

PACIFIC EDUCATION INSTITUTE 2021-22 FIELDSTEM REPORT

IMPLEMENTING FIELDSTEM LEARNING ACROSS K-12



PEI empowers educators to advance equitable civic and scientific literacy by promoting outdoor, integrated, career connected, locally relevant, real-world science.

Introduction to FieldSTEM: Asynchronous Course

Module 1: Introduction to FieldSTEM®

Module 2: Curriculum Integration

Module 3A: Community Collaborators

**Module 3B: Locally Relevant,
Integrated Content (HIFE and NGSS)**

**Module 3C: Contextualized Learning
(Math and ELA Performance Tasks)**

**Module 3D: Student Voice and
Creative Expression**

**Module 3E: Indigenous Connections
and Environmental Justice**

**Module 4: Summary and
Implementation Plan**

FieldSTEM Leadership

Meetings: 101 & 102

By the Numbers

18 Administrators Attended

12 Districts/Schools

Represented

"This meeting allowed me to hear from leaders making this work happen in their schools. I'm energized, inspired, and hopeful."

"PEI continues to lead the way in improved teaching and learning practices via an outdoor/hands-on focus and set of practices. It was very helpful to hear what and more importantly how other districts are implementing FieldSTEM."

PEI Engaged in key regional, state and national meetings:

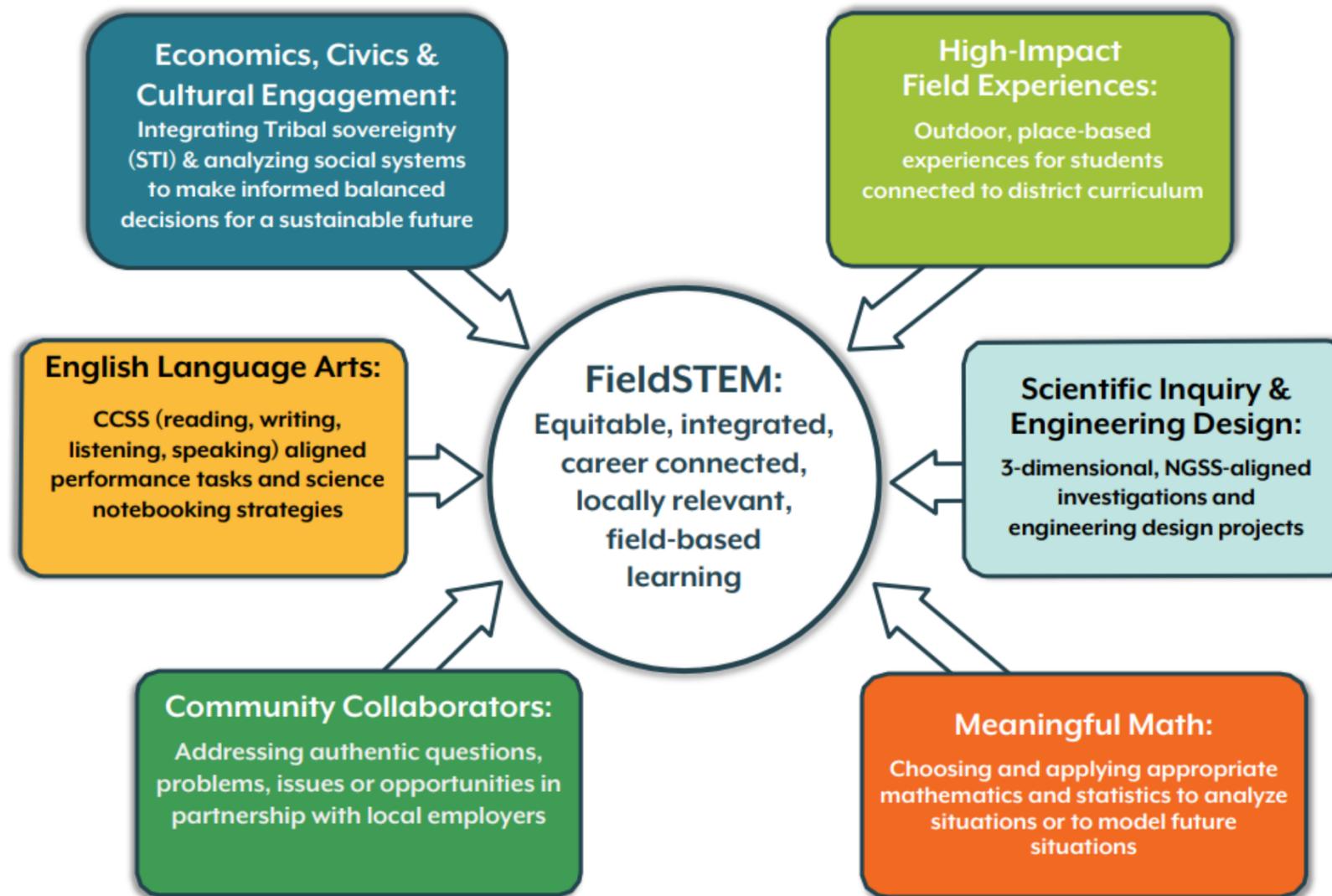
- West Sound STEM Network; Capitol STEM Network
- Environmental and Sustainability Literacy Plan Advisory
- Education Gaps, 1168 Implementation Workgroup
- National PLT Education Operating Committee
- DNR Natural Heritage Advisory Council
- Schools out Washington Thought Partner Conversation - Education at DNR
- E3 conference
- Puget Sound Partnership Education Strategy Planning
- Outdoor School For All Advisory Committee
- Presented to the Conservation District Education staff
- Capital STEM Alliance Steering Committee
- Career Connect WA
- ESSER planning and outreach

Introduction to FieldSTEM

24 participants
11 school districts
1 private school

"I was able to gain a better understanding of the FieldSTEM program and the importance of engaging my students in learning outside. I have a goal to implement more aspects of outside learning and to incorporate science into other subjects."

