Broadcom MASTERS 2020 Application Questions

This document previews the application questions for the Broadcom MASTERS online application. ALL entries must be submitted through the online application system; hard copies will not be accepted. The application deadline is **Wednesday, June 10, 2020 at 8pm Eastern Time**. The online application can be accessed at https://broadcommasters.fluidreview.com.

Entrants may email masters@societyforscience.org with any questions they may have. Please be aware this document contains many branching questions that are hidden within the application. Some of these questions will only appear based on the entrant's response to a previous question. The application appears here in its longest state.

Part 1: Registration

Please complete this form to register as an official nominee of the 2020 Broadcom MASTERS competition. The content in Part 1 is not used in evaluation. Please note that this section contains a second page.*Required Field

STUDENT INFORMATION

Student First Name*

Student Middle Name

Student Last Name*

Student Preferred Name/Nickname

Student Email Address* (we will use this email address for communications about this year's competition)

Student Long Term Email Address (please provide an email address that we will be able to reach you at in the future for alumni requests)

Student Phone Number (xxx-xxx-xxxx)

Date of Birth (mm/dd/yyyy)*

Sex

○ Female

○ Male

○ Other

Preferred Gender Pronouns

○ She/her/hers

○ He/him/his

○ They/them/theirs

○ Other (please specify) _____

Ethnicity

○ Hispanic or Latino

○ Not Hispanic or Latino

Race

☐ American Indian or Alaska Native

☐ Asian or Asian American

☐ Black or African American

☐ Native Hawaiian or Other Pacific Islander

☐ White

☐ Other

T-Shirt Size (adult sizes)*

○ Small

○ Medium

○ Large

○ Extra Large

If you are selected as one of the Top 300 MASTERS or 30 finalists, do we have permission to share your contact information with your members of Congress?*

○ Yes

○ No

Your Name for Public Materials

Please tell us how you would like your name to appear in public materials relating to Broadcom MASTERS (press releases, print materials, etc.)*

First Name for Public Materials

Middle Name for Public Materials (optional)

Last Name for Public Materials

Mailing Address

Street Address 1* [   ]

Street Address 2 [   ]

City* [   ]

State*
- ○ AK
- ○ AL
- ○ AR
- ○ AZ
- ○ CA
- ○ CO
- ○ CT
- ○ DE
- ○ FL
- ○ GA

… 33 additional choices hidden …

- ○ VA
- ○ VT
- ○ WA
- ○ WI
- ○ WV
- ○ WY
- ○ AS
- ○ PR
- ○ USVI
- ○ DC

Zip Code* [   ]

Languages

Do you speak another language besides English*?   ○ Yes

○ No

What languages do you speak?*

What languages do you speak? (select all that apply):

- ☐ Arabic
- ☐ Cantonese
- ☐ Filipino
- ☐ French
- ☐ German
- ☐ Hebrew
- ☐ Hindi
- ☐ Italian
- ☐ Japanese
- ☐ Korean
- ☐ Mandarin
- ☐ Portuguese
- ☐ Russian
- ☐ Spanish
- ☐ Vietnamese
- ☐ Other _____

Fluency*

Explain your level of fluency in speaking the language(s) selected above.

Why did you decide to conduct a research project this year? (select all that apply)*

- ☐ It was required by my science teacher/for my science class

- ☐ I was interested in a topic and wanted to investigate it
- ☐ I completed a project last year and wanted to continue my research
- ☐ My teacher encouraged me to complete a project
- ☐ My parents encouraged me to complete a project
- ☐ A friend wanted to do a team project and I decided to join
- ☐ Other (please describe) _____

Please select all that apply to your research experience this year*

- ☐ Conducted research at home or on my own time, apart from school
- ☐ Conducted research as part of my science class
- ☐ Enrolled in a research class at school
- ☐ Participated in a research program at my school after school or on weekends
- ☐ Relative, friend, or acquaintance made or helped me make an initial connection that led to my acceptance into a research setting (not at school)
- ☐ Teacher or school provided contacts or connections to scientists/engineers
- ☐ Identified and contacted a scientist/engineer independent of any support

Is your project an invention?*

Use the following definition to help you decide: An invention is a novel or unique device, process, or method. It could be an improvement on an existing product or a new process for creating a tangible product.

Do you consider your project to be an invention?   ○ Yes

○ No

Please briefly explain why you think your project qualifies as an invention.*

☐

Patents

Do you have any patents related to your research? Responses to this question are shared with our communications team for PR purposes (select all that apply):

- ☐ I have at least one patent.

- ☐ I have a patent pending.

- ☐ I am in the process of applying for a patent.

