossed to produce  $F_1$  progeny.

**Predict** the possible phenotypes and their ratios in the offspring of a testcross between an  $F_1$  individual and a  $ggdd$  individual. **(1 point)**

**Prediction (1 point)**

- 1 green dwarf: 1 green tall: 1 purple dwarf: 1 purple tall

○ Issues:

- Not writing in complete sentences
- Not using the prompt to use correct phenotypes

# AP Reading Past

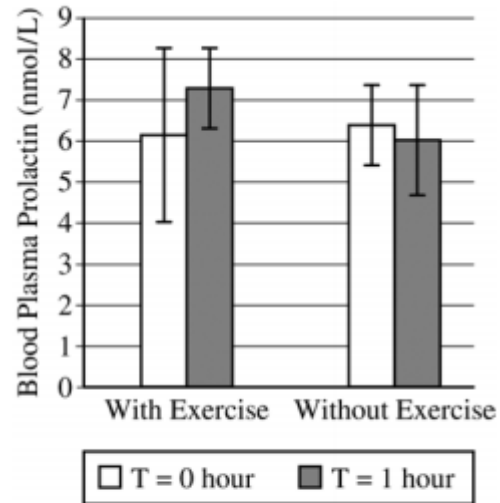


Figure 1. Effect of exercise on blood prolactin levels in adult males. The data represent the mean  $\pm 2SE_{\bar{x}}$ .

Using evidence from the specific treatments, **determine** whether prolactin release changes after exercise. **Justify** your answer. (2 points)

**Determination (1 point)**

- Exercise does not affect prolactin release

**Justification (1 point)**

- The T=1 hour with-exercise mean and the T=1 hour without-exercise mean are within  $\pm 2SE_{\bar{x}}$ .
- The  $\pm 2SE_{\bar{x}}$  error bars for the T=1 hour with-exercise time point and the T=1 hour time without-exercise point overlap.
- The  $\pm 2SE_{\bar{x}}$  error bars for the T=0 and T=1 hour with-exercise time points overlap.
- The T=0 hour with-exercise mean and the T=1 hour with exercise-mean are within  $\pm 2SE_{\bar{x}}$ .

○ Issues:

○ Lack of understanding of statistics/error bar meaning

○ Using the data from the given prompt to justify their determination

# AP Reading Past

TABLE 1. EFFECT OF 0.1 mM CAFFEINE ON MEMORY IN BEES

Treatment	Memory (average probability of revisiting a nectar source $\pm 2SE_{\bar{x}}$ )	
	10 Minutes	24 Hours
Control	$0.72 \pm 0.09$	$0.41 \pm 0.07$
Caffeine	$0.83 \pm 0.07$	$0.78 \pm 0.08$

(a) On the axes provided, **construct** an appropriately labeled graph to illustrate the effect of caffeine on the probability of bees revisiting a nectar source (memory). **(3 points)**

**Construct graph (3 points)**

- Correctly plotted means on a bar graph/modified bar graph
- Appropriate labels, units, and scaling
- Correctly plotted error bars

○ Issues:

- Scale, Label Axis, and Units
- Type of Graph
- Error Bars

# AP Reading Past

(c) **Design an experiment** using artificial flowers to investigate potential negative effects of increasing caffeine concentrations in nectar on the number of floral visits by bees. **Identify** the null hypothesis, an appropriate control treatment, and the predicted results that could be used to reject the null hypothesis. **(3 points)**

**Identification (3 points; 1 point per row)**

Null hypothesis	Increasing caffeine concentration has no effect (on the number of floral visits by bees).
Control	(Nectar/flowers with) no caffeine
Predicted results	<ul style="list-style-type: none"><li>• The number of floral visits by bees is different at increasing caffeine concentrations.</li><li>• The number of floral visits by bees is different than the control.</li></ul>

- Issues:
  - Writing extensive experimental designs
  - Null hypothesis & controls

