Frequently Asked Questions about the AMNH RGGS MAT Program
Supported by Research and Evaluation

Is AMNH RGGS MAT really a teacher residency program housed in a Museum? Not a museum education program? How does that work?

Yes, the American Museum of Natural History’s (AMNH) Master of Arts in Teaching (MAT) is a teacher residency program with a specialization in Earth science for grades 7-12 that is housed in the Richard Gilder Graduate School (RGGS) at the Museum. The AMNH RGGS MAT is a 14-month program followed by two years of new teacher induction. Program residents attend academic courses in science and pedagogy co-taught by educators and scientists at the Museum. As an urban residency program, AMNH RGGS MAT has clinical partnerships with four high-needs middle and high schools in New York City and Yonkers, which is where residents complete two school-based residencies over 10 months. During the residencies, residents are in schools working with mentor teachers 4 days a week. In addition to coursework and school residencies, residents participate in museum-based residencies working with visitors and youth in summer enrichment programs during the first summer and engage in scientific research and fieldwork with museum scientists and curators during the second summer.

How does the program contribute to the critical need for qualified and certified Earth science teachers in New York State?

The AMNH RGGS MAT program was designed to address the critical shortage of effective and certified Earth science teachers in New York State, and seeks to address concerns about children’s access to science in complex, urban schools. Nationwide, research finds that approximately 3% of secondary STEM teachers have a degree in geoscience; and, compared with other sciences, Earth sciences has the least number of trained elementary and secondary teachers (Wilson, 2016). In 2019-2020, science for grades 7-12 was designated as one of the 17 teacher shortage areas in New York by the US Department of Education (NYSUT, 2019).

The Museum’s residency program partners with three high-needs schools throughout the city and one in Yonkers, a large urban center just north of NYC, each of whom have hired AMNH RGGS MAT graduates as Earth science teachers. During 2019-2020, residents worked with a total of 24 school-based mentor teachers (comprising science teachers and specialists in English as a New Language and Special Education). Across residency partner schools, an estimated 3,600 students are taught in classes with AMNH RGGS MAT residents over the course of the year. To date, the AMNH RGGS MAT program has prepared 109 certified Earth Science teachers prepared to teach in high-needs middle and high schools. Considering the current reach of our graduates, we estimate that program graduates were teaching approximately 10,560 students across New York State and 10,800 students in high-needs schools across the 2019-2020 school year (with a shift to remote instruction from mid-March through the end of the school year due to the COVID-19 pandemic).

How does the AMNH RGGS MAT program recruit and retain teachers of color? And how does it relate to the education context in New York?

The AMNH RGGS MAT program uses a number of inclusive admissions strategies, such as outreach to HBCUs and LatinX serving institutions. Although the field of geoscience degrees tends to be predominantly white with only 7% of undergraduate and graduate degrees awarded to underrepresented minorities in the U.S (Stokes, et. al., 2015), the AMNH RGGS MAT program has
been able to recruit 30% teacher candidates of color into teaching in NYS public schools since its inception. Additional research-based strategies that the program adopts to recruit and retain teachers of color include underwriting the costs of teacher preparation by providing a full fellowship and living stipend, providing mentoring support in school residencies for a full year, and offering two years of comprehensive induction supports in which graduates receive stipends for participating in induction meetings (Carver-Thomas, 2018; Hansen et al., 2018).

The number of teachers of color in the school system remains lower relative to the proportion of students of color; shortages of teachers of color are of special concern given the importance of diversifying the profession. The student body in New York is increasingly diverse in terms of race, ethnicity, gender, and age. However, in New York, 80% of teachers are white and teachers of color are underrepresented (NYSED, 2019). Research finds that students in schools with larger percentages of students of color do not have as much access to certified teachers compared with schools with lower enrollment of students of color (Cardichon et al., 2020).

How does the AMNH RGGS MAT program’s retention rate compare with other teacher preparation programs?

The retention rate of AMNH RGGS MAT graduates is on par and even exceeds other residency programs, and is far above the national average for teacher preparation programs where teachers are working in high-needs schools. Findings from the first four cohorts reveal that 92% of AMNH RGGS MAT graduates have stayed in teaching for 3 or more years. Of those teachers, 95% continue to teach in high-needs schools and 98% continue to teach in New York State. Research shows that retention rates for teacher residency programs are especially high, with 80%-90% of teachers stay in teaching after 3 years (Guha et al., 2016).

