BLACKS IN GOVERNMENT

Science, Technology, Engineering and Mathematics Competition

2023 STEM Planning Guidelines

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2023 STEM
Student Competition

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Theme*: "**The Water Crisis in America, How do we Repair it?"***

The Blacks In Government Science, Technology, Engineering, and Mathematics-Student Competition (STEM-SC). This competition promotes science, engineering, and technology (STEM) capabilities at the local and national level. This year's competition will focus on creativity using technology, specifically building a functional video project. The official theme is *"The Water Crisis in America, How do we Repair it?"*. It is designed to introduce and encourage students to embrace STEM concepts and professions. The competition project will give students a quality learning experience and challenge them to develop important STEM competencies. No prior experience is necessary to participate in the competition. Students must work with a subject matter expert (SME) as a mentor.

Overview

This competition is designed to challenge the creative minds of high school students. The STEM competition invites students to identify a water system challenge in their area (or another area such as Flint, MI, Jackson, MS, rural towns across the US, etc. and demonstrate using computer programming a solution/improvement to the issue. Based on scientific research, students will write a story explaining the water crisis/system issue. Students will share suggestions for making improvements to the water crisis/system problem (i.e. is it a filtration, equipment, infrastructure and/or funding problem). Students use technology to create a 2-min video that shows the water system in action. Students will submit the video along with the written story.

Students will use technology to create animations, build interactive narratives, or program games. They will compete against other students at the chapter, region, and, ultimately, national level.

The STEM program is designed to teach logical and creative thinking skills, fundamental technical principles, and be the first exposure to how technology can help produce a new era of student creativity.

Connect with various students, teachers, technology enthusiasts, and hobbyists in the STEM community.

This planning guide provides the details needed to conduct a successful technical, creative competition at the chapter, regional, and national levels. Make sure every student in grades 9 through 12 has the opportunity to participate in the competition.

All student entries at the Chapter and regional level must adhere to all of the national published guidelines. Any entries submitted to compete in the national competition that do not adhere to the national guidelines at either the chapter or regional competition will be penalized and will notresubmit their entry at any level.

NOTE: STUDENTS "MUST" COMPETE AT THE CHAPTER AND REGIONAL LEVELS TO COMPETE AT THE NATIONAL LEVEL.

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If a chapter or region has only ONE entrant, the chapter president or the regional council president (as appropriate) must submit a written endorsement to the Regional Chair or National Program and Planning Committee Chair (as appropriate). Chapters and Regions must also provide the Judges' Score Sheets and the master score sheet to the Regional Chair and National Program and Planning Committee Chair, as appropriate.

PLANNING AND PROMOTION

Use the planning calendar below to determine the milestones for when to conduct the chapter and regional competitions:

CALENDAR

January 2023	Competition packages emailed out to all chapters and regions
January/February 2023	Distribute the brochure and flyers to all potentialsponsors, engineering professionals, and contestants (send to local school officials, teachers, civic organizations, churches, and youth organizations)
	Publicize the STEM competition and circulate press releases.
	Identify subject matter experts to work with the chapter to provide guidance.
	Select a diverse panel of three judges for the contest. Select judges from local colleges/universities, professionalorganizations, or high schools. The judges should have a background in engineering or another related field.
February/March 2023	Chapters conduct contests and select local contest winners.Submit the winner to the regional chair. Check with regional councils on the timeframe of regional competitions.
April/May/June 2023	Chapter/Regional Competitions. Competitions may be accomplished virtually also. *See Attachment 1.*
July 1, 2023	Submit Regional Winners and all required documents to the National Chair by email: bignationalprogramsandplanning@bignet.org or Adrianne.callahan@bignet.org. Student entry forms and ALLrequired documents must be postmarked no later than July 1, 2023. Also, provide names, addresses, email addresses, and phone numbers of primary and alternate chaperones to the National Program and Planning Committee Chair. NOTE: STEM competitors will NOT send their projects with the paperwork. They will transport them to the competition.
Aug 2023	National Competition scheduled during BIG's Annual National Training Institute.

COMMUNICATION

Contact school counselors and discuss what departments may be interested in receiving the materials. Talk with as many school officials as possible and always leave brochures and/or flyers.

As you discuss the STEM competition, remember to share Blacks In Government's goals and objectives with school officials, parents, and community leaders. Also, invite them to future chapter meetings.

