

# Learner-Focused Inquiries



## Inquiry-Based Action Projects for Each Grade Band and Adults

The intention is for teachers/facilitators to use a series of questions to guide learners in creating and pursuing an Inquiry-Based Action Project. Teachers/facilitators are strongly encouraged to allow the class/group to generate the idea for the project using the questions provided. The specific projects included below for each grade band and for adults are merely examples.

You will notice that for each set of learners, we suggest a slightly modified series of ten questions:

- 1) What can WE do about climate change? (generate list of possibilities)
- 2) What can WE do HERE about climate change? (decide which items are feasible)
- 3) What project will we do? (select from possibilities listed in #1 and #2)
- 4) What is the goal of our project? (what we will accomplish)
- 5) How will we accomplish this goal? (action steps)
- 6) What do we need to do our project? (resources—people, materials, equipment, money)
- 7) How will we distribute the work? (who will do what)
- 8) What is our timeline? (when action steps will be accomplished)
- 9) How will we know if we have accomplished our goal? (what the indicators of success are and how we will measure/assess them)
- 10) How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)

At the end of this section, you will find a worksheet with these questions that your group or class may use to create its own project.

## One Example of an Action Project for Grades K-2

### **1) What can WE do to learn about and help plants and animals? (generate list of possibilities)**

- Composting/worm farm
- Planting a window garden; butterfly garden; vegetable garden
- The Great Backyard Bird Count
- Wildlife Watch (observing weather, plants and animals throughout the year)
- Building birdhouses or feeders

### **2) What can WE do HERE about climate change? (decide which items are feasible)**

- Creating a worm farm with compost gives worms a home and food and helps turn trash into soil for plants.
- Planting a window, butterfly or vegetable garden would give plants access to sunlight and provide a home and food for insects and animals; a herb or vegetable garden would provide us with food that we don't have to buy at a store.
- Building a birdhouse and feeders would provide a home and food for birds.
- Watching birds, animals, and weather throughout the year will help us know what animals like to come to this place during the seasons. Wildlife Watch will help tell scientists what plants, animals, and weather we see at our school. This can help them know where certain animals and plants prefer to live and whether the weather affects them.

### **3) What project will we do? (select from possibilities listed in #1 and #2)**

We have decided to do the [Watch the Wild](#) program.

### **4) What is the goal of our project? (what we will accomplish)**

By observing plants, animals and weather at our school during the year, we will give real scientists information about how habitats are changing in different places.

### **5) How will we accomplish this goal? (action steps)**

- a. Observe the yard outside our classroom window once a week at the same time of day.
- b. Observe the animals we see and take pictures if we can of the trees and flowers that are growing there. In addition, observe the weather (temperature, precipitation, sunlight, etc.).
- c. Fill out a pocket chart as a class after we make our observations. Our teacher will report what we find to the Watch the Wild website using this

[online form](#).

- d. Track our observations for the whole year on a chart so we can see how the weather and animals change during the year.

### **6) What do we need to do our project? (resources—people, materials, equipment, money)**

To do this project, we will need:

- An outdoor thermometer to measure temperature
- Pictures of animals found around our school
- Pictures of plants/trees found around our school
- Pictures to represent types of weather

### **7) How will we distribute the work? (who will do what)**

We will work as a class to observe the area outside of our classroom window; our teacher will help report what we find to the Watch the Wild website.

### **8) What is our timeline? (when action steps will be accomplished)**

We will begin our observations on the first Tuesday in October; we will observe every Tuesday that we are in school until the end of May; we will observe at 10am.

### **9) How will we know if we have accomplished our goal? (what the indicators of success are and how we will measure/assess them)**

We can write a letter to Watch the Wild asking how our observations helped the scientists know about the weather, animals, and plants in our area.

### **10) How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)**

With the help of our teacher, we can create a poster or website about our project to share with other students, teachers and our families.

## **One Example of an Action Project for Grades 3-5**

### **1) What can WE do about climate change? (generate list of possibilities)**

Adding more carbon dioxide to the atmosphere makes the planet warmer. Here are ways we have found to reduce the amount of carbon dioxide we produce:



