Science Leadership Foundations Professional Learning Community

July 20-24, 2020

Syllabus

Instructors:

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Time: Monday-Friday, 4:30 -7:30 pm, Synchronous Hybrid Learning Environment with both Synchronous and Asynchronous Learning

Note:

Course objective: Equip school-based leaders with knowledge, skills, and tools to support Science instruction in a preK-8 setting.

General Overview: This 45-hour Professional Learning Course and Community focuses on the content knowledge, pedagogical practices, and leadership knowledge required to support, sustain, and advance science literacy achievement in PreK-5 and PreK-8 schools, as defined by the Common Core and Next Generation Science Standards. The class meets daily in small and large groups via Blackboard collaborative online platform.

Key Topics:

Essential Questions	Sub-topics
What does it take to run a robust science program at my school?	• How does Science instruction connect to other subjects that we teach? • How should I schedule science instruction in my building? • Management of instructional materials: What to do if I do not have materials for science experiences/labs kits? • What are the effective practices of collaborative planning and observation of instruction for science? • What are the roles, responsibilities, and characteristics of my Science Lead? • What about after-school science and STEM programming: Do they matter?
How does a Science classroom look?	• What is the Science Learning Cycle (5Es)? • What are science misconceptions and why are they important to know? • What's the difference between science by inquiry vs active learning vs scientific method vs NGSS practices vs project-based learning (PBL)? • How does science support ELA skills? (Close reading, evidence-based argumentation and writing, student discourse, analysis of complex texts, etc.) • How does science support math skills? (Developing and using models, computational thinking, etc.)

	• What are science student habits of mind?
How do I observe science instruction so that I can support my teachers?	• What are the key science teacher and student actions? • What tools do I use to provide useful science teacher feedback? • What is rigor in a science lesson? • How does the new Instructional Framework and other observation frameworks leverage NGSS instruction?
What is the design and structure of NGSS Standards?	• What are NGSS instructional shifts? • NGSS Assessments: How do I prepare my students to do well on the MISA or other standardized science assessments? • Thinking beyond standardized testing: what do students need?
How do I make science accessible for all?	• What supports and differentiation are needed for: o Students with special needs o ESOL learners o Students below grade level o Students above grade level
What's the difference between science and STEM?	• How do we integrate science, engineering, and technology? • What is the Engineering Design Process (EDP)? • How do I work with families and community to endorse and promote STEM?

Maryland State Department of Education (MSDE) CPD Credit Requirements:

1. **Attend all virtual classes and participate in Blackboard discussions.**
2. **Complete course readings and/or assignments prior to each class.**
3. **Design an NGSS-aligned lesson plan.**
4. **Present final project.**

Participation

During each class, each participant will be issued a "participation grade" based on his/her engagement in the work.

Assignments

All assignments will be graded as satisfactory or unsatisfactory. Participants must earn satisfactory on all assignments to receive course credit. Assignments that are unsatisfactory can be resubmitted once.

RE**ADINGS (provided)**

Books:

Banko, W., Grant, M. L., Jabot, M. E., McCormack, A. J., & O'Brien, T. Science for the next generation: Preparing for the new standards. NSTA Press. 2013.

Brunsell, E., Kneser, D. & Niemi, K. Introducing Teachers and Administrators to the NGSS: A Professional Development Facilitator's Guide. *Alexandria*, VA: NSTA Press. 2014.

Koch, J. Science Stories: Science Methods for Elementary and Middle School Teachers. 5th edition. Cengage Learning. 2013.

Rhoton, J., & Shane, P. (Eds.). (2006). *Teaching science in the 21st century*. NSTA Press.

Articles:

Blank R. What is the impact of decline in science instructional time in elementary school. Noyce Foundation. 2012.

Sadler P., Sonnert, G. Understanding Misconceptions: Teaching and Learning in Middle School Physical Science. American Educator, 2016.