# AP Question Writing Info

- Outline for Questions Writing
  - Learning Objective – use the terms of the L.O. in the Qs
  - Stimulus – background information to better understand Q
  - Stem – the question with the terms from L.O.
  - Options – multiple choice options

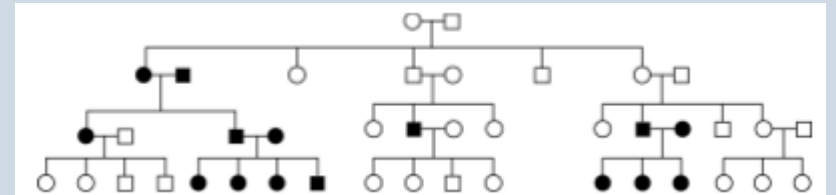
# AP Question Writing Info

## Learning Objective:

LO 3.12: The student is able to construct a representation that connects the process of meiosis to the passage of traits from parent to offspring.

## Stimulus:

In the pedigree to the right, circles represent females, squares represent males, and shaded figures represent individuals expressing a specific trait.



## Stem:

The expression of this trait is most likely due to which of the following?

## Options:

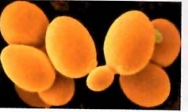
- (A) Sex-linked dominant inheritance
- (B) Sex-linked recessive inheritance
- (C) Autosomal dominant inheritance
- (D) Autosomal recessive inheritance
- (E) A codominant relationship of a single pair of alleles

Answer: D

# AP Question Writing Resources

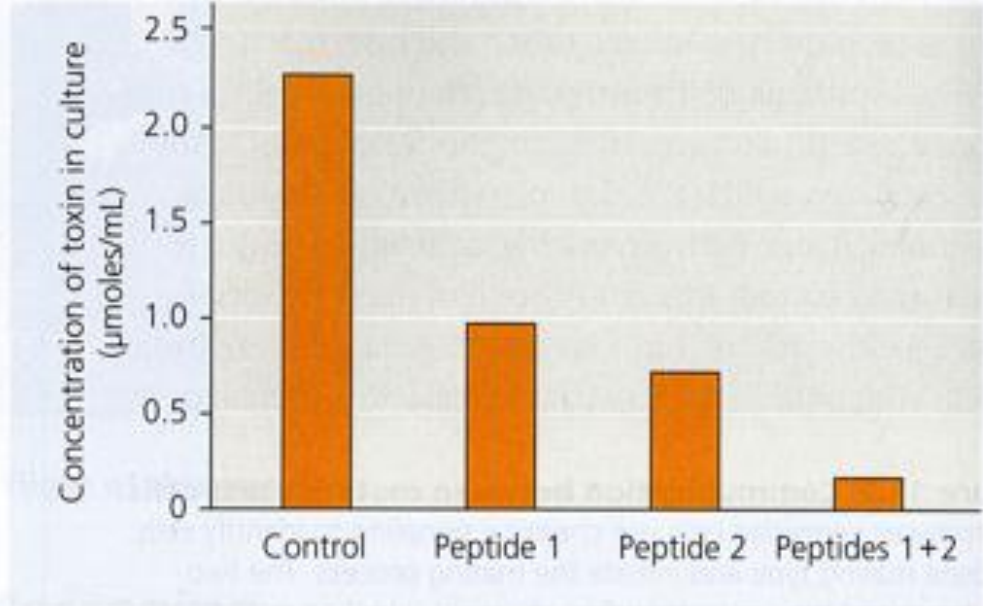
- HHMI – Data Points
- Campbell Biology
  - Scientific Skills Exercises
  - Problem Solving Exercises
- Science Articles

**Scientific Skills Exercise** ▶ Budding yeast



*Making a Line Graph and Converting Between Units of Data*

**How** Proc Budd and a pot  
**How** yeas' to a after of th fem  
**Dat**



Condition	Concentration of toxin in culture (μmoles/mL)
Control	2.25
Peptide 1	1.0
Peptide 2	0.7
Peptides 1+2	0.2

