Literacy and science go hand in hand. After all, how can you explore previous research, explain your hypothesis, demonstrate your results if not through written or oral language. It seems that it is for this reason that students who are English language learners often do poorly in science. There is a heavy emphasis on reading and writing with a plethora of new technical vocabulary. However, Amaral, Garrison and Klentschy (2002) would argue that science is a very suitable subject through which English language learners can improve their literacy skills. Their article shows a “positive correlation between the number of years students participated in the program” that is inquiry-based, “and student achievement in science, reading, writing, and mathematics” (p.238). Is scientific inquiry good for literacy?

The study conducted takes place in the El Centro school district in California over 4 years. Students were given a variety of tests including SAT-9 and a district writing proficiency test. The study included 615 fourth graders and 635 sixth graders who were involved in “kit-based” science curriculums developed by different companies including Science and Technology for Children (STC), Full Option Science System (FOSS) and Insights. The student population was divided and tested according the number of years involved in the “kit-based” program and according to English proficiency level. The district had 3 difference levels of classrooms, those where the teacher used a 40/60 ratio of English to Spanish, the second were the teacher used a 70/30 ratio and lastly a class were English only was used. All of their data support an increase in proficiency across all levels of students and all subject matters the longer the students were involved in the inquiry based “kit” program.
I found the study extremely encouraging as a teacher. However, I see that much support was given to the teachers, administration and district personnel to enact this curriculum. There seems to be a whole district buy-in that is often difficult to obtain in most schools. Perhaps this is due to the small size of the district or their motivated superintendent. Either way, the teachers received 100 hours of professional development to feel comfortable with the subject matter and to test out the kits themselves (p.221). That is a lot of time to indoctrinate your staff, and I’m sure it had a lot to do with their success. I hardly see that kind of commitment on the part of LAUSD.

Teachers were also able to provide nearly bilingual instruction (70/30) which is something I strongly support yet can not see happening in our science classrooms. We lack bilingual teachers and do not have clear cut language needs. While many of our schools do have a large Spanish-speaking student population, we also have dozens of other languages that our newly immigrated students speak and therefore often fall through the cracks of our ESL courses. I’m not sure how the kit-based science program would benefit the literacy of those students. Much of the kit-based science program revolves around students speaking to one another, sometimes translating for one another and writing in their science notebooks. Bilingual instruction can only help so much if the students in your classroom don’t know anyone else who speaks their language.

I also see that the teachers were trained in how to use and effectively evaluate student science notebooks. The students were also given these notebooks by the schools, and all supplies were replenished and counted out for each teacher by a resource center. I know that many of us use science notebooks in our classrooms, but do we use them effectively? I believe that a key feature of success in the literacy of your students depends on the successful use of science notebooks. The notebooks were used a means of enhancing English writing skills by making a list of key vocabulary, writing their own
instructions (sometimes in their native language), and designing (sometimes bilingual) experiments that came from their own questions. These are specific skills that teachers were taught and encouraged to use in their classrooms, and if these skills were also taught to other teachers, I believe that science could easily lend itself to improving literacy.

In reflecting upon the method utilized by the teachers in the kit-based program, I see that varied methods of linguistic instruction (such as using real materials, independent work, small group work and whole classroom discussion), come more naturally in a science classroom where opportunities for those varied methods present themselves on a continuous basis. We as science teachers have prime opportunities to make student thinking transparent orally and in written form during hands-on activities. Science instruction can be very good for literacy provided we know how to use it.
References