

Project Narrative

Project Name: W4WC - Youth STEM through Amateur Radio Outreach

Club Name: Andrew Johnson Amateur Radio Club (Greeneville, TN)

Your project may be simple or complex. Please use the questions below to describe the details of the project and how the grant would be utilized to make it possible.

Transformative Impact

1. Describe the goals that you hope to achieve as part of your grant program. Be sure to emphasize how the achievement of your goals will have a transformative impact on your group, Amateur Radio operators around you, and your community. Please indicate the Grant Category or Categories that your program will address and be sure to outline your goals in each Grant Category. Also please note, in the questions which follow, the number of people outside your club that you expect to serve for each Grant Category.

Answer:

Grant Category: STEM Learning and Youth Outreach

Our goal for the pilot class is for 10 students to gain their Technician license and fine tune the curriculum for future classes.

Our goal overall is to enrich the lives of Greene County Tennessee youth, their families, and the community by providing STEM classes that lead to a technician class license, a space to explore and experience electronics (electronics workbench) and get on the air (amateur radio station).

Going forward we plan to offer classes to all amateur radio class licenses, adding more STEM classes such as Arduino programming, radio building, and morse code providing fertile ground for exploring the varied interests and community services offered by Amateur Radio.

2. Describe your plans to provide training and skills development for hams and the public beyond the membership of your club. Explain how your project will enable and be coupled with your training and mentoring plans. Include an estimate of the number of people you plan to train within the first 2 years of your project.

Answer:

The AJARC and Greene County Makers will support and develop STEM classes leading to an amateur radio license (Technician) to be taught at the Greene County Makers space and make them available to the Greene County Tennessee community. We are targeting youth ages 8 to 18 primarily. Parents are also joining the classes as they are interested and supporting their

children in learning the material, all the while obtaining their license and growing the amateur radio population.

We have created a training plan for a pilot class of five home school youth and their parents. It will begin July 7, 2022 and run weekly for 3 months. At the end Volunteer Examiners (VEs) will administer the exam. Running this pilot will allow us to present the curriculum and improve upon it for future classes. The curriculum will be made available to any group that would like to hold their own STEM classes leading to a license.

Going forward we plan to offer classes to all amateur radio class licenses, adding more STEM classes such as Arduino programming and radio building. Class duration will vary depending on the topic. In the course of 2 years, we estimate that we can reach 80 to 100 youth. With other groups using our curriculum, the numbers would be much larger.

3. Describe your plans to deliver Amateur Radio based STEM education in your community through your project. Please include an estimate of the number of groups you hope to serve with STEM education and the average size of the groups within the first 2 years of your project.

Answer:

The STEM classes curriculum will follow the 2022-2026 Technician Class FCC element 2 question pool syllabus and the ARRL Ham Radio License Manual (5th Edition). Students will be taught electricity, electronics, math, radio, antennas, propagation, operation, radio and test equipment, rules and regulations, and safety. These topics align very well for a coordinated curriculum. Each can stand on its own. Combined they lead to a Technician license.

Our approach to teaching youth who may find the subjects above their head is to make each topic approachable. By that we mean each concept taught has something that can be touched. For example, we begin by showing batteries of different size and chemistry. We explain voltage. We have the student measure voltage with a multimeter. This simple exercise involves several questions on the Technician license (battery chemistry, voltmeter, for example).

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Going forward we plan to offer classes to all amateur radio class licenses, adding more STEM classes such as Arduino programming and radio building. Class duration will vary depending on the topic. Class size will be limited to 10 youth students (and parents). In 2 years, we estimate that we can reach 80 to 100 youth. With other groups using our curriculum, the numbers would be much larger.

4. Explain the steps that you are planning to involve minorities in your project and how your program will help to improve diversity in Amateur Radio within your group and your community?

Answer:

All youth and their parents are welcome to attend the classes and work toward obtaining an amateur radio license. The only requisite is that they have a desire to learn.

We are also mindful of presenting an equitable, diverse, and inclusive STEM environment. We are following the great advice from this YouTube video: Equity, Diversity and Inclusion in STEM Education (<https://youtu.be/iUiDr9LXcD0>). In this video we learn as teachers to present how diverse the contributions of minorities and their impact on STEM. In this way they can see that they have a place in the world.

