

# YOUTH-LED STEM ACTION GUIDE





YSY is on a mission to make working together for the common good the common expectation and common experience of every young person. Since 1986, YSA has activated young people, ages 5-25, and their adult champions to find their voice, take action, and acquire powerful civic and 21st Century skills as they solve problems facing their communities.



The Collective for Youth Empowerment in STEM & Society (CYESS) is an initiative of the Afterschool Alliance that brings together organizations who believe in the power of youth to improve their communities using STEM. We are a network of people and organizations working to integrate teen leadership, civic engagement, and STEM in afterschool and out-of-school time programs. Our group of educators, researchers, and leaders, is dedicated to both improving our own practice in service of a more civically engaged and STEM-literate society AND supporting other programs and practitioners to enable youth to improve their communities using STEM.



# Welcome to the Youth-Led STEM Action Guide

This guide is for young people who want to make a real difference in their communities using STEM. It helps you choose an issue you care about, use STEM skills to understand the problem, and take action. You lead the work—STEM is your tool to turn ideas into impact.

## Who is this guide for?

This guide is for youth in afterschool and out-of-school programs, including clubs, councils, and advisory groups; it can also be used in schools. You can use it on your own or with a group. Adults may support you with guidance or resources, but you stay in charge of the ideas and decisions.

## What will you do?

You'll identify a community issue that matters to you and investigate it by collecting data, spotting patterns, and exploring root causes. Then you'll plan and take action—through awareness, service, advocacy, or philanthropy—and share what you learn.

## Why does this matter?

Many schools and states recognize civic learning through projects, service, or leadership pathways. This guide helps you build skills and evidence for these opportunities by supporting real-world problem-solving, teamwork, youth voice, and action based on data. You can produce research notes, collect and analyze local data, develop an action plan, reflect on your learning, and create a final product—like a presentation, video, poster, or brief—to showcase your impact.

Before Your Project

## **Intro to Changemaking**

Changemaking is when you notice something that is not working for people or for the planet, and you take action to improve it. Changemaking can be big or small. It can happen at home, at school, in your neighborhood, or online. It can start with one voice, one idea, or one small step that builds momentum.

### **Exercise: Small Change, Big Impact**

Think of a time you helped improve something, even in a small way. Maybe you spoke up about a problem, helped someone feel included, fixed something that was broken, shared an idea, or convinced others to try a better approach.

Step 1: Write 1–2 sentences describing the change you helped create (or want to create).

Step 2: Circle what you used most: voice, creativity, teamwork, persistence, data, or kindness.

Step 3: Share with a partner: What made it hard, and what helped you keep going?

# Before Your Project

## **INVESTIGATE**

### Choose Your Issue

Identify a local, national, or global community need that you would like to address. Consider these questions as you decide:

- What problems have you seen, heard, read about, or experienced that sparked your interest or concerned you?
- What issue do you care about most?

### **Your Cause:**

Why is this issue important to you?

### **Your Vision:**

What would you like to see change?

The following are examples of common community issues. Select the one that is most important to you. The issue(s) you care about may not be listed—add those, too!

<b>Education</b> Recruit and train ____ volunteer readers, tutors, and mentors	<b>Bullying</b> Reduce bullying and violence in school by ____%.	<b>Dropout Prevention</b> Encourage ____ students to stay in school.	<b>Disasters</b> Help ____ people to prepare for a natural disaster.
<b>Safe Driving</b> Educate ____ people about the dangers of distracted driving.	<b>Water</b> Restore or protect ____ bodies of water.	<b>Reduce, Reuse, Recycle</b> Keep ____ pounds of glass, metal, plastic, or paper out of landfills.	<b>Energy</b> Help save energy and reduce your carbon footprint by ____%
<b>Hunger</b> Provide food for ____ people.	<b>Employment</b> Organize a job skills training for ____ people.	<b>First Aid</b> Get ____ people trained in CPR/first aid skills.	<b>Medical Research</b> Raise \$____ to support research to cure disease.
<b>Green Space</b> Create ____ square feet of new green spaces or community gardens.	<b>Trees</b> Increase the Earth's tree cover by planting ____ trees.	<b>Places to Play</b> Create or improve ____ playgrounds.	<b>Housing</b> Build or renovate ____ affordable housing units.
<b>Biodiversity</b> Protect ____ acres of habitat for endangered species.	<b>Health &amp; Obesity</b> Increase physical activity or healthy eating habits of ____ people.	<b>Disease</b> Stop the spread of infectious disease by educating ____ people.	Add another cause you care about:



# Before Your Project

# **INVESTIGATE**

## Learn About Your Issue

Now that you've chosen an issue, it's time to learn more about it. The more you research, the more effective your project will be.

### **Community Need:**

What do you <b>already know</b> about the issue?	What do you <b>need to learn</b> in order to take action?	Where can you find information you need?	What <b>did you learn</b> about your cause and how to address it?
In every classroom, we have recycling bins for paper and plastic.	Reasons why students might not recycle regularly.	Observations, survey of peers, conversation with school facilities staff.	At the end of class, students feel rushed and throw all trash away in the same place. The local library has an effective program that uses lids to prevent trash from getting in.



# Before Your Project

# **INVESTIGATE**

Learn About Your Issue

## **How to Identify Credible Sources**

When you investigate an issue, your goal is to learn what is true, what is happening right now, and what might actually help. Strong projects use credible information and STEM thinking to understand root causes and choose smart solutions.

## **Corroborate Evidence**

Corroborate means “double-check.” Before you build your project around a statistic or headline, confirm it using at least two of the following:

- A second reputable news source
- A government, university, or research organization
- An interview with a local expert
- Your own local data (survey, observation, counts)

## **Use STEM to strengthen your investigation:**

- Ask measurable questions (What is happening? How often? Where? For whom?)
- Collect local data (counts, surveys, simple measurements, mapping, interviews)
- Look for patterns (who is affected most, when it happens, what triggers it)
- Test ideas (small pilot, prototype, or comparison of two approaches)
- Use visuals (graphs, charts, maps, simple models)



## Before Your Project

# INVESTIGATE

### Learn About Your Issue

You can use these sources to help you research the issues in your community.

- **Media:** Read newspaper articles or blogs or watch videos about the issue.
- **Conversations and Interviews:** Talk with issue experts and with those affected by the issue to better understand their points of view and priorities.
- **Observations and Experiences:** Take notice of people, places, or behaviors and keep track of observations.
- **Surveys:** Create and distribute a survey to find out what people know, how they act, or how they feel about an issue.

## Baseline Data

What is the current status of the issue? This is the starting point from which you will set project goals and measure project impact.

Before Your Project

# INVESTIGATE

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Identify Your Passions

You researched and learned about a community need. The next step is to think about what personal passions and assets you have that can help make a difference.

Circle what you enjoy most. If you don't see one of your interests, add it!

**Theater**

**Nature**

**Reading**

**Writing**

**Animals**

**Sports**

**Music**

**Teaching**

**Speech**

**Art**

**Computers**

**Entrepreneurship**

**Building**

**Advocacy**

**Leadership**

**Movement**

**Academics**

**Spirituality**

**Outdoor Recreation**

**Comedy**

**Journalism**

**Mechanics**

**Photography/Film**

Before Your Project

# INVESTIGATE

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Identify Your Passions

## Your Skills:

How will you use your passions and assets to help your cause?

## Your Knowledge:

## Your Experiences:

## Your Traits:

Before Your Project

# INVESTIGATE

Map Community Assets

Just like your personal assets, there are good things in your community that can help you. What assets does your community have to help you make your project a success?

**People & Partners**

**Events & Traditions**

**Ideas:** How have other people tried to address this issue?  
What has worked? What hasn't?



## Before Your Project

# Empathy Snapshot

Understanding the experiences of people affected by an issue helps you design a project that truly matters. Use the prompts below to explore what the issue looks and feels like from someone else's perspective.

What do they see?

Think about what someone experiencing this issue notices in their daily life.

- What situations or barriers show up often?
- What patterns or challenges do they observe?

Consider the emotions, worries, hopes, or frustrations they might have.

