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THE SCHOOL DISTRICT OF MANATEE COUNTY FEATURES A STUDENT AND A CAREER & TECHNICAL EDUCATION TEACHER

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SCHOOL
Biz



Innovation, Invention & Inquiry

Cheryl McGrew is pioneering the Engineering by Design™ technology class at McNeal Elementary. Cheryl, a 20-year veteran of teaching, has recently traveled all over the United States as a pilot teacher for a National Science Foundation grant. She was also selected this year to be one of the top five prestigious National Curriculum Specialist recipients. All 750 of Cheryl's eager and excited students rotate through her new high-tech lab that was funded by a grant from the district's Adult, Career and Technical Education (ACT) department. Students learn the core values of technical education and engineering basics. And these are kindergarten through fifth graders! The process is cooperative, collaborative and anything but monotonous. Lesson units include Simple Machines, Power and Energy, and Robotics and young students learn about hypothesis, trial and error, and using Venn Diagrams—a process of note taking for new concepts. Cheryl believes education should be exciting and fun. Her lesson plans are full of hands-on activities where students take abstract ideas and turn them into concrete knowledge. With innovation, invention and inquiry, Cheryl McGrew is launching future engineers.

KIDZ
**Biz
& Buzz**



It Started at Home

McNeal fifth grader Ethan Howell started playing with Legos and Knex when he was just a kid. Now that he's 10 years old, this soccer-loving, guitar-playing, video-techie student loves to invent different things. In Mrs. McGrew's Engineering by Design™ technology class, Ethan is creating his very own mousetrap car—and what a cool car it is! With shiny CD wheels, a smooth balsa wood body, and a mousetrap on top strategically placed and wired with Kevlar, Ethan is learning all about the engineering process. He's looking forward to competing against his classmates' cars for distance and speed. Next up? Ethan will be perfecting the Egg Drop Vehicle challenge in preparation for the second annual Manatee County Technology Student Association (TSA) District Competition to be held at Lakewood Ranch High School in February, 2008. Ethan, along with other Manatee County fifth grade students, will participate in the Egg Drop event and a passport type scavenger hunt. This TSA function will introduce fifth graders to the events and structure of TSA competitions before they reach the middle and high school levels. Newton's Law of Motion has never been so much fun!



InnoVators Engineering By Design

Cheryl McGrew and her McNeal Elementary students follow a curriculum defined by the International Technology Education Association's Center to Advance the Teaching of Technology and Science (ITEA-CATS). This organization has developed a national model for Grades K-12 that delivers technological literacy. The ITEA has outlined Engineering by Design™ at <http://www.iteaconnect.org/EbD/ebd.htm>. The following is used by permission from ITEA.

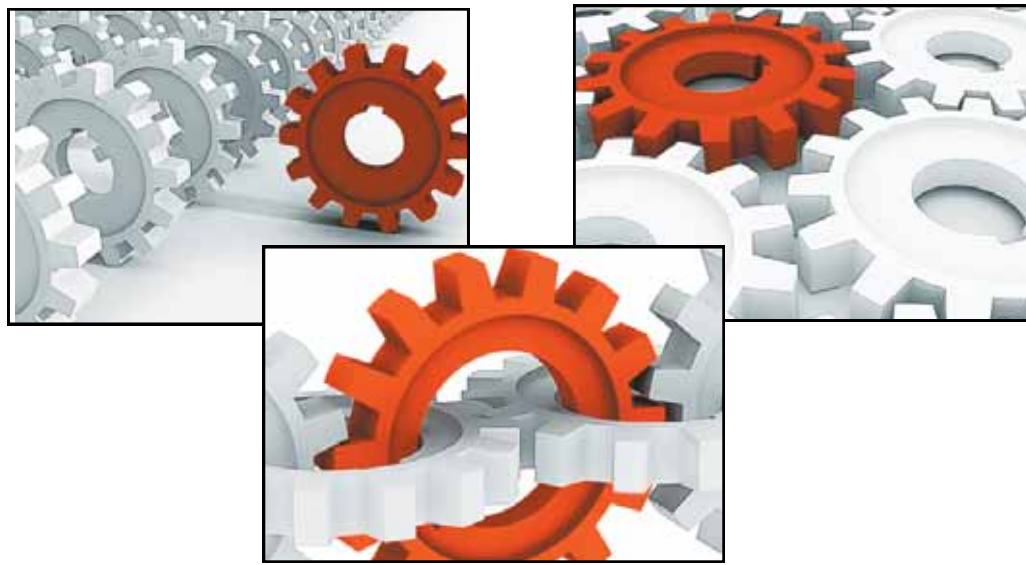
The Engineering by Design™ Program is built on the belief that the ingenuity of children is untapped, unrealized potential that, when properly motivated, will lead to the next generation of technologists, innovators, designers, and engineers.