**Data from** N. Balaban et al., Treatment of *Staphylococcus aureus* biofilm infection by the quorum-sensing inhibitor RIP, *Antimicrobial Agents and Chemotherapy* 51(6):2226–2229 (2007)

12.0	12.0
13.0	12.5
14.0	12.0

**Further Reading** G. Simchen, Commitment to meiosis: What determines the mode of division in budding yeast? *BioEssays* 31:169–177 (2009). doi:10.1002/bies.200800124

**AP**® SPs 1.1, 1.4, 2.2, 2.3, 5.1, 5.2, 5.3

# Strategies from my Classroom

## Classroom Schedule

- Mondays – Quiz
- Tuesdays – Vocabulary
- Wednesdays – FRQ
- Thursdays – Scientific Applications
- Fridays – Article Reviews/Peer Discussions

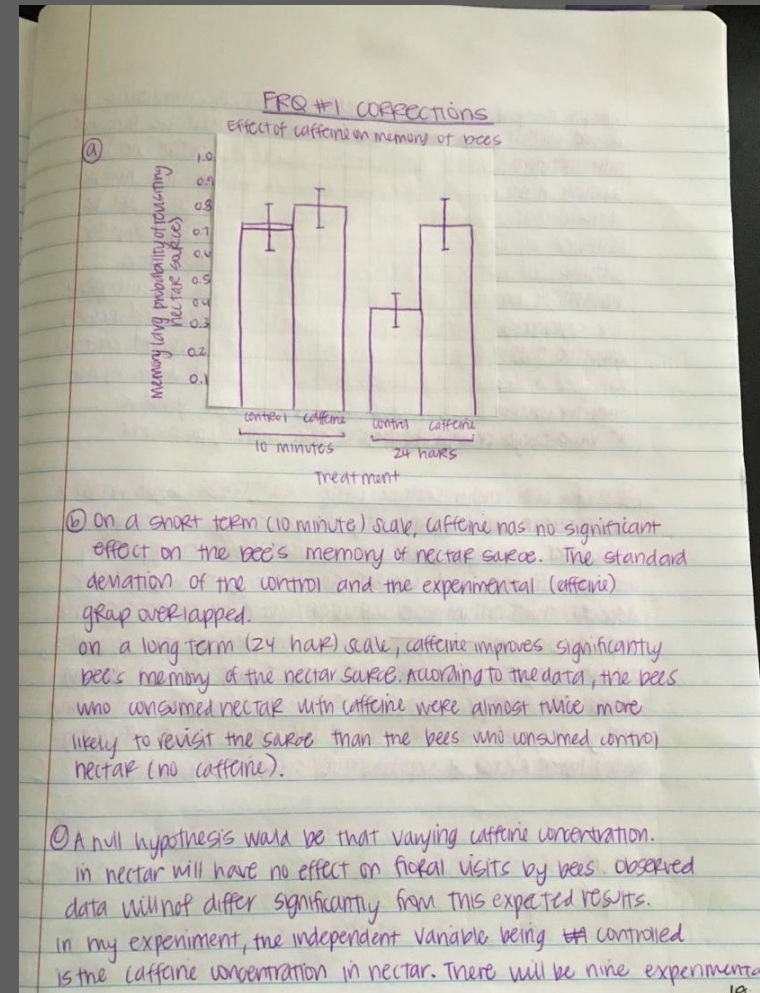




# Strategies from my Classroom

## FRQ Notebook

- Located in Composition Notebook
- Tape/Glue Question
- 20 Minutes to Write FRQ
- Self/Peer Grade
- Tape/Glue Rubric
- Corrections



# Strategies from my Classroom

## AP Review Binder

- Practice Questions/Exams
- Review Books
- Videos/Animations
- Inquiry/Applications



## AP Biology AP Exam Review Notebook



Assigned: 2/13

Due: 5/8 @ 3:15PM

You will be compiling a review notebook to assist you to prepare for the Ga Milestone (5/1 & 5/2) and AP Exam (5/8). This assignment will be an exam grade (250 points). The following are the items that are to be completed and placed into your review notebook. It would be a WISE decision to include your Race to the Slopes quizzes for extra review questions. Extra credit may be given for completion of extra items. This is a long term assignment & NO LATE SUBMISSIONS will be accepted under any circumstance! The notebook is due on Monday, May 8, 2016 by 3:15pm to Mrs. Jones' classroom.

