Implementing Citizen Science Project-Based Learning With Y4Y

Oregon 21st CCLC Spring Conference
Western Oregon University - May 5, 2017
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SESSION OBJECTIVES

• Explore why citizen science project-based learning benefits students.

• Develop strategies to implement this approach into your program.

• Identify Y4Y citizen science project-based learning resources that can be customized and used in your program.
HTTP://Y4Y.ED.GOV
How can we use Y4Y to design and facilitate engaging citizen science projects?
CITIZEN SCIENCE

- Meaningful connections with natural world
- No single “right” answer
- Inquiry-based learning
- Data used by real scientists

Tools/ Learn/Citizen Science Research Brief
What is your level of experience with Citizen Science?

– I have never done any citizen science activities or projects.
– I have participated in or facilitated at least one citizen science activity or project with students.
– I have some experience participating in or facilitating citizen science activities or projects with students.
– I have a lot of experience participating in or facilitating citizen science activities and projects.
Learn/STEM/Introduction
CHARACTERISTICS OF SUCCESSFUL PROJECTS

• Include student voice and choice
• Focus on high-interest topics and questions
• Emphasize active learning
• Build 21st century skills
  – Critical thinking, teamwork, organization
• Result in a final product or event
• Offer opportunities for reflection
PLANNING FOR IMPLEMENTATION

1. Inspire
2. Prepare
3. Engage
4. Experience
1. INSPIRE

Citizen science:

• Involves everyday people
• Assists in collecting and analyzing data
• Does not require past scientific experience
• Increases public interest in science
RICH RANGE OF PROJECTS

- Matches a wide variety of interests and needs
- Uses a wide range of resources
- Accessible through technology
SAMPLE PROJECTS

• Galaxy Zoo
• Penguin March
• S’COOL
2. PREPARE

**STEM skills**
- Science (e.g. scientific process)
- Technology (e.g. presentation development)
- Engineering (e.g. problem solving)
- Math (e.g. graphing)

**21st Century skills**
- Flexibility & adaptability
- Initiative & self-direction
- Social & cross-cultural skills
- Productivity & accountability
- Leadership & responsibility
SCIENCE PROCESS SKILLS

Observe

Ask questions

Investigate

Develop and use scientific models

Engage in arguments and construct explanations

Share findings

Collect & analyze data

Observe

Ask questions

Investigate

Develop and use scientific models

Engage in arguments and construct explanations

Share findings
GUESS MY AGE

www.ageguess.org

• Online “game” where you guess people’s ages
• Post a photo & record guesses
• Perceived age as biomarker
CITIZEN SCIENCE

GUESS MY AGE

Very Close! 5 Points

Real age
34 years
Your Guess
39 years
Difference
5 years

Guesses So Far

Average age guess
38 years
Variance
24 years
Standard deviation
5 years
Number of guesses
182

Click to enlarge
ACTIVITY: PLAN IT OUT

• Select a project and record
  – Name of the project
  – Description of the investigation
  – Ways to incorporate science process skills
Data Gathering
Gathering data may include the following:

- Interviewing people.
- Collecting samples of soil, water, air or living things.
- Making repeated observations of living things or natural processes.
- Viewing samples that have already been collected.
- Running software programs that yield different results.
http://www.nextgenscience.org/
3. ENGAGE

- Emphasize active learning.
- Invite student choice and voice.
- Focus on high interest topics.
- Produce a product.
INQUIRY BASED LEARNING

INQUIRY

WHAT IS THAT?

HOW DID THAT HAPPEN?

WHY?
Grey Squirrel (Large paper clip)

Fox Squirrel (Small paper clip)

Activity modified from Projectsquirrel.org
TIPS FOR ENGAGING STUDENTS

- Level of structure
- Amount of background information
- Use of demonstration and direct instruction
- Student voice and choice
- Student responsibility and group roles
4. EXPERIENCE

**STEM Careers**
Citizen science introduces students to potential STEM careers. From the following links you’ll get an idea of how many citizen science projects there are and the span of STEM careers they cover.