Submit a press release to the newspapers and a press release with a 30-second public service announcement to the broadcast media in your area. You may call the newspaper, radio, or TV station beforehand to find out who should receive the information — follow-up with phone calls urging them to participate in the effort to find interested candidates.

The STEM Competition Brochure has an application form for students to submit to your chapter. Before passing these out, make sure you write your chapter representative's point of contact's name and number on the form, along with your application and project deadline.

SELECTING JUDGES

Select three judges who will rank the entries individually. Their combined ratings will determine the winners. Judges should NOT be acquainted with any of the contestants. Select both males and females as judges and alternate judges. The judges should have a background in Computer Science, Engineering, Science or another related STEM field.

HANDLING TIES

In case of a tie, the competition chair will establish the means for determining the 1st place winner. Only ONE 1st place winner can compete at the regional/national level.

FOOD/LODGING/TRAVEL

Check with your regions to determine what type of support they will provide chapters who participate in the program. National Blacks In Government will provide information on any travel and lodging funding for youth to attend the National Youth Competitions at the National Training Institute.

AWARDS

Local chapter and regional awards are determined and sponsored by individual chapters and regions. The National Awards are:

First Place	$1000 and a Plaque
Second Place	$600 and a Plaque
Third Place	$400 and a Plaque

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Conduct the STEM Competition Program at the chapter and regional levels to recognize your winning students. Remember to provide certificates of participation to all contestants. Invite parents, community leaders, the judges, and all BIG members and constituents to recognize award winners. Local colleges and universities, military facilities, or local businesses may provide you with location sites for the STEM Competition Program.

COMPETITION PROJECT REQUIREMENTS

Competition Level: 9th –12th Grades

Project

This competition is designed to challenge the creative minds of high school students. The STEM competition invites students to identify a water system challenge in their area (or another area such as Flint, MI, Jackson, MS, rural towns across the US, etc. and demonstrate using computer programming a solution/improvement to the issue. Based on scientific research, students will write a story explaining the water crisis/system issue. Students will share suggestions for making improvements to the water crisis/system problem (i.e. is it a filtration, equipment, infrastructure and/or funding problem). Students use technology to create a 2-min video that shows the water system in action. The competition will promote the designing process concepts, teamwork, *creativity*, positive attitude, and enthusiasm. School and community involvement will contribute to students' success in the competition beyond winning an award.

Projects will include using innovative technologies of the participant's choice to create interactive animated narratives that tell a story, build an environment, create an app, or a simple game. **Attachment 2** includes some suggestions.

Projects submitted must be the work of students**.** Student mentors and peers' involvement will be in supporting roles to support the student with the documentation (i.e., journalists, photographers, and guidance)**.** To compete in the National Competition, the student will have to compete in the Chapter and Regional competitions.

STEM education. Chapters/Regions should provide a progression of courses or program of study that prepares students for building their projects. For successful engagement, participants may require developing more technical skills, including mathematics and science abilities.

Written Documentation. Documenting the development process in a log/journal is a fundamental part of the project development process. It involves fostering specific, descriptive writing skills. Participants must detail the method and challenges for their developmental process. Presentation could include classifying the types of project components (tools, design, software, language, and others).

Oral Presentation. Students will be required to give a 4- to 6-minute oral presentation at the chapter, regional, national competitions on their creative video project and their educational journey. They can also display their projects during this time **if they desire**.

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Competition General Rules

Provide these rules to all contestants

The official theme is: *" The Water Crisis in America, How do we Repair it?"* Students must understand the rules and guidelines of the STEM Competition. They should also be made aware of the guidelines for scoring.

The Blacks In Government STEM Competition is divided into three competition levels—Chapter, Regional, and National. You must compete at the Chapter and regional level to compete at the national level. If a chapter or region has only ONE entrant, the chapter president or the regional council president (as appropriate) must submit a written endorsement to the Regional Chair or National Program and Planning Committee Chair (as appropriate). Chapters and Regions must also provide the judge's score sheets and master score sheet to the Regional Chair and National Program and Planning Committee Chair, as appropriate.

NATIONAL FIRST PLACE WINNERS ARE INELIGIBLE FOR FUTURE CONTESTS.

