

**The 2022–2023 External Evaluation Report of  
the American Museum of Natural History RGGGS  
MAT Earth Science Residency Program**

**Year 4 National Science Foundation (NSF)  
Noyce-Funded Project**

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## TABLE OF CONTENTS

	<i>Page</i>
Introduction.....	1
Evaluation Overview.....	2
Year 4 Evaluation Activities .....	3
Cohorts 8 and 9 Interviews .....	4
Induction .....	4
Additional Museum Resources .....	6
Peer and Program Staff Relationships .....	8
Preparedness to Teach Earth Science .....	10
Looking Ahead.....	12
Cohort 9 Fellows Survey .....	12
Employers Survey .....	15
Summary and Recommendations .....	18
Appendices	



## 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 2019–25 Robert Noyce Scholarship Program to advance research and practice in the field of STEM teacher preparation and retention.<sup>1</sup> The primary aims of the NSF project are to develop and examine program practice in three areas: (1) identifying effective strategies for recruiting a diverse group of candidates for STEM teaching; (2) providing a deeper articulation of what strong preparation for science teaching looks like, including, specifically, what culturally responsive teaching looks like in STEM classrooms; and (3) situating the learning of high-leverage science teaching practices in coursework.

The MAT-ESRP is designed to support educators working in underserved schools. As part of this initiative, the program supports two cohorts (Cohort 8 and Cohort 9). These Fellows received support beginning with enrollment in the master’s degree program and continuing throughout their first four years as teachers in underserved schools. Additionally, the project will contribute to an enhanced understanding of high-leverage, culturally responsive teaching practices and their effectiveness in diverse, underserved environments.

It is important to note that, like all other teacher preparation in the United States, MAT-ESRP was affected by the pandemic. Teacher preparation programs shifted to a combination of in-person, blended, and remote settings. In March 2020, during Cohort 8’s residency, the program underwent a notable transformation as all program components shifted to a remote setting. Clinical placements with mentor teachers, which offer foundational, in-person student-teacher experiences, were instead conducted remotely during the spring of 2020. This situation presented teacher candidates in Cohort 8 with unique challenges and opportunities. The remote format continued into the summer of 2020 and eventually transitioned in August to a hybrid setting for the 2020–21 school year. As such, the pandemic heavily impacted Cohort 8’s first year of full-time teaching and Cohort 9’s entire residency.

During Year 4, which coincided with the 2022–23 school year, the program provided continuing support to Cohort 8 and Cohort 9 through its induction program. As designed, induction resources included monthly meetings, planning forums, professional learning, classroom coaching, weekly office hours, curriculum resources, workshops, peer mentors, and field experiences. In their second year of induction, a prominent resource for Cohort 9 were monthly

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<sup>1</sup> Responsibility for the evaluation transitioned to HRI from the previous evaluator at the beginning of Year 4.

induction meetings (referred to as meetups). During these meetings, teachers celebrated successes, collaborated with peers to work through challenges, and reflected on their experiences throughout the school year. Cohort 9 was also invited to attend six planning forums, each led by program graduates with a focus on various subjects, such as artificial intelligence and its implications for teaching. Cohort 9 attended the Summer Institute in August 2023 to work on long-range and unit planning for their third year of teaching. Finally, Cohort 9 induction graduates received \$500 to purchase instructional materials for their classrooms.

Although Cohort 8 completed their induction activities in Year 3, they continued to receive support from the project in Year 4. For example, graduates still had access to museum resources, such as online and onsite professional learning opportunities, and they continued to receive a \$10,000 salary supplement. Cohort 8 was also invited to attend the 2023 Summer Institute with Cohort 9 and Cohort 10. Additionally, for the past two years, graduates from Cohort 8 have been selected to speak at the annual American Association for the Advancement of Science Noyce Summit in their Voices from the Field panel.

## 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 Fellows' perceptions of induction and continuing support?
2. What are the perceived impacts in terms of teaching skill (with a focus on culturally responsive and sustaining education) and social-emotional well-being?
3. To what extent and in what ways do induction and continuing support align with best practice?
4. What factors influence the decisions alumni make about remaining in teaching after their four-year commitment?

The summative evaluation focuses on project outcomes and impacts. MAT-ESRP's goals include specific targets for persistence in the program, certification, placement in high-need schools, and teacher retention. The project also aims to positively impact graduates' preparedness as Earth science teachers. HRI will collect data on each of these outcomes, guided by the following

question: What is the impact of induction and continuing support on the quality of Fellows' teaching, as measured through student assessment results and employer reports?

## Year 4 Evaluation Activities

Year 4 evaluation activities completed by HRI are shown below.

### *Project Communication*

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

### *Program Observations*

HRI staff observed the following induction and support activities:

- Monthly induction meetings
  - October 21, 2022
  - November 2, 2022
  - December 8, 2022
  - February 16, 2023
  - March 9, 2023
  - April 28, 2023
  - May 12, 2023
  - June 9, 2023
- Planning forum (February 23, 2023)
- Summer institute (August 21, 2023–August 23, 2023)

### *Surveys*

HRI surveyed:

- Cohort 9 at the end of the 2022-23 school year (a copy of the survey, administered in June 2023, is included in the appendix).<sup>2</sup>
- Employers from partnering schools at the end of the 2022–23 school year (a copy of the survey, administered in May 2023, is included in the appendix).<sup>3</sup>

### *Individual Interviews*

HRI interviewed:

- Cohort 8 and 9 teachers at the conclusion of their third year and second year of teaching, respectively.<sup>4</sup>

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<sup>2</sup> Eleven of 13 participants responded to the survey, a response rate of 85 percent.

<sup>3</sup> Nine of 14 participants responded to the survey, a response rate of 64 percent.

<sup>4</sup> HRI invited 12 Cohort 8 Fellows, 7 responded, and 6 interviews were completed. HRI invited 16 Cohort 9 Fellows, 8 responded, and 7 interviews were completed.

### **Instrument Development**

In collaboration with program leaders, HRI is developing a survey aimed at identifying factors that influence program graduates' decision to stay in teaching. HRI reviewed the literature, compiled existing survey items, and wrote new ones. The survey will be piloted with several hundred teachers in the coming weeks and ultimately administered to program graduates.

