

Procedure for arguing for more points

1. Read through the comments and scores on your lab paper
2. Read through the rubric and comments below
3. If the issue is simply a miscounting of points (you earned 65 points but I gave you 55) and there aren't any arguments to be made, simply bring your lab and I'll recount
4. If you feel you earned more points than you did,
 - a. Come show Marshall your paper and provide an argument stating which points you should earn and why **BASED ON THE RUBRIC**.
 - b. Any arguments that boil down to Marshall "taking a second look" will not be accepted.
 - c. If you are successful in your challenge, you may challenge again.
 - d. If you are unsuccessful, you cannot make any more challenges for this lab
5. Remember: the goal is NOT to get a 100% at all costs; it's to understand why points were taken away this time so that they won't be taken away in May.
6. Another reminder: I'm basing my grades on my training as an AP reader. This is the AP program's rubric, not my own.
7. Finally, **YOUR GOAL IS TO NOT GIVE YOUR GRADERS ANY EXCUSE TO TAKE POINTS AWAY. ASSUME YOUR GRADERS WON'T "KNOW WHAT YOU MEAN." TAKE THE EXTRA STEPS TO FIX LITTLE ERRORS THAT MAKE THE DIFFERENCE BETWEEN A POSSIBLE MISS AND A DEFINITE POINT.**

Category	Score	Comments
Objective	3	Easy points to get. You simply need to state the overall goal of the lab.
Sketch	3	Artistic skills didn't matter. MUST BE ENOUGH DETAIL TO RECREATE THE DESIGN EXACTLY.
Claim	3	1 pt: Here's what I think will happen. BE SPECIFIC. 1 pt: It's something measurable. "It goes up" will not earn points. "It will increase by 3" is verifiable. 1 pt: A reason is provided, even if the reason turns out to be wrong Common mistake: Is your claim just stating the definition of osmosis? If so, that's not a claim. That's like taking credit for predicting that gravity will pull objects downward. NOTE: Claims must be made BEFORE the experiment. Predicting incorrect outcomes is normal. More often than not, if a claim is confirmed it either means the claim was done AFTER the experiment or was so simple that it would've been impossible to get it wrong.
IV/DV Part B	2 pt each 4 pt total	The IV of this lab was the molarity of the sucrose concentrations (use the right term, not "mass" or "amount"). The DV of this lab was the change in mass of the potatoes. Most commonly missed answers were too vague. "The potatoes" is not specific enough to know what I'm measuring. "The sugar" or "The

		environment” also doesn’t let me know how you set up the lab
Controls	2 pt each 6 pt total	A control must be something YOU controlled. Common misses include “the temperature.” Did you actually monitor the temperature the entire time? Or do you just assume it never changed? A control must be something that would affect an experiment if it wasn’t controlled. Common mistakes include “All containers were made of plastic” or “All containers had the same light.” Would changing these change osmosis? Besides these, the other common mistake is being so vague that I’m not sure you actually knew what the control was and therefore can’t repeat the experiment. Example: “Potato type.” Take the time to say “All potatoes were Russets/Sweets/Reds” etc. It takes the same time to type the answer, and it removes any doubt from the grader that you aren’t sure what the experiment is all about. Acceptable answers: All potatoes were reds/russetts/yams The potatoes all sat for 24 hours The volume of solution in the containers were all 100 ml Each container had four cubes Each cube was approximately 2cm³
Tables	5 pts each 25 total	25 points were dedicated to complete, properly filled out tables. However if extra labs were done it is possible more than 20 points were earned
Graphs	5 pts each 10 total	Missing any of the following can result in points lost: Title: Do not just restate the axis’ and do not make it vague. It should plainly tell the reader what they’re looking at. “Identifying the molarity of a red potato” tells me what you’re doing. “Sucrose graph” does not. Axis labels: The Y-axis is ALWAYS the dependent variable. Correct type of graph (bar, pie, scatter, line, etc) -Transpiration graph should be a line graph since we were measuring the same plant over time -Potato graphs should be a scatter plot since we were doing multiple comparisons of potatoes but each group was a completely separate potato set and we only did one measurement over time. There should be a line of best fit. Error bars must be present for your potato at least
CER Conclusion	3 pts	Claim: Briefly summarize your claim from earlier and whether it was

		supported. Not necessary to rewrite the whole thing. Evidence: Provide evidence that the claim was supported/not supported Reasoning: Explain why this evidence matters. Do not do circular reasoning. Assume I know nothing of the scientific concept you're studying, and help me understand it. Reminder: Most good claims are incorrect. Science is usually getting stuff wrong and learning from it. Any sign that your claim was established AFTER the experiment or that it was so vague as to make it difficult to pinpoint the exact reasons for something happening will not earn points. Good example: "My claim that sweet potatoes would start to lose mass at 0.9 because of how starchy and sugary they are was not supported. At 0.8 the potatoes already started to lose mass to their surrounding hypertonic solution, and the line-of-best-fit shows that most likely the molarity is around 0.64. Since the only way to lose mass was for water to leave the potatoes, and water will flow toward higher solute concentrations, the potatoes must have been losing water long before the 0.8 mark. Bad example: "I predicted the potatoes would gain mass in lower concentrations and I was proven right. In the distilled water the mass went down but in the 1.0 M it went up. Since the mass went down in lower areas it proves the mass would lower.
Error Analysis	1 pt	Hardest point in the lab. You're looking for a problem with the LAB, not with your execution of the lab. Two examples in this lab were 1. Some potatoes will float in the higher molarity, putting some surface area out of contact with liquid. Nothing you can do about that. 2. It's hard to get the stickier liquids fully off the potatoes before weighing them, and that excess liquid on the surface will affect the masses. Nothing you can do about that either. Avoid saying something "could have" happened. Lots of things could happen, ranging from foreign espionage damaging our experiment to a meteor shower. What DID happen? Your error can't be one of the things you controlled. In this lab lots of people said "the potatoes all have different sugar content." That's the actual thing you're investigating, so; it can't be an error. Also, lots of people said "the potatoes weren't cut exactly to 1cm³. That actually doesn't matter because of the % change equation, right? But even if it did, that's not the lab's fault.
Scientific Learning	1 pt	As long as you provide a specific thing you learned in this lab, you'll get the points. So be honest here. I just want to know what stood out to you.

