



Commission on
P-12 Engineering
Education

ASEE Commission on P-12 Engineering Education (CP12) 2023-2024 Annual Report

Our Mission

The Commission on P-12 Engineering Education (CP12) supports and encourages every member of ASEE, regardless of Division membership, to aid our vision of lifelong excellence in engineering education for every person in the United States from early childhood to adulthood.

We accomplish our mission through enhancing and improving internal knowledge of and communication about P-12 engineering education within ASEE, including communicating to ASEE membership the impact of P-12 engineering education, the range of P-12 efforts within ASEE, and funding opportunities appropriate to P-20 engineering education, as well as supporting mutually beneficial partnerships, collaborations, and relationships between ASEE and other organizations, including exploring partnerships with organizations to share best practices, resources, and research in engineering education infrastructure and professional development.

June 2024 Updates

1. Commission on P12 Engineering Education Rebrand and ASEE Participation

- This year's primary goal was to raise awareness of and participation in the Commission by establishing the Commission as an inclusive ASEE unit that serves all ASEE members and places preK-12 engineering education in conversations within all ASEE Divisions and Units. This year, **we socialized the use of “CP12”** to refer to the Commission, filled out our Executive Committee (14 of 15 Executive Committee roles occupied), and **expanded our Division Delegate participation from 9 Divisions to 47 of the 55 ASEE Divisions**. We held monthly CP12 Executive Board Meetings and quarterly Division Delegate meetings (35 unique Delegates attended one or more of the Delegate meetings, [slides](#) from the March quarterly meeting).

2. Summer Conference Updates

- ASEE Outreach at the 2024 ASEE Teacher Conference: The annual ASEE Teacher Conference strives to provide ASEE members with an opportunity to share their best engineering education strategies with preK-12 teachers, creating a positive impact on the area surrounding our ASEE Annual Conference and increasing the reach of ASEE members nationwide. This year, we recruited **170 local Portland-area teachers from seven school districts** registered to attend the [2024 ASEE P12 Engineering Education](#)

[Teacher Conference](#) at [Portland State University \(PSU\)](#)'s Maseeh College of Engineering & Computer Science on June 22, 2024. **Twenty-four hands-on sessions presented by 39 ASEE members and guests from 14 ASEE Divisions, Units, and Councils** will run throughout the day in four grade bands (K-2, 2-5, 6-8, 9-12), and two guest speakers at lunch will motivate Portland-area teachers to encourage and equip teachers to bring engineering education to their elementary and secondary students. 162 of 174 registered teachers indicated that they teach grades preK to 5. Our conference partners include PSU, [Portland Metro STEM Partnership](#), [Oregon MESA](#), [Portland Public Schools](#), The Lemelson Foundation, MathWorks, e4usa, eduKatey, and Tufts Center for Engineering Education and Outreach.

- The participation of ASEE Divisions and units at the 2024 conference demonstrates the need for this Commission's work. From 2023 to 2024, we increased the total number of peer-reviewed sessions from 8 to 24, which involved 14 ASEE Divisions and Units in 2024. These numbers illustrate that the ASEE community is engaged in PreK-12 engineering education, and this Commission is in the right place to uplift, share, and spread these members' engineering education reach and impact.

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| 1. Community Engagement Division (CED) | 7. Engineering Technology Division |
| 2. Computers in Education Division (COED) | 8. Environmental Engineering Division |
| 3. Design in Engineering Education Division (DEED) | 9. First-Year Programs Division (FYD) |
| 4. Energy Conversion, Conservation, and Nuclear Engineering Division | 10. Minorities in Engineering Division (MIND) |
| 5. Engineering Leadership Development Division | 11. Pre-College Engineering Education Division (PCEE) |
| 6. Educational Research and Methods Division (ERM) | 12. ASEE Commission on Diversity, Equity, & Inclusion |
| | 13. ASEE Commission on PreK-12 Engineering Education |
| | 14. ASEE Corporate Member Council |

