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## THE WALL STREET JOURNAL.

### ***Tinkerers Unite! How Parents Enable Kids' Creativity***

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Like a lot of boys, Jacob and Noah Budnitz like to build things. And they like to take things apart.



*The Battlefort: Brothers Noah and Jacob take a break from engineering with some recreational gun play near their cardboard-box stronghold. Rich Addicks for The Wall Street Journal*

First it was Bristle Blocks, then Tinkertoys. They went through Legos—lots of Legos. But now, Jacob, age 10, and Noah, age 8, have graduated to other types of building materials: Doorknobs, alarm clocks and telephones. Plastic bottles and cardboard boxes. Scotch tape. Duct tape. Keys without locks, locks without keys.

One thing they don't use? Directions.

When the boys use imagination and whatever they find at hand to create something, their mother, Tina Budnitz, calls it tinkering.

Their latest project was the "Cricketnator 5000," a contraption for feeding Noah's pet bearded-dragon lizard, Spikey.

The invention moves live crickets through a bath of calcium powder (for proper lizard bone growth) and into the lizard's tank, where they meet their fate—and the boys don't have to touch the crickets.

"There was a lot of trial and error with tubes and a few loose crickets in the house along the way," says Ms. Budnitz, of Norcross, Ga. "The mistakes are part of the discovery process."

Parents have long worried about how kids, as they get older, spend more time with videogames, cellphones and computers and less time tinkering.

Now, Ms. Budnitz and a growing number of like-minded parents are fighting back by encouraging unstructured, hands-on creativity.

A few years ago, toy companies vowed to focus on developing products that would keep kids playing with toys longer, says Adrienne Appell, trend specialist for the Toy Industry Association.

The industry's effort may have paid off. Building and construction toys were one of the few retail growth engines in toys last year. Sales of hands-on building toys jumped 23% to \$1.6 billion in 2011 from \$1.3 billion, while toys overall fell to \$21.2 billion from \$21.7 billion, according to NPD Group.

But true tinkering is more than following directions to assemble prepackaged parts. Ms. Budnitz thinks the unstructured experience is being squeezed out of childhood. With most building toys, "you can't fail," she says. "It's much more fun to tinker and fail and figure things out."

When MAKE Magazine started in 2005, its audience was adult do-it-yourselfers interested in electronics, metalworking, robotics, woodworking and computers, says founder Dale Dougherty. "But very quickly we heard from parents doing the projects with their kids, and now young teens are often creating the projects themselves."

"This idea of making something is very fundamental to human beings, and children really get that," says Mr. Dougherty, "We are not just consumers. We are makers of things."

The magazine holds Maker Faire, a sort of science fair on steroids for amateur inventors and visitors, that has grown from 20,000 in 2006, its first year, to more than 100,000 in San Mateo, Calif., in 2011. There are more than 50 MAKE-approved local fairs held around the world each year, and last year nearly half of all visitors brought their kids, the organizers say.

"There's a sense of learning, resourcefulness and confidence that comes from making or fixing something with your hands, and that really matters," Mr. Dougherty says.

Somewhere during or after their tween years, many boys seem to outgrow their Legos and lose the urge to build and tinker in favor of exercising their thumbs with electronics.

It doesn't help that retail shelves offer older boys few hands-on projects. In contrast, there are lots of options for older girls, whether it's knitting, sewing, beading and scrapbooking or edgier crafts like inkjet tattooing, make-your-own makeup and nail art.

It's tricky, though, for toy makers to address boys' and girls' differing hands-on styles without alienating parents.

Even Lego—whose intricate building sets are beloved by legions of families—hit a sour note in December, outraging feminist bloggers with a line of building sets for younger girls called Lego Friends, with themes like "Emma's Fashion Design Studio" and "Butterfly Beauty Shop."

