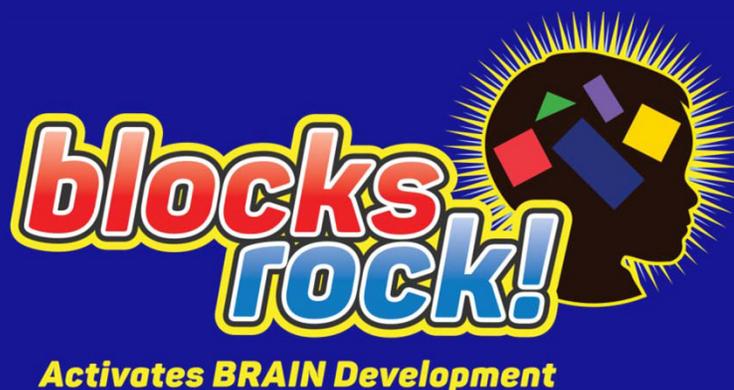


# Grant Application Guide: ASM Materials Education Foundation



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# About ASM

The ASM Materials Education Foundation awards 20 grants of \$500 annually to help K-12 teachers bring the real world of materials science into their classrooms. “Living in a Material World” grants recognize creativity and enhance awareness of materials science and the role that materials play in society.

“Material choices are part of the design of all things,” says Outreach Committee Chair, Dr. Julio Maldonado. “Yet, for many students, this part of our world remains mysterious – as unknown to our children as the depths of the ocean.”

Members of ASM International know how rewarding it is to develop and produce the metals, glasses, ceramics, semiconductors, and polymers that are at the heart of all new systems. Students, however, often learn about materials science too late for effective career planning. That’s why the ASM Foundation is committed to working with and supporting teachers through “Living in a Material World” K-12 teacher grants.

With a network of local Chapters across North America, ASM members are willing to work closely with local teachers to develop and implement various lessons. Feel free to share this information with other teachers in your district, as cooperative proposals are welcome.

## Impact of the ASM Foundation

The ASM Materials Education Foundation has extensive experience developing and disseminating classroom curriculum. Programs such as ASM Materials Camp have made a huge impact through in-depth, hands-on demonstration of what materials engineers do and the high-tech resources that are available to help solve complex problems. These programs create excitement and enthusiasm for STEM education, evidenced by the numerous testimonials that we receive from both student and teacher participants. For example, Wendy Bramlett of Tuscaloosa Magnet Middle School, Alabama, said, “This is absolutely the best workshop I have ever attended. Everything in the workshop is useful and can be easily implemented.”

In a survey of 350 camp graduates 84% are now enrolled in undergraduate STEM courses. Serving 13,356 students over the last 16 years, this programming is built on the concept that materials represent the perfect context to enhance students’ interest in STEM studies. Additionally, over 85% of the 8,915 teacher camp alumni are now utilizing “hands-on” materials concepts in their chemistry and physics classes, convinced that these concepts benefit student learning. These teachers believe that such concepts benefit their students and inspire them to learn science. Further, these hands-on demonstrations and tools have proven to make a positive impression on students by inspiring them to pursue science and engineering careers.

The Foundation is making a real difference in the drive to get more students interested in learning science, technology, engineering & math.



**ASM MATERIALS  
EDUCATION FOUNDATION<sup>SM</sup>**

# About the Grant

## **Application Process:**

Describe a hands-on, curriculum-based K-12 project that involves student observation, teamwork, mathematics, and science skills that enhance student awareness of the everyday materials around them. We encourage you to contact local ASM chapter members for assistance in creating imaginative, original projects that other teachers will want to emulate.

## **Application deadline: May 25**

Any applications received after the deadline will be considered in next year's cycle.

A one-page summary report is required upon completion of the project for each of the winning proposals.

Proposals will be reviewed by a subcommittee of the Action in Education Committee.

