

# The Pitsco NETWORK

DECEMBER 2011-JANUARY 2012

## The Shift to STEM

*Leaders of the movement in North Carolina  
are working in high gear.*

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## Eastern Region of North Carolina

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# Boosting the local economy via STEM

*Educators, businesses in Eastern Region of North Carolina recognize need to 'grow our own' workforce*

**KINSTON, N.C.** – There are no secrets in the Eastern Region of North Carolina. Business leaders know what education officials are doing. Secondary educators

are informed on what's happening in higher education. And higher education knows exactly what businesses need in their future employees. Nope, no secrets here.

Open lines of communication, regular meetings, and reliance on one another have helped the Eastern Region in general and the STEM East initiative specifically reshape a once tobacco- and textile-dependent

workforce into a skills-rich, STEM-literate base of employees who are attracting 21st-century jobs to the area.

Call it an economic about-face or a decision to deal with issues head on. Whatever it is, seemingly everyone in the community is onboard with the sharp focus on STEM (science, technology, engineering, math) education in the 13-county Eastern



*STEM East Executive Director Steve Hill*

Region – all the way down to the middle school level where four Pitsco Education STEM labs were implemented last fall.

“It’s really going to turn workforce development education in the direction we’re going economically,” STEM East Executive Director Steve Hill said in a conference room just across the hall from facilities where local residents were being trained in state-of-the-art aerospace composite material production. “Up until 40 years ago, it was all tobacco. We were agriculture based, and we were textile based. You know where that went. . . .”

Hill and other education and business leaders involved with STEM East are moving in a different direction now: up, and they’re doing it together.

“You’re looking at a situation where business leaders, hospital administrators, economic developers, community leaders, and educational leaders can sit down together and align ‘PreK to gray’ workforce education that aligns with the needs of the regional economy,” Hill said. “Our goal is to ensure that students graduate with viable work skills and can find quality employment in the region.”

## STEM: a joint venture

Instead of local education leaders deciding independently what curriculum is best for students, businesses and industry have had a voice in the process of planning courses for students in Eastern North Carolina. Craven County Public Schools Career and Technical Education (CTE) Director Chris Bailey says the recent

rough economy has prompted everyone to rethink their processes in an effort to better prepare students for 21st-century jobs.

Identified areas of business/industry growth going forward include advanced manufacturing, defense/military support (several bases located in the region), aerospace, life sciences, logistics, marine trades, tourism/retiree attraction, and value-added agriculture. STEM courses at the middle and high school levels, in combination with core offerings, are putting students on track for these specific careers.



*DEPS Security Systems owner Tom Vermillion*

Local businessman Tom Vermillion heads up the STEM East board of directors. His vested interest is in not only his business, DEPS Security Systems, but also the entire community. “For me, if Lenoir County grows, that can help my business. Individuals buy homes and need alarms. They have businesses that might need cameras and access control. Just the fact that we would not be a shrinking economy but a growing economy would help me.”

At every level, officials believe that STEM education is a key to turning around the economy. Pitsco Lab Facilitator John Scarfpin of West Craven Middle School knows all too well how the economy has changed. “I’m from the rust belt. I watched all the industries get exported, sent overseas,” he says. “Every industry I’ve worked in – plastics manufacturing, over-the-road trucking, retail, restaurant manager, construction – I’ve been in a lot of different places, and I’ve seen people who didn’t have an ability with math or science, that did not understand the engineering

portions of it. It drives me nuts. I’m thinking that STEM is the right direction to go.”

Hill says that the across-the-board buy-in on STEM – from education to all corners of the local business scene – should ensure the effort is sustained for many years to come. “When you bring businesses in and they start to see you’re listening to them and developing curriculum around them, they’re going to want to take responsibility and partnership in that. That’s your sustainability piece.”

## A skilled homegrown workforce

At the core of the STEM movement in North Carolina is a desire to cultivate a workforce that is prepared to fill the skilled labor positions that are either already open or popping up. A current shortage of engineers to fill positions with local manufacturers exists in the Kinston and New Bern/Havelock area because it’s difficult to lure these professionals to an unfamiliar, semi-rural area. The goal is to inspire local youth to want to become engineers, technicians, and skilled laborers.