How does the program continue to support teachers and their students after graduation?

After teachers graduate from the AMNH RGGS MAT program, they receive two years of comprehensive induction supports such as monthly meetups, classroom visits, and teaching and learning activities. For instance, Advances in Geosciences offers a full-day program for recent graduates with their students together with an AMNH scientist to collect rocks at an underground zinc mine, tour a scientist’s lab, and visit museum exhibitions (Trowbridge, 2019). Additional programs for AMNH RGGS MAT graduates include the EArth-sciences Reciprocal Learning Year (EARLY) initiative working with a scientist and educator engaging in fieldwork in paleontology and the Culturally Responsive Education Professional Learning Group (CRE PLG) exploring culturally responsive and sustaining education in science classrooms in high-needs schools (Wallace, Howes, & the CRE PLG, 2020).

What do we know about how students who are taught by program graduates do? What are the impacts of AMNH RGGS MAT teachers on students’ achievement?

Few studies explore student learning outcomes of residency graduates, potentially due to the recent history of residency programs (Guha et al., 2016). Since the first year of the program, external researchers at NYU have worked on assessing AMNH RGGS MAT graduates’ impact on student achievement on statewide assessments using statewide and citywide teacher and student data. From these analyses, we have learned that AMNH RGGS MAT graduates continue to teach students in high-need schools. In addition, there has been an increase in students taking Earth Science classes and the Earth Science Regents Exam in schools where AMNH RGGS MAT graduates teach.
2018-19, 59% of students in schools where AMNH RGGS MAT graduates teach took the Earth science regents exam compared with 53% of students of similar teachers. The most recent study showed that there was a 20% increase in students of AMNH RGGS MAT graduates who took the Earth Science Regents Exam compared to the previous year. As of 2017, we are beginning to see positive and statistically significant results for students of AMNH RGGS MAT graduates compared to students with similar characteristics whose teachers are did not graduate from the program (Weinstein, 2020).

**What do we know about the influence of the AMNH RGGS MAT program on teachers?**

There are multiple research studies conducted on the AMNH RGGS MAT program by researchers both internally and externally. We have learned through qualitative studies that program graduates bring what they learned in the program into their teaching. We have found that AMNH RGGS MAT graduates draw on the passion of being a scientist; they have a strong sense of identity as an AMNH teacher; that they pull from what they’ve learned in museum experiences and bring that into the classroom such as using rock samples they collected during fieldwork in the program as well as fieldtrips and museum resources; and we have evidence that they are especially attuned to their students’ thinking and to assessment to support their students’ science learning, and some early evidence that they are planning to use the ambitious science practices that they are learning in their own classrooms (Fallona et al., 2017; Howes & Wallace, in preparation; Wallace et al., 2020; Trowbridge et al., 2019; MacPherson, Howes, et al., 2020).

**What features of the AMNH RGGS MAT program are supported by research on residency programs?**

The AMNH RGGS MAT program highlights key research-based characteristics of a residency model in its very design, features that are designed to help teachers learn and support them in staying in the field. These features include recruiting strong candidates, extensive clinical partnerships with four high-needs schools, providing financial incentives such as free tuition and a living stipend to candidates, and offering ongoing mentoring at the residency schools over 10 months, and two years of comprehensive induction supports for new teachers. Studies show that teacher residency programs provide strong clinical preparation and offer promise for addressing many of the challenges that teacher preparation in this country face including recruitment, shortages, and attrition across the nation (Darling-Hammond et al., 2016). Research finds that the residency model is effective in promoting, preparing, and retaining high-quality teachers (AACTE, 2018; The Sustainable Funding Project, 2016).

The AMNH RGGS MAT program continues to make research-based investments through the practices and strategies for teaching and learning that it fosters. For instance, teachers in the program learn to teach through the use of research-based instructional practices such as culturally responsive and sustaining teaching (NYSED, 2019) and ambitious science teaching (Windschitl, Thompson, & Braaten, 2018; Hammermess et al., 2020). The program emphasizes the use of a co-teaching model throughout the program, including in residencies and courses (Villa et al., 2013).
References


http://educate.bankstreet.edu/faculty-staff/2


https://www.americangeosciences.org/workforce/reports/status-report