Equitable Access to K-5 Science Learning

Examining our Washington State education system through the lenses of equity, anti-racism, and social justice exposes a long-standing, systemic problem. It is common knowledge that our K-5 students have widely disparate levels of access to science learning experiences, with many spending little to no instructional time engaged in science generally, let alone in experiences aligned to Washington's state-adopted standards and state laws. This seriously impacts these students' foundational learning development, STEM identity and mindset, academic progress, and future opportunities.

Key Points:

A. **K-5 students of color, those receiving additional academic support, and students living with poverty are disproportionately affected and are more likely to experience little to no science learning.** Students in these groups often receive siloed, skills-based learning targeting only math and ELA. This gatekeeping perpetuates knowledge disparities between students with and without science access and tracks students onto a path where they receive only a basic education.

B. **Many K-5 students experience siloed learning focused mainly on English Language Arts and Math.** K-5 students often experience learning prioritizing math and ELA only. This narrow focus limits students and fails to leverage the anchoring arena science provides where all subjects come together in authentic learning experiences grounded in meaningful purpose. Science engages curiosity and drive to learn, provides for social and emotional learning needs, and requires students to deeply read, write, speak, and listen; apply mathematical thinking and skills to authentic contexts, and consider human relationships with the natural world.

C. **Impacted students are deprived of a well-rounded, all-literate education that prepares them for life after school.** A focus on teaching only math and ELA ignores the importance of developing students as well-rounded learners who can make connections between content areas, themselves, and the real world. Rather than focusing on math and ELA as end goals themselves, we should strive for authentic, integrated learning that prepares students to thrive in life after school.

D. **Multiple Washington State laws require equitable access to science learning for all students.** See RCW 28A.150.210, RCW 28A.230.020, and WAC 392-410-115 Therefore, failing to provide all students with the opportunity to learn science is outside of compliance with state law and infringes on student civil rights.

E. **Students who do not have access to science learning in K-5 are denied the opportunity to develop personal STEM identities and mindset.** Students in marginalized groups, including girls, face obstacles of personal mindset and social messaging about their place in science and STEM. Failure to address these issues during the formative years when students are developing their ideas about who has the right to access science and engineering learning and establish rightful identities as STEM-literate people perpetuates this problem.

F. **Students without access to K-5 science learning face a six-year disparity in learning.** The Next Generation Science Standards develop content knowledge, scientific practices, and analytical thinking skills in a clear, coherent progression, beginning in kindergarten and building grade by grade. Therefore, students without access to this early learning must enter middle and high school lacking the foundational skills, knowledge, and learner confidence of their peers that the NGSS effectively develops in the elementary years. This strongly disadvantages these students in their ability to be successful in science courses in middle school, which consequently impacts their readiness for the rigor of high school science.

G. **The 21st Century workplace requires STEM life-skills beyond reading and math.** According to WA STEM, by 2030, it is estimated that 70% of all Washington state jobs will require education beyond high school and 67% of those jobs will require STEM life skills. When students do not receive the foundational early learning that develops these crucial skills, content knowledge, and STEM identity mindset, this closes the door to them early on for future access to stable, high-paying, in-demand jobs that are even now being secured by out-of-state candidates.

H. **A lack of early learning in science contributes to the ongoing lack of STEM workforce diversity.** Since students of color are disproportionately impacted by this lack of access to early science learning, which develops a mindset of possibilities and science identity, this contributes to perpetuating the continuing lack of diversity in our Washington STEM career workforce, including our science teaching workforce at the secondary and college level, which we know is not representative of our student body diversity.

Rebuilding for an Equitable and Just System that Meets the Needs of All Learners: To provide equitable access to learning and opportunities, all elementary students in Washington State will consistently receive sufficient quality time comparable to the other content areas engaged in coherent science learning experiences aligned to our state-adopted standards and state laws so they develop as confident, scientifically literate students and adults who can solve problems, make informed decisions, and successfully pursue pathways and careers of their choice. (All standards, all students)