



What a trip!

Orange County teems with unique field-trip opportunities to spark children's interest in the sciences.

When Brenda Morace's Lake Forest Girl Scout troop set out to earn their Entertainment Technology badge, one of their first goals was to learn exactly how a roller-coaster works.

They arranged a field trip to Knott's Berry Farm, so they could experience Newton's Laws of Motion in action. There, an educator explained the physics behind one of the rides, and then they rode it together, followed by a debriefing about what the ride felt like.

"The girls had a great time making the connection between the scientific term and the actual feeling of that force through post-ride discussions with our guide," says troop leader Brenda Morace. "There were many moments when you could see the connections being made, and it was a really fun way to show them the real-world application of these scientific terms."

Her daughter, Sara Morace, who was in fourth grade at the time of the

trip, agrees it was a fun way to learn.

"I really liked learning how force and friction affect speed, and where to sit on the roller-coaster to feel the most G-force," she says.

Whether it's a physics field trip at one of its famous theme parks or visits to its world-class beaches or wetlands, Orange County is teeming with unique opportunities for outings that make the sciences come alive for children. Parents and teachers who want to bolster learning in the areas of science, technology, engineering and mathematics (STEM) have a wide range of resources for field trips in their own backyard.

Knott's Berry Farm in Buena Park offers the Energy in Motion field trip – the one attended by Morace's Girl Scouts – for students in grades 2 to 12, with children learning the physics of rides selected to be age-appropriate. For more information, go to knotts.com/group-sales and click on the "Students & Youth Programs" link.

Through its Disney Youth Programs

PHOTO: STEVE GRANITZ



[disneyyouth.com]. Disneyland offers field trips that focus on the applied sciences. The park offers an Energy and Waves Physics Lab to explore the use of sound, light and magnetism in its rides and other attractions, as well as a Properties of Motion Physics Lab at Disney California Adventure that explores how kinetic energy and speed are used.

"We are all about enrichment opportunities for students," says Angela Kline, a spokesperson for Disney Youth Programs. "We are looking to reinforce what these students are learning in the classroom. What better way to learn about gravity than the Tower of Terror?"

One of the county's largest providers of STEM field trips is Inside the Outdoors [ito.ocde.usd], a hands-on environmental education program operated by the Orange County Department of Education. In the 2013-14 school year, 32,000 students from every school district in the county attended an Inside the Outdoors field trip at one of its 14 sites, says its operations manager, Stephanie Smith.

"It's really important for kids to get out and see Orange County," she says.

"Informal education allows kids to get out of the regular classroom and into hands-on learning. There are kids who learn differently than by just looking at textbooks."

Inside the Outdoors offers a diverse range of field trips, such as a program for third- and fourth-graders to learn about the Native American lifestyle and culture, at Shipley Nature Center in Huntington Beach. Children learn about how Native Americans used plants, whether it was to repel insects with sagebrush or make shoes from Yucca.

Inside the Outdoors runs a program about wild wetland ecosystems at the Upper Newport Bay and also at Irvine Regional Park, in Orange, which includes a visit to the Orange County Zoo. There, children can see and make scientific observations about the animals.

At its Rancho Soñado location in Silverado Canyon, fifth-graders can learn about different ecosystems, including chaparral and wetlands. The students get to study a pond, make a hypothesis to see whether or not it can sustain life, and then conduct scientific tests to determine

if they were correct, Smith says.

"I think parents understand that going on a field trip is learning in a different type of classroom," she adds. "It just becomes more real for the kids."

Field trips are indeed important to children's learning, says Candace Lutzow-Felling, who heads the Informational Science Division of the National Science Teachers Association, a Virginia-based organization that promotes excellence and innovation in science teaching.

"Sometimes when you take a child out of the classroom, you spark an interest in science that is not there in the class," Lutzow-Felling says. "Outdoor learning can engage students in different ways – and deeper ways – and reinforce scientific concepts talked about in class."

There is no national standardization that helps teachers judge what makes a good STEM field trip, Lutzow-Felling says. But teachers and parents who want to choose quality experiences should ask whether informal educators teach at the appropriate grade levels, and teachers should have a solid learning objective in mind when planning a field trip. The other very important thing: This isn't a day off for the teacher. He or she needs to serve as the manager of the classroom while the guest instructor provides the instruction.

Lutzow-Felling notes that if she were teaching in Orange County, she would take advantage of our location and consider involving students in oceanographic or shoreline-based research.

One excellent resource for such field trips is the Ocean Institute in Dana Point [ocean-institute.org], which has a 30-year track record of offering more than 60 different educational programs, everything from labs that study the mackerel's digestive system to marine mammal cruises in the harbor to an ecological safari to Catalina Island.

"Kids who might not be the best students in class are underperforming because they're bored," Lutzow-Felling says. "You take these kids out of class and challenge them to investigate a real-life problem, and they come to life. These experiences aren't just for kids who are gifted and smart. All kids should be given these opportunities." 