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Camdenton Schools 'LEGO League' Is Building Little Scientists, One Block At A Time

by Janet Dabbs
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CAMDENTON, Mo. — A new program being piloted at Camdenton R-III School District is building a bridge—out of play—for preschool students, from the real world to Science, Technology, Engineering, Math, (STEM) Language and Literacy. The district was selected last year, out of 12 schools in the world, to pilot the FIRST LEGO League Jr. Discovery Edition, for students age four through six.

“Because this program involves hands-on learning, every one of my students really get into learning,” Camdenton R-III School District Early Childhood Preschool Teacher Sarah Schwantes said. “They make their own creations/models, with their own ideas, to solve a problem. This allows

them to be in charge of their own learning and have more ownership in the ‘learning process’…a much better method than teachers telling them exactly what to do step by step. This learning on their own thought process/ problem solving skill will follow them throughout their school career and on into adulthood.”

Building a Better Community in Preschool – Boomtown Build

This year’s FIRST LEGO League Jr. Discovery theme/challenge is “Boomtown Build.” In this program, children think and behave like architects and engineers, developing their ability to observe, question, gather information, and ask questions. The children are given meaningful problems to solve and then they have to work together to wonder and question, build, listen and share. Preschool classrooms will begin this challenge March 2, 2020. There is a Kindergarten and First grade pilot group currently working on the challenge.

Inspiration Creativity and Hope

In Boomtown Build, the students become a part of a thriving community full of creativity and hope for a better future, built together, by helping the city they call home. They learn about all the different types of buildings that are in Camdenton; the courthouse, the police and fire stations, hotels, restaurants, condominiums, houses and more. They will also learn about the types of equipment it takes to construct these buildings.

“The students are tasked with developing ideas on how to make their town better,” Schwantes said. They use an engineering notebook, to draw and figure out how to build their ideas with LEGOs. “Students decide what kinds of buildings the town needs, discover things about it, and try to build it, using pieces from the LEGO STEAM Park set and the Boomtown Build Discovery set.”

Students also learn about construction sites and how buildings have to be structurally sound. They learn about different types of tools and how to make buildings to withstand different types of weather. “This leads to all kinds of great conversations,” Schwantes said. They also learn about infrastructure: for example, if a river was in middle of town, they would plan ways to cross it. “We hope that they can come up with meaningful solutions such as a tunnel, a boat, or a ferry. They make their own discoveries…we do not provide the answers. Our students are brilliant…they come up with ideas I could never think of!” she praised.

“It is also important for children to have fun. The more playful the sessions are, the more motivated they will be. They are allowed the time and space to question, wonder and ask about buildings. architects and the needs of people in their community.”

Exploring, Creating, Testing and Sharing

During each session, students experience the engineering design process. There is no set order for this process, and they may go through each part several times in a single session. This means that during a session, the children will explore the theme and ideas, creating solutions, testing them, iterating and challenging them, and then sharing what they learned with others.

FIRST LEGO League Jr. Discovery Edition

“The FIRST LEGO League Jr. Discovery Program utilizes the 'Six Bricks' as foundational tools for introducing learning through play,” Schwantes said.

Key learning areas include:

- Cause and effect
- Spatial awareness
- Observing and describing
- Problem solving
- Role play and collaboration

They also use vocabulary cards to learn STEM language, becoming familiar with words like gears, rockers, turntables and ramps. The students practice skills of observing, predicting and measuring.

Working as a Team

Children work together in teams of four to six collaborating, building, learning, and playing together. They are encouraged to work with their teammates, to listen to each other, to take turns, and to share ideas and pieces, big things for preschool age students.

No "Wrong Answers" – It’s about the Learning Process

“There is no such thing as failure,” Schwantes said. “The importance is in the process of how you get to discovery. It is not about the end result, it is about the process of learning. If it did not work, how do we go back and fix it to make a workable solution?” This allows failure to be the teacher and problem solving the answer. “It’s okay to go back and find a solution. I love that there is no right or wrong answer!” Schwantes enthused. “I know it is hard for them when their solution doesn’t work. We encourage them to try and try again, until they find an answer that does work. When they go back and figure it out themselves, it provides more learning than a teacher just telling them the answer. They learn from their own trial and error. The students also learn how to cope with failure when it doesn’t go right, learning how to deal with frustration and feelings by themselves, by applying a different solution.”

Celebration Event March 23

There are no competitions in the Discovery program. Students have “Celebration Events.” The Pre-Kindergarten Celebration Event is scheduled at 5 pm on Monday, March 23, at Dogwood Elementary School in Camdenton. Parents and community members are invited to attend. They will hear students talk about what they have learned and students will share their engineering notebooks and models. “It is a night for our students to shine,” Schwantes smiled. Students will also be presented with a participation award.

What is Next?

“A new and exciting challenge is presented every year,” Schwantes said. “Experts in the field create new challenges, that relate to an important real-world issue.” Last year, the theme was Mission Moon and students learned about the moon and space travel and what they would need to survive.

Preschool to High School Robotics

There are five progressions in the For Inspiration and Recognition of Science and Technology (FIRST) curriculum in the district, including the preschool program.

These include:

- FIRST LEGO League Jr Discovery: Ages 4-6
- FIRST LEGO League Jr: Ages 6-10
- FIRST LEGO League: Ages 9-14
- FIRST Tech Challenge: Grades 7-12
- FIRST Robotics Competition: Grades 9-12

This is the second year the district has participated in the preschool program. There are seven teachers for all of the programs and each teach a morning and after school session. The kindergarten pilot has 16 participants and two teachers.

All preschool students participate in the FIRST LEGO League Jr. Discovery. "There is a huge interest, but not enough after-school staff," Schwantes explained, "so we use a lottery system to choose which kindergarten and first grade students will participate in the FIRST LEGO League Jr." All FIRST LEGO League programs, except the preschool program, meet after school.

FIRST Core Values

All teams, preschool through high school, learn to operate under the FIRST Core Values. According to firstlegoleague.org, the FIRST Core Values are the cornerstones of the program and they are among the fundamental elements that distinguish FIRST LEGO League Jr. from other programs of its kind.

The program expresses the FIRST philosophies of *Gracious Professionalism* and *Cooperation* through the Core Values of:

- **Discovery:** *We explore new skills and ideas.*
- **Innovation:** *We use creativity and persistence to solve problems.*
- **Impact:** *We apply what we learn to improve our world.*
- **Inclusion:** *We respect each other and embrace our differences.*
- **Teamwork:** *We are stronger when we work together.*
- **Fun:** *We enjoy and celebrate what we do.*

Joy of Learning

By the end of the program, the hope is that the children emerge more confident, better equipped to face future challenges and they will have discovered the joy of learning. “There are different types of learners,” Schwantes said. Some can pick up a Lego and build anything, others don’t have that kind of imagination, but they are comfortable with engineering or literature and can write or draw the idea. This covers every type of learning. In my 20 years of teaching, this program has been the most amazing and has been my favorite to implement!”