Brookline Education Foundation

FY2026/School Year 2025-2026 Teacher Grant Application
Deadline: March 3, 2025

BEFORE YOU BEGIN:
MAKE A COPY OF THIS DOCUMENT AND SAVE IT WITH YOUR NAME IN THE TITLE (file→make a copy).

HOW TO COMPLETE THIS APPLICATION:
After you've saved a copy of this document, you can work on that copy independently and share it with any collaborators for their input. Once it's ready to submit, you will need to do the following:

1. Download the file as a PDF document (file →download→PDF document)
2. Complete a brief application form by following THIS LINK: **https://airtable.com/appGV7Kkx7uq42er0/shraoWM5TWX4aYnBf**
3. Upload your PDF document into the form when prompted to do so

ONCE YOUR APPLICATION HAS BEEN SUBMITTED:
You will receive an email confirmation to acknowledge that your application was received. The Teacher Grant Committee will review the grants in late March and early April. The announcement of successful applications will be made by email in mid-April, 2024.

If you have any questions, or need assistance in uploading your application, please call 617-948-6999 or email jennie@brooklineeducation.org or kbarnum@brooklineeducation.org.

Thank you for applying for a BEF Teacher Grant!

Additional Awards for Teacher Grants:

The Charlie Baker Legacy Award ($1,000) is given to an exceptional Teacher Grant application in the areas of U.S. History or World Geography. **You must submit an additional brief application to be considered for this award - please see the final page of this document!**

The David E. Pradell Award ($500) is given to a middle school Teacher Grant recipient whose work will stimulate students' development of self-assurance, collaboration, and sense of social responsibility.

The Adam Russell Gelfand Fellowship ($500) is given to a Teacher Grant recipient whose project is recognized by the committee for its excellence.

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Project Title	Exploring Mathematical Innovation: A Cultural and Educational Journey for Math Teachers in Greece
Name of Applicant(s)	Shoshanna Kostant Julie Padgett Lisa Rodriguez
School and Grades/Subjects You Teach	Brookline High School Mathematics
Telephone Number(s)	Shoshanna Kostant: 617-875-8205 Julie Padgett: 215-589-9476 Lisa Rodriguez: 617-230-0856
Email Address(es)	Shoshanna_kostant@psbma.org julie_padgett@psbma.org lisa_rodriguez@psbma.org
Years Teaching in PSB	Shoshanna (28 years PSB/31 years teaching) Julie (17 years PSB/23 years teaching) Lisa (13 years PSB/ 13 years teaching)
Amount Requested	$8840
Are you applying for the Charlie Baker Legacy Award?	Yes

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Applicant's Name(s): Shoshanna Kostant, Julie Padgett, LIsa Rodriguez
Project Title: Exploring Mathematical Innovation: A Cultural and Educational Journey for Math Teachers in Greece

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1. **Project Summary (1-3 sentences)**

We are seeking funding for a 9-day educational trip to Greece in the summer of 2025 or during a school break in the 2025-2026 school year, where we, as math teachers, will explore the rich history of mathematics and immerse ourselves in Greek culture. This experience will reignite our passion for math and teaching, allowing us to share our newfound knowledge with colleagues and students, and also plan a future student trip. The insights gained will enhance our curricula and inspire a deeper appreciation for the subject.

2. **Goal Statement**

What explicit goals do you aim to achieve with this proposed project? Describe the ideal outcomes and intended impact of your proposal.

Our primary goal is to reignite our passion for both mathematics and teaching by immersing ourselves in the rich historical and intellectual origins of the subject. We aim to expand and diversify our understanding of the history and development of mathematics and science by exploring the regions where foundational discoveries were made. Visiting the places where Galileo, Pythagoras, Hippocrates, Aristotle, Euclid, and other influential mathematicians and scientists lived and worked will provide us with invaluable insights into how mathematical concepts were developed, applied, and evolved over time. We'll be able to experience what they learned in the same places where they lived and learned themselves.