“We have to look at it from the standpoint that we’re not just trying to satisfy the companies that are here, but we have to try and satisfy companies we want to come here,” Bailey explained. “We have to understand that we also need to be the incubators. If we don’t start to incubate those skills here, we won’t be able to grow our own. That’s the ultimate goal – to grow our own.”

Spirit AeroSystems (see related story, page 25) recently set up a manufacturing facility at the North Carolina Global TransPark near Kinston, recognizing the region’s long-

*Spirit Site Operations Director Rick Davis*





Two Havelock Middle School students had never used solder before, but that didn't stop them from completing their Blinky board.

term commitment to STEM education. The site operations director for Spirit, Rick Davis, is excited about the effort to “grow our own.”

“You get the average person to come out here and look at rural, eastern North Carolina, and a number of them say, ‘Jeez, I don’t think that’s my cup of tea.’ You get someone out of the Lenoir County school system, you have them go through the ECU (East Carolina University) engineering program over in Greenville, and hire them, and they’re liable to be here a very long time,” Davis said. “If we can grow our employee base right here within

a proactive move that could benefit the community in several ways. “Hopefully, the unemployment rate gets better and we don’t have as many on welfare. I think, too, we will start to make sure that (the curriculum) we’re dropping in, even with the Pitsco labs, that it’s going to help with the workforce needs of this community.”

Vermillion is excited that STEM education could have such a positive effect on his and other businesses in the region. “The talk before I had ever heard about STEM was that our kids never come home. They graduate, leave, and never come

the local counties, we’re going to keep them for a long time.”

Craven County Public Schools Superintendent Larry Moser adds that preparing students for *real jobs* within the community instead of focusing solely on core curriculum courses and hoping for the best is

back,” he said. “The question was, ‘Why?’ They said it was because there were no jobs. But, were we really preparing our kids for the jobs that were here? I don’t know that we were. So I hope that with STEM we can do that better.”

### ‘Education is absolutely the key’

Skills don’t just automatically form in people. They must be learned. And formal education is the logical conduit for that learning. For example, Spirit AeroSystems currently partners with a local community college to train prospective employees on specific techniques and processes needed to build components for Airbus plane parts they’re contracted to construct.

The need, though, is for STEM education to begin even earlier in the education process.

“Education is absolutely the key!” Davis said. “When (Spirit) was moving into the area, it was one of the considerations. We certainly understood the local school system and the local area, which in many respects is poor and impoverished. And

## The algebra trap

*Officials expect Pitsco program to help students avoid falling in*

It might be unrealistic to expect students to learn from traditional methods of teaching, particularly in light of the constant stimulation and instant feedback children receive in this connected, Wi-Fi world.

The principal at Contentnea-Savannah K-8 School in Kinston, North Carolina, says the dilemma is even greater in an already-difficult-to-teach subject such as algebra. “Kids are inundated with things all the time outside of school. Then we put them in a classroom, and it goes into reverse. It’s like, ‘Really, you’re making me sit through this?’” said Principal Frances Herring. “If I can put them in a lab and make it real and make it live and they can taste it and smell it and breathe it and apply it, then it’s going to click. That’s what I want.”

Thanks in part to funding support from the Golden LEAF Foundation and efforts by the STEM East initiative, Herring will soon get what she wants: a Pitsco Education Algebra

program based on real-world Modules and Individualized Prescriptive Lessons™.

“Ninth grade is a turning point. Algebra concepts should be taught much earlier,” said STEM East Executive Director Steve Hill. “We would like algebra to be the norm in middle school, not necessarily the exception.”

Herring is in full agreement, particularly after witnessing students at Kinston High School get “caught up in that Algebra I trap” during her nine years there.

“I think the lab would pull those kids out of that trap, and they can take algebra concepts and put them in a real-world application so they can see where algebra is every day. Then it’ll make sense.” **P**



Contentnea-Savannah K-8 School Principal Frances Herring

## Going straight to the top!

Principal Tabari Wallace believes the Pitsco Modules lab at Havelock (N.C.) Middle School is special, and he plans to make that known all the way up the line – as in all the way to the White House.