- What might feel stressful or confusing?
- What might give them hope or relief?

Reflect on what kinds of support, information, resources, or solutions could help.

- What would make things easier or safer?
- What could create real change?

Empathy helps you design a project that is respectful, informed, and community-centered.

## Before Your Project

# INVESTIGATE

## Your Action Strategy

You can lead change ASAP through Awareness, Service, Advocacy, or Philanthropy.

Choose what kind(s) of action you will use to address the issue you chose.

### AWARENESS

Educate. Share information and teach others to positively change people's behaviors.

*ex. promoting clean energy, raising coding awareness, or encouraging tech safety; discouraging waste or misinformation*

### SERVICE

Use your creativity, time, and talent to meet a community need.

*ex. leading STEM workshops, planting trees, distributing solar lights, or creating kits.*

### ADVOCACY

Speak out, join others, and persuade policy makers to change laws.

*ex. advocating for STEM funding, supporting climate action, lobbying for accessibility, or speaking at meetings.*

### PHILANTHROPY

Collect and donate financial and in-kind support.

*Ex. fundraising for robotics, collecting donations, organizing a tech drive, or running coding camps.*

# Putting It All Together!

My cause....

My personal passion....

**My service project is...**

My action strategy....

My community can help by...

# Are You Ready?

Answer these questions to make sure your project is actionable and meaningful:

- Are you willing to commit time and skills to this project?
- Have you talked to other members of your community to ensure this project is something that is needed? Have you incorporated their feedback into your plan?
- Can you convince friends to join you? Can you promote the project as something that will attract them?
- Will you need funds to do this project and do you have a plan for how you will raise them? Do you know where, and how, you will be able to collect needed supplies?
- Will you be able to measure and track the impact of your results of your project?
- Is there enough time to plan and complete the project?

During Your Project

# PREPARE, PLAN, ACT

## Gather a Planning Team

Bring together a diverse team by inviting people who you think have assets to help your project, even if you don't normally work together.

<b>Your Team Guidelines:</b>	What values and ground rules will help your team work well together and ensure that the project goes smoothly?
<b>Team Values:</b>	<b>Team Ground Rules:</b>

Task Team	Who?	When?	Needed Supplies
Partnerships			
Outreach			
Fundraising			
Volunteers			



## During Your Project

# **PREPARE, PLAN, ACT**

### Partnerships Team

Refer back to your list of potential partners. Contact them to talk about your project, why it matters, how they can help, and how you can support them. Partnership is a two-way street!

Be sure to discuss:

- Why you are passionate about the issue.
- Why you think your project will help resolve the issue.  
What are your measurable outcomes?
- Any and all important logistics, including when and where.
- If you need volunteers and, if so, how many. Are you requesting volunteers from this partner or asking them to get the word out?
- If you need other supplies or support and, if so, what.
- Your plans for free flowing communication. Who will you speak to when you need to contact the partner? How will you send your project updates?
- What you have to offer your partner. Are there opportunities to promote their business?

# During Your Project

## **PREPARE, PLAN, ACT**

### Partnerships Team

Community partners can help you identify community needs, effective strategies, and resources to address those needs; refine your project idea by providing feedback; and spread the word out about your project.

#### **Who should we contact?**

- Passionate, engaging people who want to get others involved!
- Set up a Google Alert on your issue to find out who is an expert.
- Attend a community workshop or lecture.
- Experts connected with these organizations working on your issue:
  - Organizations working in the community you identified
  - Government agencies or departments
  - Issue-based organizations
  - Universities or colleges

#### **How should we contact partners?**

Once you have identified someone to contact, do more research to learn about their work and accomplishments. Check out their website or read articles they have written. Then, send an email asking for a short phone call. When you talk or meet, discuss the items on the last page.