1. Contestants must be in grades 9 through 12 and must be in good academic standing.
2. Contestants must build innovative projects with guidance from SMEs/mentors.
3. Contestants must give a 4- to the 6-minute oral presentation on how they developed their project during the competition at the local, regional, and national levels.
4. Contestants not providing a presentation will be disqualified.
5. Birth certificate and PDF copy of an essay describing how students developed their project "MUST" be presented to the Chapter, Regional, and National Committee Chairs before the competition.

PROJECT

STEM Competition theme: *"The Water Crisis in America, How do we Repair it?"* The requirements take into account the scope and spirit of the competition. Participants will use technology to create interactive animated projects that tell a story of a 2-min video that shows the water system in action. The project will help students learn how to use logical and creative thinking skills and create narratives. They will get practical experience with science and technology while exploring their creativity simultaneously.

All submissions must have creative, artistic, and educational value and be interactive, exciting, and appealing visually.

1. All submissions will be evaluated for creativity, visual presentation, and technical implementation to develop the project.
2. Projects will be no longer than 3 minutes long.
3. A 4 – 6-minute oral presentation is required. Every 15 seconds under 4 minutes or over 6 minutes will incur deductions from the overall score.

4. Students will be provided with their workspace. Each team will have access to one electrical plug for charging.
5. Practice time will be available preceding the competition.

Project Construction

Animations will be interactive narratives that tell a story and build an environment. Entries to the animation category will be judged 0:

1. **Innovation and Uniqueness:** How creative and unique is the story being told or the presentation's approach?
2. **Visual Presentation:**
   - How immersive is the world that has been created? An "immersive experience" pulls individuals into a new, augmented, or more engaging reality via technology. Creation requires using one or more technologies together. (Attachment 2)
   - How complex or impactful is the flow of the visual representation, camera movements, and general composition?
3. **Technical Implementation:**
   - How detailed is the technical implementation?
   - Does the entry make use of technical concepts to create the project?
   - Is the creativity observed, making it easy to understand?
   - Does the project make use of audio, video, and other technical tools and special effects?
4. Usefulness: Does the narrative educate, inform, or entertain?
5. Oral: 4- to 6-minute presentation

Project Compliance

1. Each entry must be original in concept, design, and execution and may not violate U.S. copyright laws. Any entry copied from an existing project, narrative, or image created by someone other than the contestant violates the competition rules and will not be accepted.
2. All projects will be inspected for compliance with the rules before the competition.
3. Failure to comply with the guidelines will result in disqualification.
4. Individuals who advance to a regional/national competition are allowed to make improvements to their projects.

Penalties

Each student will be penalized 10 points for the following reasons:

1. If the student fails to provide a 1- to 2-page written narrative describing how his or her project was developed.
2. If the student required written entry document does not follow the national guidelines for entry.
3. If the student entry does not relate to the current STEM Competition theme: *" The Water Crisis in America, How do we Repair it?"*

Disqualification

Students will be immediately disqualified for the following reasons, and they will not be able to resubmit their entry for reconsideration.

1. If any of the projects appear to have inappropriate or *plagiarized* content.
2. If the contestants do not provide a demonstration.
3. If the student's paperwork was not received by the required submittal date.

Protests

Individuals may challenge/protest a decision or rule interpretation of the youth competition during the *Chapter and Regional* competitions using the following guidelines:

1. In chapter competitions, the protestor must challenge a decision within 72 hours by notifying the Chapter Program and Planning Chair (CPPC). Once an opposition is made, the CPPC shall notify the contestants potentially impacted by the challenge/protest immediately.
2. If the challenger does not receive the answers required, a written appeal request must be sent via email to the Regional Program and Planning Chair (RPPC) within seven (7) days of the chapter's decision. The written appeal should include all the facts and arguments that would support reversing the decision. The RPPC will make a decision and email a response to the challenger within seven (7) days of receipt of the appeal.
3. If the RPPC fails to comply within seven (7) days or the challenger is unsatisfied with the response, the challenger has seven (7) days to forward the appeal to the National Program and Planning Chair (NPPC). Once the appeal is submitted to the national level, the NPPC will determine the appropriate chapter, regional, and national officers required to vet the challenge/protest on a case-by-case basis.
4. Protests made at the national competitions must be submitted by the Regional Program and Planning Chair (RPPC). The protestor must challenge a decision within 72 hours by notifying the National Program and Planning Chair (NPPC) in writing via email. The protest must be based on facts with documentation.

