

# Aquaculture Studies Prepare Students For Better Understanding

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**ELIZABETHTOWN** (Lancaster Co.) — Located in the back of the Elizabethtown High School are two small buildings surrounded by a chain link fence.

One is a shed really. The other a simple frame greenhouse.

The buildings are being used as part of the school's agricultural studies. The fence is needed to prevent vandalism.

Inside the 20-foot by 20-foot shed, there are several 100-gallon fiberglass fish tanks, surrounded by a plumber's maze of white polyvinyl chloride (PVC) tubing.

The tanks are also partially hidden by living filters — aerobic bacteria-hosting mediums over which return water is trickled so that fish wastes in the water can be better broken down into harmless components.

Air pumps constantly chug. The air is humid and space somewhat restricted.

There are other tanks with water pipes and 55-gallon plastic drums filled with water. Other drums are filled with makeshift, but dependable water filters, and submersible pumps.

Sheets of bubble plastic hang down on the inside of the door.

The same is true at the 20-foot by 14-foot greenhouse — bubble plastic sheets serve as insulating curtains and protect the inside from dramatic changes in temperature and humidity.

In the greenhouse, long narrow trays hold a root and moisture medium under which flows a nutrient and acid balanced solution. The trays are really PVC rainspouting and the ends drain into large reservoir tanks.

A water-nutrient solution is cycled through a simple system and tomatoes, parsley, peppers, and cucumbers grow.

The greenhouse is the hydro-

ponics lab. The shed is the aquaculture lab.

Both aquaculture and hydroponics (water working) systems are part of the educational options available to students at Elizabethtown High School through its Agricultural Department.

The course is called the Aquatic Resources Class. But it teaches more than how to feed fish and fertilize greenhouse plants.

It teaches that when one really understands the functions of a system, then imagination and work can make it a reality.

The classes are taught by Al Martin, an agricultural instructor at Elizabethtown High School. He created the class as an elective, non-required course.

Students who sign up get educational credit for the course.

They also get an education.

There is no doubt that Martin is responsible for the existence of the course. The district doesn't really support the program. If Martin weren't there to put in the extra time, the extra effort and use his own money, it wouldn't be done.

The odd shapes and materials used in construction of the aquatic and hydroponic facilities, are the result of Martin spending his time on weekends and weeknights with the course in mind. He has purchased items at K-Mart that were designed for general home storage devices, because he saw in them the potential to be adapted for use in the aquaculture facility.

Just the way he sees potential in his students.

On his own time, on his home telephone, at his own cost, he calls across the United States to check out types of fish that the students might be able to raise.

He pays for the fish the students raise, when he orders them.

The result is that, in the two learning centers, the students can apply book knowledge of pH and

alkalinity, water temperature, humidity, fish and plant growth rates, feeding mechanics, and the basics of a complete animal and plant production system.

There are very few high school biology curriculums which can offer as much practical understanding of living systems to go along and reinforce conceptual understanding.

With 25 years teaching at Elizabethtown, Martin is currently an instructor of aquaculture, hydro-

ponics, wildlife management and agriculture at the school.

He can also teach industrial arts, which was his first teaching degree achieved. After 13 years at the school, however, the industrial arts department was cut back and in order to stay employed by the district, he returned to Penn State and got another degree in agricultural education.

Martin also currently teaches with the school's Young Farmer program, a continuing education

program for adult farmers.

The farmers have helped Martin with his students' courses. Through them, he was able to acquire the plastic drums — they are recycled teat dip containers that Martin cleaned — and other items, such as filters that are designed for use in a milking system.

Just to be sure that the use of alternate materials to construct the aquaculture facilities didn't bring

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Chris Willenbecher shows two, 1-year-old Tilapia raised in one of the tanks in the Agriculture Department's closed system aquaculture facility at Elizabethtown High School.



A student ties support strings to pepper plants in the hydroponics greenhouse at Elizabethtown High School, while other tend to other chores.



Andy Myers, son of Raymond and Barbara Myers, reads the fertilizer level in solution in the hydroponics garden at Elizabethtown High School.