OREGON
STEM
EDUCATION
PARTNERSHIP

STEM

Advancing Science, Technology, Engineering and Math Education

Introductions

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Portland State University

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Intel Corporation

Carl Mead, Deputy Superintendent
Beaverton School District

Nancy Hamilton, Director of Business Development
McKinstry Company

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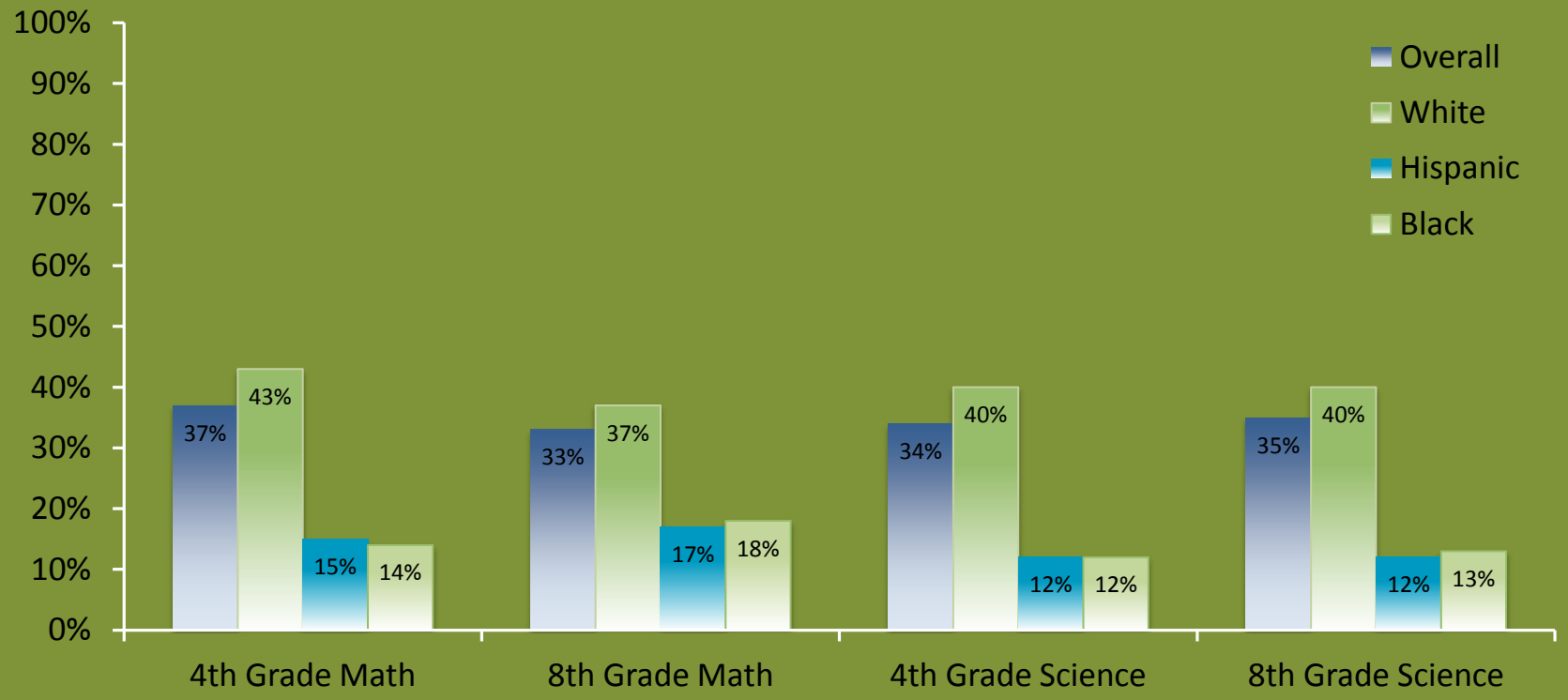
STEM Achievement in Oregon