<table>
<thead>
<tr>
<th>+ Genetics</th>
<th>+ Technology</th>
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<td>Nanocrafter</td>
<td>Cities at Night</td>
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<th>+ Mathematics</th>
<th>+ Weather and Climate</th>
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<td>Panamath</td>
<td>Season Spotter</td>
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<th>+ Astronomy</th>
<th>+ Chemistry</th>
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<td>Radio Jove</td>
<td>Measuring Vitamin C in Food</td>
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<th>+ Physics</th>
<th>+ Health and Medicine</th>
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<tr>
<td>Higgs Hunters</td>
<td>Autoimmune Citizen Science</td>
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</table>

<table>
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<tr>
<th>+ Ecology and Conservation</th>
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<tr>
<td>OpenTreeMap</td>
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</table>
Y4Y NASA GLOBE PROJECT

NASA STEM CHALLENGES
AND INVESTIGATIONS

Overview
The National Aeronautics and Space Administration (NASA), in collaboration with the U.S. Department of Education, has developed four unique science, technology, engineering and mathematics (STEM) challenges and one Global Observations to Benefit the Society (GLOBE) Science Investigation. Each STEM challenge is based upon real mission data and experiences that occur during human and robotic exploration of the solar system and the GLOBE investigation focuses on science protocols.

These contest opportunities are designed for grades 5-8, and connect students in 21st Century Community Learning Centers (21st CCLCs) with NASA scientists and engineers to discuss proposed challenge activities and science protocols in real time. Each contest opportunity comes with an educator guide, introductory videos, and resources to help educators conduct the opportunity and engage students.
LAND SNAILS AND MILLIPEDES ON THE PARKWAY

Submitted by Paul Super
How can you protect what you don’t know you have? The National Park Service is charged by Congress with conserving "the scenery and the natural and historic objects and the wild life therein" for all ...

Read more

WELCOME
Hands on the Land (HOL) is a national network of field classrooms and agency resources to connect students, teachers, families, and volunteers with public lands and waterways. Hands on the Land brings classroom learning to life in America’s largest classroom!

If you would like to apply for field site membership for your public lands, please take the following steps: 1) Subscribe, 2) Log in, and 3) Click Field Site Application. See How to Join for more information.
BREAK
THREE PHASES OF PROJECT-BASED LEARNING

PHASE I
Designing & Developing
- Project kickoff: Conceive, Plan & Launch
- Formulate a driving question about an issue that impacts both youth and communities
- Organize a project goal and plan

PHASE II
Planning & Implementing
- Learn by doing: Inquire, Work & Discover
- Site Coordinator & Staff
  - Coach: Teach, coach and foster relationships

PHASE III
Celebration, Evaluation
- Showtime: Celebrate & Share
- Youth demonstrate and share their learning in public

Youth practice!

Site Coordinator & Staff
organize and facilitate.

An Audience
affirms the work.
The audience may be public or internal, large or small.

Community
provides feedback.

Youth participate.

Reflect on growth.

Site Coordinator & Staff
organize and facilitate.

Youth plan for SHOWTIME.
Logistics are best

Youth are engaged in learning, problem solving, communication and teamwork.

Youth review the driving question.
The driving question is part of everyday activities.

Youth practice!
PROJECT-BASED LEARNING

WHAT IS IT?

- In-depth study of real-world topic or problem
- Has a realistic environment
- Directed by students and hands-on
- Focuses on DOING something rather than passively learning ABOUT something
- Project shared with an interested audience
- Aligned with the school day
Activity modified from Projectsquirrel.org
DRIVING QUESTION

What Goes Into A Good Question

- Provocative
- Complex
- Intriguing
- Real-World
- Substantial
- Open-Ended
- Challenging
- Relevant
- Actionable
WHO WRITES THE QUESTION?