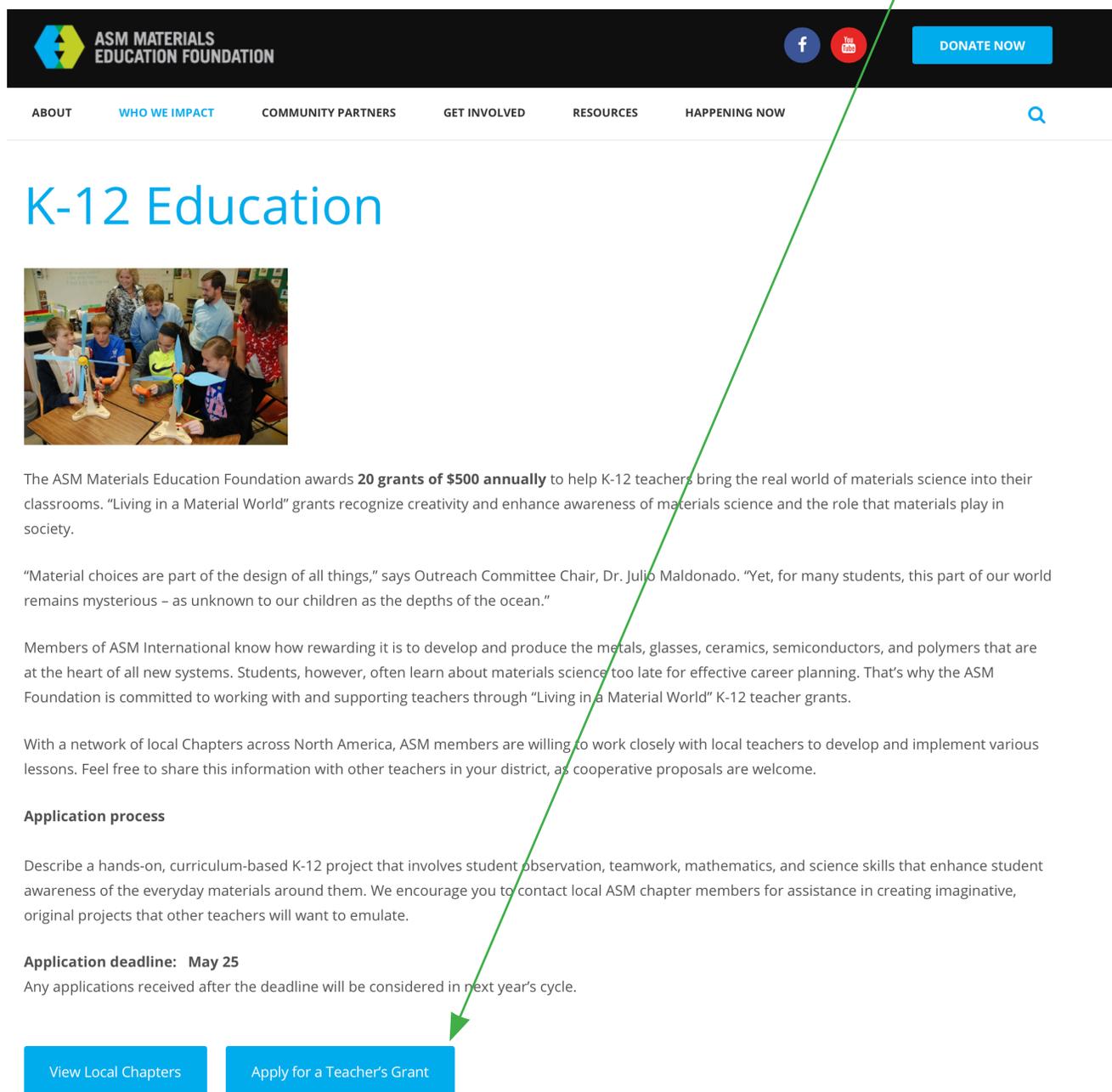
Results will be communicated to the applicants in early August.

If you have any questions, please contact: Jeane Deatherage, Administrator, Foundation Programs, at 440-338-5151, ext. 5533 or [jeane.deatherage@asminternational.org](mailto:jeane.deatherage@asminternational.org)

# Begin the Application Process

Visit <https://www.asmfoundation.org/who-we-impact/teachers/k-12-education/> to start the application process and click on the link to apply.

You may also access the survey directly at:  
<https://www.surveymonkey.com/r/T6TJ56V>



The screenshot shows the ASM Materials Education Foundation website. The header includes the logo, navigation links (ABOUT, WHO WE IMPACT, COMMUNITY PARTNERS, GET INVOLVED, RESOURCES, HAPPENING NOW), social media icons (Facebook, YouTube), and a DONATE NOW button. The main content area is titled "K-12 Education" and features a photograph of students and teachers working with a science model. Below the photo, there is text describing the foundation's grants, a quote from Dr. Julio Maldonado, and information about the application process and deadline.

**ASM MATERIALS EDUCATION FOUNDATION**

ABOUT WHO WE IMPACT COMMUNITY PARTNERS GET INVOLVED RESOURCES HAPPENING NOW

## K-12 Education



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Any applications received after the deadline will be considered in next year's cycle.