Introduction to FieldSTEM Workshops



Introduction to FieldDesign

28 participants
9 school districts
1 charter school

"Recognizing a problem, considering a solution and connecting that with beginning engineering design - all of this pulls in ELA, Math, Equity and SEL using the FieldSTEM model of going outdoors and getting our student's hands dirty."

Introduction to ELA Performance Tasks

25 participants
13 school districts
1 private school

"This was my first class from PEI - I loved it! Very easy to implement into my classroom."

"This was a great PD. It's been quite a while since I have had a good PD."

Introduction to Civic Engagement

27 participants
10 school districts
1 charter school

"I gained a lot of great ideas from the workshop about how to engage students in STEAM-based Field and civic-engagement focused experiences."

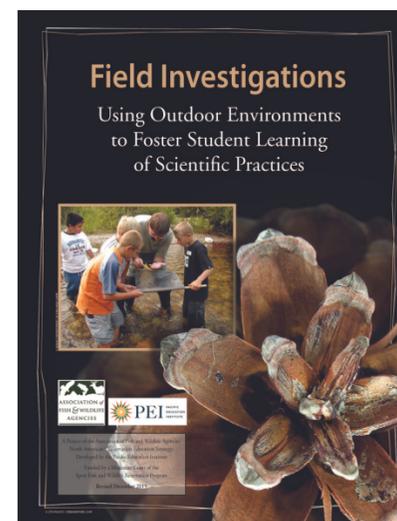
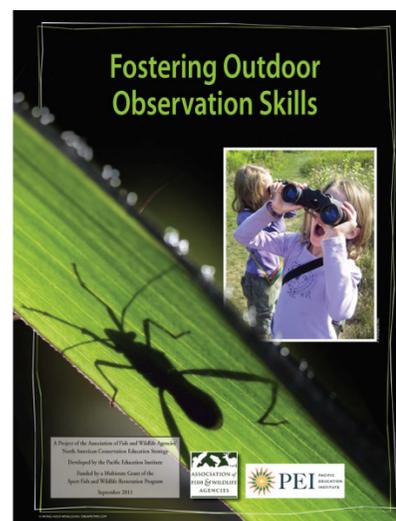
Introduction to Field Investigations

38 participants
15 school districts
1 charter school

"I appreciated the small group time we had at the end. Great for discussing and networking! I also appreciated the practice writing good questions and with CER."

Statewide FieldSTEM Professional Learning:

- (2) Designing High Impact Field Experiences
- (2) Fostering Outdoor Observation Skills with Science Notebooks
- Designing Field Investigations
- Schoolyard Investigations for Grades K-1
- Schoolyard Investigations for Grades 2-3
- FieldDesign for Grades K-12
- FieldSTEM: ELA Performance Tasks



"I love how everything was linked to NGSS and it was multi-age designed."

"I can see how this can be used for small groups in ASCA standards SEL also."

"I used to think science needed to be teacher directed and now I think students can be much more active participants."

"Getting out and carrying out important research and data collection could really get kids excited about science."

"I had time to plan with my colleague to discuss ideas for implementing the field design process. We are very excited to get started and feel so prepared after your workshop."

"I needed to have this class to re-energize me and get me excited about teaching AGAIN!"

By the Numbers:

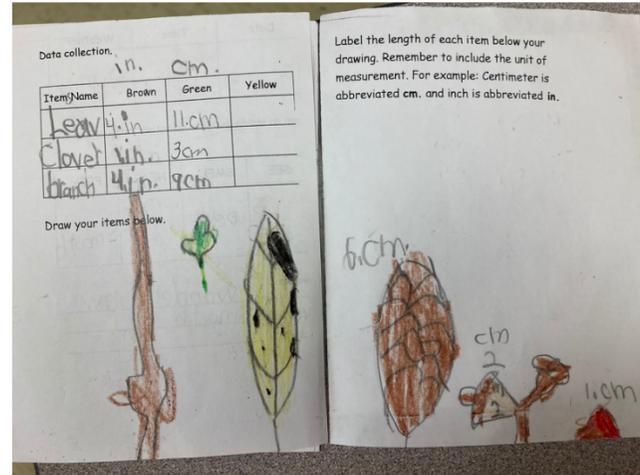
9 Workshops

432 Participants

94 Districts

32 Counties





FieldSTEM Implementation By the Numbers:

18.5% of all participants implemented

95 participants total

\$8,575 Paid



I am more excited about taking students out in all weather. We go out weekly rain or shine. I encourage them to explore and appreciate the natural resources both at school and in the community. We keep learning and observation journals.