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.

## **COHORTS 8 AND 9 INTERVIEWS**

HRI interviewed Cohorts 8 and 9 (13 individuals total, six from Cohort 8 and seven from Cohort 9) between April and October 2023. The purpose of these interviews was to learn more about their:

- opinions of induction activities<sup>5</sup>;
- utilization of museum resources;
- perceptions of preparedness to teach Earth science; and
- future career plans.

This section of the report summarizes interview findings.

### **Induction**

All interviewees were asked to reflect on helpful aspects of monthly induction meetups. One component they described most often was the ability to share resources, such as lesson plans and activities, which has reduced the burden of creating lessons and provided new methods for cohort members to try in their classrooms. Similarly, interviewees spoke about the planning forums, which provided a space to share and prepare resources to implement. As three described:

*It's also been really great to see some of the instructional materials that MAT grads have produced. [At the most recent induction], one of my fellow cohort members showed us a Socratic seminar activity that she uses, and it was totally eye-opening. I'd obviously*

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<sup>5</sup> It should be noted that Cohort 8 was one year removed from its formal induction program at the time of these interviews.



*heard of Socratic seminars before, but I'd never seen it done the way that she does it, and it was great.*

*I would say [induction] supported me a lot. There are times where I was just kind of stuck on what I need to do, and either MAT faculty or colleagues, they would help me out with those things, especially at the induction events. And it was just a good way for us to brainstorm and talk about what we're planning for the rest of the year or for that week. And they gave me a lot of resources. . . . We got three complete units for the first months of the year,<sup>6</sup> and that really, really helped me out. . . . And just brainstorming with colleagues and what they're doing in their school and how they facilitate things helped me out as well.*

*I mean, the planning forums at the beginning of the year were probably really the best thing because all summer you're not working, and then you got to get ready for the year. And [as a] young teacher or young career teacher, anyway, I don't have a lot of materials. I don't really know how to get ready. I don't know what to do. . . . Having the opportunity to meet with teachers that are at really a whole bunch of different levels to share experiences, share materials, share what they're doing to get their school year started and incorporating all these things into my own style.*

In addition, cohort members discussed how helpful it has been to seek advice during induction sessions. Having the opportunity to share their successes and failures and ask for help from their peers and museum staff has provided a valuable source of support. Two stated:

*I feel like I valued the community that was created with the induction meetups most out of all of those, because my first year was really difficult. The environment that I was in at school was really challenging, and so having a monthly meetup was nice to sort of commiserate and also bounce ideas off of one another and to talk to [project member] who ran them a little bit more one-on-one in her office hours to come up with some ideas.*

*I think [induction sessions] have supported me a lot being amongst [other teachers at my school], because at times in this school and last school, [other teachers] here do not have the same expertise as the AMNH graduates. So, the advice that I received in those induction meetings is substantially better advice.*

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<sup>6</sup> The induction leader and a subgroup of peer mentors developed these units together over six months and presented them during the Summer Institute. The collection is referred to as Earth Science Units for New Teacher Induction.

When asked what recommendation they had to improve induction, interviewees made a few minor suggestions. For example, managing interactions with colleagues and parents was mentioned as a potential area to cover. One stated:

*Maybe a greater focus on the non-pedagogical aspects of teaching. So, things like working with your union or working with your coworkers or admin or parents. . . . I kind of had to learn that on the fly.*

Another suggestion was to continue induction support throughout the four-year teaching commitment, which is surprising given that the project is providing induction support for Cohorts 8 and 9. However, one explained:

*Induction is two years after you graduate and then you're on your own after that. I feel like continuing induction for the third year or even like how we have the commitment of four years in the Title I school. So even for the four years, not as often as once a month, maybe twice a year or one time the summer before school starts. And then one time maybe around spring break would be great. I think continuing induction for the four-year commitment will be very helpful.*

## **Additional Museum Resources**

Alongside induction sessions, the museum offers a variety of other resources to continue supporting MAT-ESRP graduates as teachers. Examples include assistance with field trips, professional development sessions, and the use of museum resources to supplement their lessons, which included \$500 to purchase classroom materials. Cohort members were asked about the extent to which they were utilizing these museum supports. Most described using the resources extensively in their teaching, such as making connections to what students were learning in the classroom with field trips, incorporating resources from professional learning into lessons, and utilizing other museum resources, like manipulatives, to strengthen student understanding.

### **Field Trips**

The museum has offered to assist all cohorts with field trips, which some cohort members have taken advantage of throughout the school year. For example, one teacher took their students to a planetarium show, and another let students self-select exhibits they wanted to visit. Interviewees elaborated on these experiences, stating that the museum assisted with planning logistics. As one described:

*I got in contact with the museum when I was planning this, told them I was a part of Cohort 9, and they sort of pulled out the red carpet and everything was free, everything was accessible. We had spaces for everybody, which was really, really nice and made it*

*really easy when checking in, and also, when students wanted to split up, they could because everybody had access to whatever they wanted to see in the museum.*

In addition, four Cohort 9 interviewees had taken their students on field trips to the museum. They explained that the field trips were well received by students and helped them make connections to what they were learning in the classroom. As two interviewees explained:

*[Students] really, really enjoy [the field trip]. They were really excited about walking around and looking at amazing pieces of minerals that they hadn't even seen and wouldn't even see in their lives if it were not for the museum exhibit. Also, we tried to make a connection to what we learned in the classroom. So, everything that we learn, like minerals or the planets, the universe, . . . they're really making a connection to the things that they see at the museum.*

*We went to the Hall of Planet Earth, and they did a scavenger hunt that I had created to take them around. We were reviewing for the Regents at this point last year, so it lent itself to reviewing plate tectonics and also climate in the climate section of that hall.*

While those who have utilized the museum for field trips have had positive experiences, several cohort members did not plan and implement field trips. They mentioned a variety of logistical reasons, such as scheduling, transportation, and managing paperwork. As one stated:

*I haven't done field trips. Honestly, it is a daunting task. I haven't brought any of my students, although I would like to at some point.*