P12 ENGINEERING EDUCATION TEACHER CONFERENCE SESSIONS

<p>Grades P-5</p> <p>Design Thread 2. Lunar Living: Integrating STEM through the Engineering Design Process (repeats in the afternoon)</p> <p><i>University of Texas at El Paso</i> MIND and ELD</p>	<p>Grades P-5</p> <p>Social Thread 5. Socially engaged engineering: Who benefits? Who is harmed? (repeats in the afternoon)</p> <p><i>Museum of Science, Boston</i> PCEE</p>	<p>Grades 3-8</p> <p>Design Thread 10. Shining a spotlight on the "E" in STEM</p> <p><i>Siemens Digital Industries Software</i> PCEE</p>	<p>Grades 6-8</p> <p>Design Thread 12. Invoking The Design Honeycomb - Connecting Your Existing Educational Activities to the Engineering Design Process</p> <p><i>Univ at Buffalo, Purdue, and Penn State Behrend</i> DEED</p>	<p>Grades 6-12</p> <p>Intro level Teams Focus 14. STEM Solution Seekers: The Power of Thinking Like an Engineer and Working in Dynamic Teams</p> <p><i>ASME</i> PCEE</p>	<p>Grades 6-12</p> <p>Sustainability Thread 16. Where Does Your Cell Phone Come From? – Identifying Trade-offs Along the Supply Chain</p> <p><i>UL Research Institutes</i> Community Engagement Division</p>	<p>Grades 9-12</p> <p>Intro level Social Thread 23. Engineering for US All (e4usa) and How "Us All" Includes You!</p> <p><i>e4usa</i> PCEE</p>	<p>Grades 6-8</p> <p>CS Thread 24. Navigating the Real World with MATLAB- A Data Analysis Journey</p> <p><i>MathWorks</i> PCEE</p>
<p>Grades P-5</p> <p>6. PAW Patrol for human-centered engineering</p> <p><i>The College of New Jersey</i> PCEE</p>	<p>Grades P-5</p> <p>Invention Thread 1. Empowering All Students through Invention Education: Supercharging STEM with Real-World Problem Solving (repeats in the afternoon)</p> <p><i>The Lemelson Foundation's InventEd Network</i> PCEE</p>	<p>Grades 3-8</p> <p>Design Thread 7. Take your students on a Mission to Mars!</p> <p><i>Vivify STEM</i> PCEE</p>	<p>Grades 6-12</p> <p>Intro level CS Thread 15. Beyond the Screen - Empowering Middle and High School Teachers to Create Future Computer Science Pioneers</p> <p><i>Ohio Northern University</i> FYD, CoED, and PCEE</p>	<p>Grades 6-12</p> <p>Social Thread 17. Broadening the STEM Pool: Connecting STEM and our Communities</p> <p><i>Purdue University</i> Community Engagement Division</p>	<p>Grades 6-12</p> <p>Arts Integration 20. Encouraging Curiosity and Creativity in STEM by Establishing Engineering as an Art Form</p> <p><i>Purdue Polytechnic Institute (PPI), Purdue University</i> Engineering Technology Division</p>	<p>Grades 9-12</p> <p>Sustainability Thread 22. Creative Engineering Design: Engaging Students in Equity- and Sustainability-Focused Engineering</p> <p><i>University of Colorado Boulder</i> PCEE</p>	<p>Grades 6-8</p> <p>CS Thread 11. Engineering Design as an Avenue for Introducing Students to Machine Learning and AI</p> <p><i>MathWorks</i> ASEE CMC and CP12</p>

Lunch speakers: Lesly Rojas and Christine Cunningham

Grades P-5 Design Thread 2. Lunar Living: Integrating STEM through the Engineering Design Process <i>University of Texas at El Paso</i> Minorities in Engineering and Engineering Leadership Development	Grades P-5 Social Thread 5. Socially engaged engineering: Who benefits? Who is harmed? <i>Museum of Science, Boston</i> PCEE	Grades 3-12 Sustainability Thread 9. Designing and Utilizing Quality Engineering Activities to Engage Learners Through a Passive Solar House Design Challenge <i>University of Utah</i> PCEE and CED	Grades 3-12 8. Tall Towers, Joints & Earthquakes: Using Design & Computational Thinking to Make Better Buildings
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- CP12 at the 2024 Annual Conference: CP12 will share the ASEE Membership Services booth at the Summer Conference to increase visibility and recruitment. We will co-sponsor four sessions during the ASEE Annual Conference with 12 co-sponsoring Divisions. We are proud of this accomplishment, which brought so many ASEE divisions and members together regarding the relationship of PreK to grade 12 engineering education to our members' work. Ten P-12 teacher guests funded by ASEE will attend these sessions.

<p>Session M393 Conducting NSF-Funded Research Together on Early Engineering Experiences: Perspectives from Community Partners featuring two local ASEE member & NSF-sponsored collaborations: Mt. Hood Community College Head Start and the Ready, Set, Go! Program at Metropolitan Family Service. Our mission is to highlight productive local-level collaborations with NSF-sponsored grants. <i>Monday 11:00 - 12:30</i> <i>B119, Oregon Convention Center</i></p>	<p>ASEE Co-sponsors:</p> <ul style="list-style-type: none"> ● Commission on P12 (CP12) ● Commission on Diversity, Equity, Inclusion (CDEI) ● Community Engagement Division (CED) ● Equity, Culture & Social Justice in Education Division (ECSJ) ● Engineering Research Methods Division (ERM) ● Pre-college Engineering Education Div. (PCEE)
<p>Session M493 - Developing a K-16 Design Community of Practice: DEED/PCEE Panel We will address the role that university faculty and students can play in supporting PreK-12 pre-college engineering education, specifically when it comes to design projects. The speakers on the panel will bring teacher voices from their 2024 ASEE Engineering Education Teacher Conference, "Invoking The Design Honeycomb," into the conversation. <i>Monday 1:30 - 3:00</i> <i>B119, Oregon Convention Center</i></p>	<p>ASEE Co-sponsors:</p> <ul style="list-style-type: none"> ● Commission on P12 (CP12) ● New Engineering Educators Division ● Continuing Professional Development Division ● Pre-college Engineering Education Div. (PCEE) ● Technological and Engineering Literacy/Philosophy of Engineering Division (TELPhE)
<p>Session T293 Developing Meaningful and Effective Proposal Plans for Broader Impacts for P-12 Audiences ASEE members will bring a proposal they're working on and strengthen the broader impacts section with research-based practices for working with teachers and students." Presented by ASEE members from Notre Dame's Office of Broader Impacts. <i>Tuesday 9:15 - 10:45</i> <i>Regency Club, Hyatt Regency Portland (HQ Hotel)</i></p>	<p>ASEE Co-sponsors:</p> <ul style="list-style-type: none"> ● Commission on P12 (CP12) ● Faculty Development Division (FDD) ● Community Engagement Division (CED) ● Student Division
<p>Session T493 - ASEE Member Community Roundtables on Engineering from Pre-K to 12 This inaugural multi-division roundtable session will allow ASEE members from any Division to share concerns, experiences, and ideas to advance engineering education in grades preK to 12. <i>Tuesday 4:30 - 6:00</i> <i>Portland Ballroom C, Oregon Convention Center</i></p>	<p>ASEE Co-sponsors:</p> <ul style="list-style-type: none"> ● Commission on P12 (CP12) ● New Engineering Educators Division ● Continuing Professional Development Division ● Pre-college Engineering Education Div. (PCEE) ● Technological and Engineering Literacy/Philosophy of Engineering Division (TELPhE)