“We’re going to send a letter to President Obama to highlight what we’re doing here in North Carolina. We are going to invite him to come down here. We see the vision and are going toward it,” Wallace said of the new STEM lab. “I think this lab is the most important thing going on this year. I’m throwing all of my power, ability, and motivation behind it.”

A veteran administrator, Wallace knows to base his opinion on more than just personal experience. Students, teachers, and even parents share similar feelings about the new lab. “Now we have parents beating down the doors trying to get into the lab. If we could add another one, we would fill it up. Anytime you see the lightbulb go on in a child, that’s fruitful to any administrator or teacher because they’ve got it. That’s what we’re here for – for them to get it.” **P**

*Havelock Middle School Principal Tabari Wallace*



the education system, like all education systems, has its pluses and minuses.”

The local initiative to build up STEM education was a major plus. And STEM lab facilitators aren’t the only educators touting the merits of career-focused STEM curriculum.

“I can tell you that from our math and science departments, this has been supported by everyone,” said West Craven Middle School Principal Francis Altman. “There has not been a single teacher not excited and supportive about getting a STEM program into this school. There are collaborative planning opportunities for all teachers.”

Davis says STEM skills are vitally important in aerospace and related industries. “Anything in the math and sciences really has direct application to future skill sets that they’re going to need,” he said. “They need to know the simple math, but if you go out to our factory floor, our assemblers out there are pulling up 3-D models and being able to manipulate that. Their brain needs to work in that 3-D environment on the computer.”

### Middle-level STEM Modules

It isn’t OK anymore to wait for students to graduate from high school before teaching them career skills. And it’s not even acceptable to wait until they enter high school to begin the process. Instead, the

career exposure via STEM education must begin at the middle level and earlier.

Says Altman: “By the time they get to high school, they’ve got to start making some decisions about which direction they want to go. ‘Am I on a vocational track? Am I on a college-bound track? Do I want to go to a university level?’ Some of those decisions have to be made early on.”

**“At the core of the STEM movement in North Carolina is a desire to cultivate a workforce that is prepared to fill the skilled labor positions that are either already open or popping up.”**

It’s also important for students to know a vocational track is not a dead end; community and technical college credits can be transferred to many universities.

Scarfpin says his students get ample career exposure in the engaging Pitsco lab that has three sets of Modules to serve sixth, seventh, and eighth graders. The students also gain 21st-century skills such as critical thinking, problem solving,

and teamwork. “A lot of the times when a student doesn’t know what to do, even if they just verbalize it themselves, they’ll end up answering their own question,” Scarfpin said. “If they’re just always sitting and never saying anything and never verbalizing anything or talking themselves through it, they’re not learning it.”

CTE courses offer multiple avenues into STEM; in fact, it could be argued that CTE is shifting to STEM naturally. Bailey sees it that way.

“CTE is the application of core subjects in a career-focused setting,” Bailey said. “There’s a mindset among some students that when you’re talking about career and tech ed, you’re talking about shop classes. When you’re taking these particular concepts and molding them as Pitsco has done into this process, you’re thinking about career skills at the same time.”

Students verify that theory. Haley, a Havelock Middle School seventh grader, says she has had science and math classes before but she’s never learned the subjects as she does in the Modules lab. “It’s more fun; it’s more hands-on than reading out of a book in science class. And it’s fun to work with somebody,” she said. “It’s a lot easier than doing it by yourself. Your partner might understand something when you don’t, or you could help them understand something.”

(Continued on page 26)



## Administrators' Corner

**Steve Hill** • Executive Director of STEM East • Eastern Region, North Carolina

# The disconnect? A lack of engagement, relevance

Goal of STEM East regional approach in N.C. is to get students thinking like engineers and problem solvers

**I**ntroduction: Steve Hill served as director of secondary education in Lenoir County, N.C., before recently taking the new position of executive director of STEM East, which is a branch of the Eastern Region in North Carolina, an economic development initiative supported by Lenoir Committee of 100 and Golden LEAF Foundation. Hill works with several counties in the Eastern Region, including three where Pitsco Education STEM labs have been installed this year.