[View Local Chapters](#) [Apply for a Teacher's Grant](#)

A one-page summary report is required upon completion of the project for each of the winning proposals.

# Question 1: Contact Information

Complete your contact information on the first section of the form.



ASM MATERIALS  
EDUCATION FOUNDATION™

## "Living In A Material World" - K-12 Teacher Grants

APPLICATION FORM

### 1. Teacher's Name

Last Name	<input type="text"/>
First Name	<input type="text"/>
School	<input type="text"/>
School Address	<input type="text"/>
City/Town:	<input type="text"/>
State:	<input type="text" value="-- select state --"/>
ZIP:	<input type="text"/>
Country:	<input type="text"/>
Email Address:	<input type="text"/>
Phone Number:	<input type="text"/>

### \* 2. Grade Level/s Taught

# Questions 2 & 3

## \* 2. Grade Level/s Taught

**Tip:** You can click and drag this area on each box to expand the view of the response field. This will enable you to be able to see all of your text.



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## \* 3. Subject/s Taught

# Questions 4 & 5

## Question 4: Project Title

Enter in your project title. If you do not have a project title, you may enter in Have Fun While Building STEM Skills.

### \* 4. Project Title

*Have Fun While Building STEM Skills.*

## Question 5: Brief Description

Enter in a brief description of your project. See below for suggestions.

### \* 5. Brief Description

I plan on teaching my students additional STEM skills through the use of the Blocks Rock! product and application. Based on research completed by Indiana University, Blocks Rock! teaches students valuable skills such as math, hand-eye coordination, spatial learning, estimation and measurement skills, and more. It is my hope that by learning these skills, the students will be more prepared for careers in STEM fields, like science and engineering.

Blocks Rock game allows students to develop and learn new STEM skills while having fun in the classroom. I want to bring enough of the Blocks Rock! products into my classroom to allow my students to use them throughout the school week to encourage them to learn while having fun.

Blocks Rock! is the competitive, educational game in which two players, or two teams of players, compete to build a color- and shape-specific structure in the shortest amount of time. This project will allow me to provide the students with a STEM game that they can play and have fun while developing their skills.

Students will be able to use the Blocks Rock! game and app once a week during our daily STEM activity. ADD MORE RELATING TO YOUR SPECIFIC CLASSROOM PLAN.

Once a week during our daily STEM activity, I plan on allowing students to break into teams of 2 and compete against each other to help develop their problem-solving skills through the use of this game and the companion app. I will be monitoring the students activity and walking around the classroom to help them when I see them struggling with a puzzle. Our daily STEM activity is approx. 60 minutes in length.

# Questions 6 & 7

## Question 6: More Extended Description

Expand on your previous answer. See below for suggested wording/support information to include.

### \* 6. More Extended Description

Studies have shown that Blocks Rock! aids in developing a student's spatial ability and hand-eye coordination amongst other STEM skills. Blocks Rock! is thought to also develop skills in estimation, measurement, patterning, part-whole relations, visualization, symmetry, transformation, balance and problem solving.

Blocks Rock! is a competitive block building activity that helps students develop spatial thinking and mental rotation skills. Students also develop problem solving skills from using Blocks Rock! This brain development tool is as an educational resource to help students learn through play. Numerous research studies have shown the benefits of structured block play as part of a young student's classroom experience.

Structured block play requires the building of complex spatial configurations and more explicitly focuses on spatial analysis and spatial working memory. Researchers found that five, 30-minute sessions of structured block play resulted in changes to the neural network responsible for mental rotation as well as increased the speed and accuracy of mental rotation performance.

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## Question 7: In the event that your project is awarded a grant, the award check will be made payable to your school and sent to your attention, unless you note otherwise below.

7. In the event that your project is awarded a grant, the award check will be made payable to your school and sent to your attention, unless you note otherwise below.

# Submit Your Application

Once you have completed the application, review it one last time for any errors and then click on the “Done” button at the bottom of the page!

In the event that your project is awarded a grant, the award check will be made payable to your school and sent to your attention, unless you note otherwise below.

Done

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**Congrats on submitting your grant application!**

**The documents on  
the following pages  
can be used for  
building support for  
your project or for  
reference during the  
grant application  
process.**

# blocks rock!

## 3D

Activates **BRAIN** Development

This advanced 3D expansion to the classic competitive table-top learning game will take you to the next dimension of challenge. With the accompanying physical blocks that must be purchased from **blocksrock.com** (each

player needs a complete set), the app enables players to build complex and fun patterns that will make their brains light up! By merging the physical with the digital, Blocks Rock! has entered a whole new world of learning possibilities.