- **Drive Less:** More than half of our carbon dioxide comes from vehicles, so people can use public transit (like buses and trains), carpool, bike, or walk to school. You save one pound of carbon dioxide for each mile of driving you eliminate.
- **Change Your Light Bulbs:** Replace regular light bulbs with LED bulbs to eliminate 150 pounds or more of carbon dioxide for each bulb per year. You also can cut costs, energy use, and carbon dioxide emissions by turning out lights when you leave a room.
- **Cut Hot Water Use:** Hot water heater thermostats can be turned down to 120 degrees, and hot water heaters can be wrapped in insulation. People can use low-flow showerheads and wash clothes in cold or warm water. Run the dishwasher and washing machine only with full loads.
- **Adjust Your Thermostat:** Having your family move the thermostat down just 2 degrees in winter and up 2 degrees in summer can eliminate about 2,000 pounds of carbon dioxide each year by reducing power use. Turn the heat down before sleep at night and when leaving the house.
- **Plant Trees and Vegetation:** Trees absorb carbon dioxide and give off oxygen. One tree will absorb over a ton of carbon dioxide during its lifetime. Plant a garden. Your food will only have to travel from your yard to your house, not in a truck, on a train, or in a ship.
- **Recycle and Reuse:** Recycle your used newsprint, cardboard, glass, metal, and recyclable plastic containers. Reuse items instead of discarding them, donate to charity, or give them to others. It takes less energy to make products from recycled goods than from new raw materials.
- **Shop Smart:** Have your family bring your reusable bags to shop. Buy products with less packaging and reusable or recyclable packaging. Buy in bulk when you can and reuse the packaging.

## **2) What can WE do HERE about climate change? (decide which items are feasible)**

In the United States, 28% of our greenhouse gases come from transportation and 33% come from electricity generation. If we want to make a bigger difference, these two categories are the most important.

The first 4 topics in step 1 above address transportation and electricity use.

Become a "Cool School" and reduce your carbon dioxide output schoolwide: <http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Cool-School-Challenge.aspx>

### **3) What project will we do? (select from possibilities listed in #1 and #2)**

Encourage our families to drive less!

### **4) What is the goal of our project? (what we will accomplish)**

We will take a survey of how many miles each student's family drives in an average week. Then families will be encouraged to try to take public transit, carpool, bike, or walk and calculate how many miles we drove in our own car and in alternative transportation.

### **5) How will we accomplish this goal? (action steps)**

- a. Each student will ask their parents to help them calculate how many miles the car is driven each day for seven days. Older students can break the miles up into categories (going to school, going to work, after-school activities, shopping, entertainment, etc.).
- b. Each student will bring the total miles driven in one week to school and record it in her or his notebook.
- c. In class, students will brainstorm ways they can get to school and after-school activities using alternative transportation. They can brainstorm ways their families can use their cars less and/or use alternative transportation more.
- d. Students will design a survey sheet to record the miles they drove in their cars, and the miles they traveled by bus, carpool, bike, or walking. They can create a survey sheet that includes their family members as well.
- e. Once they have designed the survey sheets, each student will record the miles driven by car or alternative transportation.
- f. At the end of the week, they will compare their individual totals of their normal driving habits with the miles they saved by taking alternative methods of transportation.
- g. Students can create class graphs of the most miles saved. They can also create graphs of the number of miles traveled using alternative methods.

- h. Students can write summaries of their investigations and describe how they will change their modes of transportation to emit as little carbon dioxide as possible.

### **6) What do we need to do our project? (resources—people, materials, equipment, money)**

We will need to talk with our families and explain our project. The classroom teacher can provide guidance with creating surveys. We will need paper and pencils and may use computers to create graphs and data sets.

### **7) How will we distribute the work? (who will do what)**

We can work individually on our family surveys and then work in teams of four to record and compare our data. We can write our conclusions individually and then share them with the class.

### **8) What is our timeline? (when action steps will be accomplished)**

- Explanation of project: 1 class session
- Survey of normal driving mileage: 7 days
- Recording of data: 1-2 class sessions
- Survey of alternative transportation methods: 7 days
- Recording and comparing data: 2 class sessions
- Writing conclusions, creating graphs and sharing our results with the class: 3-4 class sessions



### **9) How will we know if we have accomplished our goal? (what the indicators of success are and how we will measure/assess them)**

We will compare the number of miles we normally travel in each family with the number of miles saved by using alternative transportation. If we can reduce the number of miles driven in a car, we will have accomplished our goal!

### **10) How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)**

We will share our findings with other classes and encourage them to conduct their own surveys. We can create a bulletin board display in the school showing which

class was able to reduce their carbon dioxide emissions the most by taking alternative transportation. We can send an article to our local newspaper explaining our project and our successes!

We may want to become a 'Cool School' and take the challenge: <http://www.nwf.org/Eco-Schools-USA/Become-an-Eco-School/Cool-School-Challenge.aspx>

## **One Example of an Action Project for Grades 6-8**

### **1) What can WE do about climate change? (generate list of possibilities)**

There are many things we can do. All them have one thing in common: they change how people use energy.