**TPN: The Pitsco Network**

**SH:** Steve Hill

**TPN: What are your responsibilities as director of STEM East?**

**SH:** My responsibility is to grow the STEM East initiative. I'm the one who works with industries, school districts, and teachers to build a STEM workforce development curriculum.

**TPN: Why are you such a staunch advocate for CTE in general and STEM specifically?**

**SH:** Rural and poor kids are hardly exposed to much beyond their community. This resonates with me because that's where I come from. I was intimidated because I hadn't seen a university. I had to overcome that. This is a personal thing for me, to get these kids to see that you can do this. In fact, let's take you over here and touch one of these million dollar machines and show you that you can hit that button. Your quality of life can be anything you want it to be.

**TPN: How did you build support for STEM within the community?**

**SH:** We had two initial community-based conferences, and we had a meeting with teachers. We asked, "What's wrong? Why are our kids dropping out? What's the

disconnect between the student in fifth grade, where you're still a little bit infatuated with school, and the middle schooler who totally begins to hate school? What is missing there?" The big conversation got around. They said kids are not engaged and they don't see the relevance in what they're doing. Our whole base initiative is to build off of those comments and that vision.

**TPN: Which entities have stepped forward to make this STEM push a reality?**

**SH:** Golden LEAF Foundation ([www.goldenleaf.org](http://www.goldenleaf.org)) provides some of the funding for the initiative. The Eastern Region has money in it. The Committee of 100 has money in it. The local school systems have money in it and in kind. This is really a united front effort. This isn't just one grant from a foundation. It's everybody seeing the vision, knowing we need huge change in the region.

**TPN: How did you know there was a need to start teaching STEM at the middle level?**

**SH:** The hospital director came to our group and said, "In eight years I'm going to need x number of nurses." They do projection studies about their shortages. Where are those nurses sitting? They're not in a third-year nursing program at ECU (East Carolina University). They're sitting in our middle schools and our high schools right now.

*STEM East Executive Director Steve Hill says we need to "go back into middle schools and get kids to start thinking like an engineer."*





**TPN: How is the STEM East initiative different from previous efforts to impact education?**

**SH:** Historically, education has worked in silos. What we're trying to do is put all these people at the table, including universities, community colleges, private business, and we're trying to let the economy tell us what we need to be teaching. We're trying to adjust our track at the middle and high school arena and then align that with programs at the community colleges and universities.

**TPN: Give some examples of how education needs to change.**

**SH:** We've got to get people in pre-engineering class. We've got to get people in chemistry classes where they can learn how those things work. So, what do we do? We need to go back into our high schools and get our kids interested in it, go back into middle schools and get kids to start thinking like an engineer, quit trying to fill out a formula and fill in a circle on a test. We've got to teach them failure can be a good thing when you learn from it and build on it as defined in the engineering process.

**TPN: What is being done to ensure STEM East is around for a long time?**

**SH:** We've put a team together, and that team consists of private partners like Spirit AeroSystems, community colleges like Lenoir, other community colleges in the region, and universities like ECU. The Education Department chair at ECU says, "What we're trying to do in this committee meeting is we're trying to not let the music stop." Historically, people write a grant, get together and do a project with a few kids in a summer program. The money goes away and the program ceases. She says the concept here is to keep things moving consistently and keep the hands tied together. We're trying to be that bridge between private industry and the education system so that kids are not getting out of universities, going to Spirit AeroSystems, and having to be retrained again to do that job.

**TPN: How can career and technical education (CTE) and core curriculum be brought together?**

**SH:** We want Craven County not to just be CTE labs, but we want Craven to make a difference in what's going on with science. We want to build the PLCs (professional learning communities) in those schools so that now the science sees the benefit in project-based learning, a STEM-type education. And they start looking for partners in the science classes. They also go to math and do the same thing. The curriculum becomes blurred across the core and the CTE, and

the kids start seeing relatively to what's going on throughout their school day.

**TPN: Why did you and the STEM East group select Pitsco's STEM Modules program?**

**SH:** I think Pitsco's right on the mark. What Pitsco is doing is not just developing random labs. They're going out and finding an occupation and back building that to the curriculum.