# During Your Project

# **PREPARE, PLAN, ACT**

## Partnerships Team

As you work with your community partners, make sure you can answer these questions:

<b>Goals &amp; Expectations</b>	How does your project meet you and your partners' goals? What do you and your partner expect from each other?
<b>Responsibilities</b>	What resources does each partner bring to the table? Who takes responsibility for recruiting and training volunteers?
<b>Logistics</b>	Are there specific requirements for using your space or any tools?
<b>Supervision &amp; Liability</b>	Who will supervise the project? Are any waivers required?
<b>Reflection</b>	How will you reflect during the project? Will the partner participate?
<b>Demonstration &amp; Celebration</b>	How will you demonstrate success and celebrate with your partners?



## During Your Project

# **PREPARE, PLAN, ACT**

### Partnerships Team

#### **Engaging Public Officials**

Public officials, like your mayor, school board members, or national legislative leaders work to serve you. Some ways you can ask them to support your project include:

- **Volunteering with your project** or addressing volunteers during welcome remarks.
- **Acknowledging the power of youth service** by awarding certificates or hosting a recognition ceremony
- **Inviting you** and your partners to a public meeting or forum.

Which leaders will you reach out to?	What will you ask them to do?	How will they benefit your project?

#### **Tips to Get Started**

- Focus on local officials first, but inform officials at all levels (local, state, national) who have jurisdiction where you live.
- Get to know your leaders' staff; they're always more accessible and are the ones doing the research!



## During Your Project

# **PREPARE, PLAN, ACT**

## Resource Team

Your Resource Team is responsible for leveraging financial and in-kind support for your project. Financial support includes cash donations while in-kind support includes other supplies and resources like item donations, meeting space, or training.

Your resource team is responsible for:

- Researching the cost of materials, equipment, and services you will need for your project.
- Developing and maintaining a budget throughout the project. Will your project need extra funding or support? This budget can include grants, donations, or fundraising events.
- Recognizing and thanking all sponsors, donors, and volunteers.
- Working with the outreach team to communicate project updates to donors and volunteers.

During Your Project

# PREPARE, PLAN, ACT

Resource Team

## Steps to Create a Budget & Fundraising Plan

### 1. Brainstorm Expenses

- **Make a list of all project expenses**, anything you might need for project success. This might include: equipment, supplies, water and snacks for volunteers, or space rentals.
- **Double check your list** by walking through each project activity, including planning meetings, outreach, volunteer orientation, service activities, and recognition or celebration events.
- **Think sustainability!** Budget for items that will help you do your project again. Try to reuse materials and supplies to build infrastructure.

### 2. Determine the Number of Items

Remember to keep the number of participants in mind!

### 3. Determine Item Cost

Compare several options to find the best deals.

<b>Activities &amp; Events</b> Host a fundraising event like a bake sale or concert. Tell attendees how money raised will be used.	<b>Grants</b> Check out available grants at <a href="http://www.YSA.org">www.YSA.org</a> !
<b>Donations</b> Ask friends, family, and local businesses to make a monetary contribution to your project.	<b>In-Kind Donations</b> Ask friends, family, and businesses to donate equipment, tools, food, or items to be auctioned off.



## During Your Project

# **PREPARE, PLAN, ACT**

### Outreach Team

Your Outreach Team is responsible for sharing the story of your project. They help with issue awareness by explaining the community need and can leverage additional support by telling people how they can get involved. The outreach team is critical to keeping donors, volunteers, partners, and the wider community informed about your project's status and impact.

Your Outreach Team is responsible for:

- Posting consistently on social media (TikTok, Instagram, Facebook, blogs, and more) to tell your story.
- Spreading the word about your project within the community by writing to the local newspaper or neighborhood newsletter. Where else can your outreach team spread the word? At town council or school board meetings?

During Your Project

# PREPARE, PLAN, ACT

Outreach Team

You're proud of your project and you want others to know about it and get involved. Engaging the media and telling your story is a chance to amplify your voice and your impact!

**Your Goals**

What do you want people to know about your project?

**Your Plan**

How will your team use social media, print, radio, or television to tell others about what you're doing?

Who are you trying to tell about your project? What do you want them to do (call to action)?

What are the best media outlets to reach your target audience?

During Your Project

# **PREPARE, PLAN, ACT**

Outreach Team

## **Interview Tips**

Is a journalist interested in speaking with you about your project? Fantastic! They will want to know how their readers or viewers can get involved with or benefit from your project.