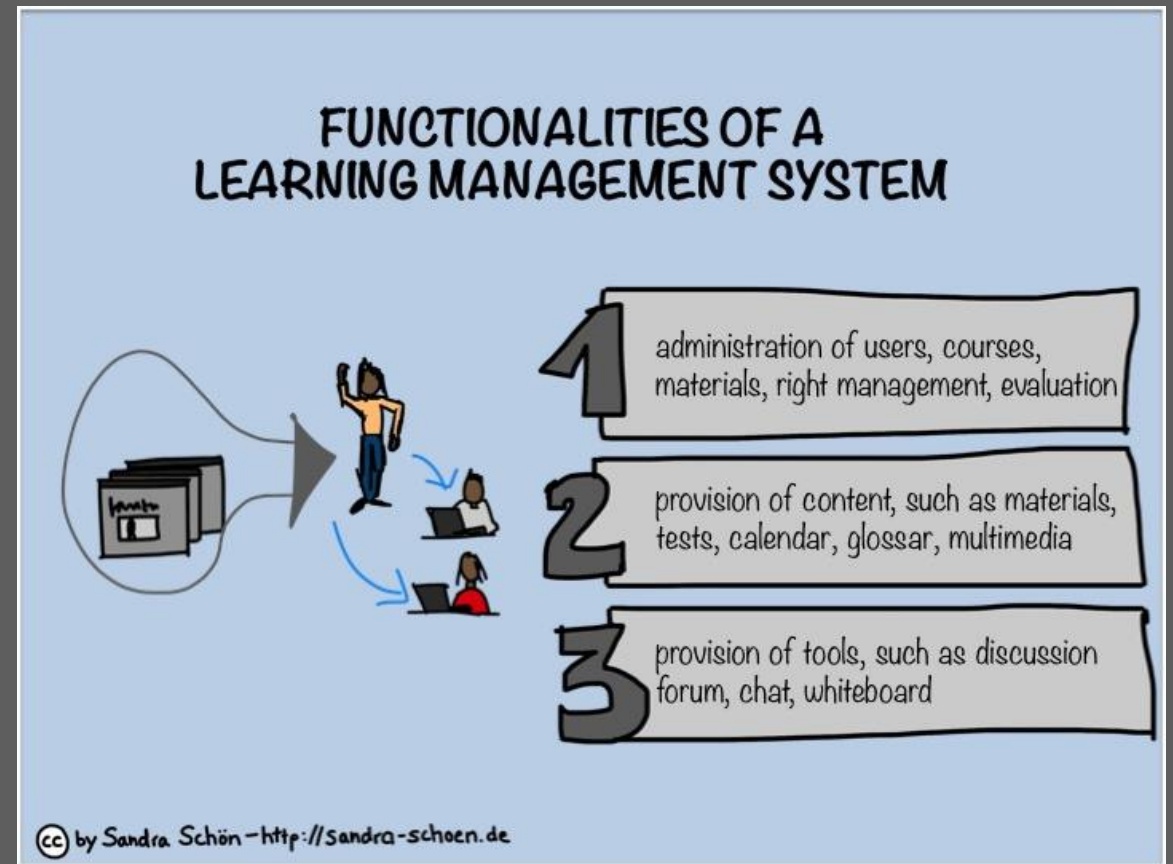
✓	Dates	Items to be Completed
	3/1	Diagnostic Test – Barron's PreTest (AP) – itsLearning (A)
	3/3	Diagnostic Test - PreTest (Ga Milestone) – USATestPrep (B)
	3/8	CHECKPOINT (40 POINTS)
	3/10	Lowest EOCT Section (90% mastery) – USATestPrep (D)
	3/13	Complete 1 Barron's Practice Test (C)
	3/17	Second Lowest EOCT Section (90% mastery) – USATestPrep (D)
	3/24	Middle EOCT Section (90% mastery) – USATestPrep (D)
	3/27	Complete released exam – itsLearning (E)
	3/31	CHECKPOINT (120 POINTS)
	4/10	Complete 1 Barron's Practice Test (C)
	4/14	Second Highest EOCT Section (90% mastery) – USATestPrep (D)
	4/17	Laboratory Review/Science Practices – 6 videos (H & I)
	4/21	Highest EOCT Section (90% mastery) – USATestPrep (D)
	4/22	AP Biology Practice Exam (student choice) (F)
	4/24	Complete released exam – itsLearning (E)
	4/28	CHECKPOINT (200 POINTS)
	4/30	Full-Length Practice Ga Milestone Exam – USATestPrep (G)
	5/8	Completed Notebook due to Mrs. Jones's room by 3:15 pm 250 POINTS GOING IN GRADEBOOK