**TPN: What do you expect from the Pitsco Module program?**

**SH:** We want 21st-century skills. We want kids who have the ability to think through problems and do it on their own. This is what business leaders are asking. They're not asking kids to come out knowing a different formula or to know these facts or to know what date this happened. They're asking, "When you get a problem, can you evaluate the problem, work through it, and ask questions? Can you ask intelligent questions?" They're looking for these types of skills that kids in these labs have to develop to get through the Modules and to work them out. That's a huge benefit.


**TPN: Explain how business representatives helped select Modules for the labs.**

**SH:** They were very excited to have the opportunity to have that input. You have two choices: either get involved or complain about it. For a long time we've complained about our education system. Now here's the opportunity for businesses to get directly involved with making changes, not at a national level, not at a political level, but at a local level where they can impact kids who will be their employees four or five years from now. They see the relevance immediately. "OK, we want input in this arena."

**TPN: What could prevent the STEM East approach from gaining wider acceptance?**


**SH:** The problem is getting people consistently doing things. We have 100 plus districts in North Carolina, and everybody can be doing their own thing. If we can show that this one is truly making a difference, we need to get that around the state.

**TPN: Is CTE gaining a stronger voice in education?**

**SH:** You're talking about a true paradigm shift in how we educate. I think we're at that tipping point. We're actually now starting to show this is the direction that education needs to go. 

# What is STEM?

{ STEM (stəm), acronym. Science, Technology, Engineering, Math. }

People in various positions in eastern North Carolina define STEM – science, technology, engineering, and math – in multiple ways. Here is a sampling of those definitions: 

“STEM in this application is exposing children to hands-on learning and science and math and technology, giving them a career focus that hopefully sparks interest for other things in their educational career that they might otherwise not have chosen to touch. When a child can put their hands on something and can do it, they own it.”

West Craven Middle School  
Principal Francis Altman



“I’ve always felt like we’ve missed the boat by not introducing some possible STEM careers to these kids early on. . . . I’m hoping it will start to make our kids understand and realize, ‘OK, I need to start thinking about some possible careers for me now.’”

Craven County Public Schools  
Superintendent Larry Moser



“I think it’s embedding it into the processes and structures of the classroom and giving confidence. A lot of students are confident in the areas that move them forward.”

Craven County Public Schools  
Assistant Superintendent  
Annette Brown



“To me, it is taking those science, technology, engineering, and mathematic concepts and making them applicable. Career and Tech Ed has long been a huge promoter of learning by doing. That’s what our courses do. STEM concepts have always been there, but we are emphasizing the real-world application of theory using 21st-century skills.”

Craven County Public Schools  
CTE Director Chris Bailey



“STEM to me is technical literacy. I’m a big literacy advocate and being able to say that there’s not a predetermined answer for everything, that you have to think through things and use critical-thinking skills to use your information appropriately, that’s what STEM is to me.”

Havelock Middle School Modules  
Facilitator Marlena Bleau



“I define STEM as life and learning, taking life and putting it in a classroom so it’s not boring and not humdrum and not slow. STEM is 21st-century education. If we don’t pull them in, we’re going to lose them.”

Contentnea-Savannah K-8 School  
Principal Frances Herring



“I really see it as the bridge between education and business and how to make our education system relevant to the businesses in your area.”

DEPS Security Systems  
Owner Tom Vermillion



“The way we’ve chosen to articulate STEM is it’s developing the learning modules that engage our children in experiential learning, hands-on learning through a computer setting, field trip, bringing business to the community that makes that learning experience real. They know, there’s an application for this, and it’s right here in my community – all while focusing on science, technology, engineering, and math.”

Spirit AeroSystems  
Director Rick Davis



“It’s a very dynamic thing. I call it a 21st-century shop class. These are not the jobs of old. These are jobs of new, jobs of the future. These are the places where the students just need the skills in order to be competitive.”

West Craven Middle School  
Modules Facilitator John Scarfpin





# Multipronged approach to funding

*Golden LEAF and other sources tapped to purchase curriculum*

**T**he Golden LEAF Foundation has a clear mission: aid the economically distressed and/or tobacco-dependent counties in North Carolina. And one of the surest ways to achieve this goal long-term is through education of the young, particularly in the STEM disciplines – science, technology, engineering, and math.