National Average (Overall): 40%: 34% 32% 29%

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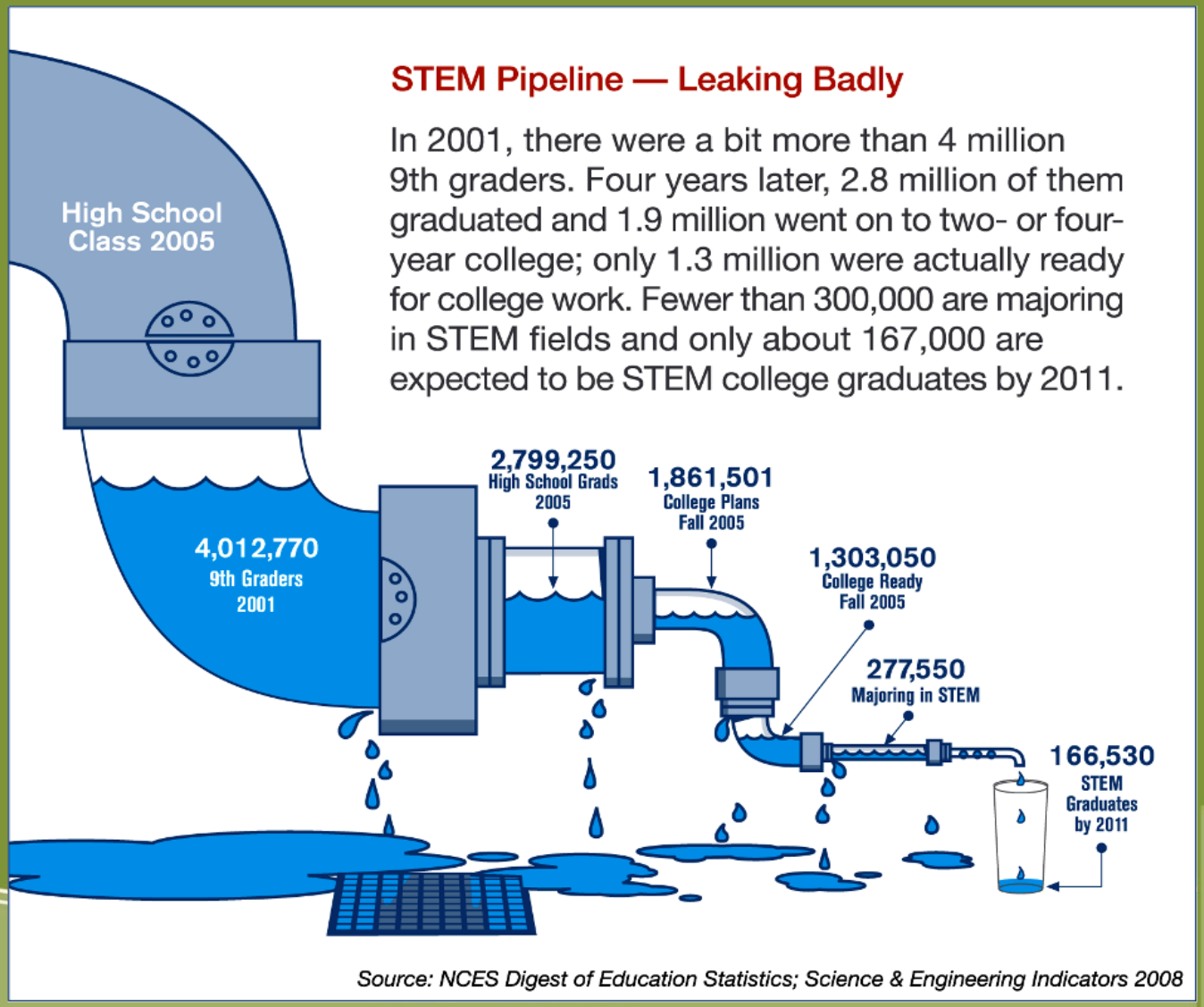
National STEM Graduates Projections