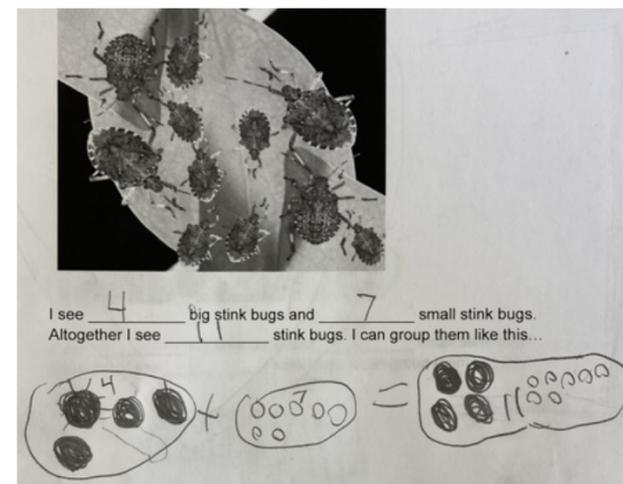
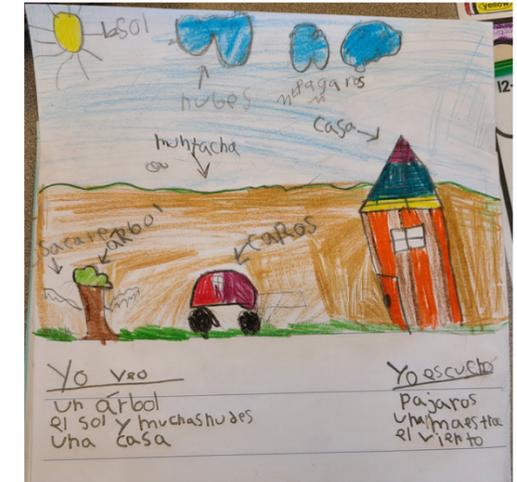
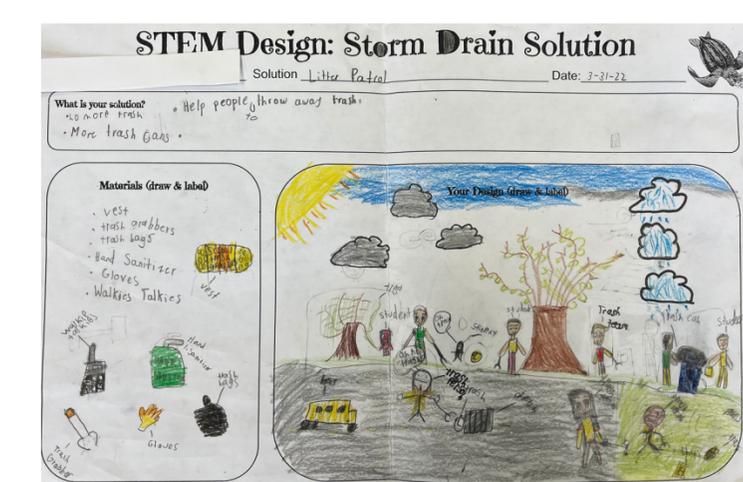
Claim:
What was the place, date, and time of my investigation?
Skamania School field, Jan 25, 2022, 11 am.
What was the answer to my investigative question?
The pH in the soil is not different in the side of the motts don't like.

Evidence:
What were the average results of my data for each of the independent variables?
6.0 PH
How many trials did I perform?
6

Reasoning:
Why do I think the amount of data I collected was enough to answer the question?
We took 3 samples from each side of the field, in cross section of the field, where moles were active and they were not.
How did the format of my investigation help validate the data?
Even though we couldn't determine if the soil alkaline or acidic, we noticed the soil samples were very similar in pH level.
What science concept or principle explains how my data answers the investigative question?
If there was a difference in the pH of the samples, it might indicate that it would affect the moles activity. There was no specific difference, so it must not affect the moles activity.

I loved completing an outdoor observation activity with my students. I can honestly say I have never seen them in this light. It was refreshing to see all their little perspectives and observations of the world around us.

My class participated in the marine debris PT and immensely enjoyed it! In 2 days, I was pleasantly surprised at all they learned and accomplished!



Walking field trip to Crystal Creek (.25 miles from campus) to collect water quality data. We monitor water temperature, pH, dissolved oxygen and flow rate throughout the school year.

Multicultural Program

- Support/mentorship to bilingual Spanish educators to successfully engage their students in environmental and sustainability education.
- Professional development for bilingual formal (teachers and instructional aides) and nonformal educators to implement FieldSTEM® in Spanish.
- Assistance to locate and/or develop dual language resources.
- Connections to community partners who can support bilingual outdoor education.
- Consultation with community partners to strengthen their bilingual science education programs.