The bloggers were offended by the curvy figures and ponytails of the female play figures. Lego says the Friends line simply offers what girls and parents have been asking for. "Girls may choose to start with Friends, but then they go into Lego City or other sets. There's a lot more instances of brothers and sisters, or fathers and daughters playing with Legos together than there was before," says Michael McNally, director of brand relations for Lego.

Lisa Damour, a psychologist and director of the Center for Research on Girls at the Laurel School in Shaker Heights, Ohio, says, the battle over girl-versus-boy Legos was, in some ways, the wrong fight to pick with the



*Jacob and Noah in their work space, called the 'Man Castle,' which is also their dad's workshop. They keep some materials in their 'Invention Box.' Rich Addicks for The Wall Street Journal*

Danish toy giant. "I think the real controversy is that everything comes out in kits," she says. "This limits both boys and girls—they need just big bags of Legos poured out on the floor."

Dr. Damour says the urge to preserve hands-on play is important. "We need to care about both boys and girls doing things with their hands because it develops spatial and mental rotation abilities, which are really important to geometry and engineering."

What motivates tinkerers to keep going through their teen years? Often, it's the desire to circumvent a rule-setting, safety-conscious mother.

Robert Scalzo, age 12, of Washington, D.C., was forced to tinker after his mom flatly refused to get him an airsoft gun for his birthday or Christmas. Instead, he built a slingshot, using a Swiss Army knife to trim a V-shaped branch, attaching two rubber bands and adding a pouch made of hockey tape. "I use a lot of hockey tape," he says.

Jim Danielson, of Arlington Heights, Ill., fell into tinkering after his mother said he couldn't have a TV set in his bedroom. "If I build my own TV, can I have it in my room?" he asked. "They probably didn't think I could do it, so they said yes," he recalls.

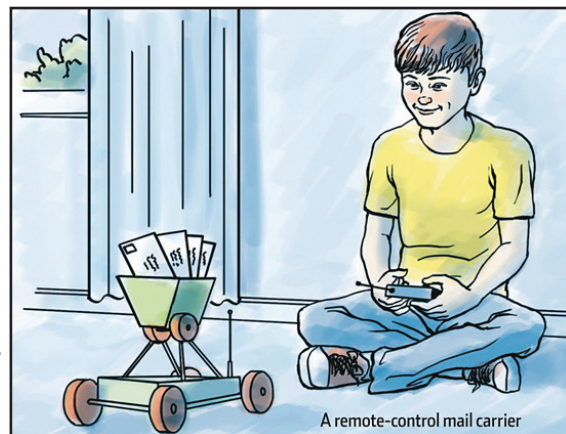
He built a projector system for his room during his high school sophomore year, and he and his friends used it to play Nintendo 64 games. His mother didn't let him take the creation to college, though, concerned it might be dangerous in a small dorm room.

No matter. Mr. Danielson, now 21, dropped out of college last year to accept a Thiel Fellowship—an unusual program started by Peter Thiel, co-founder of PayPal—which pays young innovators \$100,000 to stay out of college and spend two years tinkering instead.

Patrick Corelli, a Wayne, Pa., tinkerer, turned to YouTube and Wikipedia after his mother banned videogames when he was in sixth grade. He learned how to put together furniture, fix his computer and "mod" his remote-control cars. His favorite YouTube-inspired creation was the air cannon he and his friends made out of 4-inch PVC pipe a few summers ago.

"We put Gobstoppers candy down the tube, pumped it with a bike pump and shot the hard candy at targets across the street," recalls Patrick, now 18 and a high school senior. "So far that's the coolest thing I've built." That may not be true for long. He is heading off to the University of Pittsburgh in the fall—with an engineering scholarship.

### TINKERING CHALLENGES : Here are challenges to inspire your child's inner engineer



#### OTHER PROJECTS :

- A fort or a teepee
- A squirrel-proof backyard birdfeeder
- A marble maze in a pizza box
- A pinball machine
- A domino maze involving three of the five senses