- ☐ I plan to apply for a patent in the future.

- ☐ I do not have, nor do I plan to apply for any patents related to my research.

- ☐ I do not have a patent for my Broadcom MASTERS research, but I do have a patent or patent pending for a different project.

PARENT/GUARDIAN INFORMATION

This information will be used for communication purposes after the application has closed. You may enter the same adult listed in the Designated Adult section, or you may choose a different parent or guardian.

Parent/Guardian First Name*

Parent/Guardian Last Name*

Parent/Guardian Relationship to Entrant

Parent/Guardian cell phone number (xxx-xxx-xxxx)*

Parent/Guardian home phone number (xxx-xxx-xxxx)

Parent/Guardian Email Address*

SCHOOL INFORMATION

Name of Current School (2019/2020 academic year)*

*If your school is not listed, please email masters@societyforscience.org with the name and address of your school and we will add it to the list. You can search for your school by typing in the name or the zip code. Home schooled students should select "Home School."

Type of School*

- ○ Public

- ○ Private
- ○ Charter
- ○ Home
- ○ Online
- ○ Magnet

School Address

Street Address 1* [   ]

Street Address 2 [   ]

City* [   ]

State*
- ○ AK
- ○ AL
- ○ AR
- ○ AZ
- ○ CA
- ○ CO
- ○ CT
- ○ DE
- ○ FL
- ○ GA

... 33 additional choices hidden ...

- ○ VA
- ○ VT
- ○ WA
- ○ WI
- ○ WV
- ○ WY
- ○ AS

- ○ PR
- ○ USVI
- ○ DC

Zip Code* [   ]

Identify the teacher who has most supported your science or engineering project. This teacher MUST be a middle school teacher, a middle school informal science program educator, or a middle school homeschooling instructor. Your teacher receives application reminders and notifications from The Society, and receives notification if you are selected as one of the 30 finalists or Top 300 MASTERS. This teacher will receive awards if you advance to the Top 300 MASTERS or finalist level. You will not be permitted to change the teacher listed here after the application deadline.

Teacher Information

Teacher Prefix [   ]

Teacher First Name* [   ]

Teacher Last Name* [   ]

Teacher Email Address* [   ]

Are you related to this teacher?*

This information is not used in the evaluation of your application.

- ○ Yes
- ○ No

Principal Information

Title [   ]

Principal First Name*

Principal Last Name*

Principal Email Address*

SCIENCE FAIR INFORMATION

You were nominated for the Broadcom MASTERS by {{ applicant.field__2281 }}. Did you receive a second nomination from another science fair?*

- ○ Yes
- ○ No

Please enter the fair password from the second fair*

Is this a team project?*

Just a friendly reminder: each member of a team project needs to submit his/her own independent application in his/her own words.

- ○ Yes
- ○ No

If you worked on a team, please list the name(s) of your team member(s). If you did not work on a team, please leave this question blank.

	First Name	Last Name
Team Member #1		

	First Name	Last Name
Team Member #2		

Are you an alumnus of the Broadcom MASTERS program?*

○ Yes, I am a former entrant, former semifinalist or former finalist. (Welcome back!)

○ I have received a nomination in the past, but this is my first time applying. (Congrats!)

○ This is my first year receiving a nomination! (Awesome!)

Part 2: Project Information

This is your chance to tell us about your awesome science or engineering project in your own words.If you are feeling stumped, take a look at your science fair board for inspiration. This section is designed to feel like a judging interview at your science fair. You will have an opportunity to share charts, tables, graphs, photos, etc. containing your data in a ONE (1) page PDF visual aid later in this application. Note: there are two pages in this section.*Required field

Select a category that best describes your project*:

These categories might differ from the categories at your local science fair. Here's a helpful hint to help you choose: think about what type of scientist or educator would best understand your project.

- ○ Animal Science
- ○ Behavioral & Social Sciences
- ○ Biochemistry
- ○ Chemistry
- ○ Computer Science & Software Engineering
- ○ Energy & Sustainability
- ○ Engineering—Electrical & Mechanical
- ○ Engineering—Bioengineering & Environmental Engineering
- ○ Environmental & Earth Sciences
- ○ Mathematics
- ○ Materials Science
- ○ Medicine & Health Sciences
- ○ Microbiology
- ○ Physics (includes Air/Space Science)
- ○ Plant Science

Project Title*

This is how your project title will appear in our materials if you are selected to the Top 300 MASTERS or top 30 finalists. For any symbols, please write the name of the symbol in all capital letters (ALPHA, GAMMA, etc.) Otherwise, please use normal Title Case.

