**Radiometric Dating Activity-Beads**

**Introduction**

You will use your knowledge of radioactive decay and half-life properties to calculate the age of five different “fossils.” The bag itself represents the fossil and the beads inside represent some of the millions of radioactive atoms that make it up. As scientists, your job is to count the number of parent and daughter isotope atoms in each bag. From this data, you will determine the age of the rock.

**Procedure**

1. Draw the data table below.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Fossil Number | Number of Parent Isotope Atoms | Number of Daughter Isotope Atoms | Percentage of Parent Isotope Atoms Remaining  | Number of Half-Lives | Age of Fossil (Millions of Years) |
| 1 | Blue | Red |  |  |  |
| 2 | Red | Blue |  |  |  |
| 3 | Green | Orange |  |  |  |
| 4 | Pink | White |  |  |  |
| 5 | Yellow | Purple |  |  |  |

2. Count the number of each color of bead for each sample and record on the data table.

3. Calculate the percentage of parent isotope atoms remaining using the formula below. Record on the data table. You

 must show your work.

 **Percentage of parent isotope atoms remaining = Number of parent isotope atoms**

 **Number of parent isotope atoms + Number of daughter isotope atoms**

4. Use the graph of predicted decay rates provided on this paper to determine the number of half-lives and record on the data table. Be sure that you know the value of each line on the graph!

5. Calculate the age of the fossil using the formula below. Record on the data table. You must show your work.

 **Age of the fossil (in millions of years) = Percentage of Parent isotope atoms remaining x Number of half-lives**

6. Answer the following questions using complete sentences.

 1. Rank the fossils from oldest to youngest.

 2. Using the Law of Superposition, describe how these fossils would be situated relative to one another vertically

 in the ground.

3. Which two pairs of fossils are close in age?

4. Explain why more beads of other colors in the bag would better represent a fossil.

5. Infer whether or not scientists could use more than one type of isotope to date the same rock or fossil.

6. Explain why radioactive dating is absolute dating.

7. Analyze absolute and relative age dating by discussing topics like usefulness, difficulty, and accuracy (at least

 3 sentences).

8. Summarize how this activity represents absolute age dating in 3 sentences.

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