

**American Museum of Natural History
MAT Earth Science Residency Program
TQP Grant:
Year 4 External Evaluation Report**

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EXECUTIVE SUMMARY

The Master of Arts in Teaching – Earth Science Residency Program (MAT-ESRP), based at the American Museum of Natural History (AMNH) Richard Gilder Graduate School in New York City, is a collaboration between educators and scientists at AMNH and school districts in the Bronx, Brooklyn, Queens, and Yonkers. The cohort-based, 15-month, 36-credit program is designed to prepare and retain highly effective Earth science teachers to serve diverse student populations in high-need schools. Each cohort begins with a Museum Teaching Residency at AMNH, followed by a year of residencies in high-need schools. The program concludes with an AMNH-based Science Practicum. After completing the residency program, graduates are supported by the MAT-ESRP’s two-year New Teacher Induction Program as they begin their teaching careers at high-need schools.

This external evaluation report covers Year 4 (October 1, 2022 – September 30, 2023) of AMNH’s 2019–24 TQP grant to expand and innovate the residency program. The primary aims of the TQP project are to (1) expand the Earth science residency, mentoring, and induction program; (2) refine supports for culturally responsive-sustaining education (CRSE) in the teacher preparation curriculum; and (3) integrate computational thinking (CT) into the curriculum. The TQP grant supports residents in Cohorts 10, 11, and 12 and provides second-year induction activities for an earlier cohort.

Horizon Research, Inc. (HRI) is conducting the formative and summative external evaluation for the TQP grant. The evaluation takes a multi-method, multi-source approach to understand tradeoffs the project must negotiate as well as accomplishments and challenges. In Year 4, evaluation methods included observations of meetings and program activities, interviews, surveys, and document and web resource reviews, as well as analysis of AMNH-collected data.

Year 4 of the MAT-ESRP TQP grant includes several highlights. Among these, the program recruited its largest and most diverse cohort. The program also added a new partner school, which was important for accommodating the larger number of residents. Cohort 11 progressed smoothly throughout Year 4. All cohort members have now graduated, and all but one has begun teaching, with robust support from the induction component.

Program leaders refined the application and interview processes to address feedback from previous applicants. For example, the program moved to a rolling admissions process, making offers to candidates in batches rather than waiting to make all offers at once. The rationale was to secure acceptances before candidates fielded other offers. The program also refined the format of information sessions and began including a facilitator from an underrepresented group in the sessions. Survey data suggest that the most recent group of applicants, particularly those from underrepresented groups, found these sessions more effective than previous ones.

Continuing efforts to infuse culturally responsive-sustaining education (CRSE) in all program components were evident in observations as well as in survey and interview data. CRSE has been

a hallmark of the program since its inception, but the program has transitioned from CRSE as a feature to CRSE as the foundation.

Residents had many positive things to say about connections between their courses and their clinical experiences. They highlighted the effective modeling of instructional strategies in their courses, which was evident in observations as well. They also commented on the applicability of assignments, readings, and class discussions. Some would appreciate a tighter alignment between the lesson plan requirements of the program and those required of their residency schools.

Strong partnerships with schools continue to be a hallmark of the program. As noted earlier, one partner school was added in Year 4 and will begin hosting residents in 2023–24. In interviews, partner school administrators described their appreciation for the level of communication from the program and believe they have a voice in decisions. Administrators pointed to the benefits of having residents in their schools. They acknowledge that the mentoring workload is heavy, but they see the benefits of the partnership with AMNH outweighing the costs.

The Mentor Academy continued in a hybrid format in Year 4, with 4 of the 6 meetings in person and the other 2 by videoconference. Data from an end-of-year survey and focus group interview show that mentors have positive opinions of many aspects of the academy. They especially appreciated the opportunity to meet their resident before the placement began. Some would also appreciate a more explicit set of expectations for the mentoring experience. This seems especially important for mentors who are not program alumni.

Finally, the program continued to provide robust induction support to new teachers. This component transitioned from being fully remote to a hybrid format in 2022–23. Although most attended in person, the hybrid format accommodated those who live farther away. Induction participants gave the experience high marks, stressing the benefits participating with their own cohort and earlier ones.

INTRODUCTION

The Master of Arts in Teaching – Earth Science Residency Program (MAT-ESRP), based at the American Museum of Natural History (AMNH) in New York City, is a collaboration between educators and scientists at AMNH and school districts in the Bronx, Brooklyn, Queens, and Yonkers. Horizon Research, Inc. (HRI) is conducting the external evaluation for AMNH’s 2019–24 Teacher Quality Partnership (TQP) grant to expand and innovate the residency program. The primary aims of the TQP project are to (1) expand its Earth science student-teacher residency, mentoring, and induction program in high-need schools; (2) refine supports for culturally responsive-sustaining education (CRSE) in the teacher preparation curriculum; and (3) integrate computational thinking (CT) into the curriculum.

The Earth science teacher preparation program is based in AMNH’s Richard Gilder Graduate School. The cohort-based, 15-month, 36-credit teacher residency program is designed to prepare and retain highly effective Earth science teachers to serve diverse student populations, including English language learners (ELLs) and students with special needs. Each cohort begins with a summer-long Museum Teaching Residency at AMNH. Program participants are then assigned a fall semester residency followed by a spring semester residency in the partner schools, all of which are high-need public middle and high schools. AMNH also supports residency school mentor teachers through Mentor Academy sessions, held online or at the museum, and meetings at the residency schools to provide a robust mentoring system for the residents. The program concludes with an AMNH-based Science Practicum: an immersive Earth and space research course during the second summer. After completing the residency program, MAT-ESRP graduates begin their teaching careers at high-need schools and are supported by AMNH’s two-year New Teacher Induction Program. The TQP grant will support residents in three new cohorts (10, 11, and 12), as well as providing second-year induction activities for an earlier cohort.

Year 4 accomplishments include:

- Continuing to infuse CT activities in two focal courses—*Space Systems* and *Weather, Climate, and Climate Change*;
- Enrolling 22 new residents for Cohort 12 (a 50 percent increase over previous cohorts in this grant cycle) despite nationwide declines in applications to education programs;
- Recruiting a new partner school; and
- Transitioning from fully remote to monthly hybrid induction meetings.

EVALUATION OVERVIEW

The external evaluation includes both formative and summative components. This section of the report provides an overview, followed by a description of the Year 4 evaluation focus and activities.

The formative evaluation is guided by the following questions:

1. What are the nature, quality, and outcomes of the course revision process with respect to developing new CT components, refining CRSE content, and developing additional guidance for supporting ELL students and students with special needs?
2. How does the program attempt to (a) attract diverse, well-qualified applicants, and (b) select, enroll, and retain residents, and how effective are those efforts?
3. How do AMNH and school leaders function as partners?
4. In what ways does the project attract, prepare, support, and retain school-based mentors, and how effective are those efforts?
5. In what ways and to what extent do clinical experiences focus on specific project objectives, including CRSE and implementing CT activities?
6. In what ways and to what extent do enacted course experiences align with project objectives and support residents' clinical experiences?
7. To what extent does the induction program, including professional development opportunities, meet newly inducted teachers' needs?
8. In what ways and to what extent do residents and new teachers benefit from working with school-based and faculty mentors and coaching activities?
9. In what ways and to what extent do residents and new teachers benefit from being part of a cohort?

The summative evaluation focuses on project outcomes and impacts. MAT-ESRP's goals include specific targets for persistence in the program, certification, high-need school placement, and teacher retention. The project also aims to positively impact graduates' preparedness as Earth

science teachers, including their preparedness to use CRSE practices and implement CT activities. HRI will collect data on each of these outcomes, guided by the following questions:

1. Did the project achieve its recruitment target of 72 residents, 24 of whom identify as Hispanic and/or non-white, for the MAT-ESR program?
2. Did the project achieve its preparation, certification, and high-need school hiring target rate of greater than 90 percent and its 3-year retention rate of greater than 80 percent?
3. What is the impact of the MAT-R program on residents' preparedness to (a) teach science effectively to high-need underserved students, including ELL students and special education students; (b) use CRSE practices; and (c) implement CT activities?
4. What is the impact of the MAT-R program on graduates' preparedness to use CRSE practices and implement CT activities, and to teach underserved students, including ELL students and special education students?
5. What is the impact of MAT-R program graduates on high-need schools' performance in Earth science?

Year 4 Evaluation Activities

Year 4 evaluation activities completed by HRI are shown below.

Project Communication

- The HRI evaluation team met with the museum evaluation liaison individually and with the project leadership team as a whole on an alternating monthly basis.

Program Observations

HRI staff observed:

- All MAT-ESRP faculty meetings (by videoconference)
- A sample of MAT-ESRP admissions committee meetings (by videoconference)
- Sessions of the 2022–23 Mentor Academy (by videoconference) and initial sessions of the 2023–24 Mentor Academy (in person)
- Two after school meetings (in person)
- One session each of EDU 600 and 640 (in person)
- Monthly induction meetings (by videoconference)
- Presentations by C11 residents following the 2023 Summer Science Practicum.

Surveys

HRI surveyed:

- Individuals who had shown interest in applying to the program or received a postcard or email from the program (a copy of the survey, administered in May 2023, is included in the appendix).
- Mentor teachers following the final session of the Mentor Academy (a copy of the survey, administered in June 2023, is included in the appendix).

