



Any comments especially about your #1 ranked item?

All comments are typed verbatim including spelling!!!!

- Make the equations more accessible
- When the data comes out wrong it takes time (to) figure out the problems
- Being able to change and see how changing variables affects the rest is really helpful.
- The information boxes were good reminders about what the variables were and how they were derived.
- Changing variables allows me to see for myself (via the graphs and data) how it affects the data.
- The information in the comment boxes gave me a better understanding.
- It made me understand more, but when the data is wrong it takes time.
- Information in comment boxes were useful.
- Graphs not difficult for interpretation, relatively easy.
- The information I got from the graphs were invaluable.
- Helps show how various items influence data.
- It allows one to understand the trend in the graph.
- Allows me to better understand what I'm looking at b/c I'm a visual learner.

The counting error information was not covered in class. You had to learn this material on your own. Learning this was **3.0**

real difficult
 difficult
 so, so
 easy
 real easy
 1 5 10 5 1

The background information was not covered in class. You had to learn this material on your own. Learning this was 3.0

real difficult 1
 difficult 7
 so, so 10
 easy 2
 real easy 3

Do you think that this activity helped you understand the concepts involved with radioactive decay?

Yes 20 (87%)
 No 0
 Maybe 3 (13%)

Why? All comments are typed verbatim including spelling!!!!

- Gave me a better understanding of how radioactivity works.
- Because I was able to understand the concepts.
- Because I now really understand.
- It was fun.
- The activity contains more information about radioactive decay than the in-class lecture.
- Our projects do not offer blunt clarity which causes a lot of questioning.
- Visualizing stuff initially mentally conceived made it more exciting and easy to understand.
- I understand how decaying work(s) in a broad sense which are the basics.
- A lot of information in Excel and in this packet that gave information and show examples.
- Because I got more information on how to determine graphically the half-life using different graphs and also I learned also about the background radiation and how it influences the results.
- Because I worked on things I never learner before therefore I learner more.
- It gave me more practice with the concepts.
- I was able to visually see what was going on as opposed to being told.
- Excel activities let me see for myself how each concept works.
- I have a better understanding about what influences radioactivity, causes error in decay and when radiation is safe in the body.
- It helped me understand timelines and how when reading you can have problem (and how to fix them).
- I now understand the way to find half-life using $\log(A/A_0)$ plot.

Can you suggest a way to improve the activity? If so, explain.

- Overall, good job. Just wish the background information would've been taught in class.
- By using both the activity and lecture, so we can easily understand it.
- Yes, makes it a little difficult.
- For beginner, teach them. For us, read instructions.
- Slow down with new materials and make sure we all have an understanding.

- The activity should include more information, perhaps examples on counting error and background (radiation) information.
- My suggestion is to just do more class examples.
- Total incorporation of the activity in lectures will be very good, as more will be comprehended.
- Make it shorter!
- Not that I can think of.
- No, it is straight.
- No.
- I wish I was more knowledgeable with the software and excel. It is not that is hard, but I feel if you are going blind into this you may not understand what is going on. So I would like if a preparatory session was initiated.
- If possible, move the chart on the "safe" tab so that it's not blocking the information behind it by default.
- More exercises
- This activity didn't really need any improvement, but I would suggest giving students more time to complete since the end of the semester tends to be very hectic and students can be really pressed for time.
- It was tough but I think it was good.
- Give us extra work so that we can get familiar with the problems.
- Continue the process and get more data so you can understand the trend. add showing catalyst

If given the option of doing this activity or having your instructor just lecture on the material, which would you select?

Activity
4 (17%)

Lecture
1 (4%)

Combination of both
18 (78%)

Please explain your choice. All comments are typed verbatim including spelling!!!!

- Better way of learning for me.
- It would be easier to understand.
- As that the lecture and activity helped me
- More of hands on experience and teacher knowledge
- I like the lecture; however examples are always a plus.
- During the activity with a background knowledge of radioactive decay taught during the lecture establishes known facts about radioactive decay.
- The lesson before the test is always best.
- The activity, though real explicit, still had some technicalities which would have been more easily comprehended through lecture.
- I like this activity. If I had questions the teacher was available during his office hours to explain.

- By also having a lecture it will reinforce everything learn and clear up any questions we as students have.
- The combination of both would be better for me because I think that we become confident by repeating thing over. Therefore by combining them, we can get more information and better understand the material.
- I'd rather listen to a lecture than do that again.
- The activity was helpful, but it is helpful to be told facts by an instructor so I can be certain of them.
- In lecture, I was able to understand the concept of radioactive decay, however by doing it in excel I was able to visually see how radioactive decay will run as time passed.
- Lecture (explanation so I recognize the concept) + Activity (experimentation so I understand the concept) = better grades
- Visual and physical imaging
- Even though the activity was easy, in class lecture is a good way to reiterate some points and clean up any confusion.
- Although it took a lot to get through it, it helped me learn it.
- Sometimes I pay more attention on the lecture, and I also like to do it on my own.
- Because one can help you understand the other better.
- If your instructor lectures on the material you get an early idea of how to follow through with the instructions so you will have an idea of what to do when you start, so when you actually start your more prepared.
- I learned more hands on then if just heard it.

Any general comments or suggestions?

- Fun project
- This chemistry is above my head. I'm a nutrition consultant and I'm trying to get the R.D. behind my name.
- The activity involves critical thinking.
- I do like the idea of radioactive decay in general.
- The class will be more interactive and interesting if held in computer laboratory, where each student has a higher chances of playing with the excel spreadsheets.
- Overall I do enjoy having this type of learning because most people tend to learn more when they have to do things on their own.
- What about survey for every test or exam.
- The information provided by the packet was helpful.
- None
- You told us not to try this at the last minute. I started at 11:30 pm Tuesday night, ended the activity at 2am, ended the survey at 2:05pm... I'm dead tired, now. (Professor is wise man!!!)
- In lecture or in the activity, using the \ln or \log of A/A_0 was kind of difficult to grasp on getting the half-life... so it could be a little more clear in that explanation.
- It was not fun, but it improve my thinking strageties.

➤ The lectures ok but, its better to have the students works more in class.

...and thanks for taking time to provide feedback!