5. The decision made at the national level will be the final and binding decision. The NPPC will provide a written justification for the final decision to the challenger, CPPC, and the RPPC within seven (7) days of receipt.

Pointer for Youth

This competition aims for students to have a good time creating, designing, and developing creative video projects. Also, students will learn many academic and life skills. They should expect to encounter a set of open-ended challenges that will require solving problems, inventing strategies, and testing their projects' performances. Students can expect to test multiple designs until they meet their objectives.

In the event of a Tie

In the event of a tie at the National Competition, the tied contestants will be re-judged by an additional judge who will serve as a tie-breaker using the scoring criteria. If the additional judge's scores do not break the tie, a drawing will determine the winner. The remaining name will be the subsequent placement.

STEM Competition Scoring Categories

Scoring procedures at all levels of the competition will be identical and based on a point system. Projects will be judged on five criteria: user interface design, creative interactivity, user experience, usefulness, and oral presentation. A team of three judges with technical and non-technical expertise will evaluate the demonstration. Before the presentations, judges will be allowed to interview each contestant for 10 minutes. The following point value of each category equals a possible 100 points:

CATEGORY	EXPLANATION	POINTS
1. Innovation and Uniqueness	The story being told or the approach of the presentation is unique. Creative and engaging content Strategic uses of technology **(**interactive software/tools**).**	30
2. Visual Presentation	The flow of the visual representation, camera movements, and general composition is impactful Connected events, actual or imaginary, presented in a logical sequence of moving images and special effects	20
3. Technical Implementation	Technical implementation is intricate	15

CATEGORY	EXPLANATION	POINTS
	Uses technology to simplify or structure the project Creativity makes it easy to understand the narrative/storyline Makes use of audio, video, and other technical features	
4. Usefulness	Provides useful information (educational, informative, and entertaining)	15
5. Project Development Journal	Evidence of a design process Professionally organized and easy to understand	10
6. Oral presentation*	4- to 6-minute presentation on how they researched and developed their project	10
TOTAL		**100**

***Calculations Committee will deduct three (3) points for every 15 seconds under four (4) minutes or over six (6) minutes.**

ATTACHMENT 1: BIG Oratorical and STEM Virtual Competition Guidelines

SCHEDULE YOUR COMPETITION

- Schedule your competition at a time that works for all involved.
- Determine if you need people to register to attend. Registering can help you track who will attend your competition before it starts, how many joined, and follow-up communications after the competition.
- Get help by enlisting a competition team who can help you with logistics while students focus on delivering their orations.
- Make sure you have a communication plan, including promoting your competition on webpages, social media, and email.
- It helps to contact primary attendees and send reminders leading to the competition, including an hour before, so people remember to join on the competition day.

SCHEDULE A REHEARSAL

- Invite committee POCs, students, mentors, timekeeper, calculators, and judges to the **rehearsal**. Have someone act as an attendee to assess the experience.
- Have students and committee members connect in the same manner from the same location and device used for the live event.
- Test everyone's audio. Assign someone to control muting.
- Videotape the rehearsal. Share video in the rehearsal to ensure participants can be seen and heard clearly. Adjust lighting if needed, and have them remove distracting items from their background.
- Have all students test content sharing and any multi-media sharing from the same device they will use in the competition.
- Check the timing, transitions, and interactive features you will use.

ROLES AND RESPONSIBILITIES

- The host role is usually assigned to the person who starts the competition. The host needs to have a user account. Others will be invited.
- Assign an MC to welcome attendees, introduce speakers, keep time, and manages interactive features.
- You can also assign a person that will grant privileges to attendees, students, and judges, and manage the recording, and end the competition.
- Discuss logistics and etiquette, like identifying when presenters mute or unmute, and how comments and questions will be handled.
- If you are assigning other presenters, practice these specific activities in your rehearsal.

DAY OF THE COMPETITION

STEM Project Judging:

- Schedule the STEM project judging before their presentations. Only allow committee members, STEM students, mentors, judges, calculators, and timekeeper

DAY OF PRESENTATIONS (STEM AND ORATORICAL STUDENTS)

- Regional or chapter committee chairs should assign numbers for presenters by pulling names from a bag. Notify students of their numbers. Rules in guidelines still apply concerning sharing personal information.
- All participants should join 15-30 minutes early to allow testing their connection on the day.
- Distribute electronic programs and rules of engagement documents before the competition. That way, attendees will not be left out if they cannot see the presentation or need to join via audio-only because of low bandwidth.