Individual Interviews

HRI interviewed:

- Administrators at 3 of 5 partner schools in the summer of 2023.¹
- Cohort 10 teachers at the conclusion of their first year of teaching.²

Focus Group Interviews

HRI conducted focus group interviews with:

- Eight mentor teachers in person during the January 2023 Mentor Academy session.
- All Cohort 11 residents in person (half each in two group interviews and written responses from one who could not attend) in January.

Review of Project-Collected Data

HRI reviewed:

- Demographic data for Cohort 12.
- Data from daily feedback forms completed by Induction Institute participants in August 2023.
- Data from course evaluation surveys administered by the program.³

The remainder of this report is organized by findings relevant to specific formative evaluation questions, drawing on evidence from various data collection activities, and concludes with a summary and recommendations for the project to consider.

¹ Despite repeated attempts, HRI was unable to schedule an interview with administrators at two partner schools.

² HRI invited all 13 teachers, 9 responded, and 9 interviews were completed.

³ HRI analyzed data from course evaluation surveys administered by the program and summarized the findings in a March 2023 memo.

FINDINGS

Attracting and Enrolling Diverse, Well-Qualified Individuals

In Year 4, MAT-ESRP received 32 complete, eligible applications for Cohort 12. After reviewing all applications and interviewing 27 applicants, the program offered a position to 26. Ultimately, 22 accepted and four declined. At the conclusion of the first summer, two individuals withdrew, leaving 20 in Cohort 12 as of September 2023.

The program has made a concerted effort to reach a more diverse population of applicants. Table 1 summarizes the demographic characteristics of Cohort 12, which is both larger and more diverse than previous cohorts. It includes the highest percentage of candidates identifying as Hispanic in the program's history.

Table 1
Demographic Characteristics of Cohort 12

	Percent (N = 22)
Gender	
Female	64
Male	32
Non-binary	5
Race/Ethnicity[†]	
American Indian or Alaskan Native	5
Asian	0
Black or African American	9
Hispanic or Latino	45
Native Hawaiian or Other Pacific Islander	0
White	55
Two or more races	9
Prefer not to reply	0

[†] Percentages add to more than 100 because respondents could choose more than one category.

Like other TQP projects, MAT-ESRP has found meeting its recruitment goals difficult, but recruitment for Cohort 12 was particularly successful. As mentioned earlier, it represents a 50 percent increase over previous TQP cohorts.

To identify factors that might encourage or discourage applicants, program leaders asked HRI to survey anyone who had shown interest in the program.⁴ HRI first administered the survey in 2021 and again in the spring of 2022 and 2023, with minor revisions at the program's request.

⁴ The project maintains records of those who express interest in the program. For example, the project collects contact information for anyone who attends an interest session.

To broaden the applicant pool in the last two years, the program used a service to identify potential candidates, specifically individuals who had taken the GRE and indicated that they were interested in Earth and space science. For the most recent application cycle, the program sent postcards to 439 of these individuals, whether or not they had shown interest in the program. Including all those who received a postcard, 656 individuals were invited to respond to the survey; 90 completed it.⁵ Because most of those who received the survey had interacted minimally or not at all with the program, the low response rate (14 percent) is not surprising. Nonetheless, it suggests caution should be used when interpreting results.

Table 2 shows the demographic characteristics of respondents to the 2023 survey, both overall and by whether they applied. Similar to the middle and high school science teaching force nationally (Banilower et al., 2018), most respondents identified themselves as female, but they were much more diverse in terms of race/ethnicity. For example, nationally, just over 90 percent of middle and high school science teachers identify as White (Banilower et al., 2018), compared to 63 percent of survey respondents. With one exception, no substantial differences are apparent between those who submitted an application and those who did not. Among respondents who identified as Hispanic, there appears to be a substantial difference between those who applied and those who did not, favoring those who applied.

Table 2
Demographic Characteristics of 2023 Survey Respondents,
by Completed Application Status

	Percent of Respondents		
	Total (N = 90)	Did Not Apply (N = 53)	Applied (N = 37)
Gender			
Female	60	62	54
Male	31	28	35
Gender variant/non-conforming	4	2	8
Transgender Female	0	0	0
Transgender Male	2	4	0
I use a different term	1	2	0
Prefer not to answer	1	2	3
Race/Ethnicity[†]			
American Indian or Alaska Native	3	2	5
Asian	14	19	8
Black or African American	17	15	19
Hispanic	17	8	30
Native Hawaiian or Other Pacific Islander	1	2	0
White	63	68	57
Prefer not to answer	10	6	16

[†] Percentages may add to more than 100 because respondents could choose more than one category.

⁵ HRI offered a \$15 incentive for responding.

The remainder of this section describes applicants’ perspectives on the recruitment process across the three years the survey has been administered. A separate report focusing only on the 2023 survey was submitted to the project earlier this year.

Table 3 shows the various ways individuals heard about the program. Three recruitment methods stand out above the rest in 2023: internet search (29 percent), museum website (28 percent), and recruitment email (21 percent). Nine percent heard about the program through a program graduate or current resident, and 8 percent heard about it through an academic advisor. Fourteen percent heard about the program through other ways. Looking across years, some apparent differences are worth noting.⁶ For example, the museum website appears to have been a more effective recruiting method in 2023 than in previous years. Recruitment emails appeared to be more effective in 2022 and 2023 than in 2021, and respondents seemed less likely to learn about the program through a current or former professor in 2023 than in 2021.

Table 3
How Respondents Heard About the Program[†]

	Percent of Respondents		
	2021 (N = 50)	2022 (N = 68)	2023 (N = 90)
Internet search	30	19	29
Museum website	18	19	28
Recruitment email	10	21	21
Program graduate or current resident	6	4	9
Academic advisor	10	15	8
Coworker	2	3	4
Current or former professor	16	12	4
Professional organization conference or newsletter	2	1	4
Recruitment postcard	4	9	4
Social media	4	4	3
A different program at the Museum	2	6	1
Friend or relative who works at the Museum	0	4	1
Other	20	3	14

[†] The percentages in this table add to more than 100 because respondents could select more than one category.

The survey asked about several factors that could encourage or discourage—or even prevent—potential applicants from completing the application (see Table 4). Across all three years, most respondents rated the majority of factors as at least encouraging. (That is, respondents gave a rating of Encouraged or Strongly Encouraged on a 7-point scale where 1=Prevented me from applying, 2=Strongly Discouraged, 3=Discouraged, 4=Slightly Discouraged, 5=Slightly Encouraged, 6=Encouraged, and 7=Strongly Encouraged.) At the same time, some differences across years are apparent. For example, the museum setting and the teaching requirement after graduation appear to be somewhat less encouraging than they were two years ago. Other factors

⁶ Due to the large number of potential comparisons and the implications for statistical power, no tests of statistical difference were conducted. The report comments only on differences that appear to be substantial, but they should be interpreted with caution.

appear to be *more* encouraging, namely the time required to complete the application and the application fee. The former may reflect an overhaul of the application portal, which was aimed at streamlining the process. The latter almost certainly reflects the program’s reducing the application fee from \$50 to \$10.

Table 4
Factors Encouraging[†] Potential Applicants’ Decision to Apply to MAT-ESRP

	Percent Responding		
	2021 (N = 50)	2022 (N = 68)	2023 (N = 87)
Focus on Earth science	84	74	84
Museum setting for program	96	79	83
Program stipend/fellowship	74	79	79
School residency model (i.e., two, one in fall and one in spring)	68	62	74
Program length	74	61	70
Focus on urban education	68	55	67
Support offered after graduation	74	68	67
Focus on high-needs schools	70	57	66
Program location (New York City)	78	59	66
GPA requirement	50	50	59
Prerequisite science course requirements	56	53	50
Time/effort required for application	20	23	38
Teaching requirement after graduation	56	34	38
Application fee	14	19	30
Cost of living	12	13	21
GRE requirement	10	— [‡]	— [‡]

[†] Includes those who gave a rating of Encouraged or Strongly encouraged on a 7-point scale where 1=Prevented me from applying, 2=Strongly Discouraged, 3=Discouraged, 4=Slightly Discouraged, 5=Slightly Encouraged, 6=Encouraged, and 7=Strongly Encouraged.

[‡] Option was not available on this survey for participants to select.

Among factors included on the survey, more than two-thirds of respondents each year reported that the cost of living either prevented or discouraged them from applying (see Table 5). Also, despite the reduced application fee, about half of respondents still rated it as discouraging. The teaching requirement after graduation seems to have been a more discouraging influence in the last two admissions cycles, but the time required to complete the application seems to have become considerably less discouraging.

Table 5
Factors Discouraging[†] Potential Applicants' Decision to Apply to MAT-ESRP

	Percent Responding		
	2021 (N = 50)	2022 (N = 68)	2023 (N = 87)
Cost of living	70	82	68
Application fee	69	57	48
Teaching requirement after graduation	22	46	39
Time/effort required for application	56	49	34
Prerequisite science course requirements	34	10	27
Program location (New York City)	16	29	24
GPA requirement	24	15	21
Program length	10	17	15
Focus on high-needs schools	14	15	11
Focus on urban education	8	18	10
School residency model (i.e., two, one in fall and one in spring)	12	9	10
Support offered after graduation	6	6	7
Focus on Earth science	14	13	6
Program stipend/fellowship	8	13	5
Museum setting for program	2	7	3
GRE requirement	76	— [‡]	— [‡]

[†] Includes those who gave a rating of Prevented me from applying, Strongly Discouraged, Discouraged, or Slightly Discouraged on a 7-point scale where 1=Prevented me from applying, 2=Strongly Discouraged, 3=Discouraged, 4=Slightly Discouraged, 5=Slightly Encouraged, 6=Encouraged, and 7=Strongly Encouraged.

