

Prepared by
Cindy Jones

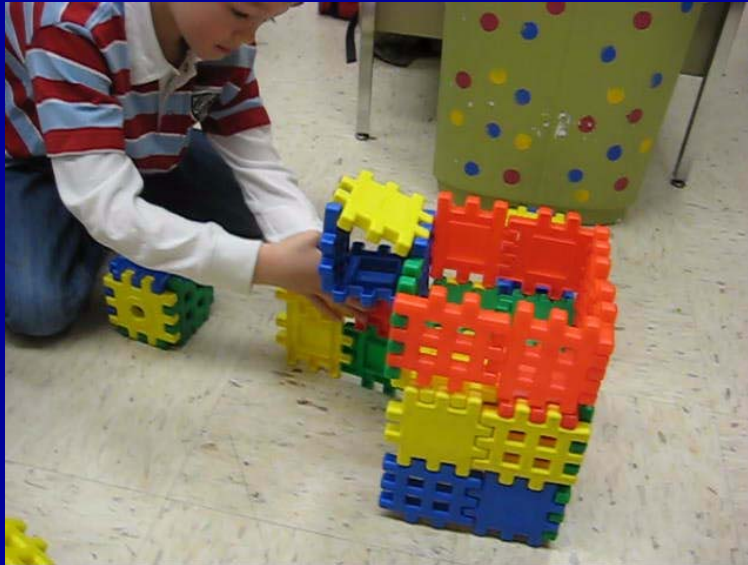
**President of the
Virginia Children's Engineering Council**

Clover Hill Elementary
Midlothian Virginia
Chesterfield County

**VTEA 2008
Teacher of the Year
Martha Smith**



J. B Watkins Elementary School



J. B Watkins Elementary School

Chesterfield County Wins Three State Awards 2008

Three Award winning Elementary Schools in Virginia; all were selected from Chesterfield County. The Awards were presented by Virginia Technology Education Association (VTEA) in August 2008.

Program of the Year

Regional Program of the Year

Teacher of the Year

Clover Hill Elementary

Evergreen Elementary

Martha Smith J.B Watkins

Clover Hill Elementary and J.B. Watkins teacher Martha Smith will also receive International Awards from International Technology Education Association (ITEA). They will travel to Kentucky to receive the "Program Excellence Award" for Clover Hill Elementary and "Teacher Excellence Award" for Martha Smith in March of 2009 at the 71st Annual ITEA Conference.

Recognized by Chesterfield County School Board

From: Dr. Marcus J. Newsome

Recognition of Staff Successes

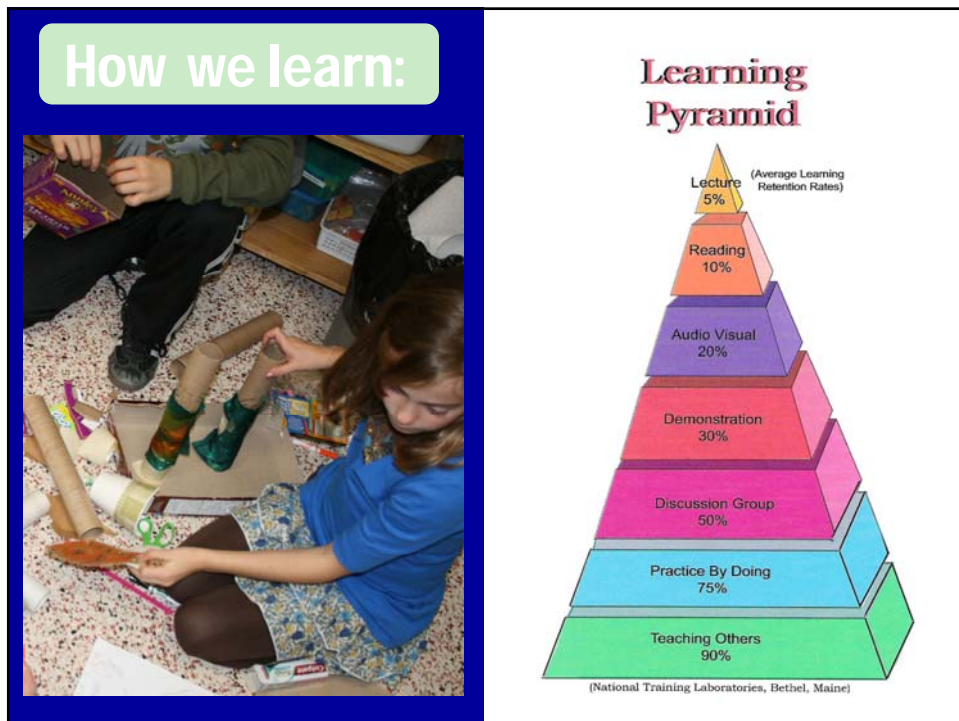
Visiting Team Observes Award Winning Chesterfield County Schools