5. Estimate the potential number of people (hams and non-hams) that would benefit from the proposed grant program within the first 2 years of your project.

Answer:

We estimate that between 80 to 100 non-hams will benefit from this proposed project in 2 years. We plan to offer license classes for General and Extra which we estimate between 10 to 20 hams will benefit.

6. Estimate the potential of your program to create growth in the number of licensed and active amateur radio operators within the first 2 years of your project.

Answer:

The proposed project presents STEM classes that are in line with the 2022-2026 Technician Class FCC element 2 question pool syllabus. The classes cumulate with a volunteering licensing exam session. The Technician exam will be the students' confirmation that they accomplished a goal: that of gaining their amateur radio license.

We estimate that between 80 to 100 non-hams will benefit from this proposed project in 2 years. We plan to offer license classes for General and Extra which we estimate between 10 to 20 hams will benefit.

7. How will your project benefit members of your community who are not hams? Estimate the scope (numerically if possible) of the benefit to the public.

Answer:

This project will benefit the community by adding a community of individuals that have greater knowledge and skills related to STEM and amateur radio. They can go into the community as ambassadors and volunteers for events and emergency communications.

8. Discuss the potential of your project to protect and utilize amateur radio spectrum.

Answer:

The potential is to enrich the youth of Greene County and expand their horizons in STEM and providing seeds for future growth in amateur radio.

9. What are your plans to create positive public awareness and support for Amateur Radio in your community as part of your project?

Answer:

Working with Greene County Makers our plans are to schedule regular events such fox hunting, antenna and radio building. We will publicize these through media channels.

10. Would you be willing to create content to help promote the ARRL club grant program? Please describe plans that you would be willing to commit to in this area. Please outline how you would utilize multiple channels including social media, Video, Print, Television, and other media outlets

Answer:

Yes. We would acknowledge the grant in enabling the STEM classes, electronics workbench, and amateur radio station by placing plaques. We would also include acknowledgement of the grant when we promote the classes through social media, local newspaper, radio and television.

Execution Capability

1. Explain the number of volunteers that are required to execute your grant program. Please explain the source of the needed volunteer help and the level of committed volunteers that you have in place currently. Also, please explain your plans to secure necessary volunteer help that is not currently in place.

Answer:

For the pilot class, we have two volunteers from AJARC, two from Greene County Makers, and two from Free Wildlings Homeschool Playgroup. These volunteers have been actively planning the pilot for over a month now.

Going forward, we will recruit volunteers from all three groups to create future classes, help with logistics, setting up the classroom area, maintaining the electronics workbench, and supervising the amateur radio station. We are fortunate that we have several people willing to join in.

2. Outline the role of and process used by key members of your club's leadership team in the following areas: 1) Securing volunteer participation in projects, 2) Administering and keeping records pertaining to the use of funds, 3) Developing plans and executing projects and schedules.

Answer:

- 1) Steven Bible, N7HPR, will secure volunteer participation from AJARC and GCM. Kim Fox from Free Wildlings Homeschool Playgroup will secure the volunteers from this group.
- 2) Larry Whiteside, KN4MVH, is the secretary/treasurer of the AJARC. He will administer the funds and keep records of purchases. We will ensure that our records keeping is transparent and auditable.
- 3) Steven Bible, N7HPR, is the overall project manager and curriculum developer. In meeting with key individuals in the three groups and actively networking with others to develop and execute the project.

3. Describe a project or program that you have successfully executed during the previous 5 years of similar scope, financial value, volunteer levels, and complexity. Describe the goals that you achieved, and the scope and makeup of the people served.

Answer:

Steven Bible, N7HPR, is the past president of the Tucson Amateur Packet Radio (TAPR) organization. In the past 5 years, TAPR has been involved in the design and development of several projects (HPSDR, WSPR, HamSCI). He has organized and executing the ARRL/TAPR Digital Communications Conference for the past 21 years.

These accomplishments were achieved by leading a diverse and global community. For example, the HPSDR project achieved the goal of designing and producing for sale a high-performance software defined radio. Its design is considered to be one of the most advanced for SDR. Over 500 HPSDR radios were produced by TAPR and sold.

