

Inspire Learning Through Hands-On Activities

To encourage future engineers, inventors, and scientists, we must go beyond teaching our students computer skills in the classroom. We need to consider process, creativity, teamwork, and ingenuity—skills we don't test and for which students don't usually earn grades. But most scientists possess these skills, giving them the ability to work with others on creative projects that have led to ingenious solutions.



As educators of young children, how can we go about instilling creativity, teamwork, ingenuity, and respect for the creative process in today's classroom? Unfortunately, these traits are not truly enhanced in the typical computer lab environment of many elementary and intermediate schools across the country. We need to encourage a hands-on approach for our students.

Enriching the Curriculum

A supplemental enrichment program for schools that enhances these necessary skills is Camp Invention (www.campinvention.org), a weeklong summer day program for children entering first through sixth grades. Developed in 1990 as an outreach program of the National Inventors Hall of Fame Foundation in Akron, Ohio, the national program can serve as a model for what can be established in our schools (see sidebar).

For the past six years, children have descended upon Granville Intermediate School to participate in the Camp Invention program. These unique classes focus on hands-on, inquiry-based learning that keeps children truly engaged. Participants rotate through five modules each day that range from science and physics to engineering and architecture. Children are energized by the offerings, and it is this enthusiasm for learning that promises to propel our next generation forward into the realm of world-class thinkers who will be the inventors and innovators of the future.

Not only are children inspired by the concept, so are teachers. They have found that the range and depth of the learning activities help to enrich their classroom skills.

Putting Creativity to Work

Here's one example of a Camp Invention module that never ceases to inspire children: surviving a simulated crash landing on Planet Zak. Creative problem-solving is the essence of this module. Children brainstorm about ways to protect themselves from acid rain while engaging in trial-and-error experimen-

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Creating a Hands-On Enrichment Program

Incorporating Camp Invention or a similar program in your school can be achieved by ensuring that:

- The curriculum is opened-ended, with no right or wrong answers. Children should be encouraged to keep trying until they are successful at accomplishing a specific task.
- Numerous activities are offered each day, with each activity building on knowledge a child learned the day before.
- Creativity is encouraged. For example, fascinating theatrics and stories evolve when children are asked to deal with a hailstorm on an alien planet, or to create safety devices for eggs that can be carried in vehicles.
- Girls are as engaged in the program as boys. In an era when we are challenged to instill passion in girls for science and engineering, the social aspects of working on team projects and exchanging ideas propels their interest.
- The program engages children at all learning levels.

tation to develop a model spaceship that will carry them back to Earth.

Another creative activity encourages children to frequently visit the recycle pile to collect materials they can use for inventions of their own design. During the first few days of the program, participants dismantle old appliances such as toasters, VCRs, and computer keyboards. For the remainder of the week, students entering grades 1-3 use recycled items to design unique inventions such as a weather predictor, a robotic homework monitor, or a cooking device.

Students entering grades 4-6 have a different assignment. Emulating Rube Goldberg, they use the recycled materials to build contraptions that complete several tasks before accomplishing the ultimate challenge—launching water balloons. After spending hours inventing, revising, and reinventing, they are jubilant when they reach their goal.

Recently, a green module was introduced in which participants create water filters out of funnels, coffee filters, sand, and pea gravel to clean up imaginary Lake Lucky. Once the participants complete several other clean-up tasks, they become the architects for a whole new green city that they build during the program week.

It's amazing what you'll see when observing children as they participate in programs that foster their ingenuity. When challenged with hands-on activities, children learn to partner with others and take an enormous amount of pride in their creations. As education moves beyond a fascination with technology, hands-on activities that focus on the development of problem-solving and creative-thinking skills will be an integral part of future classrooms. □

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