### **Professional Learning**

The museum also provides teacher professional learning opportunities, such as Seminars on Science and workshops through the Gottesman Center for Science, Teaching, and Learning. The interviewees who participated in the museum workshops spoke positively about the experiences and highlighted useful aspects like learning about new Earth science research that they can engage their students with and using materials from the paleontology fieldwork with their students. As two stated:

*Usually, when they share resources [at workshops], they might demonstrate a new website or a new feature or share some new information or maybe we all get an article that we read, and we talk about new findings in science. And I always think it's really good that it just sparks that regeneration of ideas. . . . So, it's nice when they can share new information that's going to be relevant and exciting, especially in our classrooms with our kids.*

*I did the program<sup>7</sup> through the museum where we went upstate. We collected a lot of material and brought it back for students to look for fossils and all that good stuff. They loved it. They loved being hands-on with the materials and finding all the little fossils in the limestone. It was great.*

### **Supplemental Resources**

Cohorts 8 and 9 have also utilized the museum resources to strengthen their lessons and the stipend to purchase classroom supplies. For example, cohort members described manipulatives they have purchased to strengthen their lessons, as well as using photos from the museum website to provide visual aids for students. In their words:

*In regards to any other materials, like the density cubes, they . . . love using the little cubes. They're all the same size, and they all have different densities. . . . I use the little hemispheres for my Earth-Sun-Moon unit, and they think those are really cool, being able to draw on those. And also, that's where I got most of my rocks and minerals because my school really didn't have anything when I came, so that's been so useful.*

*When we were talking about the recent hurricanes, I found a part of the museum [website] that talks about Hurricane Sandy and had some New York City pictures post-hurricane to see the effect there. Especially since a lot of my students are from urban areas, to see what it looks like in a city a bit closer to them.*

## **Peer and Program Staff Relationships**

An overarching theme throughout the interviews was the positive relationships that cohort members have established within their cohort, with other cohorts, and with museum staff. These strong relationships have created an environment in which the cohorts can seek advice and resources, as well as support one another.

### **Peer-to-Peer Relationships**

As mentioned, the relationships that members of Cohorts 8 and 9 have built within their cohort and across cohorts have been very helpful. Interviewees commented that these relationships have provided a network to ask for advice (e.g., classroom management) and to share ideas or resources for lessons. In their words:

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<sup>7</sup> This program is related to the EaRLY Initiative (the Earth-sciences Reciprocal Learning Year) and is specifically for MAT-ESRP graduates across cohorts. Graduates apply and engage in summer paleontology fieldwork and integrate these experiences with their students in the classroom. The program is a five-year initiative through an NSF CAREER grant. Teachers from all cohorts are eligible but preference is given to teachers in induction.

*We developed close relationships, and we are still a very good cohort. . . . We share resources up to this point. We call each other, “What unit are you working on? What are you doing for your rock cycle? How did you do latitude and longitude?” I keep in contact with one or two or three of them, but every time I reach out to any of my cohort colleagues, they respond to me. And I think we developed a good friendship. That’s one way of pretty much sharing resources, sharing ideas, strategies for classroom management, strategies for teaching specific topics, because some of us are more experienced or experts in one topic than others.*

*I moved here from [another state] completely by myself, completely not sure what was going to happen, and [the cohort model] definitely made it feel like I wasn’t alone in this. It took some of the weight off my shoulders as well. If it was the night before school and I didn’t have anything planned . . . I could get into a folder that one of the other alumni sent me and see what they did, and I wasn’t so panicked starting from scratch. . . . And anytime I had issues or wasn’t sure what to do for something, . . . I knew that I could reach out to anyone.*

*Oh, I loved [working with other cohorts]. I loved being with any new faces, and I know we did work with Cohort 9 a little bit, and it was really cool to meet them and see where they were at and if they had questions that maybe I could help with. . . . There really weren’t any drawbacks. . . . I think anytime we get to collaborate as a group is beneficial.*

*I think it’s great to have others around because I like collaborating and sharing ideas and getting ideas and all that kind of stuff and just learning more. And I think the more people the better. I always thought it was a little more enriching if there were other cohorts or even other people . . . probably better to have another cohort there.*

Additionally, now that Cohorts 8 and 9 have some teaching experience, they have been able to support the newer cohort members who are just entering the teaching profession, which has been mutually beneficial. As one described:

*Now I really enjoy meeting with C10 because I can offer advice. It is a reminder like, “Okay, I’m starting to understand this world, and I’m starting to get my own footing.” And then it almost clarifies things for me when people are asking advice about interviewing and the vibe that they get from the school, “What do I look for? What do I not look for or what do I care about? What should I not care about?” It’s been good to think that through and have to articulate that for myself. . . . I think that [younger cohorts] don’t realize they’ll get to where we are. Your second year, you don’t fully know what you’re doing yet, but you’re a little less stressed. You have familiarity, and so that’s a good reminder too, to see them and see my own growth.*

## Program Staff Relationships

Along with peer connections, cohort members said the relationships they have built with program staff have been beneficial. Specifically, they detailed the ability to rely on museum staff for help with lesson materials and supplies. As two interviewees stated:

*The museum staff was always so helpful. They still remain helpful. I texted [program staff member] at the beginning of the spring semester and asked her about a lab that we did in the program, and she gave me all the specifics and told me some of the stuff that she liked about it and that she didn't like about it. And so, [museum staff] still remain so helpful.*

*[Program staff member], she's awesome. Anytime you need something, she has it. Last time I asked her for some rocks and minerals to help me set up for the Regents, and she gave me a whole box of them, so that was awesome. She always has resources like books and worksheets and slides and stuff for us.*

## Preparedness to Teach Earth Science

When asked to reflect on how well prepared they felt to teach Earth science, all interviewees reported that they felt well prepared as a result of the MAT-ESRP. One aspect that several interviewees spoke to was their residency. This experience allowed them to gain valuable experience in a classroom by applying what they were learning to a real scenario. It also gave them opportunities to teach lessons and receive feedback. As two shared:

*I think the really powerful part of the program is the residency bit because . . . textbooks teach you a lot of things that are great theoretically, but sometimes those things in the book don't actually work the way that you want them to in practice. And so being able to, "Alright, I read about this thing in class, let me go try this thing and see what it looks like," before you're a year down the road, you're in a classroom, and it's your own classroom, and the things in the book aren't working, and you have to think on the fly to try and adapt them into something that's feasible.*

*I think the program prepared me to a great extent to be an Earth science teacher. For example, while we were taking courses at the museum, they paired us in a residency school with a mentor or cooperating teacher. So that was a great way for us to get some hands-on experience. . . . It was a great transition because we were not being thrown into the classroom. We were observing an experienced teacher. And then we were given opportunities to teach. And then a museum supervisor came in and observed us and gave us feedback. And we used to reflect on what went well, things to improve. So, we spent a couple months at a middle school and in high school, and I think that was a key part of the program because you were pretty much in a classroom, you were practicing some of*

*the things that you were learning in the course, and you were given the experience to teach in a classroom and to co-teach.*

Other aspects of the MAT-ESRP program that Cohorts 8 and 9 found helpful were learning pedagogy and strengthening their content knowledge. Two reported:

*I think that the museum has done a really good job of preparing me to be an Earth science teacher. I feel like I have content skills that I gained at the museum I wouldn't have had in another program. I feel like I have skills and pedagogy in terms of using the museum as a resource that I wouldn't have gotten through another program, and I think that's informed the way that I teach in terms of using real-world data sets, using real-world examples, having students do hands-on experiments that I really don't know whether I would feel confident about if I hadn't been in the program.*

*When I graduated college, I just did not feel ready to just jump in somewhere and teach Earth science because I didn't have the experience. And then I got to the museum program, and because they just broke it down so well and they just really went over all of the content and everything that we would need to know: meteorology, astronomy, geology, and then also the additional teaching practices, which I had done in undergrad. But it was great to see those in an Earth science context really helped me feel more confident in just getting into the classroom. . . . I definitely wouldn't be where I'm at today if I hadn't gone this route. I don't think I would be as strong of a teacher.*

Cohorts 8 and 9 were asked what areas they could have used more preparation in, as well as advice they would give for training future cohorts. The most offered suggestion was advice on classroom and behavior management systems. In the words of two:

*I think classroom management for sure is a big one [to address]. When you're learning to be a teacher, you're not really in front of students all the time, so it's hard to think of scenarios that you would be in, and it's like you're not going to learn until you're on the job.*

*I think more about behavior management would be nice, practice doing a specific [management strategy] would be cool, though that's a little bit limited. Again, it's not your student teaching, you're not actually running your classroom. So I'm not quite sure how they would implement that, but maybe there's room for improvement with that specific behavioral management systems.*

## Looking Ahead

Cohorts 8 and 9 were asked about their three-, five-, and ten-year career plans. The vast majority of interviewees stated that they intend to continue teaching Earth science in high-need schools for the foreseeable future. Of the few that described other plans, these consisted of pursuing other avenues in teaching or education, such as administration or curriculum development.

*I mean ideally, [I would still be in the classroom]. We're trying to enact social change here. And that's also a really positive part about the museum, about the MAT program. It didn't really hold back in talking to us about the real point of education, . . . but already, that's definitely part of my philosophy and the museum fostered that flame. As an educator, the dream would be to keep working here. So, it's like I would love to continue to work with lower socioeconomic, more disadvantaged Black and Brown students.*

*I still see myself teaching. I really love teaching or science, but I'm also looking forward to completing another master's in administration. But I just don't know. I just want to keep teaching, and eventually I want to make a greater impact, and that'll be probably becoming an administrator. But I'll still teach a class while I'm still an administrator. . . . I want to be an administrator that is still probably teaching one of the classes and can ask other teachers, "You can come and watch me and see how I do this strategy or this" and it'll be better when I'm giving feedback to other teachers.*

## COHORT 9 FELLOWS SURVEY

In June 2023, HRI surveyed members of Cohort 9 at the conclusion of their second year of teaching.<sup>8</sup> Using a retrospective pre/post approach,<sup>9</sup> the survey asked about their preparedness to implement practices emphasized in the MAT-ESRP.

Overall, Cohort 9 appeared to make considerable growth during their first two years of teaching (see Table 1). In particular, three items stand out<sup>10</sup>:

- surfacing and responding to student ideas;
- knowledge and understanding of their school culture; and

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<sup>8</sup> Cohort 8 was surveyed the previous year.

<sup>9</sup> Eleven of 13 participants responded to the survey, a response rate of 85 percent.

<sup>10</sup> Because of the large number of potential comparisons and the resulting loss of statistical power, each apparent difference was tested at an alpha level of .05 with no adjustment for multiple comparison. As such, the results should be interpreted with caution. Any difference mentioned in this report was statistically significant at the  $p < .05$  level (McNemar's test).



- using instructional time completely and effectively.

In each case, roughly half of respondents felt fairly well prepared or very well prepared upon completion of the program, compared to 100 percent two years later.

Although Cohort 9 made considerable progress, there is still some room for growth. At the end of their second year of teaching, a little more than half of respondents reported feeling prepared to collaborate with families. Additionally, about three-quarters of respondents reported feeling fairly well prepared or very well prepared to (1) foster growth by emphasizing strengths rather than deficits and (2) strive to understand and be responsive to family and community needs.