[‡] Option was not available on this survey for participants to select.

Because of the program’s emphasis on ensuring the scope of their recruitment reaches applicants with diverse life experiences (including those with diverse racial and ethnic backgrounds), the data in Table 5 were disaggregated by whether respondents were members of an underrepresented minority group or not. Table 6 shows the percentage responding that each factor encouraged or strongly encouraged them to apply in 2022 and 2023.⁷ The influence of a few factors appears to have shifted across the two years. These include the school residency model, the program stipend, the program location, the GPA requirement, and the prerequisites, all of which appeared to be more encouraging for those from underrepresented groups in 2023 than 2022. The shift in the program stipend ratings is especially encouraging, as it suggests the gap between the two groups was closed. Because these are program factors that did not change between the two years, the apparent shifts may say more about the applicants than the program.

⁷ There were not enough respondents from underrepresented groups to disaggregate the results in 2021.

Table 6
Factors Encouraging[†] Potential Applicants' Decision to Apply,
by Membership in an Underrepresented Minority Group

	Percent Responding			
	2022		2023	
	Underrepresented Minority		Underrepresented Minority	
	No (N = 48)	Yes (N = 20)	No (N = 57)	Yes (N = 30)
School residency model (i.e., two, one in fall and one in spring)	60	68	67	87
Focus on Earth science	77	65	86	80
Museum setting for program	81	74	84	80
Program stipend/fellowship	85	65	79	80
Program length	52	63	68	73
Program location (New York City)	60	55	61	73
Focus on high-needs schools	52	70	63	70
Focus on urban education	56	70	66	70
GPA requirement	48	58	54	70
Support offered after graduation	67	74	68	67
Prerequisite science course requirements	56	47	43	63
Time/effort required for application	17	42	30	55
Application fee	21	15	23	43
Teaching requirement after graduation	35	30	37	40
Cost of living	6	32	12	37

[†] Includes those who gave a rating of Encouraged or Strongly encouraged on a 7-point scale where 1=Prevented me from applying, 2=Strong Discouraged, 3=Discouraged, 4=Slightly Discouraged, 5=Slightly Encouraged, 6=Encouraged, and 7=Strongly Encouraged.

Of all those who responded to the survey, 59 percent reported that they did *not* complete an application. These individuals were shown a follow-up question asking about factors that influenced their decision. As shown in Table 7, the reasons non-applicants gave appeared to vary somewhat across years. Most notable is the fluctuation in the percentage indicating they had made other plans before completing the application, which increased from 21 percent in 2021 to 67 percent in 2022 and then decreased to 30 percent in 2023.

Table 7
Reasons for Not Completing an Application[†]

	Percent Responding		
	2021	2022	2023
	(N = 34)	(N = 45)	(N = 53)
Financial considerations (including the need to relocate to NYC)	— [±]	— [±]	38
Could not commit to the three-year teaching requirement	21	38	36
Made other work/school plans before completing application	21	67	30
Did not have the required coursework for admission to the program	— [±]	— [±]	17
Have prior education degree and/or teacher certification	0	4	— [±]
Other reason not previously mentioned, please specify	79	24	34

[†] The percentages in this table add to more than 100 because respondents could select more than one option.

[±] Option was not available on this survey for participants to select.

The survey also asked about several aspects of the application process. Across all three years, at least half of respondents agreed or strongly agreed with all statements except one, suggesting applicants generally had a positive experience (see Table 8). There also appeared to be a substantial increase from 2021 to 2022 and 2023 in the percentage agreeing that (1) steps for completing the application were clear, (2) the information session helped them understand the funding and service requirements, and (3) information on the website was easy to find, and (4) they were kept up to date about the status of their application.

Table 8
Respondents’ Agreeing or Strongly Agreeing[†] With the Application Process

	Percent Responding					
	2021		2022		2023	
	N [‡]	5+6	N [‡]	5+6	N [‡]	5+6
The eligibility/transcript review helped me understand if I was qualified for the program.	41	76	43	84	60	88
Program representatives provided full answers to my questions.	38	77	45	82	67	87
Program representatives responded in a timely manner when I contacted them.	–§	–§	–§	–§	66	86
Deadlines for providing application information were clear.	48	77	63	89	79	86
Steps for completing the application were clear.	47	66	61	90	76	86
The information session helped me understand what the program consists of.	29	86	41	80	44	84
The information session helped me understand funding and the post-graduation service requirement.	29	69	40	83	41	83
The web-based application portal was easy to use.	–±	–±	55	83	68	79
Information on the program website was easy to find.	49	61	63	78	79	76
I was kept up to date about the status of my application.	16	56	22	77	36	75
The information session helped me understand the application and admissions process.	29	72	43	79	50	74

[†] Includes those who gave a rating of 5 or 6 on a scale from 1 (Strongly Disagree) to 6 (Strongly Agree).

[‡] Those who responded “not applicable” are not included in the N.

[§] In 2021 and 2022, this item was worded, “Program representatives were slow to respond when I contacted them.”

[±] This statement was not included in this survey.

HRI disaggregated the data in Table 8 by whether respondents were members of an underrepresented minority group. Table 9 shows the percentage agreeing or strongly agreeing with each statement. Looking across the two years, some apparent differences are worth noting. In 2022, those from underrepresented groups appeared to give substantially lower ratings to the following statements:

- The information session helped me understand funding and the post-graduation service requirement.
- The information session helped me understand the application and admissions process.

- The information session helped me understand what the program consists of.
- The eligibility/transcript review helped me understand if I was qualified for the program.

For the first three statements, the differences appeared to reverse or at least narrow considerably in 2023. Regarding statements about the information sessions, it is important to note that the program began including a facilitator from an underrepresented group in each session, something that had not been done previously.

Table 9
Respondents’ Agreeing[†] With Statements About the Application Process,
by Membership in an Underrepresented Minority Group

	2022				2023			
	Underrepresented Minority				Underrepresented Minority			
	No		Yes		No		Yes	
	N [‡]	Pct	N	Pct	N [‡]	Pct	N	Pct
The information session helped me understand funding and the post-graduation service requirement.	29	90	11	64	27	74	14	100
Steps for completing the application were clear.	41	93	20	85	50	80	26	96
The information session helped me understand the application and admissions process.	31	84	12	67	34	64	16	94
Program representatives responded in a timely manner when I contacted them.	— [±]	— [±]	— [±]	— [±]	41	83	25	92
Deadlines for providing application information were clear.	43	91	20	85	51	84	28	89
Program representatives provided full answers to my questions.	29	86	16	75	42	86	25	88
The information session helped me understand what the program consists of.	30	87	11	64	29	82	15	86
The web-based application portal was easy to use.	36	86	19	79	42	76	26	85
Admission requirements were clear.	43	86	20	85	52	81	29	83
The eligibility/transcript review helped me understand if I was qualified for the program.	30	93	13	62	36	92	24	83
Information on the program website was easy to find.	43	77	20	80	51	78	28	71
I was kept up to date about the status of my application.	— [±]	— [±]	— [±]	— [±]	19	79	17	70
Program representatives were slow to respond when I contacted them.	29	17	16	0	— [±]	— [±]	— [±]	— [±]

[†] Includes those who gave a rating of 5 or 6 on a scale from 1 (Strongly Disagree) to 6 (Strongly Agree).

[‡] Those who responded “not applicable” are not included in the N.

[±] Option was not available on this survey for participants to select.

Respondents who participated in an admissions interview were presented with a series of statements about the process. These responses have been quite positive across all three years of the survey (see Table 10). More than 70 percent agreed or strongly agreed with all items in 2022 and 2023.⁸ The data for several statements suggest interviewees came away with a sense that

⁸ There were not enough responses to disaggregate these data by race/ethnicity.

interviewers took an interest in them as individuals. For example, in the most recent survey, more than 95 percent agreed or strongly agreed that interviewers showed an interest in what they had to say and tried to make them comfortable during the interview. Ninety-six percent agreed or strongly agreed they had an opportunity to describe other strengths they would bring to the program. Some statements also suggest the interview process has improved. For example, the percentage agreeing that interviewers showed interest in what they were saying appeared to increase sharply after 2021, as did statements about understanding next steps and knowing what to expect before the interview began.

Table 10
Respondents' Positive[†] Opinions About the Interview Process

	Percent Responding [‡]		
	2021 (N = 13)	2022 (N = 18)	2023 (N = 24)
	5+6	5+6	5+6
I had an opportunity to describe my science background.	84	89	96
I had an opportunity to describe my teaching background.	84	89	96
I had an opportunity to describe other strengths I would bring to the program/classroom.	84	89	96
Interview questions were related to my qualifications.	85	89	96
Interviewers showed interest in what I had to say.	77	94	96
Interviewers answered my questions.	85	94	92
Scheduling the interview was easy.	92	94	92
The purpose of the interview was clear.	84	89	92
The length of the interview was appropriate.	93	94	91
After the interview, I understood what the next steps for my application were.	76	95	88
I had an opportunity to ask questions.	92	95	88
I understood the interview questions.	84	95	88
Interviewers made an effort to help me feel comfortable during the interview.	76	100	83
I knew what to expect before the interview began.	53	83	71

[†] Includes those who gave a rating of 5 or 6 on a scale from 1 (Strongly Disagree) to 6 (Strongly Agree).