As educators teaching mathematics at various levels, it is essential that we not only convey mathematical concepts but also provide students with historical context to deepen their understanding and appreciation of the subject. This experience will enable us to enhance our curriculum by incorporating firsthand knowledge, historical narratives, and real-world applications of mathematics. By bringing back stories, images, and videos from our journey, we can create a more engaging and meaningful learning experience for our students.

Beyond immediate classroom impact, this trip has the potential to lay the groundwork for a future international student trip. Experiencing these historical sites firsthand will allow us to assess the feasibility and value of such a trip, ensuring that we can create an enriching and educational experience for students who are eager to explore the history of mathematics beyond textbooks.

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3. **Motivation**

What motivated you to apply for this grant? Are there experiences, in or outside of the classroom, that inspired you to apply for this grant?

Greek culture today places a strong emphasis on its ancient history, philosophy, and scientific achievements and we know that we will be able to find a rich trove of museums, artifacts and archeological sites that will bring the mathematical to life in a way that will inspire us and invigorate our teaching.

Studying the mathematics of Ancient Greece offers us a unique window into the evolution of mathematical thought, revealing how ideas were developed, refined, and expanded upon by successive generations. Starting around 600 BCE, legendary historical figures Pythagoras and Thales introduced the concept of deductive reasoning and formal proof laying the groundwork for geometry. Euclid then, Influenced by the mathematics of his predecessors, built the foundational geometry which is the geometry we teach our students. Roughly three hundred years after this, Archimedes laid down the precursory ideas of calculus among his many contributions. Follow this with the philosophy of Socrates, then Plato his student and Aristotle. We are fascinated by how the mathematics of Ancient Greece plainly demonstrates that ideas are not created in isolation but rather evolve, interweave and branch out from one another, forming a foundation for future discoveries.

We are also intrigued by the fact that these mathematical ideas emerged within a culture flourishing in art, political philosophy, and intellectual thought. We wonder whether Greece's advancements in democracy, aesthetics, and logic were not merely parallel developments but, in some way, products of the same mathematical and rational mindset. With that overarching question, one can see that understanding the development of ancient Greece's flourishing society of 300 BCE has transference for us. We think about the current development of mathematics and science and its relative importance to maintaining our advanced forward thinking thriving society.

Each of us see this as an opportunity on a personal level as well. Lisa, who takes pride in carefully managing her lesson planning, teaching, student management and administrative tasks has also felt like that overwhelming day-to-day work has overshadowed what drew her to mathematics in the first place. All of the daily work has taken priority over her enjoyment of mathematics. She feels like she's losing sight of what initially drew her to mathematics and why she enjoyed teaching. She is excited at the prospect of building into her lessons the history of the development of some of the mathematical ideas she teaches.

Shoshanna remembers a college trip she took abroad for eight months. She traveled to 16 countries, 40 cities around Europe/EurAsia with a political science teacher, a history, art and literature teacher, and she's always thought that the mathematics/STEM teacher would have been an important addition to the trip. It seems that math and science always takes second stage when people discuss art and culture. We think there is room for the history of the development of math and science. Julie is of this same mind. She has traveled on school trips abroad and feels the math/science perspective has been missing. We all want to be reinspired and desire the thrill of what drew us to teaching math.

Finally, today's mathematics at the postgraduate level is abstract and so advanced that high school students do not see how fundamental math is to solving today's complex real-world problems. Think about the abstract ideas involved in modern technology, space exploration and AI as examples. However, the mathematics of Ancient Greece was not just an abstract pursuit—it was deeply connected to practical problems and real-world applications of their day. Some key ways Greek mathematics addressed actual problems involved land measurement, architecture, astronomy, navigation, timekeeping, economics and trade. We can use what we learn on this trip to explain how developments in mathematics have solved problems in Ancient Greece as a way of drawing this parallel. Students are always excited when they see what they are learning has purpose and utility.