**FREE**  
Download  
at the App Store  
and Google Play



Accuracy is key, and a player only wins the round when the structure is completed successfully. The player with the most points at the end of the game wins!

Play solo, one-on-one, or in teams. Advanced functionality allows for users to connect multiple devices and for teachers to play the role of judge.

For more information visit us at [blocksrock.com](http://blocksrock.com)



In 2016, researchers of the Indiana University Department of Psychological & Brain Sciences conducted a comprehensive study that showed Blocks Rock! to be beneficial to STEM learning. This study corroborates with past research that structured block play needs to be a part of every young student's classroom experience. By playing block-building games like Blocks Rock!, students will develop greater spatial reasoning abilities.

And students with greater spatial reasoning abilities will have a higher likelihood of furthering their education and developing future careers in STEM, a field that the United States so desperately needs to improve.



# **blocks rock!**

**Activates BRAIN Development**

**Develop STEM skills with this competitive, educational game where the FUN just keeps building.**

**Play with two players or with two teams.**

**Fast-paced FUN helps build young minds.**

**Ages 4 to 104.**

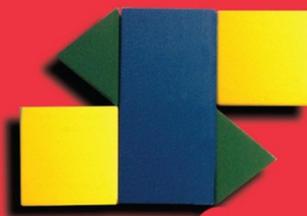


**Each carrying case comes with:**

**24 Blocks – 12 for each player**

**2 Decks of Cards – Levels 1 and 2**

**The Bell!**



# Develop STEM Skills through Playful Learning

**Blocks Rock!** is the competitive, educational game in which two players, or two teams of players, compete to build a color- and shape-specific structure in the shortest amount of time.

The game is played by choosing a card with the structure to copy, building the structure out of colored blocks, and ringing the bell to end the round. Accuracy is key, and a player or team only wins when the structure is completed successfully.

At the end of the deck, the winner of the game is the player with the most cards or with the most points as indicated on each card.

## **Proven to aid in spatial ability and STEM development skills.**

Experts believe that **Blocks Rock!** can help improve spatial ability, identified as an important component of STEM learning - Science, Technology, Engineering and Math – essential in our globally competitive world. Connections have been found between spatial ability and early learning of Math, as well as elementary and high school success in Math and Science.

The game's educational benefits include:

- **Color Identification:** Players match the colored blocks to the colors on game cards.
- **Shape Identification:** Players match block shapes to the shape of blocks on game cards.
- **Spatial Learning:** Players must build a structure to match the structure on the card.
- **Hand-Eye Coordination:** Hand-to-eye coordination is key to building a block structure in the shortest amount of time.
- **Math Skills:** Points on the cards can be added up at the end of the game to determine the winner, or younger players can count the number of cards each player has to find the winner.

**Blocks Rock!** is thought to also develop skills in estimation, measurement, patterning, part-whole relations, visualization, symmetry, transformation and balance.

## **Playing. Learning. Engaging.**

An educational tool like **Blocks Rock!** can be used for structured play at school and home alike. The game is easy to learn and requires no supervision. Teachers appreciate filling students' free time and grandparents enjoy playing the game with the grandkids. **Blocks Rock!** is the perfect addition to events and settings such as:

- **Math Night**
- **Family Night**
- **Tournaments**
- **After-School Programs**
- **Home Schooling**
- **Developmental Programs**



For more information, contact Debra Boyer  
317.602.6644 ext. 1001 or [dboyer@blocksrock.com](mailto:dboyer@blocksrock.com)

[blocksrock.com](http://blocksrock.com)

Check us out on Facebook and Twitter.



[Indiana University Bloomington](#) [Indiana University Bloomington](#) [IU Bloomington](#)

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## IU Bloomington Newsroom

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# IU neuroimaging study: Building blocks activate spatial ability in children better than board games

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• **Sept. 13, 2016**

### FOR IMMEDIATE RELEASE

BLOOMINGTON, Ind. -- Research from Indiana University has found that structured block-building games improve spatial abilities in children to a greater degree than board games.

The study, [which appears in the journal \*Frontiers in Psychology\*](#), measured the relative impact of two games -- a structured block-building game and a word-spelling board game -- on children's spatial processing. Such processing includes mental rotation, which involves visualizing what an object will look like after it is rotated.