[‡] Only those who participated in an admissions interview are included.

Respondents were also asked an open-ended question about any part of the application or admissions process that went particularly well. Looking at 2023, respondents most often-mentioned that the application and portal were easy to use (14 out of 24 responses) and that communication was efficient and effective (13 out of 24 responses). For example:

Being able to leave the application part way through to complete it later was a very useful feature. It allowed me to draft out responses to the essay questions before final submission.

The application was easy to complete, I did not require assistance, and my emails were responded to swiftly.

Additionally, the survey included one open-ended question about any part of the application or admissions process that was particularly challenging, as well as any other additional thoughts about the process. In terms of other challenges faced during the application or admissions process, responses varied, but a few factors stood out. Out of the 36 responses sharing difficulties, 7 mentioned struggles with the application questions themselves, and another 7 mentioned unclear or slow project communication. Example responses include:

The application questions. I have a lot of difficulty conveying my emotions and thoughts properly through words, and I revised it many, many times.

It was sometimes difficult to get in contact with a program representative and get more than one question answered at once.

Five respondents mentioned challenges with citizenship requirements. Other challenges included interview preparation, length of the application, and the application timeline.

Alignment of Course Experiences With Project Objectives and Clinical Experiences

In January 2023, HRI interviewed all C11 residents in two groups (half the residents in each⁹), with several questions focusing on connections between residents' coursework and their clinical experiences. Additionally, HRI interviewed members of Cohort 10 in May/June 2023, asking about the impact of coursework and residency on their first year of teaching. This section of the report summarizes data related to alignment of course experiences with program objectives and clinical experiences.

In the focus group interviews, HRI asked residents to discuss the connections they saw between their coursework and their fall 2022 residency experience. A major theme that emerged was the opportunity to use what they had learned from class in their teaching, such as designing lessons and assessments. Another was taking the time to reflect on how reading assignments applied to their residency. As three explained:

I think a lot of the things that we learn that are focused on specific pedagogical strategies have been useful. Like how do you make assessments, how do you design specific activities. That has probably been the biggest link because we can use it to actually create material when we teach.

⁹ One resident was unable to attend either group and submitted written responses later.

We are learning a lot of things, so it gives you a lot of tools to use in your classroom. I thought the Keeley probes are actually pretty helpful for designing exit tickets and formative assessments.

Some of my favorite parts of our classes here are when we reflect on our residency and talk about what is actually happening in our classroom week to week. That hasn't happened in all of our classes, I think that was in 620. We would do that in every class [session] and take whatever reading we had that week and try to connect it to something that actually happened in residency. I felt that was really helpful, and I do wish we did a little more of that.

In interviews with Cohort 10, they shared that their coursework contributed to a successful first year of teaching, stating that it prepared them for lesson planning based around student needs, as well as assisting with content knowledge. Two commented:

The coursework gave me a lot of opportunities, especially with lesson planning, even though the lesson plans were very rigorous and tedious. . . . It gave me different ways of how to think about, for example, students with IEPs or special needs, or how to incorporate cultural importance and students' backgrounds.

We took science-type courses, which to me really helped me like brush up on my own content knowledge. And that's important, you know. In order to teach other people about Earth science, I have to make sure I actually know what I'm talking about.

Additionally, Cohort 10 members were asked about the use of CRSE and CT during their first year of teaching, both of which were commented on as helpful aspects of coursework. Residents were able to incorporate CRSE methods using their own personal experiences and those of their students to establish an inclusive classroom culture, as well as to make content relevant. As two described:

I got some . . . activities to let students express themselves early on in the classroom. That way, later on in the year, once we started doing more classroom discussions and talking about different topics, students felt less afraid to participate and be themselves in the classroom.

A lot of the theory that we've learned definitely holds true, like culturally responsive teaching is something that has gotten me through. . . . I have learned what [student] interests are and then actually implemented them in the class. So, making connections to their own life to get the new material to stick.

Some residents also described ways they were able to successfully incorporate CT in their lessons, such as modeling global warming. One commented:

I had the kids do this project where they had to keep global warming below the average of 2°C. And so they had to manipulate all these factors on the simulation, like fossil fuel use, subsidizing renewables, reducing deforestation, planting trees. . . . They had to use this computer simulation in conjunction with like all the factors that we learned throughout the year of like what contributes to global warming versus what could mitigate it.

Members of both Cohorts 10 and 11 also provided some suggestions for improving the alignment between courses and clinical experiences. One was to teach residents how to write lesson plans that are more similar to what will be expected at their prospective schools—specifically, more abbreviated lesson plans. Another was more explicit guidance on how to differentiate lessons for diverse learners. In the words of two:

So I feel like a lot of the time, like our lesson plans, I understand why they wanted us to make them long and think about different things when we're writing them, but to me, I feel like it would've been more helpful for us to write a lesson plan that would be similar to a lesson plan that we would be submitting to our administrators when we're actually working instead of making us write these extensive lesson plans.

I think our residencies could do more in helping us actually practice differentiation. A lot of times in our residencies, we will learn about differentiation in class but won't have actual opportunities to do that in a classroom.

Finally, in August 2023, HRI observed Cohort 11 give culminating presentations on their summer science practicum, where they worked in groups of three or four with a museum researcher. The presentations made it clear that residents had a unique, immersive experience. They were engaged for several weeks in original research at a premier scientific institution and mentored by internationally respected museum faculty. In some cases, they developed new research techniques. One group analyzed data recently acquired from the Webb telescope by a museum researcher. Each group presentation was highly professional, both in substance and format, and conveyed deep understanding of the research topics. Perhaps most impressive was the ease with which residents answered audience questions, many of which came from scientists in the relevant fields. It seems likely that as a result of these experiences, residents grew in their ability to represent the scientific enterprise to their students accurately.

Developing Partnerships With Residency Schools

During Year 4, the program placed residents and supported mentor teachers at five schools. HRI interviewed school administrators (principals or vice principals) from partner schools¹⁰ to learn

¹⁰ Despite multiple attempts to contact school administrators, representatives from only 3 of the 5 partner schools were interviewed.

more about the partnership from the schools' perspective. These interviews took place during summer 2023, allowing interviewees to reflect on the 2022–23 academic year.

Interviewed school administrators were asked about their interactions with residents of the MAT-ESR program, including frequency of interactions. All three administrators discussed having opportunities to interact with residents on a regular basis. Typical interactions included learning more about the school and courses offered, support regarding student and parent communication, and advice on searching for employment upon graduation. A couple of interviewees mentioned offering residents opportunities to be observed and receive feedback from a school administrator to coincide with a letter of recommendation for hire. As two administrators commented:

Every semester, I do a walk through where I spend a couple of hours with them and check in on how their experience is going. We walk through classes together that they haven't gotten to see. They get to ask any questions about how the school is set up. I do offer them an observation process. I talk about hiring with them, and I offer to observe them, and then if I observe them, we do a debrief, and I offer to write them a letter of recommendation.

I see them every day. Administrators are in classrooms informally unless we're observing, and then we are in there longer. They have a few projects where they sit down with the principal or another administrator and interview us and talk about the school. . . . Sometimes residents will come to listen to feedback from their mentor teacher as well. If residents were to ask for suggestions, we would certainly give them, but we're not in any formal capacity seeing that.

All three interviewed partner school administrators shared that the communication between their schools and the program is clear and sufficiently frequent. All said that their school's senior specialist is the most frequent point of contact, but the administrators also attend meetings with other program leaders. One administrator suggested occasionally having meetings with other leaders at the museum itself. The following quotes illustrate administrators' thoughts on communication:

Oh, it's been great. It's always great. It's very clear and timely. I don't have any complaints.

At the meetings with other program leaders, they usually go over the assignments that are coming up for residents, so that's always great. Then they go over what the focus is or where they are in renewing specific grants and what that means for the program and what that might mean for partner schools, so that's really great. It's also nice to see what's going on with residents at other schools to see how we can tighten up our partnership here with the residents.

I think they're very communicative, so I would say that it's going well, and if there's any questions, I can even text the senior specialist, and they're always responsive.

All interviewees were asked about ways the program has supported their school and the benefits that they have seen come out of the partnership. Interviewees shared that the residents have been a source of additional support for students and mentor teachers. They have brought new ideas to the classroom and been involved in student organizations outside of class time. Two interviewees described the benefits of having residents at their school as follows:

Specifically, I see the residents sharing icebreakers . . . with their co-teacher, and I've seen a lot of my veteran or expert teachers trying these new things that I haven't seen before that I really appreciate. . . . So I do see influence from residents onto their mentors and then mentors onto their residents. And from there, I do see their influence from the mentors to their colleagues, so it's nice that they're sharing these strategies. . . . In science specifically, standards are changing, and it's nice that the residents are coming in with this groundwork knowledge because it's something that the department is working on. And a lot of the mentors may not be completely aware or . . . ready to implement these strategies in their classroom, so it's nice that students come in with that knowledge.

We had a really great resident who created this simulation. . . . It was very cool to see them setting it up and then to get to see our students playing it and for [the resident] to reflect on how it had gone. That was a very rewarding moment. Having the residents as part of the [field] trips again, as chaperones was really great too. . . . We had another resident who was part of our [after school group] meetings. . . . It's a student group with a teacher advisor, and one of the residents came to those meetings, so it was nice for the kids to see someone else, another adult who was comfortable being there with them and supporting them.

