



# Community-Engaged Teaching Experience at Q?rius 2015

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We want new teachers to be knowledgeable, confident, and excited to use NMNH resources in a way that supports learners' deep, meaningful, and sustained scientific inquiry.



### Q?rius goals

1. Y& A strengthen their personal connection to research through experiences with facilitators
2. Y& A explore questions and curiosities by practicing the skills of research
3. Y& A value the opportunity to engage with the authentic processes and tools and objects of research
4. Y& A increase their interest in the connections between research and current issues

### Internship goals

Attending to diverse learners' thinking

Facilitating questioning

Sustaining Engagement

### Noyce-CB goals

1. Community engagement
  - 1a. Know learners
  - 1b. Know resources
2. Disciplinary practice
  - 2a. Scientific modeling
  - 2b. Student reasoning in discipline
3. Teacher leadership
  - 3a. Reflexive practice
  - 3b. Role modeling

### NGSS practices

1. Asking questions
2. Modeling
3. Investigating
4. Analyzing data
5. Using math
6. Constructing explanations
7. Engaging in argument
8. Obtaining, evaluating and communicating information



*The project “triggered a series of critical ‘ah-ha moments’ that are likely to leave a mark on teacher candidates’ practice”*

# **Complementary Resources and Expertise**

## **NMNH**

- ★ **Informal Education**
- ★ **Collections-Based Inquiry**
- ★ **Formative Evaluation**
- ★ **Q?rius**

## **GWU**

- ★ **Science Education**
- ★ **Teacher Education**
- ★ **Foundational Research**
- ★ **Future Teachers**

# Next Steps...



- Connect with DC schools and in-service teachers.
- Connect with other potential partners who share our interests and goals.

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*Session 1: Powerful Partnerships: Engaging the Public and Private Sector*

## **About the partnership...**

The George Washington University and the Smithsonian National Museum of Natural History recently launched a summer experience to help future STEM teachers learn to spark children's curiosity and inquiry using museum collections. The field experiences took place in Q?rius ("curious"), the Natural History Museum's new multi-purpose space featuring 6,000 specimens—shells, skeletons, fossils, and more—that visitors can see, touch, and study under the microscope. GW teacher candidates acted as co-learners, helping visitors access the collection, ask questions, uncover patterns, and log their discoveries in digital field books. In an expanded project, currently under review at the National Science Foundation, GW and the Smithsonian will partner with the New York Hall of Science and Bank Street College to offer summer institutes for DC and New York City middle school science teachers seeking to integrate museum resources into their classrooms.

## **Focal Questions...**

1. Partnerships work best if all parties gain from the relationship. How does your partnership benefit the various partners?

The potential for symbiosis is enormous. Because the educators at NMNH want science teachers--local and nonlocal--to use our physical and digital resources, we are always working to understand the best ways to provide those resources. We know that alignment to NGSS is one of the easiest ways to draw teachers in. We also know that aligning resources to NGSS does not just mean covering science concepts and content. It means recognizing the shift explicit in the standards in the way science is taught. It feels like there is a great opportunity for museums and science centers like ours to help meet that need.

Likewise, GW's secondary education program contains a community-engaged teaching focus. We want our teacher candidates to immerse themselves in the vibrant cultural and scientific community, to inquire *alongside* diverse groups of learners, and to commit to integrating resources like Q?rius into their classroom teaching. Q?rius naturally involves many of the key practices that we want science teachers to integrate into their classrooms: questioning, drawing out and following learners' ideas, and reasoning from careful observations and evidence.

2. What was achieved through the partnership that would not have otherwise been achieved?

The unique learning experience developed for future teachers could not have been created without the combined expertise of NMNH and GW. NMNH brought experience in informal education, training activities for museum educators, the vision for visitor learning in Q?rius, not to mention the amazing Q?rius space itself. GW brought expertise in science education, a vision for teacher education in an informal space, and of course the future teachers!

We both feel compelled to increase DC students' and teachers access to Q?rius and other cultural and scientific institutions in the nation's capital. The summer field experiences was a small step in the right direction. The project "triggered a series of critical 'ah-ha moments' that are likely to leave a mark on teacher-candidates' practice" (Raimondo & Beil, 2015, p. 24). Participants wrote in their journals about growing confidence working with learners, becoming better questioners, and learning to inquire *with* visitors instead of giving answers to them. Working in an informal setting, alongside experienced museum educators, allowed our future teachers to see inquiry unfolding naturally among even very young learners, to see ways of using collections to facilitate NGSS practices, and to envision what could be possible in their own classrooms.

Finally, our partnership was generative in terms of brainstorming new ideas for Q?rius, for the science method courses at GW, and for research. The combination of informal education expertise at NMNH and science education/teacher preparation experience at GW led us to all kinds of exciting questions and ideas for science learning and teacher preparation. We are already working on follow up projects!

3. What advice would you give to schools/teachers/organizations wishing to establish partnerships in education?

We each came to our early meetings with a fairly clear sense of our goals and needs, written down on paper. Then we literally sat and lined up the goals side by side to look for overlap. We found significant overlap in the kind of science learning we hope to support in DC classrooms



and the kinds of experiences that could be meaningful for new teachers. Don't do everything at once. We started with a very small pilot, just a handful of future teachers, and that required an immense amount of planning. We learned important lessons from our pilot about recruitment, timing of the experiences, how to orient preservice teachers to work in informal settings, which content area foci are best aligned to the resources in Q?rius. We know that next time around we want to have more opportunities to reflect with the teachers and in order to get more feedback from them about how to incorporate field books and trying out different strategies for stimulating inquiry and deepening engagement with the Q?rius collections. We also want to build stronger connections between the summer field experiences and the unit planning and lesson planning work teachers do during their classroom-based internships. In short, we have lots of ideas and are ready to pursue larger projects together!

4. What mechanisms would be useful to have in place so that partnerships can be more readily established?

The good news is that many of the mechanisms we can suggest are already under development by the various working groups of the DC STEM Network. As we think about future work, we are asking: How can we connect with schools and teachers who want the kinds of experiences we can offer in Q?rius? What kinds of incentives exist or can we put in place for teachers to participate in these kinds of programs? How can we make contact with other partners who share our interests and goals?