4. **Impact**

The best possible outcome of this project is a revitalized approach to teaching mathematics—one that inspires both educators and students, deepens conceptual understanding, and fosters a lasting appreciation for the historical and cultural significance of the subject.

ON OURSELVES

Engaging with mathematics beyond the classroom will help to reignite our passion for the subject. It allows us to see math from fresh perspectives, explore new teaching strategies, and deepen our own understanding. This will allow us to become more effective educators as we make a more engaging and dynamic classroom experience. Additionally, rediscovering our love for math can lead to greater job satisfaction, resilience, and overall well-being, making it easier to navigate the everyday challenges of teaching.

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ON OUR COLLEAGUES

By sharing our experiences through images, videos, or personal stories we hope to reinspire and motivate our math department. We plan on sharing out with the department at a department meeting. Our goal is to enrich our curriculum content in all courses by introducing more real world applications, historical context and potentially problem-solving strategies. Engaging with each other through our discipline always strengthens our department as a whole. This is an opportunity for us to work as a professional learning community. We all desire this kind of healthy professional development connecting us to our subject. As a long term goal, we hope that other teachers will be inspired to help chaperone future student trips to Greece following an itinerary we create based off of our trip.

ON OUR STUDENTS

Currently, much of the history of mathematics is learned through textbooks and pre-existing videos, which can feel distant and disconnected from students' experiences. Our goal is to bring mathematics to life by integrating firsthand experiences and deeper historical context into our teaching, making math more engaging and meaningful for students across multiple levels.

By immersing ourselves in the historical and cultural roots of mathematics, we can introduce innovative teaching methods, real-world applications, and new problem-solving strategies that enhance student learning. For example, rather than simply reading about Pythagoras, we will share our own experiences from visiting key historical sites, such as the Tunnel of Samos and the Mathematics Museum in Greece. Seeing these mathematical discoveries firsthand will allow us to add rich, authentic details to our Geometry, Algebra 1 and 2 curricula, giving students a more personal and tangible connection to the subject. We want to share videos, showcasing the mathematical significance of the sites we visit, featuring engaging explanations, historical context, and connections to modern mathematical concepts. Through photos, videos, and storytelling, students will gain a deeper appreciation for how mathematical concepts were developed and used in the real world.

Beyond enriching our current students' learning experiences, this initiative has the potential for long-term impact. If successful, we hope to lead an international student trip, providing curious and motivated students with the opportunity to explore the global history of mathematics firsthand. This would foster a deeper appreciation for the subject, inspire future mathematicians, and create lifelong learners who see math as a dynamic, evolving discipline rather than just a classroom subject.

Will there be any positive impact of this project in terms of the ***diversity, equity, and inclusion*** *in your classroom, school, and/or broader Brookline community? If so, please describe.*

It will be important for us to give context. Immersing ourselves in Greece's rich history of mathematics would inspire us to adopt a more global approach to teaching math in general. Incorporating diverse cultural perspectives into our curriculum makes math more relatable and accessible to students of all backgrounds. For example, we associate the idea of infinity with Archimedes. That's an opportunity to also discuss our association of "zero" with the Mayans. We can imagine that after our delve into Ancient Greek mathematics, it is natural that questions will arise about the early mathematics of China, India and other cultures.

In the future, the opportunity to take students on a similar trip would further promote inclusivity by allowing them to experience firsthand the cultural and historical roots of mathematics, deepening their connection to the subject and broadening their worldview. Such experiences would create an environment where students see math as not only a universal language but as something that connects them to a broader world of knowledge and history..

5. **Project Description**

We plan to travel to Greece over the summer of 2025 (or during school vacation of the 2025-26 school year depending on coordinating schedules and flight costs within our budget). We will spend time in Athens and Samos. Our tentative itinerary is outlined below.

Day 1: Arrive Athens

Arrive in Athens. Visit the **Roman Agora** and **Tower of the Winds**, both structures showcasing ancient engineering and geometry. The Tower of the Winds served as both a timepiece and a weather vane.