**Student Voice**

**Teacher Choice**

http://bie.org/object/video/elementary_project_courtyard_redesign
CRAFT A DRIVING QUESTION

Your question must meet these criteria:

- Open-ended
- Relevant to the real world
- Challenges students to use higher-order thinking skills
- Connected to youths’ lives
- Potential for actionable solutions
### LET’S PRACTICE

#### Topic:
Helping scientists study the indicators of local ecology based on the number of grey and fox squirrels in our community

<table>
<thead>
<tr>
<th>QUESTION</th>
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<tr>
<td>How...</td>
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<td>Should...</td>
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<td>Could...</td>
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<td>What...</td>
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<tr>
<th>WHO</th>
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<tr>
<td>We</td>
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<td>We as, [Roles] [Occupations]</td>
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<tr>
<td>[Town] [City] [County]</td>
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<tr>
<td>[Community] [Organization]</td>
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<th>VERB/TO PIC</th>
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<td>Build... Create... Make...</td>
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<tr>
<td>Design... Plan...</td>
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<tr>
<td>Solve...</td>
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<tr>
<td>Propose... Decide...</td>
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<table>
<thead>
<tr>
<th>AUDIENCE</th>
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<tbody>
<tr>
<td>For a Public Audience</td>
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<tr>
<td>For a School</td>
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<tr>
<td>For a Classroom</td>
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<tr>
<td>For an Online Audience</td>
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</tbody>
</table>
CELEBRATE YOUR DRIVING QUESTION

Your driving question is important!

• Put it to music.
• Make banners.
• Make charts.
• Make graphic posters.

If students don’t know the question, how will they answer it?

http://learninginhand.com/blog/drivingquestions
THREE PHASES OF PROJECT-BASED LEARNING

**PHASE I**
Designing & Developing

- **project kickoff**
  - Conceive, Plan & Launch
  - Site Coordinator & Staff
  - Identify needs and opportunities.
  - Youth interests, needs, goals
  - Community resources, issues
  - Formulate a driving question about an issue that impacts both youth and community.
  - Organize a project goal and plan.
  - Launch the project.

**PHASE II**
Planning & Implementing

- **learn by doing**
  - Inquire, Work & Discover
  - Site Coordinator & Staff
  - Coach teachers, coach youth and foster relationships.
  - Revisit the driving question. The driving question is part of everyday activities.
  - Site Coordinator & Staff Plan for SHOWTIME.
  - Youth are engaged in learning, problem solving, communication and teamwork.
  - Project Planning Form

**PHASE III**
Celebration, Evaluation

- **showtime**
  - Celebrate & Share
  - Site Coordinator & Staff organize and facilitate.
  - Youth demonstrate and share their learning in public.
  - An Audience affirms the work.
  - Community provides feedback.
  - Reflect on growth.
  - Youth participate.

planned goal → progress & preparation towards goal → goal realized
PROJECT IDEAS

Projects should provide opportunity for active exploration:

• Extend beyond the classroom.

• Support the practice of core content knowledge and skills in relevant and meaningful ways.

• Connect to field-based investigations, community explorations and work internships.

• Require real investigations using a variety of methods, media and sources.
CHOOSING A PROJECT

• Are your staff and students new or experienced with citizen science?
• Do you want to increase students’ proficiency on specific skills?
• Do you want to increase awareness of STEM careers?
• What is that you hope to accomplish when the activity is over?
Citizen Science External Resources

Chapter 1

Audubon’s Christmas Bird Count
Every winter, thousands of volunteers take a bird census and submit their bird counts to the Audubon Society. The information collected guides conservation efforts by assessing bird populations.

Bat Detective
It can take six hours to go through one hour’s worth of sound recording to detect and categorize bat calls. The scientists behind Bat Detective help citizen scientists from around the world to pore over the amount and range of data that helps them monitor bat populations.

DogilHonk Citizen Science
You’ll play fun, science-based games with your dog. The more you play, the more you’ll discover about how your dog’s mind works. Your DogilHonk results will surprise you!

Environmental Preparedness & Resilience Empowering People
Help scientists monitor air quality with an air sampling device. Environmental Preparedness & Resilience Empowering People is a resource based on a low cost passive sampling platform including a common wristband and a stationary sampler. These samplers can be used to evaluate air quality and your personal environmental exposures.