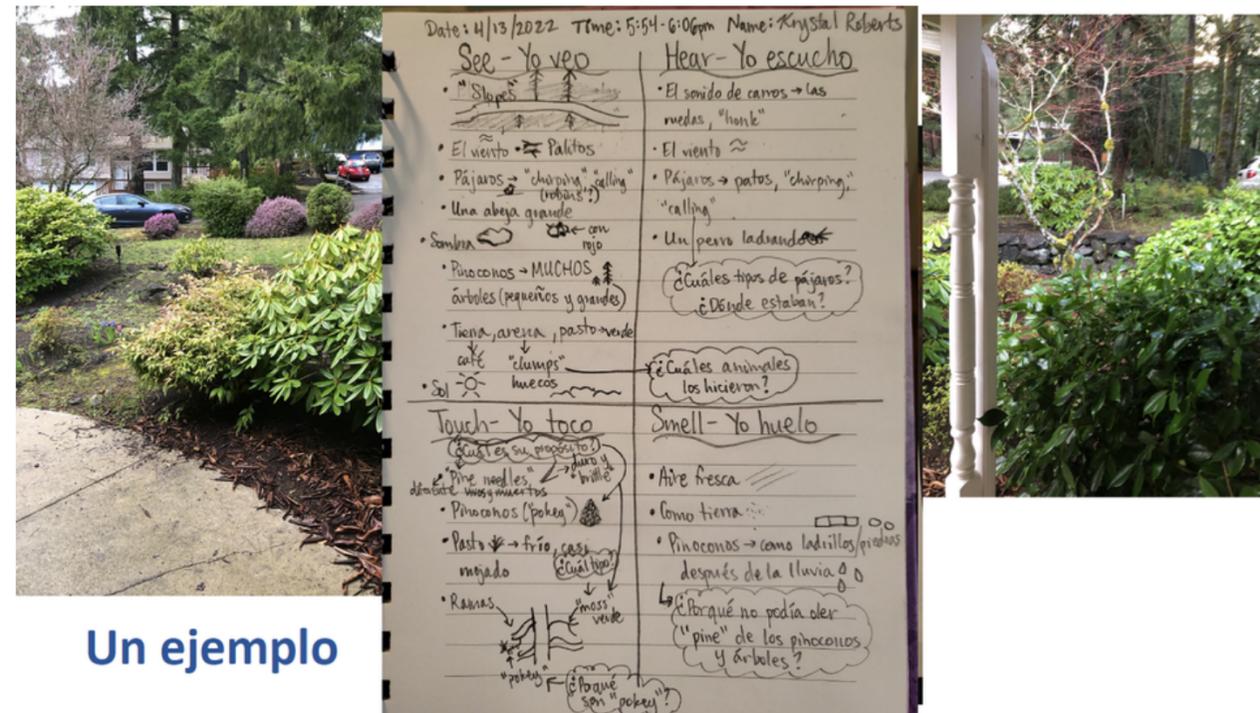
By the Numbers:

- 2** Schoolyard Investigations workshops for Dual Language Educators (in Spanish)
- 14** Participants
- \$700** Stipends Paid
- 9** School Districts
- 8** Counties
- 4** ELA Performance Tasks for Grades K-3 (Spanish Versions created)

“Esta clase me ayudo con ideas para poder usarlas en mi futuro con mis propios estudiantes. Y creo que las lecciones dan muchas ideas en como extender las lecciones para convertirlo en una unidad de investigacion.”

What's Next?

For the upcoming 2022-2023 school year, several school districts in Washington will start dual language programs from early learning through Kindergarten and First Grade. At PEI, we are ready to support dual language teachers, schools and districts, in the implementation of our FieldSTEM model in Spanish and to reach out to our diverse communities in Washington.



Un ejemplo

2 New Elementary Tasks

What's the Problem?

How many houses do we need?

3 ACT MATH TASK
Kindergarten-2nd

What do you notice and wonder?

When you walk around your community, observe the types of homes people live in. How many cars do you notice parked in front of the living spaces? Can you estimate how many adults live in the home?



Housing our Community

Exploring Affordable Housing in Washington State

3 ACT MATH TASK
3rd - 5th

Learning Goals:

- ★ Students will solve a range of complex well-posed problems in applied mathematics (SMP1).
- ★ Students will solve a complex problem by making productive use of knowledge and problem-solving strategies (SMP2).
- ★ Students will analyze complex, real-world scenarios (SMP4).

Success Criteria:

- ★ I can make sense of problems and persevere in solving them. (SMP1)
- ★ I can explain what a value represents in my solution. (SMP2)
- ★ I can use mathematics to solve and discuss real world problems. (SMP4)

Math Performance Tasks

By the Numbers:

- 2 Math Performance Tasks Workshops
- 42 Participants | 7 Implementations
- 20 School Districts | 15 Counties
- 4 New Math Performance Tasks
(2 elementary | 2 secondary)

"I am going to utilize the performance task for 3-5 with my students. I am excited to give my students a hands-on/locally related math performance task because it directly effects the world they live in."

"I love that PEI includes career connections. Often times students are stuck in their thinking of life outside of school/beyond school so the career connections will help students grow in their knowledge of what the world has to offer."

"I like to hear and see different approaches to learning that utilizes our great outdoors and real-life learning. These courses give me a starting point and I can run with it in ways that meet my students."

2 New Secondary Tasks

Get the Logs to the Mill

Management of Washington timber for processing.

3 ACT MATH TASK
Algebra

Learning Goals:

- ★ Students will solve a range of complex well-posed problems in applied mathematics (SMP1).
- ★ Students will solve a complex problem by making productive use of knowledge and problem-solving strategies (SMP2).

Success Criteria:

- ★ I can apply algebra concepts to solve a problem about timber harvest and transportation. (SMP1)
- ★ I can build a function that models a relationship between two quantities. (SMP2)

Replanting Timber

Management of Washington forests for harvest.

