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Wheel and axel was the engineering lesson tied to the story "The Three Billy Goats Gruff" in the Engineering Storybook kits recently distributed by Illinois Extension and 4-H. 4-H staff developed and distributed the kits with the goal of providing "learn by doing" home activities that would help members feel engaged and connected.

Storybook Engineering Kits Created to Provide Lessons and Connections for Youth at Home

Combining classic children's literature with engineering activities resulted in a unique learning combination for a unique situation. 4-H staff with University of Illinois Extension serving Fulton, Mason, Peoria, and Tazewell counties created "Storybook Engineering" kits for youth to use at home with the goal of providing a learning opportunity along with an opportunity to stay connected with others.

Over the summer, 4-H staff developed lessons, online videos, and reflection questions for a 6-activity series called "Storybook Engineering." Adapted from curriculum originally created by Sara Bowers from the Institute for the Study of Knowledge Management in Education, these lessons teach about simple machines by allowing young people to plan and design real-world solutions to storybook problems using everyday materials. For example, by using the story of Rapunzel as a springboard, youth are guided through a lesson and reflective questions while doing a hands-on activity to learn more about the engineering concept of the inclined plane.

Over 50 families registered for the 4-H Staying Connected @ Home program and received kits that included all the materials needed for the activities—supplies, storybooks, lesson plans, and links to the online reflection forms and video lessons. The project was financially made possible by Illinois 4-H Foundation.

"As we planned the kits and lessons, we wanted to help ease the burden of implementing the lessons on families who were already overwhelmed," explained Emily Schoenfelder, 4-H youth educator. "Families were given the option to pick up the kits at our office or have them delivered by 4-H staff. We wanted to provide a safe, but in-person, connection between 4-H staff and families."

At home, families used the kits and videos for fun, educational activities that could be done as it best worked into their own schedules. Some youth also shared the stories and activities with their 4-H clubs or other youth groups.

Over 80 reflection forms were completed (one for each activity), with 10 young people completing the entire series. 100% of the youth responding to reflections indicated that, after completing the activities, they were interested in doing more science, technology, engineering, art, and math (STEAM) projects, they learned more about simple machines, and they were better at planning or designing new things. Indeed, many of the members further commented on this planning and design process. One participant said, "It takes a lot of time to make something work the way you see it in your mind." Another indicated, "Sometimes things don't work on the first try, and it's okay to try again."

Photo by participant's family

Additionally, 100% of participants that completed reflection forms indicated they felt more connected to 4-H after doing the activities.

"In the midst of extraordinary uncertainty and change, Illinois Extension and 4-H have found new ways to continue to engage our clientele," stated Schoenfelder. "Regardless of circumstances, we are always honored to be a continuing part of our families' lives."