- Organize a campaign to increase recycling.
- Encourage people to turn down their thermostats.
- Urge people to get home energy audits and plant trees.
- More globally, support efforts to use less gasoline and switch to renewable sources of energy, such as solar, wind, hydroelectric, and geothermal power.

### **2) What can WE do HERE about climate change? (decide which items are feasible)**

Being realistic, we should probably focus on things that we as kids can actually do. We can definitely encourage our families to recycle more and use cloth sacks rather than plastic or paper bags when they shop. We can also encourage our school to take steps, such as planting vegetable gardens, because locally grown produce saves energy. Another interesting possibility is to plant trees, because trees are very important in absorbing carbon dioxide, which is a greenhouse gas.

### **3) What project will we do? (select from possibilities listed in #1 and #2)**

We have decided to plant a tree, either at school or in our community. Trees are very important in absorbing carbon dioxide from the atmosphere, helping to slow the rate of climate change. Scientists estimate that forests around the world absorb about 4.4 billion tons of carbon dioxide every year. We can plant trees to offset our carbon footprint of travel and the amount of carbon emitted by our

home. One tree absorbs about a ton of carbon over 40 years. One plane trip across the United States emits about 3 to 4 tons of carbon. The average carbon output of a student is about 10 tons per year. This is the impact planting trees can make.

We can calculate how much carbon dioxide our tree will absorb by using this calculator: [www.treebenefits.com](http://www.treebenefits.com)

A tool from the U.S. Forest Service also allows us to calculate carbon absorbed by trees.

<http://www.fs.fed.us/ccrc/topics/urban-forests/ctcc>

We can calculate the carbon output of a specific car or plane trip, or the carbon footprint of our home:

<http://terrapass.com/carbon-footprint-calculator-2>

#### **4) What is the goal of our project? (what we will accomplish)**

To successfully plant and nurture a tree in our school or in our community.

#### **5) How will we accomplish this goal? (action steps)**

We did some research, and these are the steps involved in planting a tree:

- a. Research the kinds of trees that grow in our area. To find out this information, we will talk to the appropriate agency of our local government, such as the forestry department.
- b. Select a species of tree to plant.
- c. Obtain a seedling to plant. A seedling is a very young tree. We might be able to get a seedling from our town or city government. Nurseries also sell seedlings.
- d. Select a place where we will plant the tree.
- e. Dig a hole that is deep enough and approximately twice as wide as the root ball of the tree.
- f. Place the root ball into the hole, along with enriched soil and fertilizer. We will be careful to remove any stones or stocks that are in the hole because they can cause air pockets, which prevent the soil from holding water.

- g. Fill in the hole with soil. We will be careful to make sure that the root of the seedling is covered but that the stem of the tree isn't covered with soil.
- h. With our toes, we will softly press down on the soil surrounding the tree, allowing the soil around the root to retain water.
- i. Place mulch around the trunk of the tree. The chips from cedar trees make good mulch, which helps to hold the moisture.
- j. Water the tree root well over the next several weeks.

**6) What do we need to do our project? (resources—people, materials, equipment, money)**

If our local government does not have seedlings for people, then we will need the money to purchase seedlings from a nursery. We will need a shovel, rake, enriched soil, fertilizer, water, and mulch. One way to raise the money for the seedling and the other equipment would be to have a bake sale.

**7) How will we distribute the work? (who will do what)**

- Researcher—one member of the group will research the best kinds of tree species for our area.
- Obtain the tree—One or two members of the group will obtain the tree, either from the local government or from a nursery.
- Plant the tree—All members of the group will work on actually planting the tree.
- Record the planting—One member of the group will record our efforts on a video recorder or an I-Phone.

**8) What is our timeline? (when action steps will be accomplished)**

This depends on what time of the year it is. Possible Response: We will successfully plant the tree over the next two weeks.

**9) How will we know if we have accomplished our goal? (what the indicators of success are and how we will measure/assess them)**



The tree will take root and will begin to grow. We will be able to see new leaves as they sprout, indicating that the tree has successfully taken root.

**10) How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)**

We will use the video recording to write an account of our tree planting for the school newspaper, a local newspaper, or a local news broadcast.

**One Example of an Action Project for Grades 9-12**

**1) What can WE do about climate change? (generate list of possibilities)**

We will start by generating a list of project ideas. We will write idea lists individually and then list all of the ideas on the board or poster paper for everyone to see. We can also generate ideas in small groups and then share small group ideas with the full group. Or we can call out ideas for someone to record on the board or poster paper, depending on the size and/or culture of the group.