Day 2

Visit the **Acropolis Museum**, where the mathematical engineering behind the Parthenon and other structures is explained in fascinating detail including the precision and geometry used in their construction.

Visit the **Acropolis** itself. Tour the **Parthenon**, **Temple of Athena Nike**, and **Erechtheion**. Marvel at the symmetry, proportions, and geometry that the ancient Greeks used in their architectural designs. The Parthenon itself is a great example of the golden ratio in its proportions.

Day 3

Visit the **National Observatory of Athens** on the Hill of the Nymphs. The observatory offers insight into ancient Greek contributions to astronomy and mathematics and allows visitors to explore the history of the astrolabe and other early instruments for celestial navigation.

Visit the **Herakleidon Museum**, an interactive museum that explores the intersection between math, science, and art.

Visit the **Hellenic Mathematical Society** to see where the mathematical community in Athens gathers. White there, we hope to leverage some contacts we have to arrange talks with local mathematicians about the mathematical legacy of ancient Greece.

Day 4

Day trip to Delphi. Delphi was the center of the ancient world, where the Oracle of Apollo resided. The site is full of geometric and astronomical significance, as it was a major place of learning. We'll explore the **Archaeological Museum of Delphi, the Temple of Apollo** and the **Ancient Theatre of Delphi**. The alignment of the structures and ancient Greek geometry are incorporated into the landscape.

Day 5

Visit the **Ancient Agora**, including the **Stoa of Attalos** and **Temple of Hephaestus**. The geometry of the Temple of Hephaestus, a well-preserved Doric temple, is a beautiful example of ancient architecture.

Visit the ruins of **Plato's Academy.** The park and museum give insight into the intellectual environment that shaped Euclid's predecessors.

Visit the **National Archaeological Museum** to see the ancient artifacts including the **Antikythera Mechanism** display, which is an ancient Greek analog computer used to predict astronomical positions and eclipses.

Day 6

Visit the **Benaki Museum**, which offers exhibits on Greek history, culture, and the evolution of art and science. It includes artifacts from the ancient and modern Greek world and showcases the many eras, civilizations and cultures which have influenced the development of Greece.

Visit the **Museum of Ancient Greek Technology**. It features mathematical instruments and inventions based on Euclidean principles.

Day 7

Visit **Mount Lycabettus** for an amazing view of Athens by funicular. In the midst of a packed schedule of museums and sites, we'll take time to relax and admire the city layout, which reflects mathematical precision in terms of grid systems and urban planning.

Visit the **National Library of Greece**. It holds ancient manuscripts and texts related to Euclid's *Elements*, one of the most influential mathematical works in history.

Day 8: Flight to Samos

Samos is a Greek island known for its historical connection to Pythagoras, one of the greatest mathematicians of ancient Greece. The island is home to the Pythagoreion, an ancient sanctuary and UNESCO World Heritage site, where the legendary mathematician is said to have lived and taught, offering a unique opportunity to explore the origins of mathematical thought

Visit **Tunnel of Eupalinos**. The tunnel is the second known tunnel in history which was excavated from both ends, and the first with a geometry-based approach in doing so. It was designated as an International Historic Civil Engineering Landmark in 2017.
Visit the **Statue of Pythagoras**. The statue shows Pythagoras aligned with the catheti of a right triangle, with inscriptions on its hypotenuse, illustrating the Pythagorean theorem and including inscriptions dedicated to Pythagoras and his work.

Day 9

Visit **Pythagoras' Cave**. A cave system that was once home and classroom to famous mathematician and philosopher, Pythagoras, where he retreated to in order to avoid persecution and continue to teach mathematics to his followers.

Day 10: Return
Return to Athens, then return flight to Boston.