Additionally, the program has supported partner schools by providing funds for supplies and stipends to mentor teachers, fields trip opportunities at the museum, and professional development opportunities. The schools have also benefited from the partnership by being able to hire program alumni. One administrator shared about supply stipends:

The way it works in the Department of Education is you have to purchase everything through a specific platform. But because the money is coming from the museum from a grant, we can use Amazon, which is a huge benefit because stuff that we need right away . . . we can use our museum funds to get that, and we get it so much quicker. Also, Amazon is something where it's never ending, whereas the DOE platform is more limited in the kinds of products you can pick from, so it's nice to have that variety with the museum funds.

When asked if there were any challenges with the partnership, the two interviewees identified the workload for residents as overwhelming at times. As a result, occasionally concerns arise about a resident's ability to balance their coursework with their fieldwork. Two administrators shared:

I would say the program is a lot of work, and I know that some of the residents have a hard time juggling the workload of the program and their day-to-day workload with their on the job experience. Sometimes I know residents get in trouble because they prioritize their program work, but then their day-to-day at [school] is suffering. And then we have residents who prioritize their day-to-day at [school], and then their program work is suffering. . . . I wish it could be easier for them in some way.

We had some residents not able to keep up with grading or planning and/or not great classroom management, . . . and that does place an extra burden on the mentors, so we're hoping for a good batch this year. So much of it is dependent on the work ethic and professionalism of the resident. So you have somebody who is really professional come into your school to try to learn from the teachers who are there and is open-minded, it's a real asset. And then when you have people who don't follow through . . . it's just teachers work so hard, so that can be hard.

Finally, when the administrators were asked about ways that the program could provide more support to schools, two ideas arose. One interviewee suggested that the program be even more intentional in how residents are placed, hoping to have residents placed at their school who would be interested in teaching there one day. Second, an interviewee mentioned that the program could continue to work more broadly on recruitment. These two administrators shared:

Putting someone in our school who would never teach in our school, it's hard because they make inroads in the community, but if they're never going to take a job here, being strategic about placing people in a place where they would take a job would be helpful.

I think it's a very niche program, and recruiting can be difficult. And I think there's a lot of pressure for them to fill their slots. I know they did make some changes so they were able to recruit from a slightly wider audience of potential people, and I think improving and continuing those efforts so that they are recruiting people who they really do feel like should be in the classroom.

Despite some suggestions for the program, all three partner school administrators spoke positively about the partnership with the program, agreeing the partnership was beneficial for both parties and that they were pleased to be involved. As one interviewee shared, "Our partnership with AMNH is our best partnership."

Attracting, Preparing, and Supporting School-Based Mentors

MAT-ESRP's strong connections to schools and mentors are evident in the program's success in recruiting mentors for Cohort 11. Most Cohort 11 mentor teachers also mentored in previous years, and several are program alumni and eagerly volunteered for the role. The program offers robust support for mentors, anchored by the Mentor Academy, to which all past and present mentors are invited.

This section of the report summarizes feedback on the program’s efforts to attract, prepare, and support mentors, drawing on:

- Mentor Academy observations,
- a focus group interview with mentors, and
- an end-of-year survey of mentors.

Preparing and Supporting Mentors

Thanks to strong, long-running partnerships with schools, MAT-ESRP has always been able to place residents with mentor teachers. Due to an increased number of residents in Cohort 12, the program recruited a sixth partner school during Year 4. A strong draw for mentors is the support the program offers. For the 2022–23 Mentor Academy (for Cohort 11), 4 of the 6 sessions were held in person (including the first two sessions in August), and two were held remotely. The first session in August was exclusively for new mentors. All mentors (past and present) were invited to attend the remaining days. Cohort 11 residents attended a portion of the second and fourth days (in August and January), and C12 residents attended a portion of the sixth day (in June). Having residents attend portions of specific sessions provided an opportunity for them to meet their mentors for upcoming residency placements. HRI observed the August and January Mentor Academy sessions in person and the others remotely.

All sessions had some common goals, including:

1. To use mentoring tools for evidence-based conversations about teaching and learning;
2. To understand and use the observation rubric and dispositions-for-teaching-and-learning tool to support resident development; and
3. To use the museum for learning and reflection.

Observation data make it clear that the program aims to actively engage mentors with tools and structures the program uses with residents. For example, during the first day of the 2022–23 academy, program leaders acquainted new mentors with three tools they would use throughout the year: the observation rubric, mentoring language, and the collaborative assessment log (CAL). Mentors had opportunities to engage with these tools during other days as well. Program faculty modeled ways to use each tool and provided opportunities for mentors to practice using the tools in different settings, including with their residents. For example, on Days 2 and 4, mentors and residents completed a CAL together focused on expectations for the coming semesters (fall for Day 2 and spring for Day 4). This activity allowed mentors time to practice using the CAL with their residents in a conversation that was not focused on the resident’s own teaching. The schedule also allotted time for program faculty to share feedback from previous mentors and residents so current mentors could think about their plans for the upcoming year.

The academy provided time for mentors to talk with program faculty about residents’ course assignments that were to be completed as part of their residency. These conversations both (1) made mentors aware of the expectations for residents and (2) gave mentors an opportunity to provide feedback to faculty on the assignments. Day 3 included breakout sessions led by

experienced mentors in which they shared previous mentor experiences and examples of completed CALs.

Day 4, which occurred just before the spring residency, included time for mentors to review feedback residents had given on their fall experience. Mentors met in school-specific breakout groups and discussed feedback for their school.

The 2022–23 academy reflected the program’s commitment to providing mentors and residents with resources for incorporating CRSE practices. The focus of the 2021–22 academy was diverse learners, and the 2022–23 academy focus on CRSE allowed experienced mentors to build on what they had learned in previous academies and also learn more about the CRSE framework. Mentors had homework assignments between some meetings to complete CALs related to specific CRSE practices. For example, between Days 3 and 4 mentors were asked to complete a CAL around the high expectations component of the CRSE framework.

Mentor Perspectives on the Academy

As mentioned earlier, HRI surveyed all mentors following the final Mentor Academy session in June 2023 to learn about their mentor experience, including Mentor Academy during the 2022–23 school year. In addition, during Day 4 of the academy (in January 2023), HRI conducted a focus group interview with eight mentors. The interview focused on the mentoring experience, in particular Mentor Academy and how the program’s expectations were communicated with mentors.

Of the 18 mentors who responded to the survey, 16 described themselves as content mentors and two as specialist teachers (Special Education or ENL/ELL). One question on the mentor survey asked them to give their opinions of several aspects of the academy. Overall, the ratings were quite positive; less than 20 percent disagreed with any of the items (see Table 11). All responding mentors agreed or strongly agreed that the time they had to meet with residents during academy meetings was helpful. Just over 8 in 10 gave similar ratings for usefulness of the museum halls; the helpfulness of activities related to diversity, equity, and inclusion; and usefulness of time spent in Mentor Academy. Only one item had more than one respondent disagree to any extent—that mentors learned more about computational thinking by attending Mentor Academy meetings. Although the program did not explicitly build computational thinking into the Mentor Academy, leaders were interested in gauging mentors’ perceived exposure to this component.

Table 11
Mentors' Opinions About the Mentor Academy

	Percent Responding (N = 18)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
It was helpful to have time during Mentor Academy meetings to meet with the teacher residents.	0	0	0	0	41	59
Using Museum halls during the Mentor Academy was useful.	0	0	0	18	53	29
Mentor Academy meetings were a good use of my time.	0	6	0	6	59	29
The Mentor Academy activities related to diversity, equity, and inclusion were helpful in my mentoring.	0	6	0	12	53	29
Mentor Academy meetings allowed me to better support my MAT-ESRP teacher resident.	0	6	0	12	53	29
I learned more about culturally responsive and sustaining education practices by attending Mentor Academy workshops.	0	0	0	12	59	29
I learned how to better support my MAT-ESRP teacher resident's use of culturally responsive and sustaining education practices.	0	0	0	18	65	18
I learned more about computational thinking by attending Mentor Academy meetings.	6	6	6	29	41	12

During the focus group interview, mentors generally expressed positive experiences at the Mentor Academy. They highlighted that attending sessions was valuable as professional development opportunities that have strengthened their own pedagogy in areas such as culturally responsive teaching. This has resulted in strong exemplars of instruction for residents to observe during placement. As two stated:

I feel like this year they have done a really great job of pushing us beyond just how the residents are evaluated to how can we be better teachers and incorporating culturally responsive education and making sure our classrooms also are good examples of that good teaching that we are trying to foster.

One thing that I have enjoyed is the going away from the use of the observation tool, which used to be all of Mentor Academy. Every year was basically very similar. I feel like these last two years, last year with additional of focusing on ELL strategies and then this year's focus on culturally responsive teaching, I have enjoyed that aspect of it. It feels more like ongoing professional development rather than a rehash of the same topics.

Additionally, although mentors stated that it was particularly helpful to have opportunities to meet their residents in person, they would prefer more time to do so. They also suggested allowing mentors to discuss residents' strengths prior to working together. One commented:

I always really appreciate meeting the new residents. That is always the highlight for me, and I do wish we had more time to meet with them even though I know it is a packed day. I also do enjoy talking to other mentors. I wish there could be a piece added on where we more explicitly talk about the residents' strengths and maybe it is with the [mentor] who had them last [semester].