We live in a technological world. Living in the twenty-first century requires much more from every individual than a basic ability to read, write, and perform simple mathematics. Technology affects every aspect of our lives. Citizens of today must have a basic understanding of how technology affects their world and how they exist both within and around technology. Technological literacy is fundamentally important to all students.

Engineering by Design™ is organized around seven principles. These principles are very large concepts. In order of importance, the seven organizing principles are:

1. Engineering through design improves life.
2. Technology has and continues to affect everyday life.
3. Technology drives invention and innovation and is a thinking and doing process.
4. Technologies are combined to make technological systems.
5. Technology creates issues that change the way people live and interact.
6. Technology impacts society and must be assessed to determine if it is good or bad.
7. Technology is the basis for improving on the past and creating the future.

Students—as you progress through middle and high school, technology classes are offered as electives. You can *choose* to learn more about technology. Sign up today for a technology class and discover all you can about your future.



DISCOVER
the
Future



Career Pathways in Manatee County

Regional Careers: Related occupations and current wages in the Suncoast Workforce Region.

Occupational	Entry	Average	Exper.
Civil Engineering Technicians	\$14.39	\$19.12	\$21.48
Civil Engineers	\$25.06	\$35.49	\$40.69
Computer Software Engineers	\$28.25	\$42.43	\$49.52
Electrical Engineering Technicians	\$17.72	\$23.61	\$26.54
Electrical Engineers	\$22.64	\$32.08	\$36.81
Industrial Engineering Technicians	\$15.58	\$21.11	\$23.87
Industrial Engineers	\$22.03	\$30.15	\$34.22
Mechanical Drafters	\$15.38	\$20.14	\$22.52
Mechanical Engineering Technicians	\$20.95	\$21.57	\$21.89
Mechanical Engineers	\$25.33	\$33.05	\$36.90

Source: <http://fred.labormarketinfo.com>
FL Labor Market Statistics, Occupational Employment Statistics & Wages Program

Career Pathway: Students desiring a career in any of these areas can find related educational programs at these schools*:

McNeal Elementary
Braden River Middle School
Lakewood Ranch High School
Manatee Technical Institute
Manatee Community College
University of South Florida

Explore
IT

Egg Drop Challenge

You will need one raw egg for this activity, and you may choose from these suggested materials: Styrofoam cup, 5 straws, 2 sheets of paper, any type of glue, toothpicks, rubber bands, and masking tape.

Your challenge: design and build a "vehicle" that will safely transport an egg without cracking as it drops 12 feet to the ground. Find a spot at least 12 feet up. Drop the egg. Did it SPLAT? Or did it survive? Have a contest with friends to see whose egg survives the highest drop.

But wait...there are rules!

- Get your parents permission before using up an entire carton of eggs.
- Nothing may be attached to the egg itself for the purpose of increasing the shell's endurance (for example, you can't wrap the egg in tape or cover it in glue).
- The vehicle must free-fall; no parachute or wing devices allowed.
- The vehicle can be any size or shape.
- If you use the 2 sheets of paper, you cannot wad them up.
- The free-fall distance may be more than 12 feet, but no less.
- Try to make it easy for the egg to be removed from the vehicle in case you want to try again.
- In a contest, the winning egg shell must not be cracked at all.
- Make sure the area you choose to drop the eggs is able to be cleaned up easily.

If your egg cracks, try again. Think critically and sharpen your engineering skills to protect your "cargo."



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Manatee County's Newspaper since 1922