6. **Evaluation**

We will consider this trip a success if we return feeling rejuvenated, with a renewed passion for both mathematics and teaching, and excited to share the experiences and knowledge we gained with our colleagues and students. Additionally, we will return with a well-structured itinerary for a future student trip, with the activities and sites that we feel are both possible and valuable for students to engage in. We will also return with content such as photos, videos, math problems, and relevant context to share with both students and colleagues. This material will be able to be seamlessly integrated into our curricula, enriching our lessons and providing valuable resources for both students and fellow educators.

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DISSEMINATION & SHARING OF OUR EXPERIENCE

Math Department:
At the start of the school year, we will present our findings to the entire math department during a dedicated meeting. This presentation will include a google slide deck featuring key insights, historical narratives, real-world applications, and practical strategies for integrating these mathematical discoveries into various curricula. Our goal is to provide our colleagues with new teaching materials and suggestions for historical context that make mathematics more engaging and relevant. In addition to department meetings, we will organize collaborative planning sessions where teachers can explore how to incorporate history of mathematics into their curriculum. These interactive sessions will provide practical demonstrations, discussions on lesson implementation, and hands-on activities based on our findings.

Resource Sharing via Canvas (Learning Management System):
We will upload all relevant materials—including our presentation slides, recorded videos (explaining historical content and context), images from historical sites, and sample lesson plans—onto our department's Canvas platform, which all math teachers have access to. **T**his will allow all math teachers to access and integrate these resources into their own lessons, ensuring a broader reach across different grade levels and courses.

Integration into Curriculum and Student Learning:
The insights gained from visiting historical sites, such as the Tunnel of Samos and the Mathematics Museum, will be incorporated directly into the curricula for many of our courses including **Geometry**, **Algebra 2, and Precalculus** at all levels**.** We will design lesson plans that include historical perspectives, real-world applications, videos, and engaging activities that connect students more personally to mathematics. The videos we record will showcase the mathematical significance of the sites we visit, featuring engaging explanations, historical context, and connections to modern mathematical concepts. These videos will be shared with students and teachers.

Potential for a Future Student International Trip:
If successful, this initiative could serve as a precursor for a future student-led international learning experience, where selected students could travel to historical sites of mathematical significance. We would use our experiences to help design an enriching itinerary, ensuring that students gain the same immersive learning experience.

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7. **Budget and Finances**

Please be as specific as possible. When estimating costs for travel, be conservative as prices often increase over time. Please remember that Teacher Grants generally don't cover materials or supplies unless directly tied to a program or conference (e.g., a book required by the course you would be taking). And remember that the BEF cannot pay for food.

Expense	Purpose	Cost
Consultant	n/a	**-**
Materials/Supplies	n/a	**-**
Travel/Accommodations* *please include applicable taxes*	Travel and accommodations to/from Athens and Samos, Greece for 3 people (see cost breakdown in the table below)	**$7865**
Conference Fees	n/a	**-**
Other	Museum and Site Entrance fees for 3 people (see breakdown in the table below)	**$975**
Substitutes** *$135/day; please indicate days/hours needed*	n/a	**-**
Total		**$8840**

*single rooms are acceptable, if preferred by the applicant

**the availability of subs is limited; requests will be considered case-by-case

This table shares the cost breakdown of our requested total:

Expense	**Estimate**	**Total Cost (3 teachers)**
Flight (BOS to Athens)	$1600 per person	$4800
Hotel (Athens)	$225 per night (triple room)	$2000 for 7 nights (including taxes and fees)
Transportation (Athens)	$20 airport metro pp $5 daily metro per person	$165
Roman Agora & Tower of the Winds	$10 per person	$30