**2) What can WE do HERE about climate change? (decide which items are feasible)**

We will discuss the project ideas to determine what the students themselves can do in their school and/or community, what is truly feasible given the age and number of students, the context, and resources available.

**3) What project will we do? (select from possibilities listed in #1)**

After discussing possible projects, we voted to select the ideas, or a combination of these activities. We decided to start composting food waste in the school cafeteria.

**4) What is the goal of our project? (what we will accomplish)**

Our goal is to plan and implement a composting program at our school. We will compost as much food waste as possible from our cafeteria and use the compost locally, both at school and in our community.

**5) How will we accomplish this goal? (action steps)**

- a. Be sure everyone in the group knows what composting is and how it helps to reduce the release of "greenhouse gases," thereby helping the school to reduce its carbon footprint and contribute less to climate

change. The group educates itself through research, guest speakers, and perhaps a field trip to see composting in action, preferably at another high school.

- b. Develop a preliminary timeline for the project.
- c. Interview school administrators, district food service director or food service contractor, cafeteria staff, and waste managers to gain their input as to how to best implement composting at the school.
- d. Using information gained through interviews, draft a composting plan for the school. Be sure that it includes educating the school community about why composting is important and how composting will be done at the school so that composting is made as easy as possible for cafeteria diners and workers. Be sure that if funds are necessary to purchase materials that the plan includes action steps to acquire the funds.
- e. Submit the draft plan to all of the people who were interviewed in Step d for their feedback.
- f. Revise plan based on feedback.
- g. Submit the plan to the appropriate administrator or review committee for approval.
- h. Follow the approved plan to implement composting at the school.
- i. Revise timeline and implement plan.
- j. Evaluate the composting program to determine its effectiveness, perhaps by weighing the food waste from one meal that is thrown away (not composted) and then weighing the food waste that is composted on another day after the composting program has been instituted when the same meal is on the menu.

**6)What do we need to do our project? (resources--people, materials, equipment, money)**

- a. People to be interviewed
- b. Materials mentioned during interviews, such as containers to collect food waste in the cafeteria and composting system to be installed on the school grounds
- c. Money to purchase necessary materials

## **7) How will we distribute the work? (who will do what)**

We will decide who will be responsible for what aspects of the project work. We need to identify all of the tasks and a means to assign tasks or have students volunteer for them. Then we will write a set of agreements to hold themselves responsible for the project tasks.

## **8) What is our timeline? (when action steps will be accomplished)**

We will develop a broad timeline early in the process (see 5b above) and then revise, update, or expand it after the plan has been approved for implementation. The timeline will likely need to be adjusted as the plan is implemented.

## **9) How will we know if we have accomplished our goal? (what the indicators of success are and how we will measure/assess them)**

After the composting program has been underway for two months, food waste that is going into the compost bin from a meal and going into the garbage/trash will be weighed and compared to the amount of food waste from the same menu meal that was going into the garbage/trash before the composting program was implemented



## **10) How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)**

Throughout the planning and implementation of the plan, we will make others at the school and in the larger community aware of the composting project. We can contact local newspapers, websites, and television and radio stations. After the goal has been met, we will celebrate the success with announcements in school assembly and through local media and have a celebratory event at the school, which might include adding some of the fully composted material to a garden bed or other landscaped area of the school grounds as a soil enhancement.

## **One Example of an Action Project for Adults**

This activity can be done by formal or informal community organizations and can be facilitated by an adult education professional or by the group members themselves. Have the group work through the following questions as the project is developed and implemented.

**1) What can WE do about climate change?** (generate list of possibilities)

We will begin by brainstorming possible projects. Working as a whole group or in small groups, we can share ideas "popcorn" style or write them on Post-Its or large sheets of paper.

There are many actions we can take. We could organize a campaign to increase recycling, encourage people to turn down their thermostats, do home energy audits, and plant trees and gardens. More globally, we can support efforts to use less gasoline and switch to renewable sources of power, such as solar, wind, and hydroelectric technologies. All the above actions have this in common: they reduce use of energy from fossil fuels, lowering the production of "greenhouse gases" that contribute to climate change.

**2) What can WE do HERE about climate change?** (decide which items are feasible)

Again, small- or full-group discussion can be used to answer this question. Being realistic, we should probably focus on actions that we can actually do. We can definitely recycle more within our own homes and use cloth sacks rather than plastic or paper bags when we shop and encourage others to do so. We can also encourage our community to reduce its carbon footprint in a variety of ways, such as planting vegetable gardens, because locally-grown produce saves energy, and planting trees because they absorb and store carbon dioxide (a greenhouse gas), helping to reduce the amount of carbon dioxide in the atmosphere. Perhaps we can combine a few possible actions in a single project.