Galaxy Zoo
We want to understand how galaxies are formed! Your job is very simple; all you need to do is classify the galaxies according to their shapes. If you’re quick, you may even be the first person to see the galaxies you’re asked to classify.

Penguin Watch
This citizen science website is trying to understand the lives of penguins. They want you to help mark images taken from nesting sites around Antarctica. They now monitor over 100 sites and need your help more than ever.

S’Cool
Clouds are an important part of our atmosphere, and scientists are studying how they affect our weather and climate. S’COOL observations provide one more piece of the puzzle. Observe clouds
# Checklist Project-Based Learning Project Planner

## Driving Question

- [ ] Based on youth interests?
- [ ] Based on youth hand?
- [ ] Appropriate for the amount of time?
- [ ] Engaging, interesting, relevant?

## Project Description


## Objectives for Learning and Development


## Materials Needed


## Implementation

<table>
<thead>
<tr>
<th>Project activities, who is involved</th>
<th>Start</th>
<th>End</th>
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IMPLEMENTATION STRATEGIES

- Step 1: Understand Student and Program Needs
- Step 2: Making Time for Citizen Science
- Step 3: Choosing a Citizen Science Project
- Step 4: Mapping Your Resources
- Step 5: Budget
- Step 6: Assess the Learning
CONSIDER YOUR LOCATION
MAPPING YOUR RESOURCES

- Space
- Location
- Materials
- Staff
- Partnerships
Mapping Resources for Citizen Science Implementation

Implementing a citizen science project takes a lot of preparation. To plan a successful project, you will need to have a clear sense of how the project will fit into your program and the possible resources you will need.

Use the graphic organizer below to begin mapping your citizen science project.

- **Assign Staff**
- **Citizen Science Project Title:**
- **Web Address:**
- **Grade levels and # of Students:**
- **Budget:**
- **Materials:**
- **Space:**
- **Start Date:**
- **End Date:**
- **Time of Year, # of Weeks, Hours, Days:**
- **Have:**
- **Need:**
- **Indoor:**
- **Outdoor:**

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PARTNERSHIPS

- Parents
- Family members
- Professional or retired scientists
- Older students
- Business owners
- Civic leaders
CITIZEN SCIENCE IN YOUR STATE

Select a region on the map to find a citizen science project in your state.
# Involving Community Partners Checklist

Use this checklist to identify potential community partners. Next, brainstorm and check off ways partners might be involved in civic learning and engagement projects (or are involved currently).

<table>
<thead>
<tr>
<th>Type of Partner</th>
<th>Name of Partner (Group, Organization, or Individual)</th>
<th>Interview or conduct research</th>
<th>Invite to program</th>
<th>Tours or visits</th>
<th>Meet to present an issue</th>
<th>Collaborate on project activities</th>
<th>Provide a service</th>
<th>Others</th>
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<tbody>
<tr>
<td>Government</td>
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<td>Community orgs.</td>
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<td>Service group</td>
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<td>Advocacy group</td>
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<td>Local small business</td>
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USING STEM EXPERTS

- Experience working with youth and 21st CCLC programs
- Roles and responsibilities of expert and program staff
- How the expert fits into your larger STEM goals
- Possibility of long-term relationship building
THREE PHASES OF PROJECT-BASED LEARNING

PHASE I
Designing & Developing

- **Project Kickoff**
  - Conceive, Plan & Launch
  - Site Coordinator & Staff identify needs and opportunities.
  - Community resources, issues

- **Formulate a Driving Question**
  - About an issue that impacts both youth and community.

- **Launch the Project**
  - Plan
  - Project Planning Form

PHASE II
Planning & Implementing

- **Learn by Doing**
  - Inquire, Work & Discover
  - Site Coordinator & Staff coach
  - Youth are engaged in learning, problem solving, communication and teamwork.

- **Reflect on Growth**
  - Youth participate.

