



## CLASSROOM IDEAS

### Using Professional Equipment In The Beginning Geology Course

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Bradford Junior College is what might well be termed a posh eastern two-year school for well-heeled young ladies. Our one geology course is a two-semester elective, physical and historical geology. The enrollment is variable, as few as ten or as many as sixty students, no more than sixteen per lab section. Eighty per cent of our girls go on to four-year schools. Over the last six years we have had two majors in geology and a number of others take a few courses.

Through NSF funds we acquired a Vreeland Direct Reading Spectroscope.<sup>1</sup> This is an expensive and spectacular piece of professional equipment for the kind of geology course we operate and the kind of students we have. Yet it has distinctive merits in our situation. I use our spectroscope mainly in connection with the laboratory on minerals. Since this is generally the first lab of the year, the instrument and its basic principles are introduced during the first lecture meeting of the course. Thus the students have a vague idea of what the instrument is supposed to do when they first meet it in lab. As the students work through the minerals in lab, most will have trouble distinguishing light-colored plagioclase from light-colored orthoclase. When a student asks about this, my answer is to have her run some samples of each on the spectroscope. The clear definition of sodium or potassium makes the difference apparent immediately.

The first time a student uses the spectroscope I lead her through, step by step, checking alignment of the electrodes and making sure she sees the lines she should see in the spectrum. The response is always one of excitement and enthusiasm. The possibility that these freshmen, in their first college level science course, could be using professional equipment gives the students a great boost in morale and certainly results in a clearer idea of basic mineralogy.

The feldspars are followed by a series of other unknown minerals including cuprite which these beginners seem to easily confuse with hematite until they run some on the spectroscope. The instrument becomes easier to use with each sample and it is not long before I can let students use it with a minimum of close supervision. The simplicity of our spectroscope allows these students to master its use, an accomplishment which tends to allay any fear of science some of our students have.

The fall field trip yields a couple of dark, fine-textured rocks which are tentatively identified as basalt and some unknown metamorphic. Confirmation of iron, magnesium, and calcium on the spectroscope added to the field relations and the hand-specimen characteristics confirm one as basalt and the other as a foliated amphibolite. The point, of course, is that the students use the spectroscope to extend their observations of fine-textured rocks, and thus bring more information together before making identifications and interpretations.

Unfortunately, the instrument has not been used much during the semester on historical geology. Even so, it receives occasional use as some students who are turned-on by this device seem to spend their weekends making their boy-friends stop at every rock outcrop between Bradford and Yale or Dartmouth. As these rocks come in, I encourage hand-specimen examination and spectroscopic analysis in order to get the girls to apply their rudimentary geological knowledge to interpreting what they see in the field. They are quite surprised to find geology is a subject they can have fun with and apply right away. Their experience with the spectroscope is certainly a contributing factor. Such professional equipment is of significant value in bringing vitality, interest, and real understanding to the course.