

# Hands-On STEM: Engaging Fourth and Fifth Graders in Creative Engineering

In our fourth and fifth grade STEM classes, students explore the wonders of engineering, technology, and God's amazing world through hands-on projects that challenge their creativity and problem-solving skills. Each activity is designed to enhance their understanding of how we can interact with the world around us to build useful—and often fun—creations.

One of the most exciting projects this year was our *robot arm tournament*. Using four robotic arms controlled by multi-joystick controllers, students competed to pick up marbles from a table and place them in a container. The challenge required speed, dexterity, and coordination, pushing students to refine their motor skills while also thinking strategically. The competitive aspect made it an engaging and high-energy activity that students loved.

Another major project in our STEM classes involved constructing a working *Ferris wheel model* using only popsicle sticks, bottle caps, careful planning, and plenty of imagination. With limited supplies, students have to think critically about how to design a stable, functional structure. This challenge encouraged teamwork and engineering problem-solving, as they experimented with different ways to balance and support their creations. This project is still in process.

In addition to large-scale builds, fourth-grade students worked on a St. Patrick's Day greeting card project that introduced them to basic electrical circuits. Using a small LED light, a disc battery, and copper conducting tape on cardstock, they attempted to create light-up greeting cards. While many students faced difficulties getting their circuits to work on the first try, this project became an excellent lesson in perseverance. By troubleshooting their designs and making adjustments, they learned that failure is just a step toward success.

Through these projects, students not only develop practical STEM skills but also build confidence, creativity, and resilience. Each challenge fosters curiosity and a deeper appreciation for how engineering and technology shape God's world. Whether programming robot arms, constructing Ferris wheels, or experimenting with circuits, our students are gaining hands-on experience that will serve them well in future scientific endeavors.