Full Project Title*:

If the title of your project requires any special symbols or formatting (such as italics) please explain here:

What is your current grade (2019/2020 academic year)*?
- ○ 6th
- ○ 7th
- ○ 8th

Remind us, is this a team project*?
Just a reminder that each member of a team must submit his/her own application in his/her own words.
- ○ Yes
- ○ No

Project Overview

What was the inspiration for your science or engineering project?* (max 200 words)

How did you come up with your topic? Please describe if there was a personal experience, challenge or individual(s) that inspired your choice of this project. What did you learn about your topic before you started your project? If your topic was assigned or you got your project idea from an external source, what was the source? How did you make it original?

Project Summary (max. 250 words)
Please Select ONE question, then answer in the text box below*

- ○ Submit an abstract for your project (max. 250 words)
- ○ You are on an elevator and have only until the 10th floor to describe your project to a potential investor. Describe your project in three sentences or less (max. 250 words)

Project Summary*:

☐

If selected as one of the Top 300 MASTERS or 30 finalists, do we have permission to share this summary with media?*

○ Yes

○ No

Why is your project topic important to research? Who or what does your project impact and/or benefit?* (max. 100 words).

☐

Project Details

What was your research question? For engineering projects: what was the human need or problem you wanted to solve?* (max. 50 words)

☐

What was your scientific hypothesis or engineering design criteria?* (max. 125 words)

☐

Explain your methodology and procedures for carrying out your project in detail, addressing the questions below. *For engineering projects, explain your methods and procedures for building your design, addressing the questions below (max. 400 words).

1) What data did your collect and how did you collect that data? For engineering projects, how did you build your design?2) What were your testing procedures? For engineering projects, how did you test your design?3) Discuss your control group and variables tested. For engineering projects, discuss the controls and variables tested in your design.You can reference figures, tables, and/or

images from your visual aid in this section (See the Video Resources tab if you need an example of how to do this).

[ ]

How did you analyze and interpret your data?* (max. 300 words)

Use this section to write about the process of analyzing and interpreting your data. What were the results of your data collection? Did you notice any patterns in the data? Did you use any statistical methods or special analysis? For engineering projects, this question still applies. Tell us HOW you formed your conclusions through observation and any special analysis used. You can reference figures, tables, and/or images from your visual aid in this section (See the Video Resources tab if you need an example of how to do this).

[ ]

What conclusions did you reach*? (max. 250 words)

How does your data support this conclusion? Describe any limitations you had in your study and how that might have affected your results.

[ ]

What questions or problems arose that you were not expecting? How did you, or would you in the future, adjust your experimental design or your engineering design process to address these problems?* (max. 150 words)

[ ]

If you chose to continue exploring this topic, what would be the next step?* (max. 100 words)

[ ]

What was your favorite part of working on your research project? What did you learn about yourself from this experience?* (max. 100 words)

[ ]

Where did you conduct your experimentation?*

Please select all that apply.

- ☐ Home
- ☐ School
- ☐ Lab (Please Specify) _____
- ☐ Workplace (Please Specify) _____
- ☐ Other (Please Specify) _____

A science or engineering project is never a solitary activity. Tell us who contributed to your research and what resources did they bring to your project:* (max. 250 words)

Where and how did you conduct your research? What special equipment did you use? Who supervised and/or collaborated with you on your research (i.e. parents, teachers, mentors, peers)? What were their contributions? Were there others who helped you perform your research who you wish to tell the evaluators about?

If you were a member of a team project, please explain your role in researching, developing and presenting your project. Describe how work was divided among your team. (max. 150 words)

Part 3: Essay Questions

This section provides you with an opportunity to tell us more about yourself and your thoughts about science, technology, engineering and math (STEM) as they relate to your project and in general.Select one (1) question in each of the sections: About Me, and Solve a Problem, then compose your answers in the resulting text boxes.

About Me* (please select ONE question, then answer in the text box below):

○ Following the logic of Peter Parker becoming Spiderman after being bitten by a radioactive spider, what radioactive animal would you want to get bitten by? Why? What new abilities would you gain, and what would you use them for? (max. 250 words)

○ In your opinion, what is the greatest invention of all time? Why? If you had unlimited time and resources, what would you do to improve it?