Golden LEAF, which was established in 1999 as part of the Master Settlement Agreement with tobacco companies, pumped hundreds of thousands of dollars into STEM initiatives in 2011. North Carolina's Eastern Region, an economic development organization, spawned STEM East, which is using a \$350,000 Golden LEAF grant and support from Lenoir Committee of 100 to assist four counties in establishing labs that "drive relevant STEM content that is linked to industry needs in the region."

One of the counties, Craven, set up two Pitsco Education STEM labs last summer, and two other counties, Jones and Wayne, brought Pitsco labs onboard during the fall semester. Lenoir County officials plan to implement a Pitsco Modules-based algebra lab at one of their middle schools in the spring.

Craven County Public Schools CTE Director Chris Bailey said his district used a combination of Golden LEAF, Race to the Top, state, and federal funding to put in the labs at Havelock and West Craven Middle Schools.

Golden LEAF and Race to the Top are onetime funding sources, so Bailey is already planning ways to get additional labs funded for the other schools in his district, looking to traditional resources as well as those who stand to benefit the most from a well-prepared and well-trained workforce. "We know businesses are a resource that historically has helped education," he said. "We want to give them a reason to support us. We want them to help us because we're going to help them in the end."



*Curriculum that captures students' attention and teaches them STEM concepts is finding support in eastern North Carolina.*

Craven County Superintendent Larry Moser said that in these tough economic times the district has had to get creative in funding important programs such as the STEM labs. "One thing we've got to do is get more funding partners to come onboard to help support these labs and hopefully put in some more." **P**



*CTE Director Chris Bailey wants to help Craven County students become employable.*

## Selfish – but good – motives

Sometimes, it's OK to be selfish – particularly when your efforts make students more employable. Craven County (N.C.) Career and Technical Education Director Chris Bailey openly acknowledges his personal selfish motives for improving the CTE offerings within the school district.

"I know that one day I'm going to retire, and I'm going to need a little bit of social security," Bailey explained. "I want to make sure that I have provided enough experiences to our kids that they become employable, that they become successful, and they pay that social security because I want to have a little taste of it." **P**



**By John Scarfpin, Career and Technical Education Instructor** • West Craven Middle School

## CLOSE-UP: STEM Education: Preparing Students for the Global Workforce

**Editor's note:** This article originally appeared in Sun Journal, New Bern, N.C., on October 1, 2011.

The language of the education world is full of acronyms, and the one getting the most national attention is STEM education. So what is STEM? STEM stands for Science, Technology, Engineering and Mathematics.

Why is this getting so much attention? The focus on STEM education is to prepare students to become future scientists and engineers. Students are exposed to complex open-ended problems that they must research and collaborate to solve while they learn how to use the skills of the applied sciences and technology. Deployment of STEM in a school setting can range from small after-school programs to entire schools dedicated solely to STEM education.

Craven County students are very fortunate that the district has the vision to invest in STEM at various levels. The students at West Craven Middle School are the beneficiaries of this vision as the grant-funded STEM Lab has 12 stations that can host two students at a time with 18 different modules provided by Pitsco.

The modules are geared so students will experience a taste of the career fields around which the modules are designed with options such as alternative energy, biotechnology, CNC manufacturing, robotics, flight technology, electronics and applied physics and forensics.

In these areas students learn how to program computers, build circuits, reconstruct a crime scene and lift finger prints, extract DNA, design a wing for an airplane and test it, and use physics

equipment such as air tracks, oscilloscopes and signal generators.

In the past, when a student took a vocational class, it included items such as tablesaws, welders, forges, ovens and sewing machines. A STEM lab is “the 21st-century shop class,” providing students with the necessary experiences and skills to pursue the job or college track of their choice and become part of a globally competitive workforce.

For me, as an educator, it is so inspiring when a student tells me that they can't wait to come to class, or when they see another student working on something and they share that they want to try it too. This lab has ignited an excitement for learning within my students. [P](#)



**By Marlena Bleau, Career and Technical Education Teacher** • Havelock Middle School

## STEM initiative gives students real-world experience

**Editor's note:** This article originally appeared in Sun Journal, New Bern, N.C., on October 15, 2011.

Havelock Middle School students have been offered a new Career and Technical Education class this school year.

