***Webinar series – “Clarifying the Crosscutting Concepts – Preparing the Next Generation of Scientists”***

**Exploring the Crosscutting Concept of Cause and Effect with Your Students
Tuesday, May 8, 2018
4:00 PM PT/5:00 MT/6:00 CT/7:00 ET
Grades K-12
Hosted by Dr. Michael Passow**

Join Dr. Mike Passow to learn how you can build your students' understanding about the crosscutting concept of cause and effect. We all experience causal relationships every day. Some are simple, while others are very complex. Your students need to learn how to identify situations involving causality, as compared with correlations that may not result from causality. At the highest levels, we need to help students make predictions about changes in natural and human-designed systems due to cause and effect relationships. Discover new ways to teach about this important NGSS\* Crosscutting Concept.

**About the Presenter:**

Mike Passow taught over 40 years in middle school, high school, and college classrooms before finally retiring from Dwight Morrow High School in his hometown of Englewood, NJ. Dr. Passow continues to provide professional development for science teachers. He is the founder and organizer of the Earth2Class Workshops for Teachers at the Lamont-Doherty Earth Observatory of Columbia University. Dr. Passow is also active in many professional Earth Science societies, serving multiple terms as President of the National Earth Science Teachers Association and National Association of Geoscience Teachers, Eastern Section.

***Developing and Using Models – A Hands-On Webinar for All Grade Bands***

**Wednesday, May 9, 2018
4:00 PM PT/5:00 MT/6:00 CT/7:00 ET
Grades K-12
Hosted by Michael DiSpezio**

Join Michael for an informative, interactive (yes, this webinar has a hands-on element), and enjoyable experience in which you'll construct an understanding of Science and Engineering Practice 2: Developing and Using Models. As you explore the tenets of modeling across the grade bands, you'll engage in several hands-on activities that illustrate the application of various types of static and dynamic representations. To fully engage in the process, make sure that you have the following materials at hand: one large paper clip (ideally color coated), several drinking straws, clean scissors, a water filled drinking glass, and a metal spoon.

**About the Presenter:**

Michael DiSpezio has authored many HMH instructional programs for science and mathematics. He has also authored numerous trade books and multimedia programs and hosted dozens of studio and location broadcasts for organizations in the U.S. and worldwide. Most recently, he has been working with educators to provide strategies for implementing the Next Generation Science Standards, particularly the science and engineering practices, crosscutting concepts, and the use of Evidence Notebooks. To all his projects, he brings his extensive background in science; his expertise in classroom teaching at the elementary, middle, and high school levels; and his deep experience in producing interactive and engaging instructional materials.

**How Crosscutting Concepts Are Related: A Case Study from Astronomy
Thursday, May 10, 2018
4:00 PM PT/5:00 MT/6:00 CT/7:00 ET
Grades K-12
Hosted by Dr. Cary Sneider**

Although the many different topics of science and engineering may suggest that these fields are fragmented, crosscutting concepts show that they are actually part of the same approach to making sense of the world around us. In this webinar, Dr. Cary Sneider will take the next step in unifying the sciences by showing that crosscutting concepts are closely related to each other. The webinar will begin with an activity that will help participants understand what motivated Galileo to support the very unpopular idea at the time that Earth is not the center of the universe, but rather a planet spinning and whirling through space. While the examples used will be from a middle school astronomy unit, the essential ideas can be applied across the K–12 spectrum.

**About the Presenter:**

While studying astrophysics at Harvard, Cary Sneider volunteered to teach in an Upward Bound program and discovered his real calling as a science teacher. After teaching middle and high school science in Maine, California,

Costa Rica, and Micronesia, he settled for nearly three decades at Lawrence Hall of Science in Berkeley, California, where he developed skills in curriculum development and teacher education. Over his career Cary directed more than 20 federal, state, and foundation grant projects, and was a writing team leader for the Next Generation Science Standards. He has been instrumental in ensuring HMH Science Dimensions meets the high expectations of the NGSS and provides an effective three-dimensional learning experience for all students.

**Crosscutting Concepts Across the Ages
Wednesday, May 16, 2018
4:00 PM PT/5:00 MT/6:00 CT/7:00 ET
Grades K-12
Hosted by Marjorie Frank and Bernadine Okoro**

Participants will learn the history of the "crosscutting concepts," one of the major tenets of the Next Generation Science Standards (NGSS). Participants will explore the crosscutting concept "Structure and Function" at the elementary, middle, and high schools levels. Participants will perform activities that illustrate Structure and Function at work and get ideas on how to incorporate Structure and Function into their subject matter. If time permits, participants may also explore "Systems and System Models."

