FARLabs Nuclear > Radioactivity Turntable experiment. Learning Goals:

- Become familiar with radioactivity by observing real radioactive sources
- Understand there are three distinct types of radioactive materials
- Appreciate the penetrating power of different radioactive sources

Directions:

Part1: Alpha Radiation

1. Select the Alpha source.
2. Estimate the average number of counts over some time interval (eg, 30 seconds) for the Absorber: None, Plastic, Thin Aluminium, Thick Aluminium and Lead.
3. Record these values on your worksheet.

None:

Plastic:

Thin Aluminium:

Thick Aluminium:

Lead:

Question: What did you notice when you went from no barrier to a barrier?

Part2: Beta Radiation

1. Select the Beta source.
2. Repeat the procedure above.

None:

Plastic:

Thin Aluminium:

Thick Aluminium:

Lead:

Question: What did you notice when you went from no barrier to the different kinds of barriers? Was there a difference between the thin and thick piece of Aluminium? Was the thickness important?

Part1: Gamma Radiation

1. Select the Gamma source.
2. Repeat the procedure above.

None:

Plastic:

Thin Aluminium:

Thick Aluminium:

Lead:

Question: Does anything affect the average number of counts for gamma radiation? If so, how?

Test your knowledge:

1. Which kind of radiation is the most difficult to contain? Why?

2. Which kind of radiation is the easiest to contain? Why?

3. If you discovered that an Aluminium container of radioactive beta material was still emitting radiation, how could you reduce the radiation emitted?

4. What do you think the unknown sample is? Alpha, beta or gamma? Can you explain why?

5. Which is the safest kind of radioactive material to handle and why?

6. Gamma radiation is particularly nasty, but can you describe a beneficial use?

7. The unknown sample has been taken from a smoke detector, where there is a radioactive sample a short distance from a radiation detector, which is open to the air. How does a smoke detector work?