3 ACT MATH TASK
Algebra

We would like to have survival of 300 trees/acre (TPA) at the end of 2 years of the following mix:

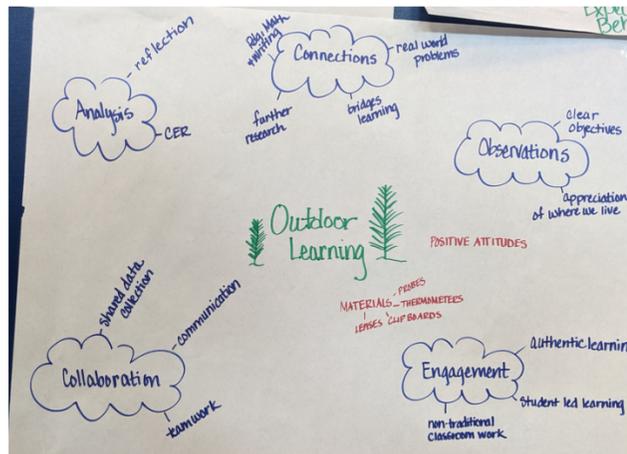
60% Douglas-fir (DF)
25% Western Hemlock (WH)
15% Western Red Cedar (WRC)

What other information do you need?

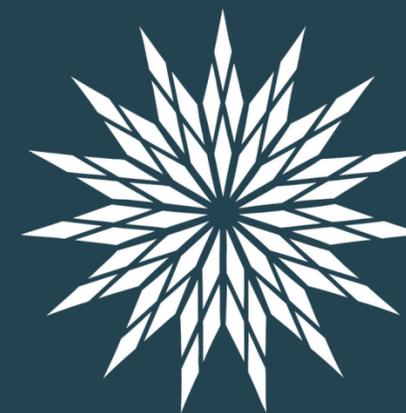
How large is an acre?	What is the planting season?
How many trees can be planted daily?	What are the tree species survival rates?

Ongoing Regional FieldSTEM Support

This summer PEI collaborated with Aberdeen School District to support a group of teachers in designing lesson plans for their new school gardens. Participants and PEI staff created lessons for grades K-5 plus a middle school lesson plan.



By the Numbers:
18 Workshops
345 Participants
10 School Districts
8 Counties



PEI facilitated a three STEM clock hour FieldDesign: Engineering Design for Field-Based Applications for Grades K-5 workshop for Sherman Elementary School in Tacoma Public Schools. The entire 32-person teaching staff, instructional coach, and principal engaged in an afternoon of learning about and practicing the engineering design process.

29 Community Collaborators

10,000 Years Institute, Cascade SD, Cle Elum Roslyn School District, Eastside Audubon Society, Ellensburg SD, Food is Free Washington, GRuB, Inland Northwest Land Conservancy, Kalispel Natural Resources Department, Marine Science & Technology (MaST) Center at Highline College, Mid-Columbia Fisheries Enhancement Group, North Olympic Salmon Coalition, OSPI, Pierce Conservation District, Pierce County Parks, SeaDoc Society, Spokane Audubon Society, Spokane Conservation District, The Lands Council, The River Mile, Washington Sea Grant, Washington State University Extension Forestry Program, Waskowitz Environmental Learning Service, Wenatchee Internet Academy, WSDA, WSSC, WSU Extension - Wahkiakum County, WSU-Forest Health Watch Program, WSU-Puyallup Research and Extension Center

Career & Technical Education (CTE) Work

Forestry Education in West Sound and the Olympic Peninsula

3-hour workshop as part of the West Sound STEM Café series. Participants completed a forest management activity and discussed trade-offs inherent in forest management. A panel of industry professionals including representation from Merrill and Ring, Rayonier and WA Department of Natural Resources discussed career paths in forestry and the knowledge and skills youth need to enter the career field as well as responding to questions from the participants.



CTE Frameworks Forest Management

- aligned to employer needs- forest practice laws
- dual high school/college credit
- Science equivalency w/ OSPI
- support worksite visits for students

Worksite visits for teachers and students



Learning, dual credit and industry recognized credential (IRC) alignment. PEI met with Forest employers to gather input on a document of competency aligned to the forest management framework.



Part of a bigger picture

Forest Management is part of a bigger "braided pathway that allows students to enter natural resource and conservation careers through experience in career exploration, preparatory and career launch opportunities



Applied Math Modules:

Get the Logs to the Mill
Management of Washington timber for processing.
3 ACT MATH TASK
Algebra

Replanting Timber
Management of Washington forests for harvest.
3 ACT MATH TASK
Algebra

Justice, Equity, Diversity & Inclusion (JEDI) Work

By the Numbers:

- 4 Learning Opportunities
- 20 Hours
- 15 Staff Engaged
- 5 Board Members Engaged