James G. Batterson Aerospace Engineer NASA Langley Research Center
Thomas E. Pinelli NASA Langley Research Center
Jesse W. White Career & Technical Education

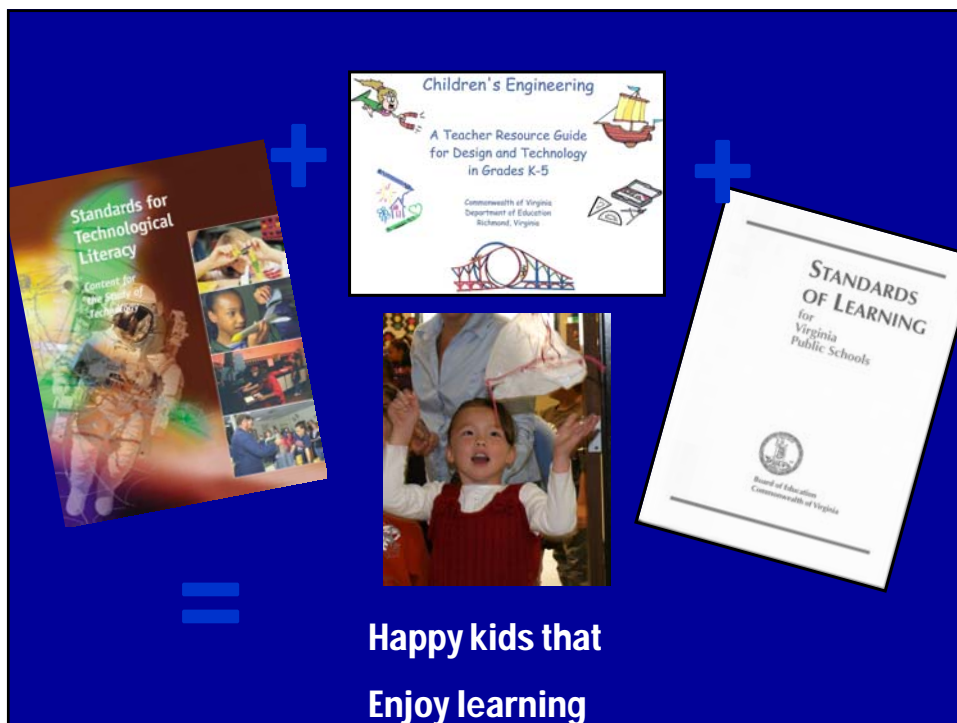
Jacob is making his "Perfect Pet."





Why Should Children Study Engineering?

- **Make connections between the natural and human-made world.**
- **Develop critical thinking skills.**
- **Develop problem solving skills.**
- **Have experiences with the true application of knowledge.**
- **Gain ownership of essential knowledge.**
- **Bridge the gap between memorization of facts and the comprehension of skills and processes.**



Children's Engineering

Design Process

Technology Design Loop

1. What is the problem?

5. Evaluate your solution.

- Was it the best solution?
- What would you have done differently?
- Can you add to it to make it better?

2. Brainstorm solutions.

- Use your productive thinking talent to list many, varied, and unusual ideas.

4. Test your solution.

3. Create the solution you think is best.

- Make sure that you have a plan for how you will create your solution.
- What things will you need to create your solution?
- How will you build it? A sketch might help.
- List the problems that might keep you from building your solution.



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Benefits from using Children's Engineering in the Elementary Classroom

Develops **active learners**, not passive learners

Develops **self directed learners**

Develops **intrinsically driven learners**

Involves children in **problem solving, critical thinking, decision making, and small group participation—cooperative learning groups**



Children remember when they apply concepts.