**Table 1**  
**Cohort 9 Fellows' Ratings of Their Preparedness<sup>†</sup>**

	Percent of Respondents (N = 11)	
	Upon Completion of Program	Now (Two Years Later)
<b>Science Content</b>		
Use effective communication skills to teach content knowledge	73	100
Surface and respond to student ideas*	55	100
<b>Student Needs</b>		
Address students' different learning challenges, strengths, and socio-emotional needs	73	100
Adjust content to students' level of understanding	82	100
Embrace and understand differences and show respect and sensitivity to students and colleagues, their communities, and/or cultures	82	100
Set high expectations for learning and achievement by framing clear learning goals	82	91
Relate science to the personal lives, needs, and interests of students	73	91
Foster growth by emphasizing strengths rather than deficits	55	73
<b>Instructional Planning</b>		
Align goals, strategies, and assessments	82	100
Align science instruction with state science standards appropriate to the grade level	91	100
Develop and manage diverse and effective student groups	64	100
Engage students in doing science through the Science and Engineering Practices	91	100
Effectively plan and implement instruction	91	91
<b>Learning Environment</b>		
Create and maintain effective learning environments that encourage enthusiasm for learning and engagement in science	70	90
Use instructional time completely and effectively*	50	90
Create an effective environment for learning	70	90
<b>Instructional Strategies</b>		
Use a variety of assessment strategies to assess students	82	100
Use questioning and discussion strategies	64	100
Use technology effectively to support learning	91	100
Use informal science learning experiences in your instruction	64	82
Use AMNH and its resources in instruction	73	82
<b>School and Community Relations</b>		
Know and understand the culture of the school*	45	100
Build relationships to support students and their well-being	82	100
Strive to understand and be responsive to family and community needs	55	73
Collaborate with families	36	55
<b>Safety</b>		
Plan for and attend to material safety	82	91
Plan for and implement safety and emergency procedures	82	91
Plan for and attend to the ethical treatment of living organisms	55	64
<b>Professionalism</b>		
Interact well with colleagues and others	82	100
Engage in reflective practices	82	91
Use supervisor's feedback constructively to improve practice	91	91
Collaborate with colleagues for continual learning	82	91
Stay current on both educational and science research and trends	82	91
Set professional goals	73	91

<sup>†</sup> Includes those giving a rating of 3 or 4 on a scale of 1, not adequately prepared; 2, somewhat prepared; 3, fairly well prepared; and 4, very well prepared.

\* There is a statistically significant difference in Fellows' ratings of preparedness upon completion of the program and now (McNemar's test;  $p < 0.05$ ).

## EMPLOYERS SURVEY

In addition to surveying Cohort 9 at the conclusion of their second year of teaching, HRI surveyed their employers (e.g., principals, assistant principals). The survey asked these individuals to assess the preparedness of Cohort 9 in comparison to other recently hired beginning teachers.<sup>11</sup>

On 27 of the 35 statements, at least 75 percent of employers rated Cohort 9 graduates as fairly or very well prepared, the top two points of the four-point scale<sup>12</sup> (see Table 2). In particular, the following items stand out as areas in which their employers thought the graduates were well prepared:

- knowing and understanding major concepts and principles of the science being taught;
- aligning science instruction with state science standards appropriate to the grade level;
- setting professional goals;
- knowing and understanding the culture of the school;
- planning for and attending to material safety;
- planning for and implementing safety and emergency procedures; and
- planning for and attending to the ethical treatment of living organisms.

The data also highlight areas where, according to their employers, graduates can improve. For example, only about half of employers reported that their graduates were at least fairly well prepared to set high expectations for learning and achievement by framing clear learning goals. Other items with similar ratings include surfacing and responding to ideas, addressing students' different learning challenges, creating an effective environment for learning, and using questioning and discussion strategies.

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<sup>11</sup> The survey asked, "In comparison to other beginning teachers you have hired recently, generally how would you rate AMNH-MAT graduates for their ability to do the following?" Employers responded on a scale ranging from 0 to 4: 0, I don't know; 1, not adequately prepared; 2, somewhat prepared; 3, fairly well prepared; and 4, very well prepared. Nine of 14 participants responded to the survey, a response rate of 64 percent.

<sup>12</sup> The response scale was 1, not adequately prepared; 2, somewhat prepared; 3, fairly well prepared; and 4, very well prepared.

**Table 2**  
**Respondents' Assessment of Cohort 9 Graduate Preparedness<sup>†</sup>**

	N <sup>‡</sup>	Percent of Respondents
<b>Science Content</b>		
Know and understand major concepts and principles of the science being taught	9	100
Use effective communication skills to teach content knowledge	9	78
Surface and respond to student ideas	9	67
<b>Student Needs</b>		
Relate science to the personal lives, needs and interests of students	9	78
Foster growth by emphasizing strengths and expressing that all students have the ability to grow	9	78
Embrace and understand differences by showing respect and sensitivity to students and colleagues, their communities, and/or cultures	9	78
Address students' different learning challenges, strengths, and socio-emotional needs	9	67
Adjust content to students' level of understanding	9	67
Set high expectations for learning and achievement by framing clear learning goals	9	56
<b>Instructional Planning</b>		
Align science instruction with state science standards appropriate to the grade level	9	100
Effectively plan and implement instruction	9	78
Develop and manage diverse and effective student groups	9	78
Engage students in doing science through the Science and Engineering Practices	9	78
Engage in reflective practices	9	78
<b>Learning Environment</b>		
Create and maintain effective learning environments that encourage enthusiasm for learning and engagement in science	9	67
Use instructional time completely and effectively	9	67
Create an effective environment for learning	9	67
<b>Instructional Strategies</b>		
Use AMNH and its resources in instruction	6	83
Use informal science learning experiences in instruction	9	78
Use technology effectively to support learning	9	78
Use questioning and discussion strategies	9	67
Use a variety of assessment strategies to assess students	9	67
<b>School &amp; Community Relations</b>		
Know and understand the culture of the school	9	89
Build relationships to support students and their well-being	9	78
Strive to understand and be responsive to family and community needs	8	75
Collaborate with families	8	75
<b>Safety</b>		
Plan for and attend to the ethical treatment of living organisms	8	100
Plan for and attend to material safety	8	88
Plan for and implement safety and emergency procedures	8	88
<b>Professionalism</b>		
Set professional goals	8	88
Engage in reflective practices	9	78
Use supervisor's feedback constructively to improve practice	9	78
Interact well with colleagues and others	9	78
Collaborate with colleagues for continual learning	9	78
Stay current on both educational and science research and trends	9	78

<sup>†</sup> Includes those giving a rating of 3 or 4 on a scale of 1, not adequately prepared; 2, somewhat prepared; 3, fairly well prepared; and 4, very well prepared.

As seen in Table 3, when asked to rate their overall satisfaction with their graduates, over two-thirds of employers responded they were very satisfied. On the other hand, 22 percent of employers reported feeling dissatisfied or very dissatisfied.