JEDI Committee

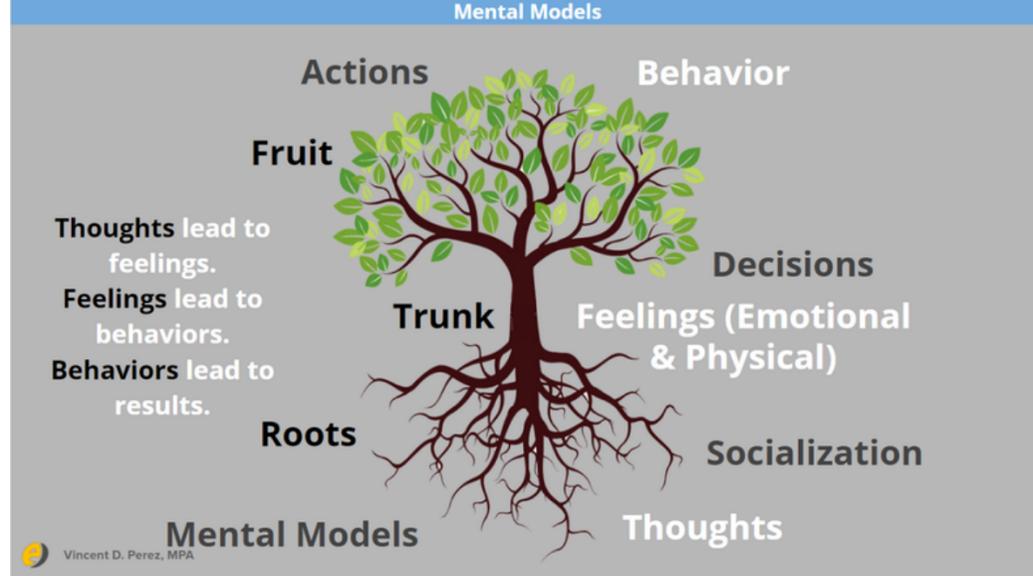
- 7 Members
- 21 Meetings

21/22 JEDI Subcommittees

- Board Engagement
- Document Review
- Indigenous People's Day
- Communications
- Professional Learning
- Juneteenth
- Land Acknowledgement
- Diversity Survey

KSA's		
Knowledge	Skills	Attributes
Mental Models	Humanize: Dignity, Identity, Values	Rooted in Values
<i>Glossary of Terms</i>	Circle	Group Trust
Agreements (DiAngelo)	<i>Agreements / Restorative Resolution</i>	Learning Organization
Cognitive Dissonance	Cognitive Dissonance: Responses	
Race & Our Body (Menakem)	Ground-In • Team Breath	
<i>Intersectionality</i>	<i>Self-Reflection: Privilege / Marginalization</i>	
<i>Four I's of Oppression</i>	<i>Calling-In</i>	
<i>History of Race, Slavery, Policing in US</i>	<i>Historicize</i>	

- Agreements / Norms**
- How will we treat one another?
 - How will we engage with challenging content?
 - What will we do if we disagree?
 - How do we uphold our agreements?



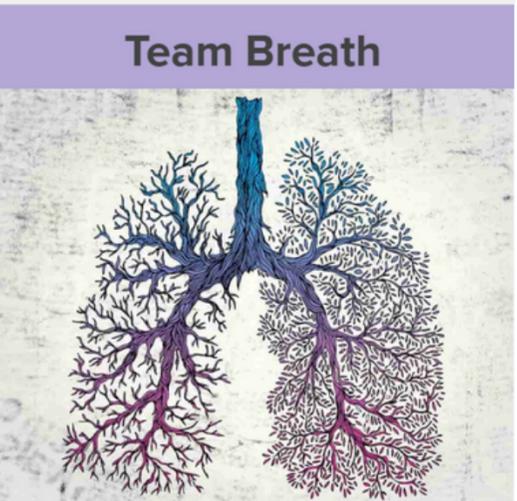
On Cognitive Dissonance:

“Sometimes people hold a core belief that is very strong. When they are presented with evidence that works against that belief, the new evidence cannot be accepted. It would create a feeling that is extremely uncomfortable, called cognitive dissonance. And because it is so important to protect the core belief, they will rationalize, ignore and even deny anything that doesn't fit in with the core belief.”



Staying close to your values

- Grounding ourselves in our values can help us get through moments of cognitive dissonance with our integrity intact. We can do this through:
1. **Mindfulness:** noticing, increasing awareness, refraining from judgement, accepting observations/evidence
 2. **Challenging current beliefs, thought, or behaviors:** Identifying the cause of the inconsistency, exploring the opportunity for deeper self-knowledge
 3. **Consider the weight of the dissonant thought:** What is there for me to learn from? What kind of response does this call for? How big a deal is this?
 4. **Apply your values:** Does my response reflect my values? How can I adjust my response to match them?



FieldSTEM Communications

FieldSTEM in Action

Community Partners Bring Real-World Application to PEI's FieldDesign Workshop

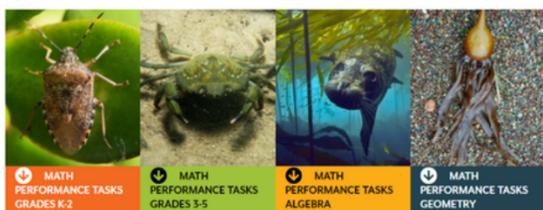


Engineering design can be a daunting topic to teach and having the right tools makes all the difference. In January, 58 educators from 35 schools and districts attended PEI's 2-day FieldDesign: Engineering Design for Field-Based Applications workshop, and came away with a framework, resources, and connections to local conservation organizations to support students at any grade level in hands-on learning.