Create three talking points about the important messages you want to share with your audience. Base these on the key details of your project (who, what, where, when, why, and how).

- Who is involved in your project? Who does this issue affect?
- What is the goal of your project?
- When and where will your project happen?
- Why is this project important to you? What motivated you to act? Why should the community support your project?
- How can others get involved?

### **Check Out The Media is Your Megaphone!**

**These training modules are designed to help prepare young people to engage with traditional media sources, such as talking to reporters, having interviews on television or radio, and submitting letters to the editor.**

Visit: [cyess.org/projects/youth-consultants/](http://cyess.org/projects/youth-consultants/)

During Your Project

# PREPARE, PLAN, ACT

Outreach Team

## Documenting the Project

Photos and videos of your project can be used for many purposes, including:

- Promoting your project
- Tracking project progress
- Sharing project results
- Preserving memories

Remember to be sensitive to those being photographed. Always get permission from the people you're photographing and make sure the guardians of anyone under 18 approve, too.

**How will photos and videos benefit your project?**

**Who and what will you photograph or record?**

### Tips!

**Engage volunteers!** Find someone that enjoys videography and make them the project's official photographer.

**Document the whole process!**

**Get inspired!** Think of your favorite media. What makes them great?



## During Your Project

# **PREPARE, PLAN, ACT**

## Volunteer Team

Your Volunteer Team is responsible for working with volunteers through the whole cycle: recruitment, orientation and training, management, and recognition

Your Volunteer Team is responsible for:

Before the Event:

- Identifying how many volunteers are needed and what they will do.
- Working with other teams to recruit volunteers to the cause.
- Training volunteers so they feel prepared to serve effectively.

During the Event:

- Greeting and preparing volunteers when they arrive.
- Checking on volunteers to make sure they have what they need.
- Encouraging reflection to make the experience meaningful.

After the Event:

- Recognizing and thanking each volunteer



## During Your Project

# **PREPARE, PLAN, ACT**

## Volunteer Team

### **Some Tips!**

**Just ask!** Being asked is the #1 reason people volunteer.

**Be specific and personal.** Tell people why they are needed and the specific talents they provide.

**Think diversely about your volunteer pool.** Promote through evites, posters, and community calendars.



# During Your Project **PREPARE, PLAN, ACT** Volunteer Team

## Supporting Volunteers

Once you've recruited your volunteers, how will you make sure they show up? Quality support provides volunteers with a quality experience and helps encourage them to volunteer with you again!

Before Project	During Project	After Project
<p><b>TIPS:</b></p> <p>Send a reminder the week before and again the day before. Include information on logistics, what to wear, where to park, and anything they need to bring.</p>	<p><b>TIPS:</b></p> <ul style="list-style-type: none"><li>- Greet your volunteers to make them feel comfortable.</li><li>- Supervise volunteers throughout the project to give positive feedback and answer questions.</li></ul>	<p><b>TIPS:</b></p> <ul style="list-style-type: none"><li>- Lead a reflection activity.</li><li>- Ask for feedback.</li><li>- Thank them!</li><li>- Share outcomes.</li><li>- Invite them to re-engage.</li></ul>



During Your Project

## **Strengthening Your Project With STEM**

**Use STEM to explore the issue:**

- Collect and analyze data
- Observe patterns or test ideas
- Research community impacts
- Look at root causes using scientific thinking

**Use STEM to design solutions:**

- Build or test simple prototypes
- Create models, maps, or visualizations
- Use technology to improve communication or access
- Apply engineering steps: ask, imagine, plan, create, improve

**Use STEM to measure your impact:**

- Track before-and-after data
- Survey participants or partners
- Create graphs or visuals to show results
- Use digital tools to document growth

# After Your Project **REFLECT**

Reflect on how you connect what you are doing with what you are learning. How has your participation in this project impacted you? How have you impacted your community?

Try to reflect before, during, and after your project takes place. When appropriate, include volunteers, partners, and the people benefitting from your project in your reflection activities.

- What inspires you to serve?
- What does service mean to you?
- Service is power because...