Mentor Perspectives on the MAT-ESRP

Mentors, especially those who were program alumni, generally feel that expectations for their role are clear. However, in the focus group interview, some commented that program expectations are not explicitly stated. For example:

I was in one of the former cohorts, and I feel like the expectations are very clear, very reasonable. But what I've heard at these mentor meetings with other people who didn't go through the program themselves is that sometimes the expectations are very unclear. And when I think about it, I'm like, "The expectations really aren't written out anywhere in a very explicit way."

The June 2023 mentor survey asked about mentoring activities, use of program tools, and benefits of the program. Table 12 shows mentors' responses to several questions about benefits of the experience and helpfulness of mentoring tools. The survey asked about the fall and spring semesters separately because some respondents had a resident in only one semester. In both semesters, 100 percent of mentors agreed to some extent that their students benefited academically from the resident and that co-teaching with the resident was a positive experience. A large majority of respondents agreed that student behavior was improved by having residents present, and mentors' impressions of the observation rubric and dispositions tool were generally positive.

Table 12
Mentor Opinions About Benefits of the Program and Program Tools,
by Semester

	Percent Responding											
	Fall 2022 (N = 12)						Spring 2023 (N = 12)					
	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
My students benefited academically from having the teacher resident in my classroom.	8	0	0	17	33	42	0	0	0	50	25	25
Co-teaching with the AMNH teacher resident was a positive experience overall.	0	0	8	8	42	42	0	0	0	43	33	25
Student behavior was improved by having the teacher resident in my classroom.	0	0	17	25	25	33	0	17	17	42	17	8
The MAT-ESRP Disposition Tool was useful in supporting my teacher resident's growth and having structured conversations.	0	0	8	42	42	8	0	0	17	42	33	8
The MAT-ESRP Observation Rubric was useful in supporting my teacher resident's growth and having structured conversations.	0	0	17	17	58	8	0	0	8	42	50	0

Mentoring Activities

Regarding mentoring activities, the June 2023 survey asked how often mentors engaged with their residents in various ways (see Table 13). In both semesters, the majority of mentors reported having co-taught lessons with their teacher residents at least 1–3 times per week. Similarly, approximately 80 percent of teachers in both the fall and spring semester provided feedback to their teacher resident at least 1–3 times per week.

Table 13
Frequency With Which Mentors Engaged in Activities with Residents,
by Semester

	Percent Responding									
	Fall 2022 (N = 12)					Spring 2023 (N = 12)				
	Never	Less than once a month	1-3 times per month	1-3 times per week	Every day	Never	Less than once a month	1-3 times per month	1-3 times per week	Every day
I co-taught lessons with my MAT-ESRP teacher resident.	0	8	8	50	33	0	17	0	42	42
I provided feedback to my MAT-ESRP teacher resident.	0	0	17	42	42	0	8	17	42	33
I co-developed lesson plans with my MAT-ESRP teacher resident.	0	9	55	18	18	0	27	45	9	18
I graded student work collaboratively with my MAT-ESRP teacher resident.	17	8	8	50	17	8	25	17	33	17
I debriefed with my MAT-ESRP teacher resident after they led a lesson or activity.	0	8	33	42	17	0	25	33	25	17
I collaboratively managed small group work together with my MAT-ESRP teacher resident.	8	17	33	25	17	0	25	17	50	8
I took notes on my MAT-ESRP teacher resident's instruction.	0	17	67	17	0	0	27	55	18	0
I looked at video of instruction with my MAT-ESRP teacher resident.	64	36	0	0	0	82	18	0	0	0
I helped my MAT-ESRP teacher resident prepare for job searches.	50	25	17	8	0	42	33	0	25	0

The survey also asked mentors how often they used tools and resources provided by the program. Because the responses did not vary appreciably between the two semesters, they are combined in Table 14. These data are more difficult to interpret, in part because one would not expect residents to use some tools frequently (e.g., the Getting to Know Students tool). Still, it appears that the CAL, together with the museum and other informal learning resources and seating chart tool, were used the most. In half or more residencies, the following tools were never used:

- ASW (Analyzing Student Work) tool
- Getting to Know Students tool
- Instructional Groups tool

Table 14
Frequency With Which Mentoring Tools Were Used in Residencies

	Percent of Residencies (N = 24 [†])				
	Never	Less than once a month	1-3 times per month	1-3 times per week	Every day
MAT-ESRP Disposition Tool with my MAT-ESRP teacher resident	0	92	8	0	0
CAL (Collaborative Assessment Log)	0	46	50	4	0
The museum and/or other informal learning resources	10	52	38	0	0
MAT-ESRP Observation Rubric to observe my MAT-ESRP teacher resident	0	75	25	0	0
Seating Chart tool	18	50	32	0	0
ASW (Analyzing Student Work) tool	50	45	5	0	0
Getting to Know Students tool	50	41	9	0	0
Instructional Groups tool	64	18	18	0	0

[†] In this case, the N is the number of residencies, not the number of mentors. Several of the mentors were the same in the fall and spring.

Induction Support for Recent Graduates

MAT-ESRP continues to support graduates through their first years of teaching. Drawing on interviews, observations, and survey responses, this section of the report summarizes feedback on these activities.

During Year 4, MAT-ESRP faculty provided ongoing induction support for recent graduates (Cohorts 9 and 10), holding monthly hybrid meetings during the 2022–23 school year. Meetings were shortened to 90 minutes in Year 4 to address Zoom fatigue for those who joined virtually. In some instances, the in-person meeting started 15–30 minutes before the hybrid meeting to allow time for informal community gathering. Even though many attendees opted to join in person, the hybrid format allowed alumni farther away to participate and build community within and across cohorts. In interviews, members of Cohort 10 commented on the benefits of working with Cohort 9 during induction:

I know I said it was nice to mingle with my own cohort. That's more so for when we're like trying to vent or talk about specific situations. But when we are just looking for overall advice, it's helpful to speak to other cohorts because they have a little more experience.

It was extremely helpful because we met [Cohort 9] when they were graduating on the tail end of things. We were beginning, so we got to see them before they even started teaching. We still have communication with them after they started teaching. Seeing someone else complete their first year in the same situation that you did before you got there gives you something to expect. I really appreciated us being able to have that relationship with them.

Priorities for induction support included both providing social emotional support for teachers and helping teachers provide that same support to their students. These priorities were addressed by three main goals at induction meetings:

- Reflecting on teaching at different points of the school year;
- Celebrating successes and troubleshooting challenges with fellow alumni; and
- Collaborating on an area of teaching with peers in small groups.

Year 4 also offered beginning teachers opportunities to brainstorm and lead sessions during induction meetings with support from peer mentors that was relevant to teachers' needs in the moment, such as preparing for the Earth science Regents exam. As one teacher shared:

The last [induction session] I went to was really, really helpful because it was about Regents prep, and I had never seen the Regents exam. And they actually had all the materials laid out and the stations laid out, like the Regents would have it laid out, and they have had us play the part of the students going through each station. So, I feel like if I hadn't done that, I wouldn't have understood what it looked like in order to prepare my students. So I'm really grateful, and they gave us materials to help study with, so that was really great.

In addition to monthly induction meetings, a planning forum was held in February 2023. Both monthly induction meetings and the planning forum provided inductees opportunities to share ideas for planning upcoming lessons and units. Inductees found the collaborative time spent during induction activities useful. Said one teacher:

Just the sharing of different ways teachers do things was super beneficial. And every time we had an induction session like that, and I think most of them were like that, it was super beneficial. Also, the group planning times were super helpful, too.

Near the end of Year 4, HRI observed the project's three-day, remote summer induction institute. The institute was structured to proactively address the needs of beginning teachers in Cohorts 9,

10, and 11, with a focus on applying the CRSE framework to their setting. The institute goals were to:

- bring together Cohorts 9, 10, and 11 to plan, and reflect, as well as discuss and apply the CRSE framework to their settings;
- collaborate with colleagues to plan for student-centered learning routines and structures that affirm student identities in their science classrooms;
- support planning for effective classroom discussion, dialogue, and participation that is inclusive of all voices in their science classrooms;
- plan routines for science activities and labs that bring rigor, critical thinking, and reflection on students’ lives; and
- engage with MAT graduates’ approach to teaching Earth science, which includes four units of resources.

Approximately 30 teachers across the three cohorts attended each day of the institute, with the majority attending all sessions on all three days. At the end of each day, institute leaders asked participants to respond to three rating-type questions in a feedback form:

1. How would you rate your level of engagement in today’s session(s)? (Response scale from 1 (I was completely disengaged) to 10 (I was on the edge of my seat))
2. Did today’s session(s) support you in achieving our shared objectives—to collaborate with colleagues to plan for student-centered learning routines and structures to affirm student identities in your science classroom? (Response scale from 1 (strongly disagree) to 5 (strongly agree))
3. How effective were you at using the Planning/Collaboration Time? (Response scale from 1 (not effective at all) to 5 (very helpful and accomplished some planning))

As shown in Table 15, feedback was quite positive. Each section of the table shows the ratings overall, as well as for each day. Eighty-five percent or more gave high ratings for support for achieving shared objectives, and more than 75 percent gave high ratings for effectiveness using planning/collaboration time.