- **Showtime**
  - Celebrate & Share
  - Site Coordinator & Staff organize and facilitate.

PHASE III
Celebration, Evaluation

- **Showtime**
  - An Audience affirms the work.
  - The audience may be public or internal, big or small. Invite the project director.

- **Showtime**
  - Youth demonstrate and share their learning in public, promote pride in their work.

- **Showtime**
  - Community provides feedback.

planned goal → progress & preparation towards goal → goal realized
ASSESS THE LEARNING

• Helps to determine if instruction worked
• Informs continuous improvement
• Provides clear goals for students
TYPES OF ASSESSMENT

• Formal
  – Pretests and posttests
  – Quizzes
  – Term papers or reports

• Informal
  – Rubrics
  – Checklists
  – Lab notebooks
REFLECTION QUESTIONS

• What worked?
• What didn’t?
• How can we improve the experience?
PROJECT COMPLETION ACTIVITIES

• Project culminates in a final event or product
• Celebrate learning, achievement
• Examples:
  ➢ Presentation to peers, families, community members
  ➢ Published blog
  ➢ Video chat with researchers
### Integrating Project-Based Learning Into Citizen Science Activities

Citizen science and project-based learning have a lot in common — for example, they both emphasize hands-on learning, teamwork, real-world applications and more. If you can incorporate project-based learning strategies into your citizen science project, you can enhance your citizen science efforts and strengthen skills in an engaging and academic way. Look at each project-based learning strategy and description, then brainstorm activity ideas for how to implement each strategy in your program.

| Project-Based Learning/Strategy | Description | How can I implement this strategy in the Citizen Science activities?
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Emphasize active learning</td>
<td>Students should learn by doing through hands-on opportunities to answer the driving question.</td>
<td>Sample Activity: Create an opportunity to interview a scientist in the field (face-to-face or virtually) and to collect data outdoors. Activity:</td>
</tr>
<tr>
<td>Follow a well-established sequence</td>
<td>Projects follow a sequence of planning, active inquiry, and opportunities for students to share and reflect on what they’ve learned.</td>
<td>Sample Activity: Use the 5Es of Learning to help students engage, explore, explain, elaborate, and evaluate. Activity:</td>
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TRAININGS TO GO

• Introducing Citizen Science
• Facilitating Learning to Practice Inquiry and Science Process Skills
• Assessing Citizen Science
## Training Starters

- **Fitting Citizen Science Into Your Program**
- **Choosing a Citizen Science Project**

### Choosing a Citizen Science Project

**Training Starter Template**

**Objectives:** All participants in the training will be able to:

- Identify key characteristics needed for their citizen science project
- Determine and discuss the goals of their citizen science project
- Consider strategies to research project ideas
- Figure out how to incorporate youth voice and choice into the citizen science project selection

<table>
<thead>
<tr>
<th>Total Amount of Time:</th>
<th>Number of Participants:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Preparation:**

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Training Opening**

- Engage Participants ______ minutes
  (Begin with icebreaker/warm-up activity related to the topic)

- Introduce the Topic ______ minutes
  (Motivate participants, show them why the topic is important, and share objectives and agenda)
What are your next steps in enhancing citizen science project-based learning in your program?
CITIZEN SCIENCE

CONTACT

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jkim@foundationsinc.org

Allyson Zalewski
azalewski@foundationsinc.org

Visit y4y.ed.gov
Project-Based Learning

**Project Kickoff**
Conceive, Plan & Launch

- **Site Coordinator & Staff** identify needs and opportunities.
- **Youth** interests, needs, goals
- **Community** resources, issues

**Learn by Doing**
Inquire, Work & Discover

- **Site Coordinator & Staff**
  - **Coach**
    - Teachers coach youth and foster relationships.
- **Youth** are engaged in learning, problem solving, communication and teamwork.
- **Revisit the driving question.**
  - The driving question is part of everyday activities.
  - **Community**

**Showtime**
Celebrate & Share

- **Site Coordinator & Staff** organize and facilitate.
- **Youth** demonstrate and share their learning in public.
- **An Audience** affirms the work.
  - The audience may be public or internal, big or small. Invite the project director.