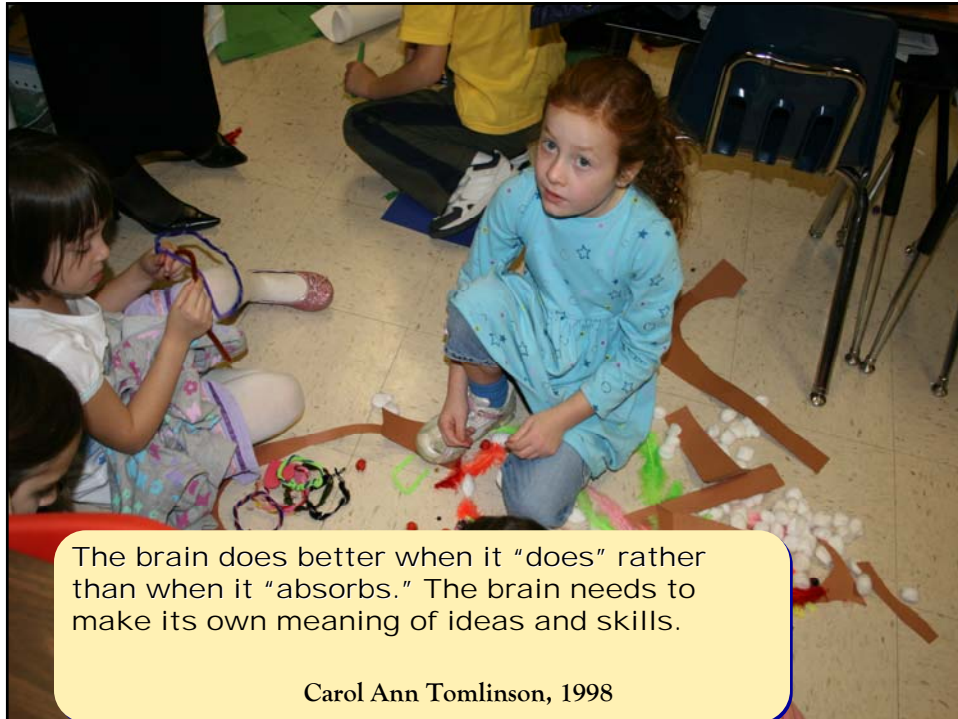
cooperative learning



A project they will never forget.



The experiences promote critical thinking and problem-solving abilities, and build upon a child's capability to retain content described in the Standards of Learning.



*Creating Native
American Shelters*



Application of knowledge

Research also says...

that it is **analysis** of the material that aids in
the recall of it.

R.C. Matthews, "Semantic Judgments as Encoding Operations"
Journal of Exceptional Learning, 1977



"My kids love it and they learn so much from each other."

Mrs. Gunther, 1st grade CHES

"The kids learn from each other, and the mistakes are good and fine, and they learn from their thinking and their doing."


Mrs Davis, 2nd grade CHES

"Facts can be outdated; the ability to continue to learn and apply knowledge to new areas can't . Continuing to learn through Children's Engineering will provide my child with the flexibility and knowledge she needs to adapt and succeed in today's changing world."

Parent at J.B. Watkins

"I was excited that my daughter will be exposed to assignments likely to foster original thinking, independence, and respect for alternate solutions."

Parent at J.B. Watkins



The graphic features the word "TEAMWORK" in a large, stylized, outlined font. A glowing yellow lightbulb is positioned between the "W" and "O". Below this, the phrase "Across the Curriculum" is written in a white, sans-serif font.

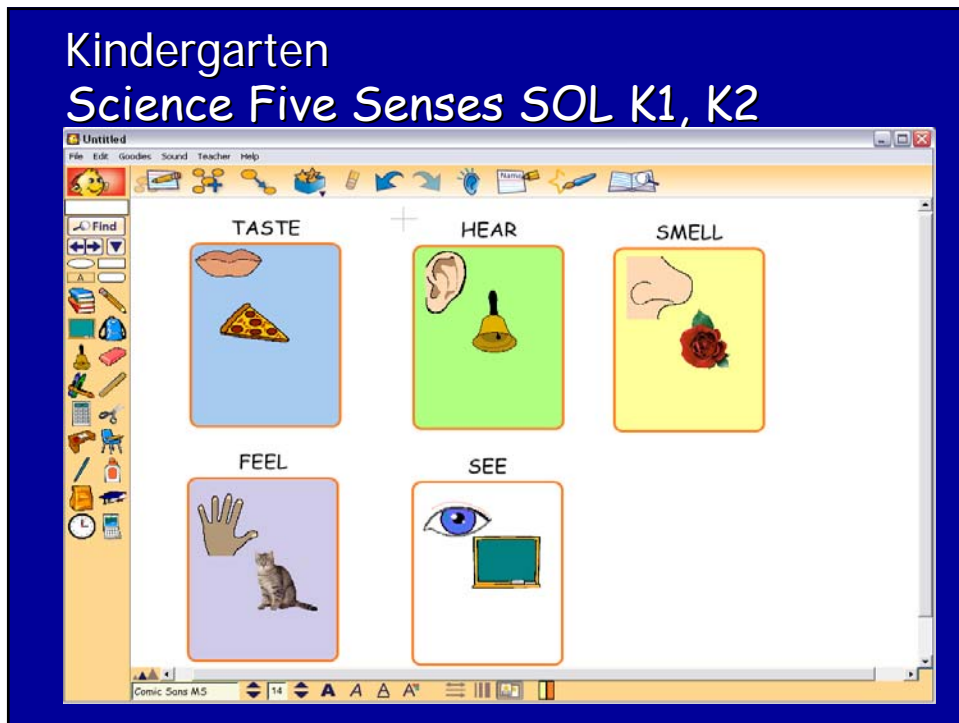
Language Arts	Art
Math	Music
Science	Computer
History	Physical Education