		“Further understanding” or “A greater idea” or other similar vague terms are no good. Problems: • If the thing you learned was the basis for your claim, how could you have learned it? • If the thing you learned was just a simple definition, you didn’t need the lab to learn it. HINT: If you’re having trouble figuring out what you learned, it probably means your claim wasn’t very complex. Try risking a little more next time.
Next Experiment	3 pt	Common mistakes here include an experiment that has no relationship (or a vague one) to the one we just did. I want to CONTINUE the previous experiment, not start a new one. • Are you furthering the learning from the previous experiment? You maybe want to narrow the sucrose down to get a more specific range with less error? Or you’re combining the design of the cell races with the molarity lab somehow. “This time we’ll change the temperature” or “we’d like to try a different solute” are the beginnings of a new experiment, not the next logical step. • Do you explain why? What was it about the lab that made you want to study this new thing?
Q1: Which allowed trans?	3 pts	Data must back up your graph. The answer is supposed to be fan or light, but the graph will determine it for everyone. Lots of you said the exact same thing: “Light stimulates stomata to open.” This is an incomplete answer itself and doesn’t actually answer the question. Plants like light and photosynthesis, so why would the loss of water (a necessary component of photosynthesis) be a step in photosynthesis? You’re missing at least one important point of context. Also, lots of you said “evaporation. Very different thing. Beware of googling an answer and writing it down without understanding it; you won’t be able to do that in May, right? You’re better off relying only on your brain. <u>(66 of the 83 labs all wrote some version of this down. Coincidence? Or maybe a bit more sharing was happening than needed?)</u>
Q2: Water Potential	3 pts	Did you ever actually explain the role of water potential in your answer? Water potential is the potential energy of water. When water moves, it will carry that energy with it. So if the water potential is higher, the more water (and therefore potential energy) will move with it. Lots of you correctly told me the path water will take, but that wasn’t the question.
Q3: Stomata	3 pts	The benefit of closing stomata is that the plant cannot lose any water. The disadvantage is that it won’t be able to obtain carbon dioxide.

Q4: Cell feature	3 pts	The question asked about your “cell races” cell. Generic answers about cells didn’t earn points. What was it about your cells’ design that allowed or prevented diffusion? I got lots of vague answers about what you actually did, and almost no one explained WHY it worked or didn’t work.
Q5: % change	3 pts	Most of the missed answers here were due to being vague. The starting potatoes probably aren’t the same mass, so you can’t do a straight mass vs mass comparison when everything is a different starting value. But % change of mass converts everything to the same scale, therefore you can compare them fairly to each other. I think most of you understood this but went with some of the most confusing language possible to explain it. Beware of “science lingo.” It sounds great...until you read it out loud. Here is just a sampling of what students said to answer this question: It puts the data in perspective It evens out It makes the data more balanced “Percent shows the change overall.” It shows a greater accuracy It’s more comparable It’s a more concise relationship It’s a more universal measurement It standardizes the data (By the way, “Mass” does the same thing as most of these too)
Q6: Molarity	3 pts	If the molarity didn’t match the value from your X-axis crossing, you didn’t get full points
Q7: IV Fluids	3 pts	As we discussed in our circulation lab, your blood is not just water. It contains salts, hormones, proteins, etc. If your IV was just water, the excess water would create hypotonic blood. But the saline in your IV is isotonic to your blood, so your blood and cells remain isotonic..
Q8: Error bars	3 pts	The job of the error bars is to show whether the standard error for each molarity overlaps with any other molarity standard error. If they do, you CANNOT use that data. Avoid fluff language like “it means my data may not be as accurate” or “the data is probably not usable.” The differences in the data is, statistically, significantly unreliable. You have to assume the data is the same value.
Common errors		Hedging your bet is never good. Be specific with your answers. Never ever ever say “the environment” or “affects.” They are just too vague and never earn points. What specific part of the environment are you referring to? How did it affect the results?

		If the change in mass didn't increase as much, that is not the same as "decreasing." For example, if I give you \$20 this week and \$10 next week, you don't lose money next week. You just don't get as much. Look at the space provided for the answer. If I only give you 1-2 lines to write with, it probably means you can answer the question in 1-2 sentences. Writing 3 paragraphs and adding an extra page probably means you're writing too much and/or hoping if you dump everything on the page the correct answer is in there somewhere. It might work, but if you do that in May you'll run out of time before you've attempted half the essays. It's a bad habit to rely on. How to get your point across without "just writing more" • Skip filler words, lines, intros, etc. • If it asks for 2 things, give 2 things. Not 3, 4, etc. • Give the details that AREN'T already part of the question or procedure. Focus on showing YOU adding information Other ways to save time: • When the water (H₂O) moves from... • There is one way that this experiment had a critical error that affected our results. For example... • Restating questions, claims, etc in a short summary is fine. Not word for word. ○ Our claim that the potato mass change would go down in 10% increments was unsupported. ○ Our claim that if we place the potato in six different molarity solutions, then the potatoes would reduce by 10% for each 0.2 molarity solution due to the potatoes wanting to reach an even 50% mark for osmosis' concentration gradient was unsupported.
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