

Toying with Technology News

Iowa State University, Materials Science and Engineering Department

Volume 2, Issue 1

Fall 2000

About the Program

The Toying with Technology (TWT) program at Iowa State University was initiated in 1996 via a Miller Fellowship awarded to professors Larry Genalo and Charles Wright (1941 - 2000). Originally the course aimed at students, primarily education majors, in non-technical fields that wanted an appreciation for the technological innovations that surround them.

The TWT program has expanded over four years to include not only a college course for non-engineering students, but for its participants to develop and conduct educational workshops for PreK- 12 students. Dr. Larry Genalo of the MSE Department directs the TWT program.

Students Teaching Students

By: Jennifer Kirby and Jake Pierson

Iowa State students from the MATE 370 TWT class spent time in October working with kindergarteners at King Elementary School in Des Moines.

The ISU students helped with a new learning project developed by kindergarten teacher Comfort Akwaji. They participated as "buddies" in groups with the children each Tuesday for five weeks. The groups were given a task in order to help them learn more about simple machines and their uses. Using Lego Duplos and teamwork the kindergarteners and their buddies built and presented their inventions.

The children were very enthusiastic about the project and looked forward to the visits with their ISU buddies each week. Mrs. Akwaji and the ISU students made improvements as the project progressed. As education majors, many of the ISU students found the activities provided good insights for teaching in the future.

TWT Helps

"Teachers with Technology"

The College of Education at ISU recently received a 1.5 million dollar grant from the U.S. Department of Education. The grant will focus on incorporating technology into the classroom.

Thirty ISU students will take part in a cohort group that will take all of their core classes together and will work with teachers and students in the North Polk schools. Future cohorts are expected to work in King-Perkins Elementary Schools in Des Moines. The Toying With Technology class is just one of the classes that these cohort students are required to take. Because of TWT's involvement with this grant, each of the schools the cohort works with will be given a classroom set of the Lego materials used in the TWT lab.

TWT is also working to educate the in-service teachers at these schools on how to use these materials by offering a summer class and numerous in-service days.

Newsletter Alert!!!!

If your school would like to keep receiving the TWT newsletter please let the staff know, as we will only be sending out electronic newsletters to those who reply. You may reply by e-mail or through the web page. The letter will continue to have "Challenge Corners," "In- Depths," and useful information for teachers, but will only be sent through e-mail.

Contact Us

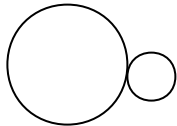
Dr. Larry Genalo
(515) 294-4722
genalo@iastate.edu

Mindy Gallagher
(515) 294-3882
mgallagher@iastate.edu

Challenge Corner

Most people have heard that a year in the life of a human is equal to seven years in the life of a dog, but that is not the case for every breed. A collie, for instance, has a life span ratio of 1:6. This means that for every year that goes by in your life, approximately six years have gone by for Lassie.

To make a LEGO Age Translator for Lassie we need to work with gears, creating a ratio of 1:6. To create the Translator you can use any of the following gears: 40-tooth, 24-tooth, 16-tooth, and 8-tooth. An example of how to figure gear ratios follows. Line the first set of gears in front of you. Make a ratio of the number of teeth in the first gear against the number of teeth in the second gear. For example, you have a 24-tooth gear and an 8 tooth gear.



$$24:8 = 3:1$$

The ratio would be 24:8. Find the greatest common denominator of this ratio and use it to simplify the ratio. The simplified ratio would be 3:1.

To determine the gear ratios using more than one set of gears, set the gears in front of you in the order they will be mounted. Put each ratio of gears in a column (first gear: second gear). Remember that your second gear will become your first gear in the second ratio.

$$\begin{array}{ccc} 40 & : & 8 & : & 24 & & 40:8 \\ & & & & & & 8:24 \end{array}$$

Simplify each ratio: Multiply down the columns:

$$\begin{array}{ccc} 5:1 & & 5 & 1 \\ 1:3 & \begin{array}{|c|} \hline 5 \\ \hline 1 \\ \hline \end{array} : \begin{array}{|c|} \hline 1 \\ \hline 3 \\ \hline \end{array} & & \begin{array}{l} \underline{\times 1} \quad \underline{\times 3} \\ 5 : 3 \end{array} \end{array}$$

Congratulations...5:3 is your new gear ratio. Good luck figuring out a 1:6 ratio.

In-Depth Lie Detector

The idea of the fall comes to us from <http://www.plazaearth.com/usr/gasper/gsr.htm>, and it deals with students creating a lie detector using the RCX brick.

Now I bet your asking, "Why would my students want to build a lie detector?" A lie detector would be a great devise to help solve a class or school mystery, where the students get to do the detective work. There are many ways to add the lie detector into your classroom. For more info see our website.

Fifth Graders Explore

Science with TWT

By Travis Smith

This semester the TWT class went to Edwards Elementary School to help the fifth graders in Mrs. Schmidt's class learn about science. TWT worked with two different classes, and the kids were given many projects to work on during the month that the ISU students were there.

The first class was given the task of building a robotic zoo. The children paired up with students from the TWT class and chose animals to build. Then they went about the scientific process, doing research, making scale drawings, and through trial and error came up with their robotic designs. The students also built habitats for their animals and then presented their robots to each other and parents during a Science Night at their school.

The second class was given the egg drop challenge. These students had to create machines to lower an egg from their desktops to the floor. They were encouraged to create scale drawings and to list all the pieces they used. This list was used as a way to calculate their machine's total cost. There were very few eggs broken on the last day when the students tested their final machines.

Both the fifth-graders and the ISU students learned new ways to design and build. The students really enjoyed the opportunity to have fun while learning science.

TWT STAFF: FALL 2000

- Dr. Larry Genalo, MSE
- Mindy Gallagher, graduate student, C I
- Terri Mortvedt, senior, FCEdS
- Christal Tilley, senior, C I
- Carrie Thompson, senior, C I
- Kristine Briedis, senior, Genetics
- Jenny Golder, junior, CprE
- ✓ <http://class.ee.iastate.edu/twt/>