35.5: Analysis

Rolling the Cubes

1. Look at your data for the cubes. You will need to decide whether the number of **throws** or the number of **cubes remaining** is the independent variable. Determine a scale that will allow you to place data for all three colors onto a single graph. Use a different colored pencil for each of the different colors on the cubes. Graph your data for each list (red, black, and white). Include a sketched best fit line for each set of data.
2. Do the graphed sets of data indicate a constant or non-constant rate of decay? How do you know?
3. Determine and record the half-life, in units of throws, for each color (red, black, white), based on your data. This is the approximate number of throws it took to have half of the cubes remaining; this will be a whole number. Record your answers. Compare this information with your predicted half-life for each color. What could account for any differences between your predicted and actual half-life for each color?

Table 35.5.1

Color	Actual Half-life (Number of Throws)
Red	
Black	
White	

Dating the Beans

4. Assume the black beans are carbon-14 atoms and that each sample started with 32 black beans. Complete and document the decay process to track the fractional amount of black beans that would remain out of the original 32, after each decay, and follow the decay process until you have numbers that match your bean samples. Include the time that has passed at each half-life. The process is started below for you.

Table 35.5.2

Amount	Fraction	Time
64	-	-
32	1/2	5730 years

4. Use the decay process for your black beans, and the half-life of carbon-14, to carbon date your fictitious samples.

Table 35.5.3: Age of Fictitious Samples

Sample	Age (Years)
1	
2	
3	
4	
5	

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