About Me*:

Solve a Problem* (please select ONE question, then answer in the text box below):

○ Without searching the exact answer, how would you estimate the amount of trash generated in the United States in one year? What units would you use to quantify the amount? (max. 300 words)

○ Wildfires have torn across Australia. Imagine you are tasked with trying to end the wildfires. What new solutions would you engineer to help mitigate and/or prevent the wildfires? (max. 300 words)

Solve a Problem*:

Part 4: Personal Interests

Tell us a bit about yourself as an individual, apart from your science fair project and your thoughts on science or engineering. Share information that will help us get to know you better.*Required field

Check activities in which you are currently or have been involved:
Check all that apply

- ☐ Science Club
- ☐ Science/Math Olympiad
- ☐ Boy Scouts/Girl Scouts (provide rank) _____
- ☐ 4-H
- ☐ Future Farmers of America
- ☐ Boys & Girls Club
- ☐ School Publications
- ☐ Music (instrument or choir)
- ☐ Athletics
- ☐ Art Club
- ☐ Computer Club
- ☐ Community Service (where?) _____
- ☐ Robotics
- ☐ Odyssey of the Mind
- ☐ Science Bowl
- ☐ Science or Engineering Summer Camp
- ☐ Yearbook
- ☐ Student Council
- ☐ Foreign Language studies (list language) _____
- ☐ Other _____

Which instrument? (select all that apply)

- ☐ Piano

- ☐ Cello
- ☐ Violin
- ☐ Trumpet
- ☐ Guitar
- ☐ French Horn
- ☐ Saxophone
- ☐ Flute
- ☐ Clarinet
- ☐ Choir/Singing
- ☐ Drums/Percussion
- ☐ Oboe
- ☐ Other, please specify... _____

Which sport? (select all that apply)

- ☐ Lacrosse
- ☐ Soccer
- ☐ Baseball
- ☐ Basketball
- ☐ Tennis
- ☐ Swimming
- ☐ Golf
- ☐ Volleyball
- ☐ Track/Cross Country
- ☐ Gymnastics
- ☐ Softball
- ☐ Dance (you may specify type) _____
- ☐ Martial Arts (you may specify type) _____
- ☐ Fencing
- ☐ Other, please specify... _____

What hobbies or extra-curricular activities do you most enjoy and why? (max. 100 words)

[ ]

Science Training Institutes, Research Programs, Summer Programs

Please list the names of programs where you have conducted research projects, science summer camps you have attended, etc. Check the box to indicate if your Broadcom MASTERS project was conducted at any of these institutions. You may list up to 3 programs

	Name of Program	City	State	Dates	Website	Broadcom MASTERS Project?
Program 1						☐
Program 2						☐
Program 3						☐

Is there additional information that you wish to share with the judges to help them better know you as an individual and what is personally important to you? Future goals, favorite topics, accomplishment of which you are most proud, etc.– this is your chance to share anything (max. 100 words)

[ ]

Which one of the following STEM careers are you most interested in pursuing*?

Please note-- careers will display below in random order. To find a specific career, click inside the box and type the name. If it's included in the list, the career will appear in blue.

☐ Electrical Engineer

- ☐ Climatologist
- ☐ Medical Doctor
- ☐ NanoSystems Engineer
- ☐ Cartographer
- ☐ Biologist
- ☐ Biomedical Engineer
- ☐ Neurologist
- ☐ Chemist
- ☐ Mechanical Engineer
- ☐ Cardiovascular Technician
- ☐ Industrial Engineer
- ☐ Astrophysicist
- ☐ Computer Scientist
- ☐ Physicist
- ☐ Science Teacher
- ☐ Animal Trainer
- ☐ Sound/Light Engineer
- ☐ Pharmacist
- ☐ Epidemiologist
- ☐ Aeronautical Engineer
- ☐ Surgeon
- ☐ Surveyor
- ☐ Meteorologist
- ☐ Civil Engineer
- ☐ Materials Scientist
- ☐ Computer Engineer
- ☐ Nutritionist
- ☐ Optometrist
- ☐ Nuclear Engineer
- ☐ Dentist

- ☐ Orthodontist
- ☐ Physical Therapist
- ☐ Nurse
- ☐ Hydrologist
- ☐ Anthropologist
- ☐ Forensic Scientist
- ☐ Forest Ranger
- ☐ CAD Technician
- ☐ Imagineer
- ☐ Astronomer
- ☐ Audiologist
- ☐ Laboratory Technician
- ☐ Respiratory Therapist
- ☐ Health Care Professional
- ☐ Geologist
- ☐ Speech/Language Pathologist
- ☐ Veterinarian
- ☐ Statistician
- ☐ Mathematician
- ☐ Emergency Medical Technician
- ☐ Seismologist
- ☐ Zoologist
- ☐ Semiconductor Processor
- ☐ Satellite Imaging Engineer
- ☐ Biochemist
- ☐ Environmental Engineer
- ☐ Imagineer
- ☐ Web Developer
- ☐ Psychologist
- ☐ Software Developer

☐   Other _____

Why does this career interest you*? (max. 100 words)

☐