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Acropolis Museum	$20 per person	$60
Acropolis/Parthenon Tour	$50 per person	$150
National Observatory of Athens	$10 per person	$30
Herakleidon Museum	$10 per person	$30
Hellenic Mathematical Society	free	-
Day Trip to Delphi	$100 per person	$300
National Archeological Museum	$15 per person	$45
Plato’s Academy	free for park and museum	-
Ancient Agora	$10 per person	$30
Benaki Musuem	$15 per person	$45
The Museum of Ancient Greek Technology	$10 per person	$30
Mount Lycabettus funicular	$15 per person	$45
The National Library of Greece & musuem	free	-
Flight to Samos (roundtrip from Athens)	$150 per person	$450
Hotel - Samos	$200 per night (triple room)	$450 (2 nights + taxes and fees)
Pythagoras Cave (Samos)	$30 per person (tour/transportation)	$90
Tunnel of Eupalinos (Samos)	$30 per person (tour/transportation)	$90
Pythagoras Statue (Samos)	free	-
	TOTAL:	$8840

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Will there be additional funding from other sources? Please describe.

No

Are resources needed to continue the work of the project after BEF funding ends? If yes, please describe how these resources will be obtained. If no, please describe how the work of the project will be funded or continued after completion of funding by the BEF.

No, we do not need additional funding after returning. We'll complete the work of sharing our learning, updating our curricula, and planning a possible trip with students within curricular planning within school hours and during meeting times.

Do you foresee any potential challenges/obstacles? What is your strategy for dealing with them should they occur?

No

Will you be able to complete the project if only partial funding is available? ☐Yes X No Please explain how you might adjust the scope of the project if you receive partial funding::

There may be a few smaller cost items (like museum entrance fees) that we could eliminate those museums or sites from our itinerary, but the bulk of costs are flight and hotel which, if not fully funded, means we could not fund the trip.

For groups of three or more educators applying together: If the BEF can only fund a subset of your group, would you be able to move forward with this project? ☐Yes X No Please explain:

Each of us brings a different background and perspective to this trip and much of what we will gain from this trip is experiencing it together and learning from one another. If not fully funded for all 3 of us, the others would also not go.

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Charlie Baker Legacy Award Section

If you are applying for the Charlie Baker Legacy Award (fully described in the Call for Proposals), please indicate how the additional $1,000 funding would extend and/or enrich your project.
Please limit your response to one page.

If we were able to receive an additional $1000 in funding, we would extend our trip by 2 days to be able to visit the island of Crete.

Crete offers a rich blend of history, culture, and natural beauty beyond what we would find in Athens and Samos. Adding it to our trip presents an exciting opportunity to further blend mathematics with history, culture, and nature in ways that are not only educational but also inspiring. As the birthplace of the Minoan civilization as well as famous mathematicians like Euclid, visiting Crete would allow us to further explore the roots of mathematical thought and connect classroom learning to the legacy of a civilization that laid the groundwork for ancient Greek mathematicians.

The Minoan civilization, which flourished on the island of Crete from around 1450 BCE to 1100 BCE, made significant contributions to the development of mathematics, especially in the realms of geometry, measurement, and the application of math in architecture and engineering. While the Minoans did not leave behind a written mathematical tradition like the Greeks, their achievements laid the groundwork for later mathematical advancements. Learning about these foundational applications and advances would add richness and context to our study of later Greek mathematicians from our time in Athens and Samos.

Crete is home to ancient ruins, such as the Palace of Knossos, where geometric patterns and mathematical concepts like symmetry, proportions, and architecture come to life, and the Heraklion Archeological Museum, one of the largest museums in Greece and the best in the world for Minoan art, as it contains by far the most important and complete collection of artifacts of the Minoan civilization of Crete. Visiting these historical and architectural sites would provide us real-world examples of how math influenced early civilizations.

The art, music, and crafts of Crete provide diverse opportunities to explore patterns, proportions, and symmetry in cultural design. From traditional Cretan weaving to ancient pottery, we hope to draw connections between local artistry and mathematical concepts to create projects for students to complete. Additionally, Crete is known for its beauty and culture. Adding these 2 days to our trip would allow us to visit more leisurely, embrace the beauty of the country, and return rejuvenated and ready for the new school year.

Additional Cost Breakdown: Travel/Accomodations: $800 Museum and Site fees: $200