3. Communications Committee Update

- CP12 increased its web footprint this year with [Facebook](#), [X/Twitter](#), [LinkedIn](#), and an updated [website](#). [Please follow us if you use any of these platforms.](#)
- The CP12 Communications Committee worked with the Teacher Conference Sponsor, The Lemelson Foundation, to create and share recruiting advertisements for the Teacher Conference, including Oregon Public Broadcasting (OPB) [radio](#), [website](#), and [magazine](#) advertisements.

4. Outreach Committee Update: *Engineering Navigator*, an AI-Enhanced Search Bot Progress

- A previous goal of CP12 was to create a “clearinghouse” of PreK-12 engineering education opportunities for students and teachers to showcase ASEE member’s outreach and research work. Previous attempts by this Commission included a [Google Map](#) and a [Looker Studio data viewer](#). This year, we worked closely with IEEE and DiscoverE to propose a grant to UEF for funding to create an AI-powered “front door to engineering” tool called the Engineering Navigator that would serve as an access point to all partners’ engineering education and career-related information for P-20 students, teachers, faculty, and parents. We will submit a full proposal for the August 1 UEF deadline based on the positive reaction to our two-page concept paper. Our current advisory partners include:
 - Society - ASCE, ASEE, ASME, and IEEE
 - Industry - MathWorks
 - University - University of Mount Union, The Ohio State University
 - PreK-12 - Engineering is Elementary, Youth Engineering Solutions, Museum of Science (Boston)
 - Government - STEM Education Coalition

5. CP12’s 2024-2025 Goals

- ASEE member engagement in professional learning workshops about P-12 engineering education and outreach best practices.
- We will increase CP12’s presence at ASEE Regional Conferences.
- We will support ASEE members in becoming more involved in other P-12 engineering education-related conferences, such as NSTA, NARST, ITEEA, etc.
- CP12 Best P-12 Paper Award application revision, approval, and roll-out.
- We will receive funding and pilot the Engineering Navigator.
- We will host the 2025 ASEE P12 Engineering Education Teacher Conference in Montreal.

We welcome any feedback or clarifying questions. Thank you to ASEE and the Board for prioritizing PreK-12 engineering education. We are excited to share ASEE members' expertise as P-12 engineering education leaders throughout the organization and the nation.

P-12 engineering is everyone's business.

Submitted by:

The ASEE Commission on P-12 Engineering Education (CP12)'s Executive Board ([website](#))
 Katey Shirey, Chair, 2023-2026, katey@edukatey.com

2023-2024 CP12 Executive Board Members:

Role	2023-2024	Institution
Commission Chair	Katey Shirey	eduKatey, LLC
PCEE Division Chair	Merredith Portsmore	Tufts University
Secretary-Treasurer	Keith Besterman	American Association of Colleges and Universities (AAC&U)
Immediate Past CP12 Chair	Mindy Zarske	UC-Boulder
Pre-College Division Rep	Leon Grant	Marietta High School
Pre-College Division Rep	Erdogan "Kaya"	George Mason University
Pre-College Division Rep	Bruce Wellman	Purdue Engineering Education graduate student
MIND Representative	Diane Elisa Golding	UTEP: The University of Texas at El Paso
WIED Representative	Kristi Shryock	Texas A & M University
First-Year Programs Rep	Katy Schulte Graham	Northeastern University
Members-at-Large	Mariam Manuel	University of Houston
Members-at-Large	Anna Newley	Sonoran Schools science teacher
Members-at-Large	Ezgi Yesilyurt	Weber State University
Members-at-Large	Doug Roberson	Oxford Prep HS engineering teacher
Corporate Member Council Rep	PJ Boardman	MathWorks
Engineering Dean's Council Rep	(open, 3-year term)	[Requested support from Kenneth Ball]

Engineering Technology Council Rep	John Irwin (year 1 of 3)	Michigan Technological University
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