Lesson Spotlight

New Math Performance Tasks

What do stink bugs and green crabs have in common? They are both invasive species in Washington and part of our new math performance tasks. These tasks use environmental problems or issues as the context while students apply age-appropriate math to complete the work. Performance tasks are tailored to assist educators in integrating locally relevant, complex texts with the Next Generation Science Standards (NGSS) and Common Core while providing frameworks for constructing meaningful field experiences for students.



FieldSTEM in Action

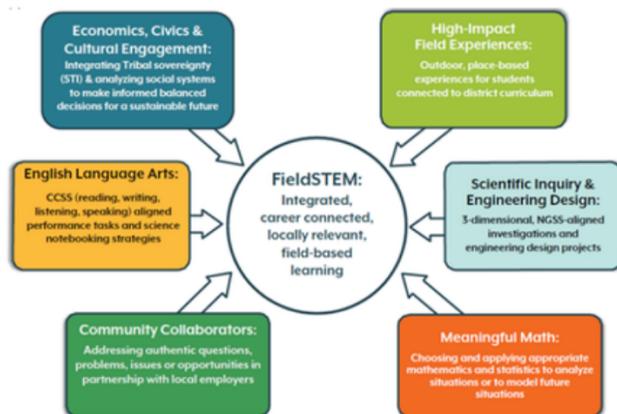
PEI's HIFE Workshop Connects Teachers Statewide through Inspired Collaboration



You know a workshop has been successful when the participants are excited to share what they learned. Karen Lippy, West Sound FieldSTEM Coordinator for Pacific Education Institute led the workshop "Designing High Impact Field Experiences" (HIFE) and before the workshop ended, teachers began asking her for a way to share projects and ideas, regardless of their region.

FieldSTEM in Action

School Leaders Inspired by Real-World Examples at PEI's Leadership Workshops



FieldSTEM in Action

Designing High Impact Field Experiences

One of the greatest benefits of Zoom workshops has been the ability for more participants to learn from some incredible educators around the state. Dale Sweet, 6th grade teacher at Walter Strom Middle School in Cle Elum, has been integrating high-impact field experiences into his curriculum for the past 39 years. As the co-facilitator for the Designing High Impact Field Experiences workshop in March 2022, Dale was able to share his knowledge and expertise with educators new to designing these types of experiences. His anecdotes, tips, and suggestions were invaluable to participants. "It really helps to have your admin support" stated Dale, who also reiterated how important it is to collaborate with teachers of other subject areas.



In Dale's current iteration of his 6th grade field experience, he works with other 6th grade teachers to incorporate math, science, ELA, art, and social studies.

[Read more](#)

By the Numbers:
10 Articles
17 Social Media Posts
3,627 People Saw our Posts
393 People Engaged

Pacific Education Institute
 Published by Katie Hatam · April 26 ·

Read about our March Designing High Impact Field Experiences workshop!



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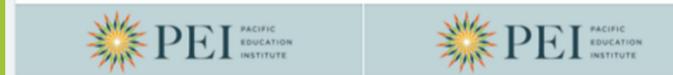
After learning from Dale in a statewide session, 38 participants used the planning tools supplied by Pacific Education Institute to start preliminary planning of their own High Impact Field Experiences (HIFE). The tasks provided participants a chance to work toward the goal of designing a HIFE or adapting a current field trip to a more integrated HIFE. Participants were broken into smaller, regional groups for the second Zoom session, and had the chance to share ideas with job-alike colleagues in their region.



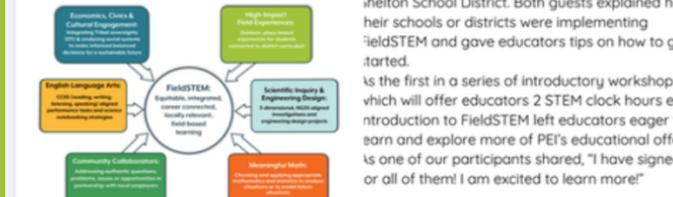
Participants also heard from other regional educators and community leaders about their own experiences. Overall, participants appreciated the time spent with their educators and experts and the content and resources shared. Stated one participant, "I just wish more of my coworkers would have taken it with me so we could have all collaborated on a field experience together!"

Pacific Education Institute
 Published by Katie Hatam · April 11 ·

On March 10, we kicked off our Spring FieldSTEM Introduction Series with our Introduction to FieldSTEM workshop. Check out more of our Introduction workshops by visiting our calendar: <https://pacifieducationinstitute.org/.../professiona.../>



On March 10, 24 educators from 10 districts across the state settled into a two-hour introduction to FieldSTEM Zoom session to learn about Pacific Education Institute's (PEI) innovative FieldSTEM Model. PEI's East Sound South Coordinator, Cindy Haverkamp, and South Sound Coordinator, Lara Tukarski, walked educators through the model step-by-step. Educators were inspired! One shared, "as a new teacher and first time PEI participant, there was so much information to absorb, and I look forward to digging up more." Another educator said that this workshop "opened my mind to different ways to implement field training experiences."



Also impactful were the two guest speakers, Dr. Heather McMullen, Director of Instructional Leadership, Math & Science, PK-12 for the Puyallup School District, and Mike Burette, 7th Grade Science and Math Teacher, Oakland Bay Junior High in the Shelton School District. Both guests explained how their schools or districts were implementing FieldSTEM and gave educators tips on how to get started.