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Portland Metro STEM Education Partnership: Mission and Alignment

We will measurably increase the college and career readiness of K-12 students by engaging teachers and whole schools in collective impact partnerships that transform the learning and teaching of science, technology, engineering and mathematics (STEM) for all students in support of Oregon's 40-40-20 educational goal

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Successful Collective Impact Partnerships

- **Common Agenda:** Transform STEM learning cultures in K-12 schools by providing pathways for all students to college and career readiness and the achievement of Oregon's 40-40-20 goal.
- **Shared Measurement:** Establish a shared outcomes-based system for measuring student achievement, program performance and partnership engagement.
- **Mutually Reinforcing Activities:** Align the programming, research and development assets of core and collaborating partners by targeting the needs of students, teachers and schools.
- **Continuous Communication:** Establish the Portland Metro STEM Center for College and Career Readiness as the communications and programming hub for the partnership.
- **Backbone Organization:** Engage a board of core partners of school districts, colleges and universities, businesses, community organizations and government agencies as the backbone of this collective impact partnership.

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Outcomes-based Transformation of STEM Teaching and Learning: Common Measures

- **Student Achievement Measures:** Knowledge and skills, cognitive strategies, academic behaviors, contextual awareness
- **Teacher Effectiveness Measures:** Pedagogical content knowledge and instructional practices
- **Program Performance Measures:** Impact of the support system toward reaching partnership goals

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Theory of Change: Three Assertions

1. Contextualized instruction with clearly articulated learning outcomes will improve student achievement.
2. Strategic partnerships that focus their efforts on whole-school interventions will enable principals and classroom teachers to make sustainable improvements in teaching and learning in STEM, particularly for traditionally underrepresented groups.
3. A STEM Center for College and Career Readiness can deliver research and development programming to bring about sustainable transformations of STEM learning.

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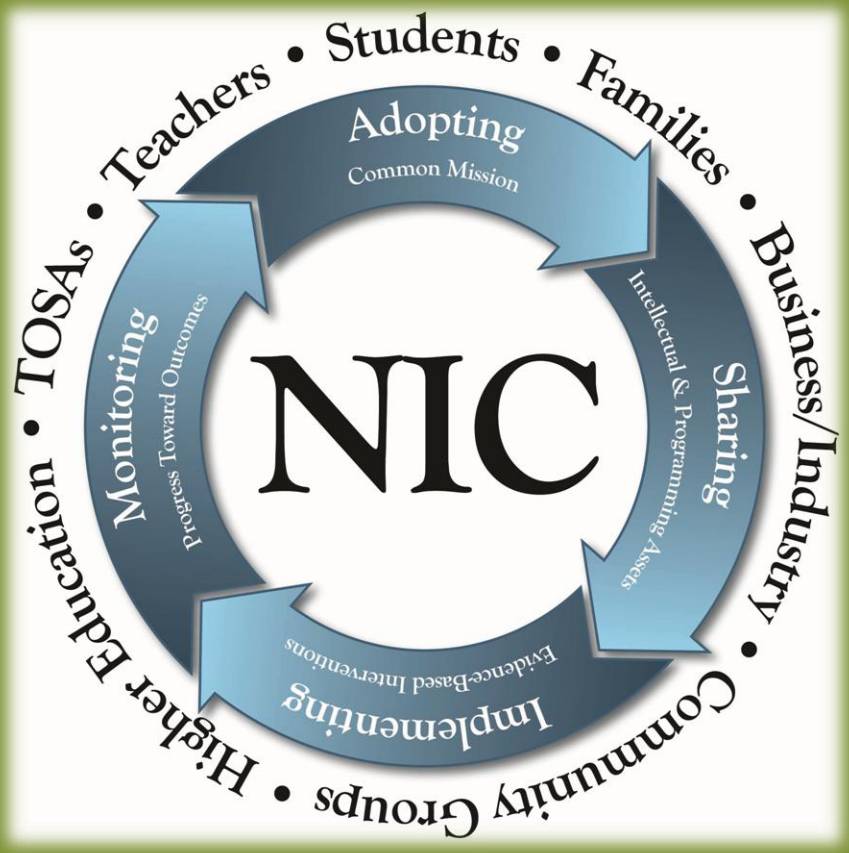
Whole School Transformations through Networked Improvement Communities