**Table 3**  
**Respondents' Satisfaction With Graduates**

Percent of Respondents (N = 9)					
Very Dissatisfied	Dissatisfied	Somewhat dissatisfied	Somewhat satisfied	Satisfied	Very Satisfied
11	11	0	11	0	67

As reported earlier, Cohort 9 self-evaluated their preparedness in the same or similar areas (see previous section).<sup>13</sup> Although employers evaluated graduates of Cohort 9 as prepared overall, there are notable differences in their assessment and Cohort 9's self-evaluation. For example, in six items, there was at least a 30-point difference,<sup>14</sup> with the self-evaluations being higher in each case:

- addressing students' different learning challenges, strengths, and socio-emotional needs;
- adjusting content to students' level of understanding;
- setting high expectations for learning and achievement by framing clear learning goals;
- surfacing and responding to student ideas;
- using a variety of assessment strategies to assess students; and
- using questioning and discussion strategies.

These differences might be explained by a few factors. For example, administrators typically observe teachers only once or twice per semester for a portion of a class period. Because administrators see only a small amount of a teacher's instruction, making claims about all aspects of their pedagogical preparedness is difficult. Similarly, the employers who completed the survey may not be the administrators of the Cohort 9 graduates who participated in the survey. Additionally, because Cohort 9 had only just completed their second year of teaching, the comparisons they made in their self-evaluations are to the beginning of their teaching career. Although these teachers likely made considerable growth, they may not yet be aware of the growth they will make as they gain more classroom experience.

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<sup>10</sup> With the exception of two items, Cohort 9 was given a survey with the same items and scale with which to evaluate their preparedness.

<sup>14</sup> Because it is not clear that Fellows and employers were using the same criteria (as discussed below), these were not tested for statistical significance.

## SUMMARY AND RECOMMENDATIONS

In Year 4, the project continued to support Cohorts 8 and 9, both of which were both particularly affected by the pandemic. In March 2020, during Cohort 8's residency, the program underwent a notable transformation as all program components shifted to a remote setting. The remote format continued into the summer of 2020 and eventually transitioned in August to a hybrid setting for the 2020–21 school year. As such, the pandemic heavily impacted Cohort 8's first year of full-time teaching and Cohort 9's entire residency. The benefits of of induction support for new teachers are well established, but teaching conditions associated with the pandemic made induction for Cohorts 8 and 9 particularly important. The formal supports consisted of induction sessions, coaching visits, office hours, professional learning opportunities, a financial stipend, a planning forum, and a summer institute.

During interviews, both cohorts said the induction sessions and planning forum have provided a place to share resources and create lessons together, as well as seek advice from one another and museum staff. In addition, the program has supported both cohorts by assisting with field trips, offering professional learning sessions, and providing lesson materials such as fossils and rocks. A central theme throughout interviews was the strong, positive relationships Cohorts 8 and 9 have built within their cohorts, across cohorts, and with museum staff. This has created a culture in which cohort members can rely on each other for support and encouragement.

Responding to the Cohort 9 Survey, Fellows indicated growth in several areas compared to when they completed the program. These included surfacing student ideas and using instructional time completely and effectively. The data also suggest areas where Fellows can grow, in particular working with students' families and within their communities.

In addition, Cohort 9 employers were surveyed. Most rated their graduates as fairly or well prepared in areas such as (1) knowing and understanding major concepts and principles of the science being taught and (2) aligning science instruction with state science standards appropriate to the grade level. However, there appear to be differences between Cohort 9's self-evaluations and their employers' ratings in some areas, like setting high expectations for learning and achievement by framing clear learning goals and surfacing and responding to student ideas.

As the project moves into its fifth year, HRI offers the following recommendations for consideration.

- *Consider extending induction supports throughout the four-year teaching commitment.* Both Cohorts 8 and 9 reflected positively on their experiences during the induction sessions and would benefit from continuing to participate in these experiences through their teaching commitment. Of course, extending induction would require more financial resources, so the decision is not as simple doing what would benefit the cohorts. However, if extending the

supports is possible, the project may want to consider incorporating topics that cohort members and employers indicated they were not as well prepared for, such as utilizing a growth mindset, working with families and their communities, and addressing students' different learning challenges, strengths, and socio-emotional needs.

➤ *Consider increasing the emphasis on classroom management in induction.*

During interviews, some Fellows said they would appreciate more opportunities to discuss strategies for managing their classrooms, including advice on approaches to student behavior. This topic already receives some attention in induction. That typically happens in breakout rooms, which are strategically organized to include both first-year teachers and more experienced ones. Given that classroom management is a challenge for first-year teachers in particular, more attention may be warranted. One approach would be to devote some time specifically to this topic during whole group induction sessions.

# APPENDIX A

## ITEM FREQUENCIES



**Table A-1**  
**Cohort 9 Fellows' Ratings of Their Preparedness to Teach Science Content**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Use effective communication skills to teach content knowledge	0	27	55	18	0	0	55	45
Surface and respond to student ideas	0	45	36	18	0	0	91	9

**Table A-2**  
**Cohort 9 Fellows' Ratings of Their Preparedness to Address Student Needs**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Embrace and understand differences and show respect and sensitivity to students and colleagues, their communities, and/or cultures	0	18	45	36	0	0	55	45
Relate science to the personal lives, needs, and interests of students	0	27	45	27	0	9	45	45
Set high expectations for learning and achievement by framing clear learning goals	0	18	55	27	0	9	55	36
Foster growth by emphasizing strengths rather than deficits	0	45	27	27	0	27	36	36
Adjust content to students' level of understanding	0	18	73	9	0	0	82	18
Address students' different learning challenges, strengths, and socio-emotional needs	0	27	64	9	0	0	91	9

**Table A-3**  
**Cohort 9 Fellows' Ratings of Their Preparedness for Instructional Planning**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Engage students in doing science through the Science and Engineering Practices	0	9	55	36	0	0	45	55
Effectively plan and implement instruction	0	9	55	36	0	9	36	55
Align science instruction with state science standards appropriate to the grade level	0	9	45	45	0	0	55	45
Develop and manage diverse and effective student groups	9	27	55	9	0	0	64	36
Align goals, strategies, and assessments	0	18	82	0	0	0	82	18