The research lends new support to the idea that such block games might help children develop spatial skills needed in science- and math-oriented disciplines.

It is also the first study to use neuroimaging to explore the effects of block building on brain activity, said [Sharlene Newman](#), a professor in the IU Bloomington College of Arts and Sciences' Department of Psychological and Brain Sciences, who led the research.

"Block play changed brain activation patterns," Newman said. "It changed the way the children were solving the mental rotation problems; we saw increased activation in regions that have been linked to spatial processing only in the building blocks group."

The structured block-building game used for the study was called "Blocks Rock"; the board game was Scrabble.

The research builds upon previous studies that have shown that children who frequently participate in activities such as block play, puzzles and board games have higher spatial ability than those who participate more in activities such as drawing, riding bikes, or playing with trucks and sound-producing toys.

It also demonstrates that training on one visuospatial task can transfer to other tasks. In this instance, training on the structured block-building game resulted in transfer to mental rotation performance.

"Other studies look solely at behavioral changes, such as the improved performance on measures of spatial ability," Newman said. "We're actually scanning the brain."

To conduct the study, IU researchers placed 28 8-year-olds in a magnetic resonance imaging scanner before and after playing one of the two games. Play sessions were conducted for 30 minutes over the course of five days.

To create an equal distribution of spatial ability between the two groups from the start, the children were divided evenly according to several categories that have been linked to differences in spatial ability: gender, age, musical training, mathematical skill and socio-economic status.

The two groups of 14 children also took a mental rotation test while inside the scanner, both before and after playing the games. The test -- a longstanding measure of spatial visualization and analysis -- presents two versions of the same letter, and the children had to decide whether the second letter was simply a rotated version of the same letter or a rotated mirror image of that letter.

There were no differences in mental rotation performance between the two groups in either the brain activation or performance during the first rotation test and scan. But the block play group showed a change in activation in regions linked to both motor and spatial processing during the second scan.

The group who played board games failed to show any significant change in brain activation between the pre- and post-game scans, or any significant improvement on the mental rotation test results.

Insofar as the spatial abilities of 8-year-olds are still developing, Newman said the change from the first scan to the second scan might reflect a shift in the strategy used to solve the mental rotation problems.

In other words, as children develop their spatial abilities, they may move from a piecemeal strategy in which they analyze the internal relations or parts of an image to a holistic strategy in which the image as a whole is mentally rotated.

"The block play group showed a change in activation in regions linked to both motor and spatial processing," Newman added. "This raises the possibility that the block play group changed how they were performing the mental rotation task after training."

Ultimately, Newman, who in other work has explored the relationship between math and spatial reasoning, hopes that such findings will help students struggling with math and other disciplines.

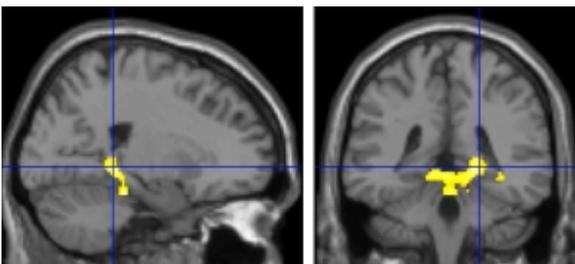
"Any way you can improve a child's mathematical competence, whether through block-building or any other method, that's where my interest lies," she said.

Newman is also the director of the [IU Imaging Research Facility](#) and associate vice provost of undergraduate education at IU Bloomington. Other IU researchers on the study were Mitchell Hansen, an undergraduate student, and Arianna Gutierrez, a research associate who was an undergraduate at the time of the study. Both are members of the IU Bloomington Department of Psychological and Brain Sciences.

This work was supported by a grant from the LaCrosse Family Business Trust. The IU Imaging Research Facility supported the work as well.



Children underwent brain scans before and after playing with either a block-building game or a word-spelling board game. | Photo by Indiana University



Brain scans show increased activation in the anterior lobe of the cerebellum and the parahippocampus during the second mental rotation test after children played with blocks. | Photo by Indiana University

# Questions?

If you have questions regarding the Blocks Rock! product, please contact us at [dboyer@blocksrock.com](mailto:dboyer@blocksrock.com).

Questions regarding the ASM Grant, please contact Jeane Deatherage, Administrator, Foundation Programs, at 440-338-5151, ext. 5533 or [jeane.deatherage@asminternational.org](mailto:jeane.deatherage@asminternational.org).



**Activates BRAIN Development**