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## ***NGSX PATHWAY FOR TEACHER STUDY GROUPS: REASONING, MODELING, AND COMMUNICATING ABOUT MATTER – FREQUENTLY ASKED QUESTIONS***

### **What is the Next Generation Science Exemplar (NGSX) PD system?**

The Next Generation Science Exemplar System for Professional Development or NGSX is a new kind of PD environment. It is a web-based system designed to engage learners in the three major dimensions of the National Research Council's Framework for K-12 Science Education - core ideas of science, scientific and engineering practices and crosscutting concepts. At the same time, NGSX participants are engaged with student performance expectations found in the Next Generation Science Standards.

### **Why is NGSX an important PD resource?**

States and districts are asking how should professional learning (PD) and pre-service education change to support this new roadmap for science teaching and learning? How do we get started? What does this roadmap look like? Our response to these and questions like them has been to design a PD system designed to make this new vision of science teaching and learning visible and coherent. Drawing from highly respected research-based principles on learning we have assembled a library of usable tools, tasks, and resources to help you and your colleagues grow in your knowledge, confidence, and facility with the major ideas in the Framework and NGSS - core ideas in science, scientific and engineering practices, and crosscutting concepts.

### **Why is NGSX web-based?**

Advances in digital, media, and network technologies have boasted professional learning capabilities in many professions. Education, however, has been slow to adapt and fully realize the potential of these technologies. We believe this should change. This is particularly true now when PD is becoming more important than every in response to the NRC Framework, NGSS, and the Common Core.

The web is a very versatile platform where high quality image-rich resources can be made widely accessible and where learners can come together as a community

at times and in locations convenient to all. While you are a NGSX participant you can access videos, texts, and tools 24/7. Learning is ongoing, not stopped artificially because the clock gives us an ending time.

### **What can you expect as a participant in this NGSX learning pathway?**

This learning pathway contains nine, three-hour units. They are intended to be flexible, allowing you and your colleagues to move through units at your own pace. Each unit is based on a particular set of learning goals involving the three dimension of the NRC Framework and student performance expectations found in NGSS. In this initial unit the focus is on physical science, the structures and properties of matter. Your own learning will be guided by the question, "*How do particles combine to form the variety of matter one observes?*" (NGSS, PS1.A, Structures and Properties of Matter).

Intentionally integrated into learning about matter are two of the scientific and engineering practices - modeling and argumentation from evidence. In the form of questions, here is a sample of learning goals we have built into this pathway.  
*What is different about the new NRC and NGSS vision for science teaching?  
What is model-based reasoning and how is it fundamental to science as well as science teaching and learning? How do I build a culture of reasoning with evidence in my classroom? How do I create a classroom culture where students will go public with their ideas and build on the ideas of their classmates?*

Given our research-based belief that learning builds progressively over time, this pathway has things for you to do between units. Yes, you can think of it as homework. You also can think of it as bridge building, further exploring the ideas, videos, and activities contained in the current unit while preparing for the next. Part of your bridge building will be opportunities to try out activities in your classroom and bring back those experiences to your learning colleagues during pathway meetings.

### **So if NGSX is web-based, what will our PD look and feel like?**

Imagine yourself seated around a table with a group of teaching colleagues from the district or region where you teach or perhaps two or three educators from a local science and technology center have joined you. Everyone has a laptop computer or a tablet of some kind like an iPad. In front of you is a large screen where the NGSX website is projected.

Someone from the group has volunteered to act as the facilitator for this first session and her laptop is connected to the projector so that the entire group can see the NGSX website. You were asked to bring your laptop or tablet as there are times in the unit you will be asked to record comments, make observations, or break into small groups to watch a video, perhaps making notes along the way.

Once everyone is logged into the NGSX website, usernames and password used, you will be greeted by the unit leaders talking with you via video. They will provide you with an overview of the unit. You are now underway and as you move through the unit you will receive other prompts via video about what activity is next and what your role in that activity might be.

If you want to log into the NGSX website at some point after the group PD session to review a video or re-read one of the resource essays you will be able to, as long as you have your user name and password and are a NGSX participant. We want this PD learning pathway to be accessible to you 24/7. You may find that you want to use Skype or whatever your favorite communications software program might be to contact with others from your study group between PD sessions to talk through activities, resources, or homework.

***Why are selected states piloting this initial NGSX learning pathway?***

We need opportunities for teachers, educators from informal science learning settings, teacher education faculty, and administrators to engage with our current version, a beta version, of a NGSX learning pathway. The pilot process will provide feedback to us as project co-leaders along with other project designers, resource developers, videographers, and website designers so that technical and pathway content revisions can be made. Our goal is one of continuous improvement. We very much want this new web-based PD learning process to do what it was designed to do - enable professionals to build their understanding and capacity to provide students with high quality learning experiences that reflect a progressive and coherent understanding of scientific and engineering ideas and practices aligned with the NRC Framework and NGSS.

Thank you for participating in this pilot of the NGSX Pathway: Reasoning, Modeling, and Communicating about Matter. And best wishes from the NGSX project co-investigators: Sarah Michaels (Clark University), Jean Moon (Tidemark Institute), and Brian Reiser (Northwestern University).