**Formulate a driving question** about an issue that impacts both youth and community.

**Organize a project goal and plan.** Plan should include a goal to answer driving question and launch project.

**Launch the project.**

- **Project Planning Form**

**planned goal** → **progress & preparation towards goal** → **goal realized**

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2011

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Learn more about project-based learning at [http://y4y.ed.gov](http://y4y.ed.gov)

Youth practice!

Site Coordinator & Staff organize and facilitate.

Youth participate.

Community provides feedback.

An Audience affirms the work.

Youth demonstrate and share their learning in public.

Promote pride in their work!

Youth are engaged in learning, problem solving, communication and teamwork.

Youth practice!
Citizen science and project-based learning have a lot in common – for example, they both emphasize hands-on learning, teamwork, real-world applications and more. If you can incorporate project-based learning strategies into your citizen science project, you can enhance your citizen science efforts and strengthen skills in an engaging and academic way. Look at each project-based learning strategy and description, then brainstorm activity ideas for how to implement each strategy in your program.

<table>
<thead>
<tr>
<th>Project-Based Learning Strategy</th>
<th>Description</th>
<th>How can I implement this strategy in the Citizen Science activities?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emphasize active learning</td>
<td>Students should learn by doing, through hands-on opportunities to answer the driving question</td>
<td>Sample Activity: Create an opportunity to interview a scientist in the field (face-to-face or virtually) and to collect data outdoors Activity:</td>
</tr>
<tr>
<td>Follow a well-established sequence</td>
<td>Projects follow a sequence of planning, active inquiry, and opportunities for students to share and reflect on what they've learned</td>
<td>Sample Activity: Use the 5E’s of Learning to help students engage, explore, explain, elaborate and evaluate Activity:</td>
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**Checklist Project-Based Learning Project Planner**

**Driving Question**

- 

**Project Description**

- 

**Objectives for Learning and Development**

- 

**Materials Needed**

- 

**Implementation**

Project activities, who is involved

<table>
<thead>
<tr>
<th>Activity</th>
<th>Start date</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

**Planning Check**

- Is the project
  - Based on youth interests?
  - Based on youth input?
  - Appropriate for the amount of time?
  - Engaging, interesting, sustainable?

- Do the objectives
  - Reinforce, practice, or expand on what youth already know or are able to do?
  - Clearly specify outcomes?
  - Tie to demonstrations and documentation of learning?
  - Connect with skills or knowledge needed for success in school?

- Are materials needed to
  - Guide youth in making a project plan?
  - Carry out the project work?
  - Help youth document learning?
  - Help youth set learning objectives?
  - Establish agreements with or among youth, partners, volunteers?
  - Conduct a culminating event?
  - Reflect, review?
## Checklist Project-Based Learning Project Planner

### Reviews

<table>
<thead>
<tr>
<th>Date</th>
<th>Review purpose</th>
<th>Reviewers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Planning Check

#### Are the reviews

- Purposeful, with purpose clear to youth?
- Based on documentation, evidence, or product?
- Appropriate to project and youth?
- Useful in reinforcing skills of self-assessment and reflection?
- Inclusive of peers, staff, or others?

### Showtime: Culminating Event

**Description**

________________________________________________________________________

________________________________________________________________________

**Date** ________

**Planning and implementation schedule**

________________________________________________________________________

________________________________________________________________________

### Documentation of Learning

**How will learning be documented?**

- Checklists of tasks, products completed.
- Rating, scoring, or assessment of processes, products or demonstrations against a rubric.
- Portfolio content, tied to objectives.
- Reflection logs or journals by youth.
- Self-assessments completed by youth completing project.
- Peer assessments of demonstrations and culminating events.
- Assessments provided by outsiders.
- Other.

