



Vista Newsletter #4
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Understanding Who and What We Are Teaching

When I was teaching fifth grade, my students could count on a number of familiar expressions that they soon dubbed “Costello-isms.” One of my favorites was reminding the class that the authors of our many curricular resources had never met Open Window students. I would use this to illustrate the point that my lesson plans were much more guided by the strengths and interests of the eager minds in front of me, rather than a scripted, one-size-fits-all instructional procedure.

Learning is ignited in the science lab, not in the science textbook. Mathematical connections are made within a real life context, not through problem after problem on worksheets. Middle school is a living, breathing thing, not a physical building.

Recognizing that we teach children and not subjects, it is of paramount importance that we understand the talents, complexities, and changes within the middle school student. Last month, I discussed in some detail the characteristics of gifted adolescents and how Vista Academy will serve their needs. Here I offer another snapshot highlighting the uniqueness of this age -

Middle School students

- are fiercely independent, yet yearning for meaningful relationships with adults
- reveal emotional vulnerability, yet are deeply self-protective
- are capable of complex analytic thinking, yet can be disorganized
- are compassionate and altruistic in the desire to make the world a better place, yet are capable of striking out cruelly at a classmate
- are able to understand and accommodate the needs of others, yet can display self-centeredness
- can worry us and astonish us at the same time
- are naturally broadening their focus from a family-oriented context to school, peer, and community-oriented contexts

These contradictions are developmentally necessary and some struggle is normal. It's important to note, however, that early adolescence is not only a time of turmoil; it can also be a period of tremendous resilience, productivity, cognitive growth, generosity, and increasing involvement in school and community.

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Vista Academy's academic program will be strong in all areas, with special emphasis in math and science, where students will be given unique opportunities to dig deeper and explore further.

Textbooks explain, but they do not create. Math and science courses need to be structured in such a way as to allow students to think like mathematicians and scientists. At Vista, students will discover that mathematical and scientific concepts grow out of everyday experiences and concerns we share. They will explore the similarities and differences between how one persuades someone about an everyday concern and how one persuades someone about a mathematical or scientific truth. Further, students will gain an understanding of how scientific laws differ from mathematical axioms and definitions.

The United States is one of the only countries in the world that teaches courses with names like Algebra 1 and Geometry. The rest of the world simply teaches Mathematics, not as separate courses, but as a continuous program. As students move through Vista's program, their mathematics experience will focus on connecting their work with numbers and operations to more symbolic work with equations and expressions.

The National Council of Teachers of Mathematics recently issued a report, *Curriculum Focal Points*, which urges that math instruction focus on a few skills in each grade level so students learn how to solve problems and develop critical thinking and reasoning abilities. We welcome the Council's recommendations, as they represent an important step in advancing discussions about what mathematics students should know and what they should be able to do. Vista's program ensures that students possess the basic mathematical skills essential for mastering higher level concepts.

Mathematics is helpful in almost every kind of human endeavor, from laying bricks to prescribing medicine to drawing a face. In particular, mathematics has contributed to progress in science and technology for thousands of years and still continues to do so today.

In science, Vista believes that students need to become more systematic and sophisticated in conducting investigations, some of which may last for weeks or more. This means closing in on an understanding of what constitutes a good experiment. The concept of controlling variables is straightforward but achieving it in practice is difficult. Students can make some headway, however, by participating in frequent experimental investigations and explicitly discussing how explanation relates to experimental design.

Our inquiry-based approach to science refers to the diverse ways in which scientists study the natural world and propose explanations based on the evidence derived from their work. Research confirms that students learn best in an environment where they can make discoveries and actively construct their own understanding of science concepts. Through a learning cycle of focusing, exploring, reflecting,

and applying, students develop scientific literacy, while embracing the process of inquiry-based teaching and learning.

Systematic learning of science concepts must also have a place in the curriculum, for it is not possible for students to discover all the concepts they need to learn, or to observe all of the phenomena they need to encounter, exclusively through laboratory investigations. Middle school is an excellent time to introduce stories of scientists making discoveries - not just world-famous scientists, but scientists of very different backgrounds, ages, cultures, places, and times.

Vista students will come to recognize that math and science are creative acts requiring decisions and initiative. They will realize that the creation of a new subject involves an intense self-examination of assumptions and intellectual biases. In short, they will come to see that math and science are deeply human activities.

Tim Costello
Middle School Head