\* additional points are either Barron Review Sections or student choice point assignments (see the student choice list)

# Strategies from my Classroom

## Learning Management System

- Videos
- Animations
- Virtual Labs
- Supplemental Reading Material
- Additional Practice Questions



# Strategies from my Classroom

## Data Analysis

- Quiz: Break down by Section
- Exam: Break down by Chapter/Topic
- Used for:
  - Strengths/Weaknesses
  - Item Analysis
  - Communication
  - Personalized Remediation

Ch. 8	Avg	Ch. 9	Avg	Ch. 10	Avg	Ch. 11	Avg
6		9		9		8	
3	50	4	44.44444	6	66.66667	5	62.5
5	83.33333	4	44.44444	8	88.88889	8	100
2	33.33333	3	33.33333	1	11.11111	3	37.5
4	66.66667	2	22.22222	5	55.55556	4	50

SciQ	Avg	Science Practice	Avg	AP	Avg	Quiz	Avg
1		1		11		14	
0	0	0	0	7	63.63636	8	57.14286
0	0	0	0	8	72.72727	10	71.42857
0	0	1	100	3	27.27273	3	21.42857
0	0	0	0	6	54.54545	5	35.71429

MC		SA	FRQ			Total	
19	52.77778	5	5	50		51.38889	2
27	75	6	7	65		70	4
32	88.88889	9	10	95		91.94444	5
25	69.44444	5	5	50		59.72222	3
16	44.44444	1	0	5		24.72222	1

# Strategies from my Classroom

## Mail Merge

- Parent/Student Communication
- Data Analysis Sharing
- Personalized Feedback

Section Breakdown						
	12.1 Avg	12.2 Avg	12.3 Avg	13.2 Avg	13.3 Avg	13.4 Avg
Number of Qs	2	7	1	5	4	1
Student 1	50.0	57.14	0.0	100.0	75.0	100.0
Class Average	51.5	69.7	23.5	65.9	60.3	35.3

Your Score: 70%

Remediation:

- quiz corrections (due by next quiz)

Section Breakdown						
	12.1 Avg	12.2 Avg	12.3 Avg	13.2 Avg	13.3 Avg	13.4 Avg
Number of Qs	2	7	1	5	4	1
Student 2	0.0	57.14	0.0	80.0	75.0	0.0
Class Average	51.5	69.7	23.5	65.9	60.3	35.3

Your Score: 55%

Remediation:

- quiz corrections (due by next quiz)
- choose one of the following:
  - watch a Bozeman/Khan/Crash Course video over topic & write 1-page summary
  - complete remediation work based on weaknesses
  - chapter vocabulary (hand-written, word + definition)

# Questions?



# Contact Information

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- Twitter: [tjones1rmsst](https://twitter.com/tjones1rmsst)
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