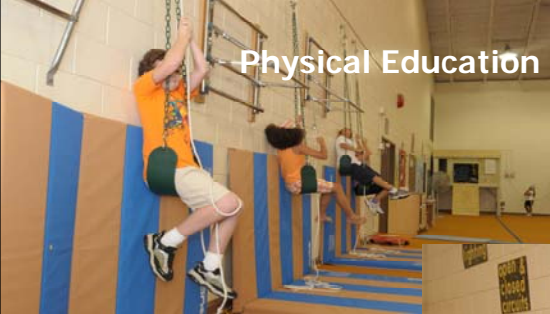
All teachers and *all subject areas* are working together.

Reaches *all children* in the school and reinforces core areas with the Design Process.

Supports the *Virginia Standards of Learning*.







Physical Education

Simple machines


- pulleys – block and tackle
- gears
- wedge tag
- lever
- wheel and axel
- screw

Electrical circuits (parallel and series)

Magnets – repel relay

Magnetic levitation

Geography



Benefits from physically experiencing
...Engineering

Close your circuit








Learning
is
Fun!





Science for all Americans AAAS Project 2061

The American Association for the Advancement of Science

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- Chapter 6: THE HUMAN ORGANISM
- Chapter 7: HUMAN SOCIETY
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(NOT addressed State-wide)
- Chapter 9: THE MATHEMATICAL WORLD
- Chapter 10: HISTORICAL PERSPECTIVES
- Chapter 11: COMMON THEMES
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- Chapter 14: REFORMING EDUCATION
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Some Selected Engineering Results

- There is no state wide “STEM” program in VA
 - There is Math (Theory) and Science (Theory) and a little Technology (**St_M**) **Engineering is missing.**

engineering is not required for students in VA nor is it generally available to **all** students.

- Children's Engineering Guide is available (K-5)
used in 12 out of 134 VA school divisions.



STEM

Science – the *study* of the physical world and its manifestations, especially through systematic observation and experiments.

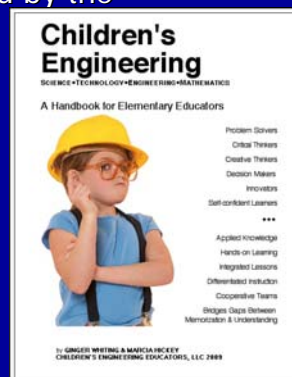
Technology – the application of scientific and engineering knowledge to achieve a *practical result*.

Engineering – the creation or development of new devices and objects that are of *importance or value* to humans and society.

Mathematics – a branch of pure science or philosophy (logic) that in its *applied* state can be used to help make quantitative analysis and predictions for science, technology, and engineering.

Where are we...?

- The **Children's Engineering Convention**, in its 13 year history, has provided professional development experiences for K-5 teachers and administrators.
- In 2003 *A Teacher Resource Guide for Design and Technology in Grades K-5* was published by the Department of Education.
- In 2007 *Children's Engineering*
The handbook focuses on how to teach children's engineering.



What do we need...?

- ***Professional Development:*** Teachers need to be trained so that they can be confident in implementing design and engineering as a means to extend and support Virginia's Standards of Learning.
- **Perkins** (type) **fund** for Elementary schools
- **K-5, 6-8, 9-12** Engineering Curriculum

Preparing the Next Generation for Their Tomorrow

By infusing the Standards for Technological Literacy & Engineering in the elementary school curriculum, the Commonwealth will strengthen the educational foundation of children in Virginia.