**About the Presenters:**

An educator and linguist by training, a writer and poet by nature, Marjorie Frank has authored and designed a generation of instructional materials in all subject areas, including past HMH Science programs. Her other credits include authoring science issues of an award-winning children’s magazine, writing game-based digital assessments, developing blended learning materials for young children, and serving as instructional designer and co-author of pioneering school-to-work software. In addition, she has served on the adjunct faculty of Hunter, Manhattan, and Brooklyn Colleges, teaching courses in science methods, literacy, and writing. For HMH Science Dimensions, she has guided the development of our K–2 strands and our approach to making connections between NGSS and Common Core ELA/literacy standards.

Bernadine Okoro is a 2010–2011 Albert Einstein Distinguished Educator Fellow. She is currently serving her fellowship with the National Science Foundation in the Directorate of Engineering, in the Division of Industrial Innovation and Partnerships. Prior to her fellowship, she taught chemistry and earth science for five years in the District of Columbia Public Schools at Woodrow Wilson Senior High School. She is a trained chemical engineer and has worked in industry as an engineer for nine years for various companies including Bethlehem Steel, Arco Chemical, Perfecseal, U.S. Patent & Trademark Office and BioCore Medical Technologies. She earned her B.S. in Chemical Engineering at Drexel University, and she earned her Master of Arts in Producing Film & Video and Masters in Teaching at American University.

**An Elementary and Middle School Approach to Energy and Matter**

**Thursday, May 17, 2018
4:00 PM PT/5:00 MT/6:00 CT/7:00 ET
Grades K-12
Hosted by Michael DiSpezio**

Join Michael for an informative, motivating, and enjoyable experience in which you'll construct an understanding of Crosscutting Concept 5: Energy and Matter. Discover not only the fundamental tenets of this crosscutting concept, but experience effective classroom strategies for teaching this understanding through hands-on explorations and self-directed discovery. At the end of this webinar, you'll walk away with an assortment of engaging strategies that are seamlessly integrated into an NGSS elementary or middle school science classroom.

**About the Presenter:**

Michael DiSpezio has authored many HMH instructional programs for science and mathematics. He has also authored numerous trade books and multimedia programs and hosted dozens of studio and location broadcasts for organizations in the U.S. and worldwide. Most recently, he has been working with educators to provide strategies for implementing the Next Generation Science Standards, particularly the science and engineering practices, crosscutting concepts, and the use of Evidence Notebooks. To all his projects, he brings his extensive background in science; his expertise in classroom teaching at the elementary, middle, and high school levels; and his deep experience in producing interactive and engaging instructional materials.

**Metric Measurements, Magnitudes and Mathematics Matter in the Science of Scale
Monday, May 21, 2018
4:00 PM PT/5:00 MT/6:00 CT/7:00 ET
Grades 5-12
Hosted by Dr. Thomas O’Brien**

Scale was identified as a critical “big idea” long before the AAAS Benchmarks (1996), and the NRC’s NSES (1996), Framework (2012), and NGSS (2013). Participants will engage in exploring “powers of ten” from macroscopic metric models, the “too sweet” science of soft drinks, a toilet paper timeline for evolution, and textbook lies of not-to-scale Earth-Moon and “far out” solar system science illustrations. These examples will explain how scale is a “forest for the trees” crosscutting concept for three-dimensional science learning. Participants will be challenged to apply and elaborate the lessons learned across every unit they teach and to evaluate the “size” of student impact in terms of their enhanced appreciation for the awesome scope of science.

**FOR OPTIMAL EXPERIENCE: If possible, please collect the following materials: a meter stick, a magnifying lens, table salt, a meter-long section of toilet paper, and 4–6 spherical sports balls (e.g., a ping pong or golf ball, a racquetball or tennis ball, a baseball, a softball, a soccer or volleyball, and a basketball).**

**About the Presenter:**

Thomas O'Brien, a professor at Binghamton University (SUNY), is a distinguished leader in science education. During the 1980s, he was a member of the writing team for the innovative Chemistry in the Community (ChemCom) program produced by the American Chemical Society. He has also authored a three-book series with the NSTA Press, Brain-Powered Science: Teaching and Learning with Discrepant Events, and served as an author/editor for Science for the Next Generation, another NSTA Press book. His research interests include constructivist approaches to science teaching, professional development, and leadership. For HMH Science Dimensions, he has helped guide the planning and development of the high school chemistry content.