**3) What project will we do? (select from possibilities listed in #1 and #2)**

We have decided to "green up" and "take back" an alley in our neighborhood.

**4) What is the goal of our project?(what we will accomplish)**

Goal: to make our alley a neighborhood resource where all feel welcome and safe.

**5) How will we accomplish this goal? (action steps)**

- a. Some research may be required to clearly identify action steps to meet the project goal. Committees or individuals, depending on the project, might do research. The full group can create the project action steps when informed by the research, which might include finding out about and learning from similar projects in other communities.

- b. Find out who owns the alley.
- c. Get permission/approval to "green up" the alley.
- d. Publicize in advance a meeting to discuss the project and solicit ideas from community members for how the alley can be improved and address climate change.
- e. Hold a community meeting to discuss the project and solicit ideas from community members.
- f. Have a city planner and/or landscape designer consult with the project group about ways to improve the alley to benefit the community and help to address climate change with consideration of community members' ideas.
- g. Create a plan and drawings of the alley improvement. This might include creation of a raised bed garden, planting trees and other vegetation, designating and furnishing play areas, identifying space for a street food vendor, installation of photovoltaic outdoor lighting, etc.
- h. Hold another community meeting to present the plan and drawings and engage citizens in the project. Many hands make light work! At this time begin to create a plan for the maintenance of the alley after it has been improved. Who will have responsibility for the raised bed garden, caring for the other trees and plants, sweeping and disposing of recyclables and trash, and seeing that play equipment is safe and well maintained? Committees can be created to identify, coordinate, and accomplish work after the alley has been improved.
- i. Apply for grant funding for the project, including funding for alley maintenance after the project is completed.
- j. Implement the alley "green up" plan.

## **6) What do we need to do our project (resources--people, materials, equipment, and money)**

The alley improvement project will require citizen volunteers and the expertise of professionals, such as planners, landscape designers, urban gardeners, and public officials. Materials will be required, too, such as equipment to remove pavement if necessary, construct raised beds, and create play structures. We will also need soil seeds and plants. Some of these resources, including professionals' time, may be donated or paid for through grants and community contributions.

### **7) How will we distribute the work? (who will do what)**

It will be important to have a project coordinator, and that can be a citizen volunteer or someone paid by a grant. It is likely that initially the project will require a citizen volunteer and that in the early stages of the project, interested community members will do most of the work until grants or other funding can be secured for implementation of the project. As adults, we will need to be willing to volunteer to do the work and take responsibility.

### **8) What is our timeline? (when action steps will be accomplished)**

It will be important to create a timeline for our work, and it will be dependent on the availability of community members and professionals. After we have received approval for our alley "green up" project, we can create a timeline that is realistic and flexible.

### **9) How will we know if we have accomplished our goal?( what the indicators of success are and how we will measure/assess them)**

When our alley is transformed, we will have accomplished our goal. We can document this through photos and video of the entire improvement process, from start to finish, so that we have "before" and "after" pictures as well as a record of how we met our goal. These will be useful in reporting to grant funders on the project. Of course, the clearest indicator of our success will be having community members enjoy the alley, using it as a place to meet neighbors, relax, and take pride in their neighborhood.

### **10) How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)**

We will have an alley party and invite all of our neighbors as well as local public officials. We will also invite media to cover as many steps in our project process as possible, from preliminary meetings to removing pavement to building raised beds to our alley party when the project is complete.



# Worksheet to Guide the Development of an Inquiry-Based Action Project

The purpose of these questions is to guide learners through the development of their very own Inquiry-Based Action Project. The questions should be modified to be developmentally and culturally appropriate for the group that will be doing the action project.

1. What can **WE** do about climate change? (generate list of possibilities)

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2. What can **WE** do **HERE** about climate change? (decide which items are feasible)

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3. What project will we do? (select from possibilities listed in #1 and #2)

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4. What is the goal of our project? (what we will accomplish)

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5. How will we accomplish this goal? (action steps)

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6. What do we need to do our project? (resources--people, materials, equipment, money)

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7. How will we distribute the work? (who will do what)

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8. What is our timeline? (when action steps will be accomplished)

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9. How will we know if we have accomplished our goal? (what the indicators of success are and how we will measure/assess them)

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10. How will we celebrate our project? (how we will make others aware of our accomplishment and take pride in our work)

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