**Seeing Is Being**

**A glimpse into the optics class at Academe of the Oaks**

On the first day of their required course in Visual Physics, high school seniors at Academe of the Oaks are taken to a lake, where they are asked to spend ten minutes simply sitting and looking at the surface of the water. What images capture their attention? How do they focus on them? How does reflection change the appearance of the objects reflected?

Only then, says Dr. Tara Wyman, can they really begin the class. In keeping with the Waldorf approach to education, “Experience comes first,” she explains. “These are not dead concepts taught from a textbook, but concepts the students form for themselves from their own perceptions.”

Wyman, who has a PhD in physical organic chemistry and did post-doctoral work in pharmaceutical chemistry, has taught this optics course every spring since Academe was founded ten years ago. She previously taught chemistry at the college level, but says she enjoys the high school students. “It’s different from college because you are really involved with the students,” she says.

The Visual Physics class, Wyman says, is really about “the intentionality of paying attention.” Through readings, lectures, tests, and a series of interactive physical experiments, students learn about the science of reflection, refraction, diffraction, polarization, and color. They look through prisms, trace rays, and puzzle over various optical illusions.

They study the theories of Isaac Newton and also Johann Wolfgang von Goethe, one of the first to challenge Newton’s ideas regarding color by positing that colors are born of both light and dark—not, as Newton believed, only pure white light, continuously divided and bent by an atmosphere that acts as a prism. Waldorf founder Rudolph Steiner studied Goethe and was particularly interested in his emphasis on the role of human visual perception, or the notion that the seeing of color is not wholly objective, but influenced by the individual brain.

“It’s an interesting subject,” says Wyman, who also teaches chemistry, biochemistry, physics, anatomy and physiology. “The students get all the information that they would from a traditional optics class, but they also interact with living pictures. The hands-on aspect gets them more engaged. It’s easier to remember things that you learn from experience.”

Steiner deliberately placed the optics course in the senior year, Wyman says, as part of the careful progression of the Waldorf high school curriculum. At this point in their education, students are ready to explore the question, “who am I?” in relation to the world around them. So thinking deeply about how they perceive external phenomena visually—the interplay between subject (themselves) and object (everything else)—is not only fascinating, but also an important step in their intellectual development.

The final project for the Visual Physics course is a photo slideshow representing the class topics and how they’re manifested in everyday life. With identical requirements, the students produce an astonishing array of images, Wyman says. “One student really loved his car, so he made every picture a part of his car,” she says. “The rear view mirror, the bumper—it was amazing that he could find every image he needed in this one thing. The project helped him see it differently.”