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### Op-ed: Adopt Next Generation Science Standards in schools

It's imperative we adopt, implement and fund the nation's new Next Generation Science Standards in Washington state, according to guest columnists Sonia Siegel-Vexler and Jeff Estes.

By Sonia Siegel-Vexler and Jeff Estes

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ON her 11th birthday, Olivia Kinney donned goggles and gloves to test oxygen levels in pond water at an off-site Pacific Science Center program. "I love this," the Bothell girl said. "I want to do this the rest of my life."

As educators, we're thrilled. As a society, we have a responsibility to provide the strong science education Olivia and her generation will need to compete in a global economy and make meaningful decisions about water quality, health care, climate change and cybersecurity.

It's imperative we adopt, implement and fund the nation's new Next Generation Science Standards in Washington state, one of the most science- and technology-dependent economies in the nation. National recommendations on science education have not changed since 1996. Back then, the Internet was not as widely used, brain research had not yet revealed children's capacity for scientific understanding and classroom science relied more on acquiring facts than understanding concepts.

The new guidelines build a clear progression of science skills from kindergarten through grade 12. By graduation, students should understand science and technological information so they can engage in public dialogue and make personal decisions. They should possess the skills required for a STEM workforce, short for science, technology, engineering and mathematics.

In Washington, Boeing, Microsoft, Amazon.com, Paccar, Pacific Northwest National Laboratory and the LIGO Hanford Observatory are leading global change in transportation, software, e-commerce, energy and space. Businesses are hungry for graduates literate in science and technology. Sadly, we cannot provide the talent needed to fill higher-wage positions since Washington ranks 46th in the nation in the number of STEM graduate students.

Washington currently has 20,000 unfilled jobs due to lack of qualified candidates in health care,

computer science, engineering and other STEM sectors. By 2017, the gap is expected to skyrocket to 45,000 jobs. Instead of growing and employing our own talent, we're exporting jobs, outsourcing and importing science-tech grads.

The problem, and solution, starts in elementary school, where most children do not get the sustained science education they deserve. Half of fourth-grade teachers in Washington teach less than two hours of science per week. Only four states in the country report less science instruction. And one in four Washington elementary school teachers do not teach any science at all.

We know it can be done. Washington State Leadership and Assistance for Science Education Reform (LASER) has worked with Yakima's West Valley School District for more than a decade on science themes in K-12. In this rural community, where 42 percent of children qualify for subsidized lunches, elementary students study salmon life cycles and raise salmon fry. Middle-schoolers study how dams impact salmon and provide energy. High-schoolers examine stream health and salmon survivability.

Last year, 80 percent of West Valley's fifth-graders met state science standards, 14 percent above state average and a 45 percent increase since science testing started eight years ago.

Let's open career doors for all children — including girls, low-income students and students of color — by providing strong science education early, both in and out of the classroom. Studies show the most important determinant of a STEM career is whether by age 13 youngsters can picture themselves doing a STEM-related job.

Every student should learn science every day, starting in kindergarten. Kids are naturally curious and learn best from firsthand investigation and engineering challenges. Subsequent grades can build on this strong foundation. And as Olivia's aha moment shows, we must cultivate an educational ecosystem that connects the classroom to the world beyond, including community institutions dedicated to STEM learning.

Everyone can help make science and the Next Generation Science Standards accessible to all students. Ask your legislator to support funding for professional development in science education. Request your school district teach science in every grade. And take your kids, or any kids, to a science center, science festival, aquarium, zoo or park. Our students and economy thank you.

*Sonia Siegel-Vexler and Jeff Estes codirect LASER, a state program led by Pacific Science Center and Battelle with the Office of Superintendent of Public Instruction, Educational Service Districts and school districts.*