**What will be done with the documentation of learning?**

- Provide to classroom teachers.
- Provide to youth.
- Use in discussions with parents.
- Display.
- Keep as program record.
- Use to revise projects or PBL processes.
- Other.
Implementing a citizen science project takes a lot of preparation. To plan a successful project, you will need to have a clear sense of how the project will fit into your program and the possible resources you will need.

Use the graphic organizer below to begin mapping your citizen science project.

- Citizen Science Project Title:
- Web Address:
- Grade levels and # of Students:
- Budget:
- Assign Staff
- Start Date: __________
- End Date: __________
- Time of Year, # of Weeks, Hours, Days:
- Have:
- Need:
- Schedule
- Materials
- Space
- Indoor:
- Outdoor:
- Schedule
- Materials
- Space
- Indoor:
- Outdoor:
# Involving Community Partners Checklist

Use this checklist to identify potential community partners. Next, brainstorm and check off ways partners might be involved in civic learning and engagement projects (or are involved currently).

<table>
<thead>
<tr>
<th>Type of Partner</th>
<th>Name of Partner (Group, Organization, or Individual)</th>
<th>Options for Involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Interview or conduct research</td>
</tr>
<tr>
<td><strong>Government:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elected Official</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parks and Recreation Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Court House/Judicial Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>City Council</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire Department</td>
<td></td>
<td></td>
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<tr>
<td>Police Department</td>
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<td></td>
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<tr>
<td>State or Federal Department</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Community organizations:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood Civic Association</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advocacy group</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local health organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local environmental organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local education organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Businesses:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local small business</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large company with local office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Schools:</strong></td>
<td></td>
<td></td>
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<tr>
<td>Neighborhood school</td>
<td></td>
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</tr>
<tr>
<td>College or University</td>
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You for Youth | Civic Learning and Engagement

Involving Community Partners Checklist

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Student Engagement Tips for Grades K-12

Because students’ needs vary as they learn and grow, you’ll want to design and implement your program according to students’ ages and grade levels. Use this tool for engaging youth in tailored citizen science experiences.

**Elementary: Grades K-5**

Staff should be prepared to provide lots of support:

- Provide extra background information and explanations along the way.
- Use very detailed graphic organizers and other data collection documents to help students keep track of information and document their progress on projects. Spend extra time to make sure students understand how to use them.
- If applicable, assign specific roles to members of a group (e.g. researchers, data collectors, etc.) and designate clear responsibilities.
- Set concrete objectives and due dates so students know what they will be responsible for completing.
- Use demonstration and direct instruction when needed to teach how to collect or analyze the data.
- Suggest ways to share what has been learned at the end of the citizen science project and help them plan it out.

**Middle School: Grades 6-8**

Staff should provide quite a bit of support, while also making room for some independence:

- Offer some background information and explanations along the way, and provide guidance to help the youth find additional information on their own.
- Demonstrate how to develop documents to help students keep track of information, but with less structure than for elementary-age students.
- Provide opportunities for youth to choose what to investigate or make decisions about the structure of the project.
- If applicable, assign specific roles to members of a group (e.g. researchers, data entry clerks, fieldwork supervisors, etc.) and designate clear responsibilities.
- Collaborate with students to analyze the data.
- Provide guidance to help students choose how they will share what they've learned at the end of the citizen science project through a culminating event such as a presentation or report.

**High School: Grades 9-12**

Staff can allow a great deal of independence, while paying attention to when support is needed:

- Provide guidance to point students in the right directions to find background information and explanations on their own.
Student Engagement Tips for Grades K-12

- Demonstrate how to develop or customize documents to help students to collect and analyze data for the project. These can include Excel spreadsheets, databases, graphs, charts, etc.
- Suggest roles for students to assume when working in a group (e.g. researchers, data entry clerks, fieldwork supervisors, etc.) and designate clear responsibilities.
- Guide students as they figure out how to analyze the data by applying the skills they have learned.
- Give students freedom to choose and develop their own ways of sharing what they’ve learned at the end of the citizen science project.
- Encourage students to engage in discussions about the project with potential partners, the scientists running the initiative or local stakeholders.