The AJARC, with a membership of 57 people, has produced and manned an annual hamfest (<https://greenevillehamfest.com/>). Club members organized and set up the hamfest. For the 2022 hamfest, 192 people attended. In addition, AJARC organizes and sets up Field Day at a local park and operating a 6A station. Several members participate in setting up the equipment and operating for the event. Both the hamfest and Field Day have been promoted in the local newspaper, radio, and television.

4. Provide a detailed plan including a schedule with key milestones identified, a budget breakdown for the use of grant funds, and the numbers of and roles for the volunteers required to execute your project. Please use the budget and schedule templates provided.

Answer:

In summary,

- 1) We have been planning the pilot class for the past two months. We introduced the class to the youth and their families during the AJARC 2022 Field Day event. The first class is scheduled for July 7th. We will run the class weekly for 3 months.
 - 2) Upon receiving the grant, we can purchase the equipment for the electronics workbench and the amateur radio station. Space has already been allocated at the Greene County Makers space for the class, workbench, and radio station. Volunteers will be mustered to setup and maintain each.
 - 3) After the pilot class, the curriculum will be finalized and made available to others who wish to emulate our classes.
 - 4) We will then begin planning the next Technician Class.
 - 5) We will begin planning future STEM classes based on the requests from students.
 - 6) Classes will be advertised through social media (Facebook) to regional hams, homeschool groups, and makers.
 - 7) We will promote the classes (before, during and after) on social media, local newspaper, radio and television.
5. Please identify any dependencies that you have for support by third parties from outside your club for the successful execution of your project. Please secure and attach letters outlining each required third party's commitment to supporting your project.

Answer:

Greene County Makers – To whom it may concern, I would like to articulate this organization's commitment to the project outlined in the amateur radio licensing proposal. We would be delighted to provide resources to nurture this and other STEM based programming at our facility.

Regards,

Peter E Higgins

President, Greene County Makers

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Mobile: (423) 278-8279

Free Wildlings Homeschool Playgroup – "I, Kim Fox, a member of the Free Wildling Homeschool group, is committed to supporting the project outlined in this project proposal." You can reach me at my email address: jkfox05@yahoo.com phone: 423-637-9054

6. Discuss the risks associated with achieving the goals stated in your proposal. Also discuss the top risks you face in executing your program on schedule and within the planned budget. For each risk, outline your plans to mitigate or limit negative impacts.

Answer:

The risks are:

- 1) Teaching seemingly technical topics (e.g., electricity, electronics, radio, etc.) to youth to the level they learn and understand. We will not be teaching the exam questions. We will be teaching the topics in the 2022-2026 Technician Class FCC element 2 question pool syllabus. Therefore, it is up to the curriculum developers to think of ways of presenting the topics in an approachable manner. This will be a major goal of this project.
- 2) Low class attendance. For the pilot class, we have 5 students and their parents already signed up.

7. Does your project require funding beyond what is outlined in your grant application? What other funding sources are you pursuing and what is the probability you will receive the additional funds? Have you applied for funds that duplicate or overlap those requested in your grant application? If so, please list the sources and requested amounts.

Answer:

No. The only other funding source is from the AJARC. It has already agreed to two hundred dollars to support this project's pilot.

8. Discuss the funds that will be required to operate and sustain the project in your grant after the funds you are requesting have been exhausted. What level of on-going funding do you require and what is your plan for securing the necessary funding to sustain your project? If you are going to charge use fees to use the resources funded by your grant or existing resources directly enhanced by your grant, please explain these fees in detail and specifically relate the fees to ongoing costs directly associated with operating your project. Note that ARRL club grants may not be used for profit activities, commercial activities, or revenue generation beyond covering the direct costs for ongoing sustaining operations of the funded project.

Answer:

Funding required after the initial fund are anticipated to be sustaining class materials. For example, the flip charts are consumable. Funding for consumable items can come from the students themselves paying a small fee to enter the class. Charging a fee also shows a level of commitment to attending the class. In our experience, if offered a free class, there is very little holding them to attending and completing it.

This project is not for-profit. Any fees collected will only be for purchasing consumable items and assisting the Greene County Makers in incidental expenses such as electricity.