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NIC Engagement in Whole-School Transformation

- **Plan**: Develop Strategic Investment Plans to establish shared visions of success
- **Build**: Increase the capacity of schools to transform STEM learning cultures to achieve targeted student learning outcomes
- **Implement:** Transform STEM learning and teaching practices and document the impacts of change
- **Refine:** Use assessment and evaluation data to modify and optimize practices

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Teachers on Special Assignment (TOSA): Half-Time Teacher Leaders in the STEM Center

- Collaborate with the STEM Center staff to design develop, implement and assess professional development programming
- Lead professional learning communities to implement strategic investment plans in schools
- Serve as liaisons to university and community partners as they conduct improvement research to increase student engagement and success

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Portland Metro STEM Center for College and Career Readiness

The Capital Center, 185th Ave. and Walker Rd.

- Office of Partnership Development
- STEM Teachers Academy
- Office of Research and Evaluation
- Teacher Education Alliance
- Student STEM Co-laboratory
  - Northwest Science Expo System
  - Student Research Incubator
  - Student Success Programming

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Structure and Governance of Oregon STEM Education Initiative

Oregon Education Investment Board

Oregon STEM Education Initiative Board* and the Oregon STEM Education Director

Oregon STEM Education Partnership

Multi-State STEM Networks

OR STEM Partnership, Portland Metro Region
OR STEM Partnership, Central Oregon Region
OR STEM Partnership, Southern Oregon Region
OR STEM Partnership, Willamette Valley Region
OR STEM Partnership, Eastern Oregon Region

Boards of Governors** and Executive Directors for Regional STEM Centers

*Comprising Oregon STEM business leaders, the executive directors of the regional STEM Centers, OUS partner(s), ODE representative(s), STEM teacher(s), school district administrator(s), community college representative(s), community-based STEM education partners

** Comprising core partners and the executive staff of the regional STEM Centers

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Investing in Oregon STEM Future: A private-public partnership for success

- Establish an advisory committee to the OEIB to guide the development of the Oregon STEM Education Partnership and represent our State in multi-lateral networks and partnerships

- Establish a private-public matching fund, up to $20 million per biennium, to support the work of the Oregon STEM Education Partnership

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Many thanks to the Oregon Education Investment Board for the opportunity to share our vision for transforming STEM learning and teaching in Oregon.

Development of the Portland Metro STEM Education Partnership has been guided by the commitment of numerous individuals among our founding partners:

Beaverton School District
Hillsboro School District
Intel Corporation
JP Morgan Chase
Lewis and Clark College
McKinstry Company
Oregon Department of Education
Oregon Health & Science University
Portland Public Schools
Portland State University
Vernier Software & Technology

Special thanks for valuable insights also goes to:

Jim Connell, Institute for Research and Reform in Education

Paul LeMahieu, Carnegie Foundation for the Advancement of Teaching

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STEM Education: Driver of Economic Development and the Creation of Jobs

- STEM jobs represent 5.6% of the Oregon economy (2008), and that percentage is expected to grow by 8% by 2018
- STEM workers earn nearly twice the income of non-STEM workers ($30/hour vs $16/hour)
- STEM occupations require higher levels of educational attainment than non-STEM careers (78% require associate's degree or higher, vs 29% for non-STEM; 2/3 of STEM jobs require 4-yr degrees, vs <20% for non-STEM)
- The Portland Metro area is home to a high concentration of STEM industries that require a well-educated workforce to remain competitive, grow and attract more STEM businesses

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