Grant contributions from North Carolina's Golden LEAF Foundation gave students a STEM Lab that aligns to career options in Eastern North Carolina.

STEM is an acronym for science, technology, engineering and math, all of which lead the way to twenty-first century education models. Learning interface software developed by Pitsco encourages students to use literacy, math, critical-thinking skills and collaboration to draw conclusions, find and correct mistakes, and complete projects related to a specific discipline. Students interact with the software and complete hands-on projects that provide an experience and insight into industry-based careers.

Students crave real-world, relevant experiences within classrooms. They want to know: “How is what I'm learning going to help me when I grow up? When will I ever use this?”

The STEM Lab is a place where students are able to apply and connect what they have learned in the core classes to a real-world application. Additionally Craven County School's Career and Technical Education department continues to articulate with the area high schools, Craven Community College and the local community industries, including FRC East, to assess the future workforce needs in Craven and surrounding counties. Career and Technical Education Director Chris Bailey stated: “By educating in the STEM areas now, we will be able to attract and retain industry in our communities by providing a highly trained workforce.”

STEM learning modules at Havelock Middle School include the following topics: flight technology, CNC manufacturing, rocket science, plastics and polymers, robotics, material science, electronics, simple machines, electricity, Computer Aided Drafting and Design (CADD), engineering bridges and energy, power and mechanics.

Havelock Middle School students continue to be excited about what they are learning. [P](#)

## Problem solvers who can work together

*That's what business owners want in their new employees*


He's a business owner who has a lot invested in his company. He has a wife and four children who rely on him to provide for the family. And his 23 employees count on him to generate enough revenue to make payroll.

With all of that on his plate, how can Tom Vermillion invest valuable time as a leader of the STEM East initiative in the Eastern Region of North Carolina? Simple. The University of North Carolina graduate knows that his future workers will come out of local schools, and he wants those workers to possess the skills necessary to be successful as an employee for DEPS Security Systems.

"I think sometimes there seems to be too much 'Memorize this. Take a test on that. Memorize this. Take a test on that.' Ultimately, in the real world, we're not testing. I don't need somebody to recite a bunch of stuff to me," Vermillion said. "I need them to be able to understand the technology and then work together as a team to make whatever it is work."

Other business leaders – in North Carolina and across the U.S.

– are saying the same thing. They need employees who possess key 21st-century skills: the ability to problem solve and work as part of a team. Craven County CTE Director Chris Bailey and STEM East Executive Director Steve Hill have heard Vermillion and Co. loud and clear. They've spearheaded the effort to get Pitsco STEM labs set up in four area schools. The STEM labs introduce middle school students to various careers and skills through hands-on, real-world activities, but the labs also give students the opportunity to cultivate those highly sought-after 21st-century skills.

"You can target a particular career, but five years from now that career's going to change or morph," Bailey said. "We want to give kids the basic skills so they understand how to problem solve and know the areas in which those skills fit." 

*Students practice and hone 21st-century skills at a Module workstation in eastern North Carolina.*



## Aerospace manufacturer likes the STEM spirit in N.C.

*Large employer expected to attract other businesses and industries*

Every shopping mall has one, an anchor tenant – the store that occupies the most space, has the most employees, and attracts other merchants to fill the remaining store fronts.

Communities are set up the same way. They need anchor businesses and industries that build large facilities, hire lots of employees, and attract ancillary businesses that provide component parts and support services.

Kinston, North Carolina, recently attracted an anchor aerospace industry

giant, Spirit AeroSystems, with hopes that other aerospace-related businesses and retail shops and restaurants will soon follow to meet the needs of the facility's nearly 250 employees (workforce projected to reach 700 within four years).


One of the selling points that attracted Spirit to eastern North Carolina was an obvious commitment to improve STEM – science, technology, engineering, and math – education from middle school through community college.

