

RADIATION ABSORPTION OF PLAY-DOH

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ABSTRACT

All objects have innate properties that allow for the absorption of radiation to some degree. By looking at the thickness of a Play-Doh barrier at a fixed distance between a gamma radiation source and a sensor, the level of absorption was observed. Three different thickness trials were taken, and from the trials, no significant amount of changes in the absorption counts were able to be seen from 1.2 cm to .9 cm, but large amounts from .9 cm to .6 cm. A better fit of the exponential equation used to display radioactivity would be expected to be seen with more thickness trials between .9 cm and .6 cm.



BACKGROUND

The absorption rate can be found from the equation,

$$I = I_0e^{-\mu x}$$

, where x is the material thickness. As this is a negative the greater increase in thickness the less of an effect the increase had on the overall absorption. An exponential graph is therefore expected to found based on increasing thickness of the Play-Doh.

PROCESS

The data was collected by putting the Play-Doh into various-size molds and having it platformed a set distance between the radiation emitter and the sensor. The number of counts per thirty seconds was measured for each thickness with 10 different trials conducted. Color variations were initially also tested, but scrapped due to the lack of variation being found.

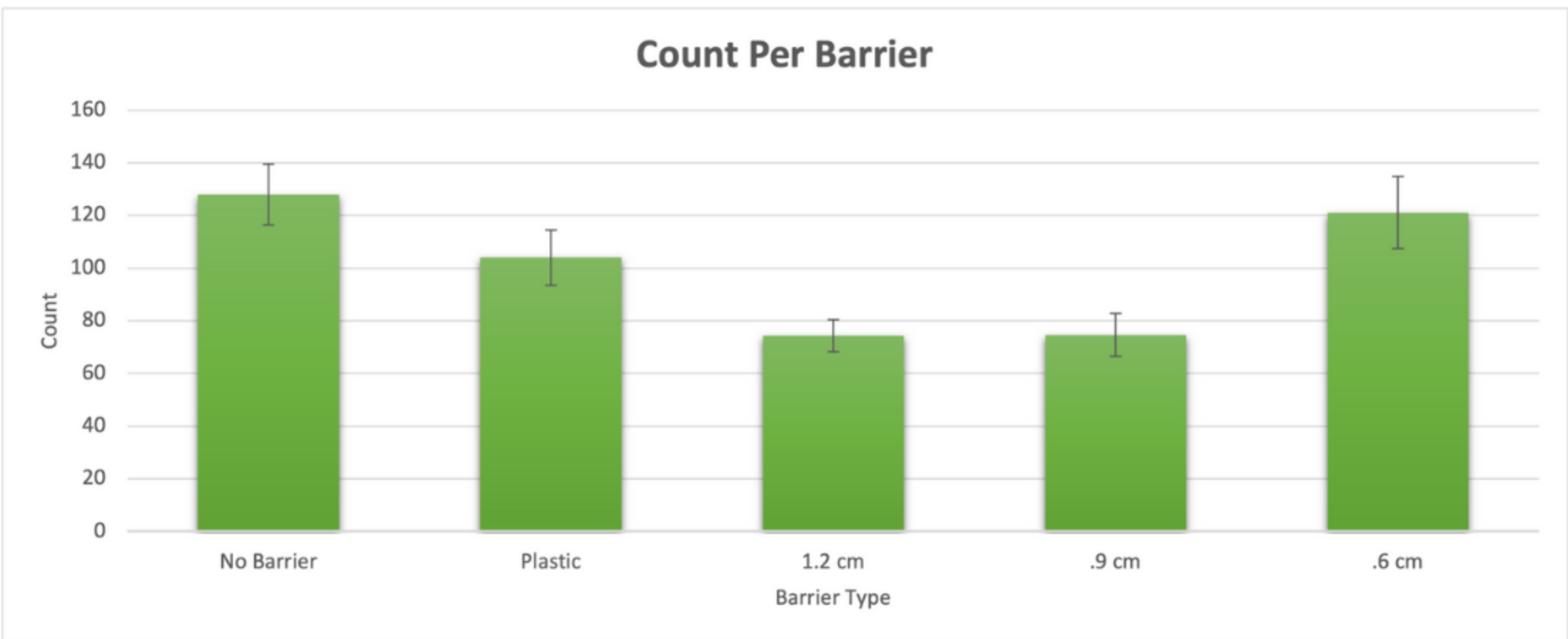


REFERENCES

[1]Beiser, A.; Berg, I.; Beiser, A. Concepts of modern physics; McGraw-Hill: New York, 2003.

DATA AND ANALYSIS

The data found was compiled according to the thickness of the Play-Doh.



It can be seen that there is no noticeable difference in the counts observed between the 1.2 cm and .9 cm barrier. There was a large increase in the counts observed from .9 cm to the .6 cm barrier. From this observation, more barriers sized in between would be a point of interest for future experiments.

The difference in color was found to be negligible

	Average	Standard Deviation
Large Black	84	6
Small Black	84	8
Large White	91	6
Small White	85	10

CONCLUSION

From this data, we can see that Play-Doh was a semi-reliable barrier to the gamma radiation as in the best-case scenarios the count observed decreased by about half. The largest gap in the count can be seen from .9 to .6 cm and should be investigated further to get a more accurate exponential data set. It was also observed that the color had no noticeable effect on the outcome of the results.