- Which skills are you developing through this project?
- What careers have you learned about?

- How would you describe your connection to your community?
- What short- and long-term impacts will your project have on your community?



## After Your Project **EVALUATE**

Discover what changed in your community as a result of your project. Did you meet your project goals?

Your Vision	Project Goals	Baseline Data	Project Outcomes

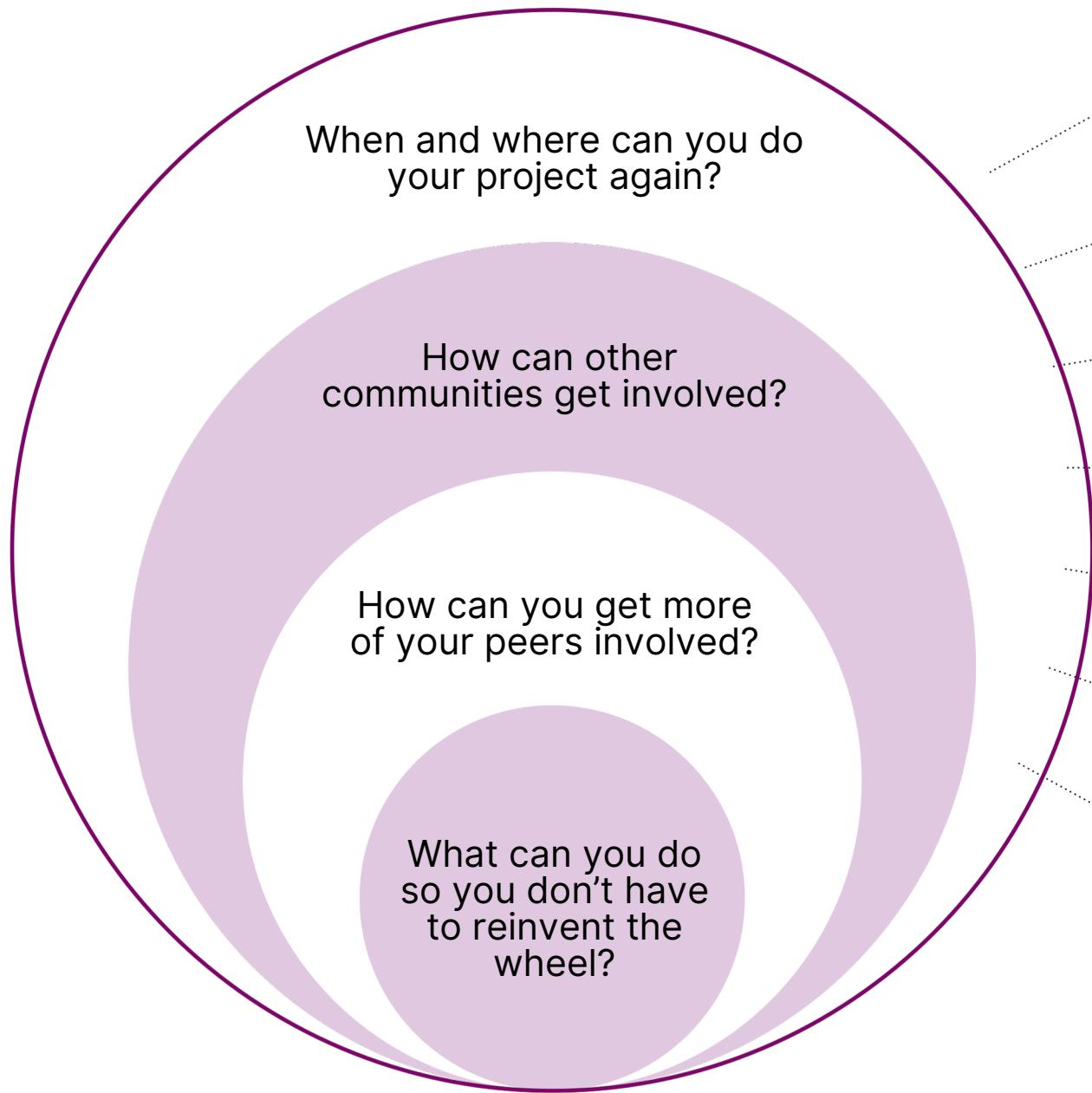
Sometimes things don't go as planned and that is okay. Think about the challenges you encountered and how you overcame them. Next time you plan a project, you can use this experience to make a bigger impact.