Table 15
Participants’ Indicating Positive Opinions of the Institute

	Percent Responding
Ratings of Engagement[†]	
Overall (N = 67)	64
Day 1 (N = 22)	68
Day 2 (N = 25)	56
Day 3 (N = 20)	70
Ratings of Support for Achieving Shared Objectives[‡]	
Overall (N = 67)	93
Day 1 (N = 22)	95

Day 2 (N = 25)	96
Day 3 (N = 20)	85
Ratings of Effectiveness Using Planning/Collaboration Time[‡]	
Overall (N = 67)	84
Day 1 (N = 22)	77
Day 2 (N = 25)	88
Day 3 (N = 20)	85

[†] Includes only those who gave a rating of 8, 9, or 10 on a scale from 1 (completely disengaged) to 10 (on the edge of my seat).

[‡] Includes only those who gave a rating of 4 or 5 on a scale from 1 (strongly disagree) to 5 (strongly agree).

[±] Includes only those who gave a rating of 4 or 5 on a scale from 1 (not effective at all) to 5 (very helpful and accomplished some planning).

Participants elaborated on their ratings in open-ended responses. One teacher shared their general reflection following Day 2, “I think that the meetings are very well planned, and it works very well when other cohort members share their experiences. It’s very helpful to see what others who have been teaching longer are experiencing.”

Some cited a session on student feedback as especially helpful, with one participant sharing, “Discussion about grading goals was enlightening about what is realistic.” Another participant elaborated:

The discussion on grading provided me with a lot of insights. I’ve also had differences of opinion on how to grade students and on school management. However, I’ve noticed that everyone has had similar experiences, and other cohorts have also presented their solutions, which I find very valuable.

The workshop format brought three cohorts together and allowed them to access each other’s work folders on Google Drive. Participants found this format particularly useful for sharing ideas and resources. As one participant explained, “It allowed me to look at other people’s work and then think about how I would incorporate what they were doing into my own resources.” In addition to sharing resources with colleagues, the project provided tangible resources for a beginning-of-year unit (named Unit Zero at the institute) focused on helping teachers build relationships with students before shifting the focus to content.

SUMMARY AND RECOMMENDATIONS

Year 4 of the MAT-ESRP TQP grant includes several highlights. Among these, the program recruited its largest and most diverse cohort. The program also added a new partner school, which was important for accommodating the larger number of residents. Cohort 11 progressed smoothly throughout Year 4. All cohort members have now graduated, and all but one has begun teaching, with robust support from the induction component.

Program leaders refined the application and interview processes to address feedback from previous applicants. For example, the program moved to a rolling admissions process, making

offers to candidates in batches rather than waiting to make all offers at once. The rationale was to secure acceptances before candidates fielded other offers. The program also refined the format of information sessions, working to include a facilitator from an underrepresented group in each session. Survey data suggest that the most recent group of applicants, particularly those from underrepresented groups, found these sessions more effective than previous ones.

Continuing efforts to infuse culturally responsive-sustaining education (CRSE) in all program components were evident in observations as well as in survey and interview data. CRSE has been a hallmark of the program since its inception, but the program has transitioned from CRSE as a feature to CRSE as the foundation.

Residents had many positive things to say about connections between their courses and their clinical experiences. They highlighted the effective modeling of instructional strategies in their courses, which was evident in observations as well. They also commented on the applicability of assignments, readings, and class discussions. Some would appreciate a tighter alignment between the lesson plan requirements of the program and those required of their residency schools.

Strong partnerships with schools continue to be a hallmark of the program. As noted earlier, one partner school was added in Year 4 and will begin hosting residents in 2023–24. In interviews, partner school administrators described their appreciation for the level of communication from the program and believe they have a voice in decisions. Administrators pointed to the benefits of having residents in their schools. They acknowledge that the mentoring workload is heavy, but they see the benefits of the partnership with AMNH outweighing the costs.

The Mentor Academy continued in a hybrid format in Year 4, with 4 of the 6 meetings in person and the other 2 by videoconference. Data from an end-of-year survey and focus group interview show that mentors have positive opinions of many aspects of the academy. They especially appreciated the opportunity to meet their resident before the placement began. Some would also appreciate a more explicit set of expectations for the mentoring experience. This seems especially important for mentors who are not program alumni.

Finally, the program continued to provide robust induction support to new teachers. This component transitioned from being fully remote to a hybrid format in 2022–23. Although most attended in person, the hybrid format accommodated those who live farther away. Induction participants gave the experience high marks, stressing the benefits of participating with their own cohort and earlier ones.

Again, the program can point to many important accomplishments in Year 4. In the spirit of a critical friend, HRI offers the following considerations as the program seeks to continue improving.

➤ *Continue to explore new advertising methods.*

The program already uses a wide variety of complementary advertising efforts, and their effectiveness is evident in the size of Cohort 12. Still, the program can only benefit from

having a larger pool of applicants from which to choose. At present, the program advertises through its own website, presentations at conferences, physical mailings and email to potential candidates, and connections with undergraduate faculty at colleges and universities. Residents themselves might be a source of ideas for new advertising strategies. However, given that the current strategies worked for these individuals, it might be worth asking for input from current undergraduates in Earth science majors. The program has connections with faculty in such programs who might be willing to recruit their students for a survey or virtual focus group. These students might be able to suggest new strategies, including a broader array of social media approaches.

➤ *Consider highlighting program features that are particularly appealing.*

In addition to trying new forms of advertising, the program might consider revising the substance as well. Evaluation data and the program's own interactions with residents point to program features that residents and alumni find particularly appealing. Two that stand out are the cohort model and induction support, both of which are unusually robust in MAT-ESRP compared to teacher education programs generally. The website includes explicit information about induction, but the cohort model is only implied. These features and others could be highlighted more, perhaps through video testimonials, which might be more engaging than text.

➤ *Consider convening a group of mentors to help the program clarify expectations for their role.*

The preparation and ongoing support for program mentors is extensive and has been well received. Still, some mentors would appreciate a more structured set of expectations. Last year's report noted the difficulty in meeting this need, acknowledging that each residency has to be negotiated between the mentor and the resident based on the needs and assets of each. It might be worthwhile to convene a group of mentors to work with program on developing a document that provides adequate clarity while acknowledging the need for flexibility.

REFERENCES

Banilower, E. R., Smith, P. S., Malzahn, K. A., Plumley, C. L., Gordon, E. M., & Hayes, M. L. (2018). *Report of the 2018 NSSME+*. Horizon Research, Inc.

APPENDIX

MAT-R Applicant Survey

Survey introduction

This survey asks about your experience applying to the [American Museum of Natural History's Master of Arts in Teaching Earth Science Residency](#) program. Each person who completes the survey will receive a \$15 check as a gesture of appreciation. The survey should take no more than 15 minutes to complete. [Horizon Research, Inc.](#), (HRI) is conducting this survey as part of an external evaluation of the program because the program is interested in understanding how to improve the application process. Survey results will help ensure all applicants have a clear, supportive, and explicit understanding of the process in the future. HRI will report results of the survey to the program, but individual survey responses are accessible only to researchers at HRI. Your name will not be included when HRI reports results. Although there are no anticipated benefits for you personally, your responses may improve the application and admission processes at AMNH and other teacher preparation programs and ensure that these processes are equitable.

The last question on the survey asks for contact information so that we can send your check. Your response to that question will be separated from all other information you provide and will be accessible only to HRI researchers.

Survey questions

1. How did you hear about the program? (RQ 1a)
[Select all that apply]
 - a. Recruitment postcard
 - b. Recruitment email
 - c. Museum website
 - d. A different program at the museum
 - e. Program graduate or current resident
 - f. Friend or relative who works at the museum
 - g. Current or former professor
 - h. Academic advisor
 - i. Coworker
 - j. Professional organization conference or newsletter [fill in]
 - k. Social media [fill in]
 - l. Internet search
 - m. Other, please specify [fill in]
2. How did each of the following affect your decision to apply to the program? (RQ 1)
[Rate on a scale of "Prevented Me from Applying," Strongly Discouraged,"

“Discouraged,” “Slightly Discouraged,” “Slightly Encouraged,” “Encouraged,” “Strongly Encouraged”]

- a. Focus on Earth science
 - b. Focus on urban education
 - c. Focus on high-needs schools
 - d. Program length
 - e. Program location (New York City)
 - f. Museum setting for program
 - g. School residency model (i.e., two placements, one in fall and one in spring)
 - h. Teaching requirement after graduation
 - i. Program stipend/fellowship
 - j. Cost of living
 - k. Prerequisite science course requirements
 - l. GPA requirement
 - m. Application fee
 - n. Time/effort required for application
 - o. Support offered after graduation
 - p. Other, please specify [fill in]
3. *Did you complete an application to the program? [Yes/No]
4. [For those who answered No to Q3] Did any of the following influence your decision to **not complete an application** to the program? (Select all that apply) (RQ 3)
- a. Could not commit to the 3-year teaching requirement
 - b. Made other work/school plans before completing application
 - c. Did not have the required coursework for admission to the program.
 - d. Financial considerations (including the need to relocate to NYC).
 - e. Other reason not previously mentioned, please specify: [fill in]
5. Please rate your agreement with each statement about the application process:
Scale: Strongly Disagree, Disagree, Agree, Strongly Agree; include a “Not Applicable” option
- a. Steps for completing the application were clear. (RQ 2b)
 - b. Deadlines for providing application information were clear. (RQ 2b)
 - c. Admission requirements were clear. (RQ 2c)
 - d. Information on the program website was easy to find. (RQ 2b-c)
 - e. The web-based application portal was easy to use (RQ 2b)
 - f. The information session helped me understand the application and admissions process. (RQ 2b-c)
 - g. The information session helped me understand what the program consists of. (RQ 2d)
 - h. The information session helped me understand funding and the post-graduation service requirement. (RQ 2d)
 - i. Program representatives responded in a timely manner when I contacted them. (RQ 2d)