"We know that our future workforce right now is being educated within the school systems in Lenoir County, Green County, and Pitt County and will be attending the community colleges in the area and the colleges within the state," said Rick Davis, site operations director for the Spirit facility. "We became very interested in any initiative to improve the technical skills within those school systems and university systems."

Davis serves as a member of the STEM East committee that spearheaded an effort

to set up four Pitsco Education STEM labs in local middle schools. Spirit is intent on being an active member of the community in general and of the education sector specifically.

"The company itself has a community interest. When we reside in a community, we take that responsibility seriously. We shop at the grocery stores. We have kids who may be working at Wal-Mart or the local Dairy Queen or wherever. Our employees become a part of the community," Davis said. "We're going to be here a long time. We're going to build more buildings out here."

That commitment has STEM East Executive Director Steve Hill optimistic that other businesses will locate to Kinston's Global TransPark complex, which boasts one of the longest airstrips on the East Coast. "What we look at here is, once you get a Spirit, all the companies that have to support a Spirit will start coming. That's the ripple we're looking for – raw materials and anything that goes along with putting in that kind of advanced manufacturing system," Hill said. 

*Spirit AeroSystems' skilled employees build aircraft structures using state-of-the-art composite materials.*



## Passionate teacher begets passionate students

It's hard to tell who enjoys the Pitsco STEM lab more – the teacher or the students – at West Craven Middle School in New Bern, N.C. One thing is for sure, though, they all appreciate what the lab offers.

John Scarfpin brings passion and a deep knowledge of math, science, and technology (teaching certification *and* work experience in all three areas) to the classroom every day. Consequently, his students have developed a curiosity and a desire to learn about physics, forensics, robotics, electricity, engineering, and just about everything else set up at the workstations.

It's a classic case of "passion begets passion."

*Facilitator John Scarfpin brings passion and a deep knowledge of STEM to the classroom every day.*



"I do enjoy going through the Modules myself because this is a lot of the stuff I've done in the past," Scarfpin said. "Prior to becoming a teacher, I started out as a computer engineering major, so a lot of this stuff was right up my alley anyway."

Scarfpin's alley has had many twists and turns. He's worked in retail, construction, electronics, and a variety of other areas. Since becoming a teacher, he's gotten his students involved in robotics, NASA activities, Science Olympiad, and even environmental science and sustainable business practices that stem from his involvement last summer in a Fulbright Teacher Exchange Program in Japan.

Robotics is his No. 1 passion, though, and he's already planting that seed among sixth graders in the lab, who sometimes stay after school an hour or two to create and play with robots.

"I worked with the LEGO® NXT robots for the last three years at Tucker Creek Middle School," Scarfpin said. "What I'm doing here with the sixth graders is incorporating what I did with my club. I'm actually using it as a teaching method."

The Pitsco *Robots* Module is a great introduction to the functions and programming potential of robots. "I'm very impressed with that Module. What it has them learn in seven short sessions is very impressive."

His students' enthusiasm for the activities virtually ensures their success. After all, passion begets passion. **P**

## Boosting the local economy via STEM (Continued from page 19)

Haley's teacher, Marlene Bleau, concurred, going so far as to compare the lab experience to a real work environment. "They have somebody to bounce something off of. In the world of work, I run everything by my peers or my supervisors just to make sure I'm thinking about it correctly," Bleau said. "I really feel this is a more grown-up environment that they are functioning in."

Altman added that students coming out of the Pitsco lab will be eager to learn more about specific careers of interest in high

school. "The things they see in here are intriguing. They're cool. They want to learn more. To me, that is one of the big reasons for bringing this in here. Here in the STEM lab, they can take this algebraic concept they're learning and see it work. They don't have that opportunity for tactile learning in the regular classroom."

Specifically, the process and content learned at various Modules, such as *CNC Manufacturing*, *Electricity*, and *Engineering Bridges*, result in the same outcomes that businesses seek from their own processes.

"It's not unlike the way I think of our manufacturing processes," Davis said. "We set up our manufacturing processes with repeatability and reliability in mind. We want to be able to do the same thing every time. When we set up our processes with that repeatability and reliability, we know it'll yield the best result. I think of these education Modules in the same way. They take a structured approach to learning and provide some hands-on, real-life settings that take the student through the learning processes." **P**