INTEGRATING GREEN CHEMISTRY AND SUSTAINABILITY INTO CHEMISTRY EDUCATION

Natalie O’Neil  Janie Butler  Kate Anderson  Jen Sherburn  Erika Fatura  Robert Baldo  Steven Kosmas
Cassie Knutson  Jane Wissinger  Douglas Raynie  Matthew Miller  Ken Hoffman  Andy Dicks  Loyd Bastin
This session will highlight collaborations between K-12 educations and academic partners.
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Fostering a Green Chemistry Education Community of Practice with K-20+ Stakeholders

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Beyond Benign is a non-profit organization founded in 2007 by Dr. John Warner and Dr. Amy Cannon, located north of Boston (Wilmington, MA).

Mission: Beyond Benign develops and disseminates resources that empower educators, students and the community to practice sustainability through green chemistry.

Vision: Beyond Benign envisions a world where the chemical building blocks of products used every day are healthy and safe for humans and the environment.
How does green chemistry reduce risk?

Reducing Chemical **Hazard** through the 12 Principles

\[
\text{RISK} = \text{EXPOSURE} \times \text{HAZARD}
\]

Green Chemistry is the **only** science where the focus is reducing and/or eliminating the intrinsic hazards.

Chemists and materials scientists have the greatest potential to impact pollution prevention.
Advancing green chemistry education for a sustainable future.
Why Green Chemistry in K-12?

- Equity of access
- Student exploration and invention
- Classroom safety
- Connect to Industry
- Interest to Students
The Lead Teacher Program

• In-classroom teachers practicing green chemistry
• 3-year commitment to advancing the field of green chemistry
• Leaders in green chemistry education
Lead Teacher Work
Conferences & Trainings
In past 4 years

- Cultivating communities of change
- Connecting with regional industries/universities
- Broaden reach of teachers exposed
The Outcome

EXPOSE

602 teachers reached through webinars, conferences, & presentations

ENGAGE

1,634 views on Green Chemistry and Safety Student-tutorial

IMPLEMENT

132 teachers trained through online courses or 3-5 day trainings

+1,030 TEACHERS ADDED TO OUR COMMUNITY in 2019-2020 School Year

358 listens to Green Chemistry Podcast

Fostering a Green Chemistry Community, July 28, 2020
Advancing green chemistry education for a sustainable future.
The **Green Chemistry Commitment (GCC)** is a consortium program that unites the green chemistry community around shared goals and a common vision to:

- expand the community of **green chemists**
- grow departmental resources
- share **best practices** in green chemistry education
- affect systemic and lasting **change** in chemistry education
GCC Opportunities

- Contribute to Collective Voice
- Track Progress
- Shape the Commitment
- Collaborative Working Groups
- Professional Development
- Green Chemistry Curriculum
- Access GCC Member Benefits
- Networking and Collaborations

Fostering a Green Chemistry Community, July 28, 2020
New Initiatives

- Dow Academic Partners Program
- DuPont Professional Training & Academic Partners Program
- Green Chemistry Education Position Statement
- Toxicology for Chemists Curriculum Program
BIONEERS CONFERENCE
Ideation and Inspiration

FACULTY ADVISORY BOARD
Restructuring of the GCC

GCC LAUNCH
2013
13 signers, GC&E Conference, Washington, DC

1st INTERNATIONAL INSTITUTION
2016
University of Toronto, Canada

GCC FIRST SUMMIT
2018
BCCE, University of Notre Dame

70 GCC signers
U.S., Canada, Brazil, Columbia, Thailand, Nigeria, Australia

70 signers globally, including:
64 in North America; and in the following countries: Brazil (1), Colombia (1), Thailand (1), Nigeria (2), Australia (1)

12 R1 Institutions
9 R2 Institutions
4 R3 Institutions
40 PUI Institutions
5 Community Colleges

http://www.beyondbenign.org/he-whos-committed/
New Signers in 2019–2020:

Current 70 Signers (up from 59 last June)
Most recently:
- Prairie View A&M University
- Wayne State University
- UC/Santa Barbara
- Univ. of Minnesota/Morris
- Bingham University
- Harvey Mudd College
- Monmouth College
- Buena Vista University
- Monash University
- First Technical University, Ibadan
- Seton Hall University

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Making Connections in the Green Chemistry Community

https://bit.ly/LeadTeachers_GCCSigners_Map
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