**What worked well?**

**What would you do differently next time?**

# After Your Project **SUSTAIN**

Make plans to continue, expand, or re-run your project.



- Who will carry on your work after your project is finished?
- How will your project continue to impact your community?
- What do you want people to say about your project in one month, one year, five years, or ten years?

# ADVOCACY DEEP DIVE

Sometimes the best way to grow your impact is to change what causes the problem in the first place. Advocacy is using your voice, data, and story to influence decisions, policies, or practices so the change lasts longer than one event.

### **Advocacy may be a good next step if:**

- The issue keeps happening even after your project
- A rule, system, or routine needs to change
- Adults with decision-making power control resources or access
- Your data shows a clear pattern or unfair outcome

### **Choose one path that fits your project:**

1. School or program change (principal, staff, afterschool leaders)
2. Community change (city, transit, parks, local agencies)
3. Policy change (school board, county/state leaders, elected officials)

### **Advocacy actions to consider/make your own:**

- Present your results at a meeting (PTA, school board, youth council, city council)
- Create a one-page brief with your problem, evidence, and request
- Share a petition or pledge with a clear, specific ask
- Write an op-ed, record a short video, or pitch local media
- Meet with a decision-maker (bring data + a personal story)

### **Your Advocacy Ask**

What needs to change?

Who has the power to change it?

What do you want them to do by a specific date?

What evidence will you bring (data, quotes, photos)?

### **Check Out the CYESS Youth Policy and Advocacy Training Modules!**

These training modules are designed to help prepare young people to engage with their policymakers, identify where change happens in their communities, and provide the building blocks to establishing relationships with their representatives.

Visit: [cyess.org/projects/youth-consultants/](http://cyess.org/projects/youth-consultants/)

# After Your Project **SHOWCASE**

Congratulations! You used your passions and skills to lead your community and make a difference. Now, share your results and replicate your project.

Some ways you can share your project results include:

- Creating a blog or video that features before and after pictures
- Hosting a Grand Opening and inviting community members to learn about your community garden, restored wetland, etc.
- Presenting to your school board or town council
- Sending a press release to local media or writing a column for the school or community paper.
- Post photos and results on the project's social media pages.

Some ways you can teach others to replicate your project include:

- Hosting a workshop for your peers that explains the process.
- Creating "how-to" guides and videos and posting them publicly.
- Presenting your project at a conference.
- Creating an FAQ or Q&A section on your project's website.

**How will you share your results and  
teach others to replicate your project?**

# After Your Project **CELEBRATE**

**How can you thank all your volunteers, partners, and funders/donors?**

## Celebration and Recognition Ideas

- Host a final event to bring everyone together and celebrate your accomplishments. This could be an awards banquet or a less formal potluck picnic. Recognize the efforts and impact of youth and your partners.
- Report project results to everyone who served. Encourage pride in the project and appreciate everyone's involvement.
- Offer recognition items like certificates, plaques, t-shirts, pins, or flowers.
- Nominate outstanding youth for local and national awards or scholarships like YSA's Everyday Young Hero!
- Get feedback from key stakeholders and participants to gather ideas for your next project.
- Coordinate with schools so that youth get credit toward graduation requirements or college applications.
- Send thank you notes to organizers, funders, and anyone else that assisted with the project.

After Your Project

## **Additional STEM Resources**

### **CYESS**

Resources, stories, and tools for youth-led STEM civic engagement.

[www.cyess.org](http://www.cyess.org)

### **Afterschool Alliance STEM Resources**

Guides, research, and best practices for STEM in afterschool and out-of-school-time programs.

[afterschoolalliance.org](http://afterschoolalliance.org)

### **YSA Learning Center**

Project ideas, planning tools, and inspiration for youth-led action.

[ysa.org](http://ysa.org)