GO LIVE

- Welcome attendees and announce that the call will be starting in x amount of minutes.
- Go over the rules of engagement for attendees like muting and opportunities they will have to comment on.
- Tell your audience if you will be sharing your content and recording after the competition.

AFTER THE COMPETITION

- Plan to stay in the virtual competition after the scheduled time has concluded to answer additional questions and save chat panels for post-competition follow-up.
- Make available the recording links or shared content from the competition.

ATTACHMENT 2: Technology Suggestions

An "immersive experience" pulls a person into a new or augmented reality, enhancing everyday life (making it more engaging or satisfying) via technology. They often use one or more technologies linked together. The technologies available to us today make it easier than ever to create immersive experiences that people love. Here are some of the most common types and examples of how brands have used them successfully.

Augmented Reality

Augmented reality (AR) uses technology (like a camera and screen on a smartphone) to add a computer-simulated layer of information on top of the real world. AR can be considered an enhancement of the world around you – rather than creating a new virtual world like VR, it simply adds (or subtracts) information already there. The Skyview app is a great example of AR in action, allowing you to see where constellations are in the sky in real-time as you move your phone around:

Virtual Reality

Virtual reality (VR) immerses the user inside a digital simulation they can interact with. Stimulating as many senses as possible is key to ensuring the user feels like they are in that virtual environment. Furthermore, most VR experiences (but not all) will use special hardware to do so. Google's Expeditions is a great example of mobile VR in action, offering users the opportunity to explore imaginary worlds:

Mixed Reality

Mixed reality (MR) is an enhanced version of AR, tying in VR elements as well. It often integrates entire virtual objects into the real world vs. simply adding information to create an even more immersive experience than AR could alone. Time's Immersive app mixes the virtual world and the real world with objects in your home (like your kitchen table) to bring experiences to life:

Digital Twins

Digital twins are near-exact virtual models of real-life objects, processes, or systems. They are most commonly used in manufacturing or engineering to simulate physical things to optimize or study how they behave before building them. For example, NASA uses digital twins to monitor and optimize satellites in space from the ground, and Mercedes uses a digital twin to optimize its F1 cars' performance.[7]

360º Content

360º content is a photo or a video you can "explore." As the name suggests, 360º photos and videos are shot in every direction at the same time and let you rotate the viewing angle to see what's "around you" as you view the video/picture. A great example of 360º content is how Expedia created a series of videos on different travel destinations, immersing the viewer in each location:

Excerpt from: What is an Immersive Experience And How Do You Create One? | CleverTap

Types of Software

NAME	DESCRIPTION	URL	COST
NCH Software	YouTube Video Media	https://www.nchsoftware.com/software/video.html	Free
Storyblocks	Includes libraries of already existing videos with opportunities to combine and create own unique project	https://www.storyblocks.com/video -	Free
Vimeo	Similar to YouTube	https://vimeo.com/	Free
Filmora Video Editor	Create & edit your videos just in minutes	https://www.iskysoft.us/lp/filmora-video-editor/bing.html?msclkid=1e6df033507a196e98daafee36765845&utm_source=bing&utm_medium=cpc&utm_campaign=FilmoraWin_SS_US_pid(1598)_%2BRlsa_Bing&utm_term=video%20creator%20free%20download&utm_content=video%20creator-Windows	Free
Video Editor	Video and audio editor	http://www.videosoftdev.com/	Free
SKETCHAR's	SketchAR is an AI-based mobile app and a platform for developing people's creativity through the unique interactive approach of AR drawing, photo editing, and gamification.	Enhance your creativity using AI+AR (sketchar.tech)	Free
The 9 Best Coding Games to Build Your Programming Skills	Coding games help you learn faster with hands-on practice and experience. Plus, they are a fun way to test your programming skills!	The 9 Best Coding Games to Build Your Programming Skills (makeuseof.com)	Free
Adobe Premiere Pro	Turn raw footage into flawless productions with the industry-leading video editing software.	https://www.adobe.com/products/premiere.html	Cost

NOTE: This list is not all-inclusive. Participants are encouraged to use whatever technology will bring their water system and solution to life in an immersive environment.

NOTES