

WLB audience? WLB; award?? TPT? Online SSR?
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 690 Project

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Rutherford Backscattering as a Review Exercise

Test Q? How used?
 Worksheet? How are to be used?
 WLB?

What is this paper, is it included in, May too chatty, who is it intended for?

Review time can be very boring for both teachers and students. In an attempt to make this time more intriguing for students while still being informative for students, suggest that an advanced topic in physics be broken down into introductory physics pieces. In this manner students can be subjected to interesting topics in physics while reviewing for final examinations. A variety of advanced topics can be broken down into fundamentals. This paper will lay out a review exercise suitable for introductory physics classes while exploring the concept of Rutherford Backscattering Analysis.

Students have

Connections to Physics Education Research

In this exercise students are lead through a series of problems appropriate for the high school level physics classroom. These problems contain the concepts of kinematics, energy, momentum and electric fields. Often there is a disconnection between the real world and the classroom. This exercise attempts to bridge the gap between the classroom and actual application of the concepts being taught to students in school.

In Arnold Arons' (1990) book, A Guide To Introductory Physics Teaching, he states "Some students, particularly disadvantaged students and many non-science majors with scant experience in quantitative or graphical reasoning, have great difficulty interpreting v versus t graphs;" (p. 30) Often kinematic graphs have little meaning to a student. In this exercise students are required to tie a real physical situation to these kinematic graphs. This allows these graphs to have a physical meaning, which will connect with the students prior experiences with displacement, velocity and acceleration.

Often in science education the historical importance of breakthroughs is not emphasized in the classroom. Scientific discoveries such as Rutherford's experiments with alpha particles and gold foil are turning points in the evolution of science. These are the discoveries that can be points of interest to students. Discoveries such as this one can create interest in our field of study, and can have an immeasurable impact on some of our students.

Students tend to separate concepts into categories such as electricity or kinematics. Students often look at these concepts as unrelated to each other. This can create a disconnected overall understanding of the concepts in physics. This exercise forces a student to connect concepts such as electricity and kinematics. This is in an effort to create a better overall understanding of the relationships between concepts in physics.

This activity can be conducted as an interactive learning exercise. Students can work in groups and present their ideas to each other and to the class. Sokoloff & Thornton (1997) support the effectiveness of interactive learning in their paper (p. 346). Using interactive lecture demonstrations to create an active learning environment.

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Rutherford Backscattering Review Exercise