**Table A-4**  
**Cohort 9 Fellows' Ratings of Their Preparedness to Establish a Learning Environment**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Create and maintain effective learning environments that encourage enthusiasm for learning and engagement in science	0	30	40	30	0	10	40	50
Create an effective environment for learning	0	30	40	30	0	10	60	30
Use instructional time completely and effectively	0	50	30	20	0	10	70	20

**Table A-5**  
**Cohort 9 Fellows' Ratings of Their Preparedness to Implement Instructional Strategies**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Use technology effectively to support learning	0	9	45	45	0	0	64	36
Use AMNH and its resources in instruction	0	27	27	45	0	18	45	36
Use informal science learning experiences in your instruction	0	36	45	18	0	18	55	27
Use a variety of assessment strategies to assess students	0	18	82	0	0	0	82	18
Use questioning and discussion strategies	0	36	55	9	0	0	91	9

**Table A-6**  
**Cohort 9 Fellows' Ratings of Their Preparedness for School and Community Relations**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Build relationships to support students and their well-being	0	18	73	9	0	0	91	9
Know and understand the culture of the school	0	55	45	0	0	0	91	9
Strive to understand and be responsive to family and community needs	0	45	55	0	0	27	73	0
Collaborate with families	11	33	33	22	0	45	55	0

**Table A-7**  
**Cohort 9 Fellows' Ratings of Their Preparedness to Follow Lab Safety**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Plan for and attend to material safety	0	18	55	27	0	9	55	36
Plan for and implement safety and emergency procedures	0	18	64	18	0	9	64	27
Plan for and attend to the ethical treatment of living organisms	18	27	45	9	18	18	45	18

**Table A-8**  
**Cohort 9 Fellows' Ratings of Their Preparedness for Professionalism**

	Percent of Respondents (N = 11)							
	Upon Completion of the Program				Two Years After Completing the Program			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Engage in reflective practices	0	18	18	64	0	9	18	73
Interact well with colleagues and others	0	18	36	45	0	0	36	64
Use supervisor's feedback constructively to improve practice	0	9	27	64	0	9	36	55
Collaborate with colleagues for continual learning	0	18	27	55	0	9	36	55
Set professional goals	0	27	27	45	0	9	36	55
Stay current on both educational and science research trends	0	18	45	36	0	9	55	36

**Table A-9  
Employers' Assessment of  
Cohort 9 Graduate Preparedness in Science Content**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Know and understand major concepts and principles of the science being taught	0	0	0	22	78
Use effective communication skills to teach content knowledge	0	11	11	22	56
Surface and respond to student ideas	0	11	22	11	56

**Table A-10  
Employers' Assessment of  
Cohort 9 Graduate Preparedness in Addressing Student Needs**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Embrace and understand differences by showing respect and sensitivity to students and colleagues, their communities, and/or cultures	0	0	22	11	67
Foster growth by emphasizing strengths and expressing that all students have the ability to grow	0	22	0	11	67
Relate science to the personal lives, needs and interests of students	0	11	11	11	67
Address students' different learning challenges, strengths, and socio-emotional needs	0	22	11	33	33
Adjust content to students' level of understanding	0	22	11	44	22
Set high expectations for learning and achievement by framing clear learning goals	0	11	33	33	22

**Table A-11**  
**Employers' Assessment of**  
**Cohort 9 Graduate Preparedness in Instructional Planning**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Align science instruction with state science standards appropriate to the grade level	0	0	0	33	67
Engage in reflective practices	0	22	0	11	67
Effectively plan and implement instruction	0	0	22	22	56
Engage students in doing science through the Science and Engineering Practices	0	22	0	33	44
Develop and manage diverse and effective student groups	0	11	11	56	22

**Table A-12**  
**Employers' Assessment of**  
**Cohort 9 Graduate Preparedness in Developing a Learning Environment**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Create and maintain effective learning environments that encourage enthusiasm for learning and engagement in science	0	22	11	11	56
Create an effective environment for learning	0	11	22	22	44
Use instructional time completely and effectively	0	11	22	44	22

**Table A-13**  
**Employers' Assessment of**  
**Cohort 9 Graduate Preparedness in Instructional Strategies**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Use informal science learning experiences in instruction	0	22	0	11	67
Use technology effectively to support learning	0	0	22	11	67
Use AMNH and its resources in instruction	33	0	11	11	44
Use a variety of assessment strategies to assess students	0	0	33	33	33
Use questioning and discussion strategies	0	11	22	44	22

**Table A-14**  
**Employers' Assessment of**  
**Cohort 9 Graduate Preparedness in Establishing School & Community Relations**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Know and understand the culture of the school	0	0	11	44	44
Build relationships to support students and their well-being	0	22	0	33	44
Strive to understand and be responsive to family and community needs	11	11	11	22	44
Collaborate with families	11	22	0	22	44

**Table A-15**  
**Employers' Assessment of**  
**Cohort 9 Graduate Preparedness in Safety Protocols**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Plan for and attend to the ethical treatment of living organisms	11	0	0	22	67
Plan for and implement safety and emergency procedures	11	0	11	22	56
Plan for and attend to material safety	11	0	11	22	56

**Table A-16**  
**Employers' Assessment<sup>†</sup> of**  
**Cohort 9 Graduate Preparedness in Maintaining Professionalism**

	Percent of Respondents (N = 9)				
	Do Not Know	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
Interact well with colleagues and others	0	0	22	11	67
Set professional goals	11	11	0	22	56
Collaborate with colleagues for continual learning	0	0	22	22	56
Engage in reflective practices	0	22	0	22	56
Stay current on both educational and science research and trends	0	11	11	22	56
Use supervisor's feedback constructively to improve practice	0	11	11	33	44



## APPENDIX B

### COHORT 9 FELLOWS SURVEY

## COHORT 9 FELLOWS SURVEY

Please indicate your level of preparedness to do each of the following 1) upon completion of the MAT-ESRP program, and 2) now:

### 1. Science Content

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Use effective communication skills to teach content knowledge	<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. Surface and respond to student ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 2. Student Needs

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Address students' different learning challenges, strengths, and socio-emotional needs	<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. Adjust content to students' level of understanding	<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. Set high expectations for learning and achievement by framing clear learning goals	<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. Relate science to the personal lives, needs, and interests of students	<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. Foster growth by emphasizing strengths rather than deficits	<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. Embrace and understand differences and show respect and sensitivity to students and colleagues, their communities, and/or cultures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 3. Instructional Planning

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Effectively plan and implement instruction	<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. Align science instruction with state science standards appropriate to the grade level	<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. Align goals, strategies, and assessments	<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. Develop and manage diverse and effective student groups	<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. Engage students in doing science through the Science and Engineering Practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 4. Learning Environment

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Create and maintain effective learning environments that encourage enthusiasm for learning and engagement in science	<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. Use instructional time completely and effectively	<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. Create an effective environment for learning	<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. Instructional Strategies

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Use questioning and discussion strategies	<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. Use informal science learning experiences in your instruction	<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. Use AMNH and its resources in instruction	<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. Use technology effectively to support learning	<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. Use a variety of assessment strategies to assess students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 6. School and Community Relations

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Know and understand the culture of the school	<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. Build relationships to support students and their well-being	<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. Strive to understand and be responsive to family and community needs	<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. Collaborate with families	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 7. Safety

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
c. Plan for and attend to material safety	<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. Plan for and implement safety and emergency procedures	<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. Plan for and attend to the ethical treatment of living organisms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 8. Professionalism

	Upon Completion of the MAT-ESRP Program				Now			
	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared
a. Engage in reflective practices	<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. Use supervisor's feedback constructively to improve practice	<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. Interact well with colleagues and others	<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. Collaborate with colleagues for continual learning	<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. Stay current on both educational and science research and trends	<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. Set professional goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Thinking about the science content you teach, please rate your knowledge and understanding of the major concepts and principles:

- a. Upon completion of the MAT-ESRP program
- b. Now
  - i. Beginner
  - ii. Intermediate
  - iii. Advanced
  - iv. Expert

10. Which aspects of the program were most helpful in preparing you for teaching? Please explain.

11. Overall, how well prepared were you for teaching upon completing the AMNH-MAT program?

- Very well prepared
- Adequately prepared
- Somewhat prepared
- Poorly prepared
- Unprepared

12. To what extent do you agree with each of the following statements about your experience with induction activities?

	Strongly Disagree	Disagree	Slightly Disagree	Slightly Agree	Agree	Strongly Agree
a. The content of induction activities was interesting to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Induction activities provided strategies I have been able to apply to my instruction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. There were sufficient opportunities to celebrate teaching successes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I received useful support when sharing a challenge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. There were sufficient opportunities to collaborate with my peers during induction activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Participating in induction activities helped me reflect on my own teaching practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I felt comfortable participating in induction activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Induction activities 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"/>

13. In what ways have you been able to incorporate culturally responsive and sustaining education practices or a focus on social-emotional well-being in your teaching?
14. In what other ways have you sought assistance or support from the MAT-ESRP program and the museum?
15. How could the MAT ESR program and AMNH be helpful to you as you prepare to begin teaching again in the fall?

## APPENDIX C

### EMPLOYERS SURVEY





## EMPLOYERS SURVEY

**Please choose the response that best reflects your opinion. In comparison to other beginning teachers you have hired recently, generally how would you rate AMNH-MAT graduates for their ability to do the following:**

### 1. Science Content

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Know and understand major concepts and principles of the science being taught.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Use effective communication skills to teach content knowledge.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Surface and respond to student ideas.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 2. Student Needs

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
f. Address students' different learning challenges, strengths, and socio-emotional needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. Adjust content to students' level of understanding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Set high expectations for learning and achievement by framing clear learning goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. Relate science to the personal lives, needs and interests of students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. Foster growth by emphasizing strengths and expressing that all students have the ability to grow.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. Embrace and understand differences by showing respect and sensitivity to students and colleagues, their communities, and/or cultures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 3. Instructional Planning

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Effectively plan and implement instruction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Align science instruction with state science standards appropriate to the grade level.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Develop and manage diverse and effective student groups.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Engage students in doing science through the Science and Engineering Practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Engage in reflective practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 4. Learning Environment

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Create and maintain effective learning environments that encourage enthusiasm for learning and engagement in science.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Use instructional time completely and effectively.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Create an effective environment for learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 5. Instructional Strategies

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Use questioning and discussion strategies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Use informal science learning experiences in instruction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Use AMNH and its resources in instruction.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Use technology effectively to support learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Use a variety of assessment strategies to assess students.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 6. School and Community Relations

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Know and understand the culture of the school.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Build relationships to support students and their well-being.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Strive to understand and be responsive to family and community needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Collaborate with families.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 7. Safety

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Plan for and attend to material safety.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Plan for and implement safety and emergency procedures.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Plan for and attend to the ethical treatment of living organisms.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## 8. Professionalism

	Not Adequately Prepared	Somewhat Prepared	Fairly Well Prepared	Very Well Prepared	I Do Not Know
a. Engage in reflective practices.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Use supervisor's feedback constructively to improve practice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Interact well with colleagues and others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. Collaborate with colleagues for continual learning.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. Stay current on both educational and science research and trends.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. Set professional goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. How would you rate your overall satisfaction with AMNH-MAT graduates?

- Very Satisfied
- Satisfied
- Somewhat satisfied
- Somewhat dissatisfied
- Dissatisfied
- Very Dissatisfied

10. What do you value the most out of the preparation that your AMNH-MAT graduate received?

11. What do you wish your AMNH-MAT graduate would have had more preparation or practice around before starting to teach at your school?

12. In your own words, how would you describe the preparedness of your AMNH-MAT graduate compared to other beginning teachers you have recently hired?

13. The AMNH-MAT program includes a focus on culturally responsive and sustaining education practices. Have you seen evidence of this in your graduate(s)' teaching? If so, please provide an example.

14. How could the MAT program and AMNH be helpful to you and your school?