

Peer Review & Reflection Student Guide

How does the intensity of radiation from radioactive strontium-90 change as a function of distance from the source?

How do you know if your data and analysis are accurate?



Credit: Karen D'Avignon



Credit: Scientists@Work

Now that you have completed one run of the Radioactivity iLab, it's time to think about what your results mean. A good way to understand your data is to share and discuss it with others who have also done the experiment. Scientists do this often to judge the quality of their data, and better understand the phenomenon they are studying.

The purpose of this activity is for you to figure out what kind of relationship exists between radiation and distance, and to see if your data makes sense compared with other students' data. The Radioactivity iLab is a real experiment, and everyone's results will be somewhat different. The **goals** of this activity are to:

- Compare your lab reports, including your experimental designs, data, and best-fit analyses in a small group.
- Try to determine the relationship between radiation and distance, based on your group's data and analyses.
- *Individually*, choose a new experimental design for the Radioactivity iLab that you will use in a second run of the lab.

Follow the guide on the next page to discuss your results with your classmates.

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1. Get in a group of 3-4 students.
2. Compare your lab report and analysis with your group. Have each person tell the group their:
 - a. Research question
 - b. Experimental Design (distances, measurement time, and number of trials)
 - c. The function (either linear or power) that best fits the data, with the corresponding R^2 value for that function
3. Discuss the following questions:
 - How do your research questions, experimental designs, and analyses differ from one another's?
 - Looking at your data, how does radiation change as a function of distance?
 - Does everyone's data conclude the same thing? If not, why?
 - How do you know whose data and analysis are accurate?
 - If you were to do the lab again, how would you change your experimental design to better examine radiation over distance?
4. Based on your group discussion, **decide on a new experimental design that you will use in a second run of the Radioactivity iLab**. If your research question from the first experiment did not accurately describe what you were aiming to study in this lab, try to **improve your research question in the second run of the lab**.

After your group discussion, do the Radioactivity iLab a second time with your new design. Follow the same procedure as you did for the first experiment. Download and print your lab report, and hand it in to your teacher.