- j. Program representatives provided full answers to my questions. (RQ 2d)
 - k. The eligibility/transcript review helped me understand if I was qualified for the program. (RQ 2c)
 - l. [For those who answered “Yes” to Q3] I was kept up to date about the status of my application. (RQ 2d)
6. [shown if strongly disagree or disagree was chosen for Q5i] You indicated that program representatives did not respond in a timely manner when contacted. We are interested in hearing more. Could you please describe any communication delays you encountered during the admissions process? [open-ended]
7. The program no longer requires the GRE. What effect did this have on your decision of whether to apply or not?
- a. **Encouraged** me to apply
 - b. No effect
 - c. **Discouraged** me from applying
8. [For those who answered “Yes” to Q3] Did you participate in an admissions interview?
[Yes/No]
9. [For those who answered “Yes” to Q8] Please rate your agreement with each statement about the interview process:
Scale: Strongly Disagree, Disagree, Somewhat Disagree, Somewhat Agree, Agree, Strongly Agree (RQ 4)
- a. The purpose of the interview was clear.
 - b. Scheduling the interview was easy.
 - c. The length of the interview was appropriate.
 - d. I knew what to expect before the interview began.
 - e. Interviewers showed interest in what I had to say.
 - f. Interviewers made an effort to help me feel comfortable during the interview.
 - g. I understood the interview questions.
 - h. Interview questions were related to my qualifications.
 - i. I had an opportunity to describe my science background.
 - j. I had an opportunity to describe my teaching background.
 - k. I had an opportunity to describe other strengths I would bring to the program/classroom.
 - l. I had an opportunity to ask questions.
 - m. Interviewers answered my questions.
 - n. After the interview, I understood what the next steps for my application were.

10. [For anyone who responded Strongly disagree, Disagree, or Somewhat Disagree to length question (Q9c)] Was the interview: [Choose one: Too long Too short] (RQ 4)
11. [For anyone who answered “Yes” to Q3 but, based on the participant spreadsheet, was not accepted] Please rate your agreement with the following statements: (RQ 5)
- I received the admission decision in a timely manner.
 - I understand what would have made my application more competitive.
 - I feel the admissions process was fair.
 - I know who to contact with questions about the decision process.
12. [For anyone who answered “Yes” to Q3 and was offered residency but, based on the participant spreadsheet, declined or dropped] What were your reasons for choosing **not to enroll** in the AMNH MAT Earth Science Residency program? (RQ 5)
13. [For anyone who answered “Yes” to Q3 and, based on the participant spreadsheet, completed an application but was not accepted OR who was offered a residency but declined] Would you be interested in reapplying to the AMNH MAT Earth Science Residency program in the future? [Choose one: Yes/Maybe/No] (RQ 5)
14. Please describe any part of the application/admissions process that went particularly well. (RQ 2e)
15. Please describe any part of the application/admissions process that was particularly challenging. (RQ 2a)
16. Do you have additional thoughts about the application/admissions process you would like to share? (RQ 2a or e)

[new page]

17. With which gender identity do you most identify? (select one) (RQ 6)
- Female
 - Male
 - Transgender Female
 - Transgender Male
 - Gender variant/non-conforming
 - I prefer another term [text box]
 - Prefer not to answer
18. Are you Hispanic or Latino?
- Yes
 - No
19. What is your race/ethnicity? (select all that apply) (RQ 6)
- American Indian or Alaska Native

- b. Asian
 - c. Black or African American
 - d. Native Hawaiian or Other Pacific Islander
 - e. White
 - f. Prefer not to answer
20. The following information will be used to send your check. Responses to these items will be separated from all other information you have provided.
- a. Please enter your name as it should appear on the check:
 - b. Please enter the address to which we should mail the check: (Street 1, street 2, city, state, zip, country?)

d. ASW (Analysis of Student Work) tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Seating Chart tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Getting to Know Students tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Instructional Groups tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. The museum and/or other informal learning resources	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Mentoring Language tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Did you participate in AMNH-sponsored professional development activities and/or events (e.g., Chancellor's Day, Election Day, Educator Evenings, etc.)? **RQ3**
- Yes
 - No

6. Did you use your AMNH badge to visit the museum outside of school-related events? **RQ3**
- Yes
 - No

In responding to the following questions, Content Mentor teachers should think about the teacher resident assigned primarily to your classroom.

Specialist mentors (ENL/ELL and Special Education) should try to respond thinking about the teacher residents who rotated through your class, on average.

7. To what extent do you agree with each of the following statements about your experience with the MAT-ESRP teacher resident? **RQ2**

Fall Residency	Spring Residency

	<u>Strongly disagree</u>	<u>Disagree</u>	<u>Slightly Disagree</u>	<u>Slightly Agree</u>	<u>Agree</u>	<u>Strongly Agree</u>	<u>Strongly disagree</u>	<u>Disagree</u>	<u>Slightly Disagree</u>	<u>Slightly Agree</u>	<u>Agree</u>	<u>Strongly Agree</u>
a. Co-teaching with the MAT-ESRP teacher resident was a positive experience overall.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. My students benefited academically from having the teacher resident in my classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Student behavior was improved by having the teacher resident in my classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. The MAT-ESRP Observation Rubric was useful in supporting my teacher resident's growth and having structured conversations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. The MAT-ESRP Disposition Tool was useful in supporting my teacher resident's growth and having structured conversations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the following questions, “Senior Specialist” refers to the AMNH educator responsible for supervising teacher residents and holding mentor meetings (Julie Contino, Elaine Howes, and Natasha Cooke-Nieves).

8. To what extent do you agree with each of the following statements about your experience as a mentor teacher? **RQ2**

	<u>Strongly disagree</u>	<u>Disagree</u>	<u>Slightly Disagree</u>	<u>Slightly Agree</u>	<u>Agree</u>	<u>Strongly Agree</u>
a. The Senior Specialist at our school is knowledgeable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. The Senior Specialist is helpful when I have questions about the program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Monthly mentor teacher meetings with the Senior Specialist are helpful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. The connection to AMNH has brought helpful resources to my classroom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I have taken my class(es) on field trips to AMNH in addition to the Fall course requirement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I have seen positive changes in my school because of my involvement in the MAT-ESR program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I have changed some of my own classroom practices as a result of my involvement in the MAT-ESR program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I feel included and heard in the MAT-ESRP learning community.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I understood the expectations that the MAT-ESR program had of me as a mentor teacher.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Communication from the MAT-ESR program was clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. To what extent do you agree with each of the following statements about your experience with Mentor Academy? **RQ4**

	<u>Strongly disagree</u>	<u>Disagree</u>	<u>Slightly Disagree</u>	<u>Slightly Agree</u>	<u>Agree</u>	<u>Strongly Agree</u>
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a. Mentor Academy workshops were a good use of my time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Mentor Academy workshops allowed me to better support my MAT-ESRP teacher resident.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The Mentor Academy activities related to diversity, equity, and inclusion were helpful in my mentoring.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Using Museum halls during the Mentor Academy workshops were useful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. It was helpful to have time during Mentor Academy workshops to meet with the teacher residents.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I learned more about computational thinking by attending Mentor Academy workshops.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I learned more about culturally responsive and sustaining education practices by attending Mentor Academy workshops.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I learned how to better support my MAT-ESRP teacher resident's use of culturally responsive and sustaining education practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. [if Q9a is any answer except strongly agree] How could Mentor Academy workshops be a better use of your time?

11. [if Q9b is any answer except strongly agree] How could Mentor Academy workshops help you to better support your MAT-ESRP teacher resident(s)?

12. This year's Mentor Academy emphasized culturally responsive and sustaining education (CR-SE) practices. To what extent do you agree with each of the following statements about this aspect of the Mentor Academy? RQ4

	<u>Strongly disagree</u>	<u>Disagree</u>	<u>Slightly Disagree</u>	<u>Slightly Agree</u>	<u>Agree</u>	<u>Strongly Agree</u>
a. I learned more about CR-SE practices by attending Mentor Academy workshops.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I learned how to better support my MAT-ESRP teacher resident's use of CR-SE practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Which CR-SE strategies do you think will be most helpful in mentoring your MAT-ESRP teacher resident?

14. [open-ended] Through this past year, how did you have the MAT-ESRP teacher residents assist you with your teaching? How did this approach help the teacher residents gain teaching experience? RQ2

15. [open-ended] In what ways could the MAT-ESR program and AMNH be more helpful as you prepare to work with future MAT-ESRP teacher residents? RQ2

16. What mentoring practices or strategies have you found particularly helpful when working with your residents this year? Please describe.

17. [open-ended] Do you have any additional comments, questions, or concerns that you would like to share about your experience as a mentor teacher? RQ2

Thank you for your time and effort. Your feedback is extremely valuable to the AMNH RGGS MAT Earth Science Residency Program.