This is the first in a series of introductory workshops which will offer educators 2 STEM clock hours each. Introduction to FieldSTEM left educators eager to learn and explore more of PEI's educational offerings. As one of our participants shared, "I have signed up or all of them! I am excited to learn more!"

Pacific Education Institute
 Published by Katie Hatam · May 3 ·

Check out this video from one of our participants, Paulette Hines, who demonstrates perfectly the when, where, how and why of a Sit Spot. Thank you for sharing Paulette! #SitSpot

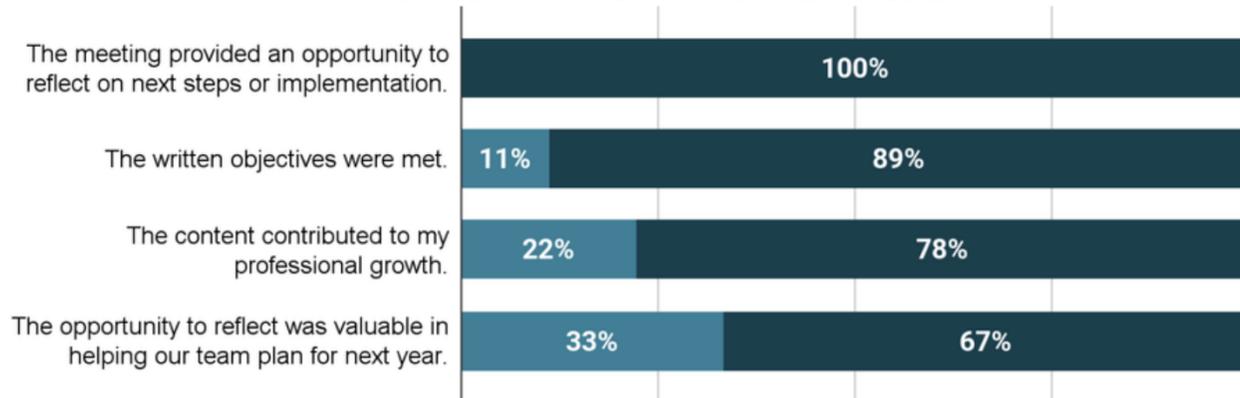


Final FieldSTEM Evaluation Report

Pacific Education Institute's FieldSTEM® model is designed to help classroom teachers, schools, and school districts implement equitable environmental and sustainability education. This report outlines the evaluation of FieldSTEM activities for 2021-2022.

FieldSTEM® Leadership Support: Satisfaction

Strongly disagree Disagree Agree Strongly agree



3rd Party Evaluation

PEI worked to identify evaluation questions to better understand the effectiveness of the FieldSTEM program. In order to answer these questions, four surveys were developed: Leadership Meetings; Educator Workshops; Introduction to FieldSTEM series; and one focused on implementation.

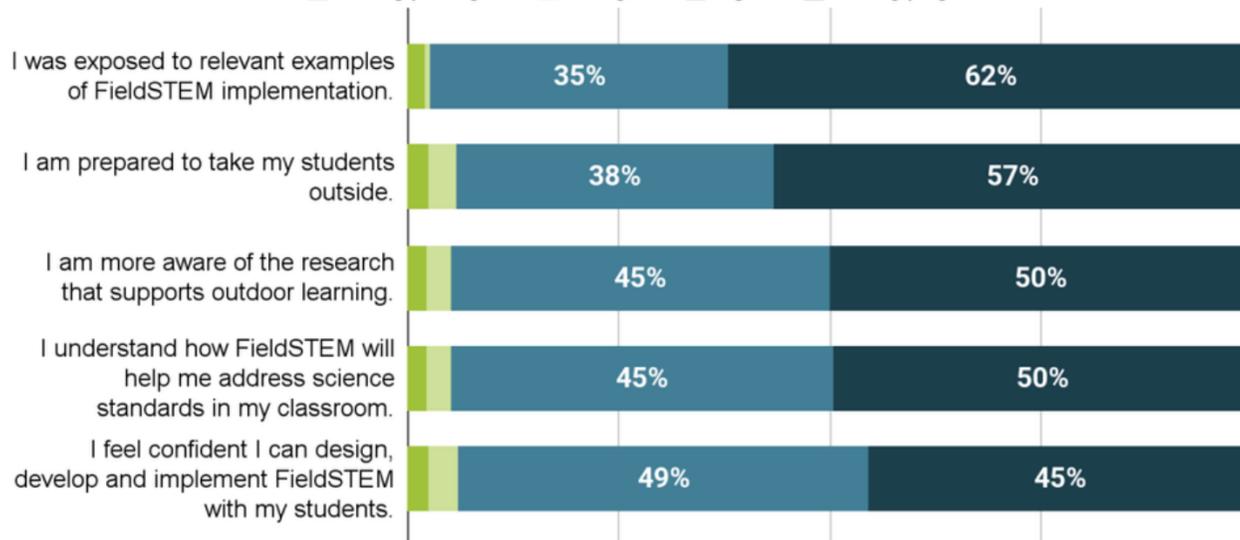
FieldSTEM® Spring Introduction Workshops

Strongly Disagree Disagree Agree Strongly Agree



FieldSTEM® Educator Workshops

Strongly Disagree Disagree Agree Strongly Agree



FieldSTEM Implementation (select all that apply)

