Project-Based Learning: Assessment

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MS4SSA
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Project Based Learning

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Math and Science for Sub-Saharan Africa

- Project work helps students become better collaborators, critical thinkers, public speakers, and communicators
- Great young minds often bring ingenious approaches to an array of challenges
- Projects can fundamentally change the students, building leaders who possess passion, proficiency, and a certainty that their life's work can change the world

Project Based Learning

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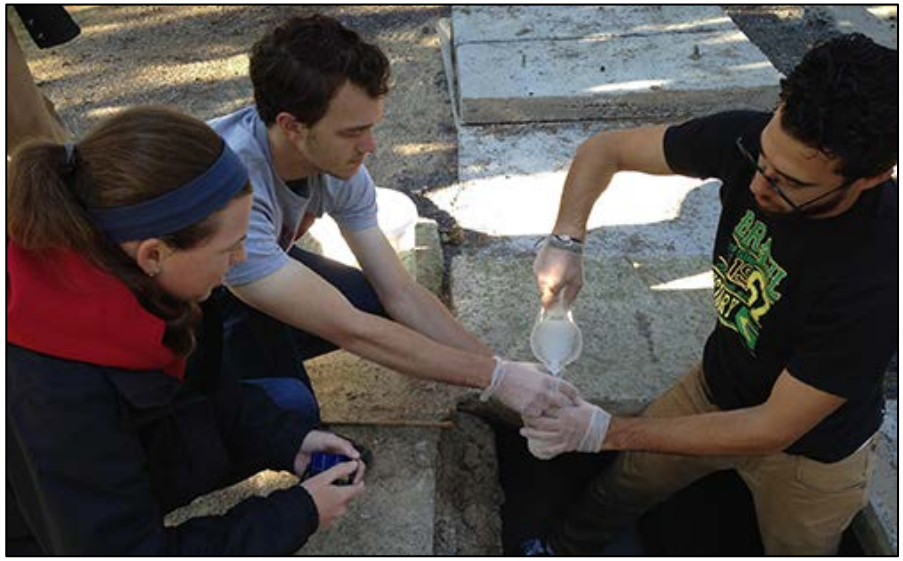
- Project Based Learning encourages students to develop an entrepreneurial mindset
- Which focuses on curiosity, connections, and creating value to society



Steps to Effectively Plan and Assess a Project

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1. Decide what learning outcomes the project will address

2. Decide what evidence will allow you to determine the extent to which a student achieved each learning outcome

3. Explain what varying levels of achievement of a learning outcome look like

4. Design a project that will give students opportunities to produce evidence that they are achieving the learning outcomes

What is a learning outcome?

A learning outcome…

- …is a statement that describes **significant and essential learning** that students will **achieve** and can reliably **demonstrate** at the end of a project, lesson, course, or program
- …identifies what a learner will know or be able to do by the end of a project, lesson, course, or program

Examples of Learning Outcomes

- By the end of this project, students will be able to explain the factors that affect the growth of plants
- By the end of this project, students will be able to classify objects and count the number of objects in each category
- By the end of this project, students will be able to show that addition is putting together and adding to, and they will be able to show that subtraction is taking apart and taking from

What is “evidence” of achieving a learning outcome?

- Evidence that a student achieved a learning outcome is **information a student conveys that indicates the student’s knowledge or ability**
- Evidence can take many forms. Some examples:
  - Test score
  - Demonstration or performance: dance, prepared meal
  - Created product: painting, poem, essay, research paper
  - Others?

Rubrics are a good way to assess student achievement

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- A rubric is a document that articulates the expectations for an assignment
  - Lists the criteria
  - Describes levels of quality from excellent to poor
- Often used to grade student work
- Can be used to evaluate and teach
  - Teachers and students can make dependable judgments about the quality of work or performance
  - Can guide ongoing feedback about progress towards standards

Examples of Rubrics

- For student writing (see handout)
- For WPI's Integrative Student Projects (see handout)
- Embedded in a student assignment for a materials course (see handout)

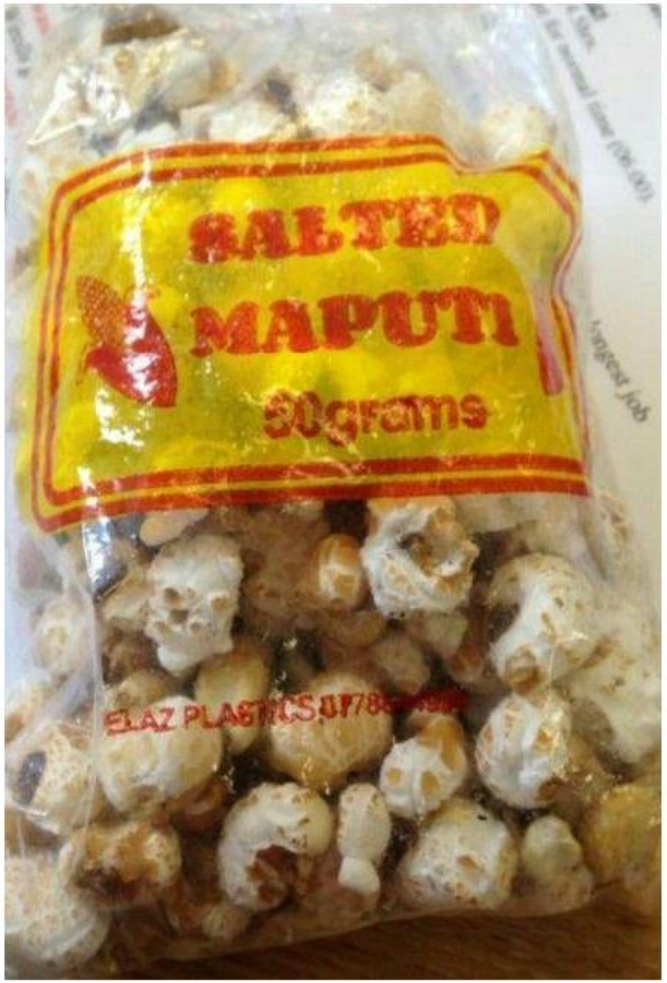
Some Notes on Projects

- All projects should yield products, BUT
- **Products <u>do not</u> have to focus on design or engineering!**
- Products could be the following:
  - Written papers
  - Posters
  - A performance, such as dance, music, stories, poems
  - Preparation of a meal
  - Something else?

Project Examples

- Not engineering or design projects
- Done with students at the primary or middle school level (below grade 9)
- Rely on local context
- Low or no cost

The Maize Project



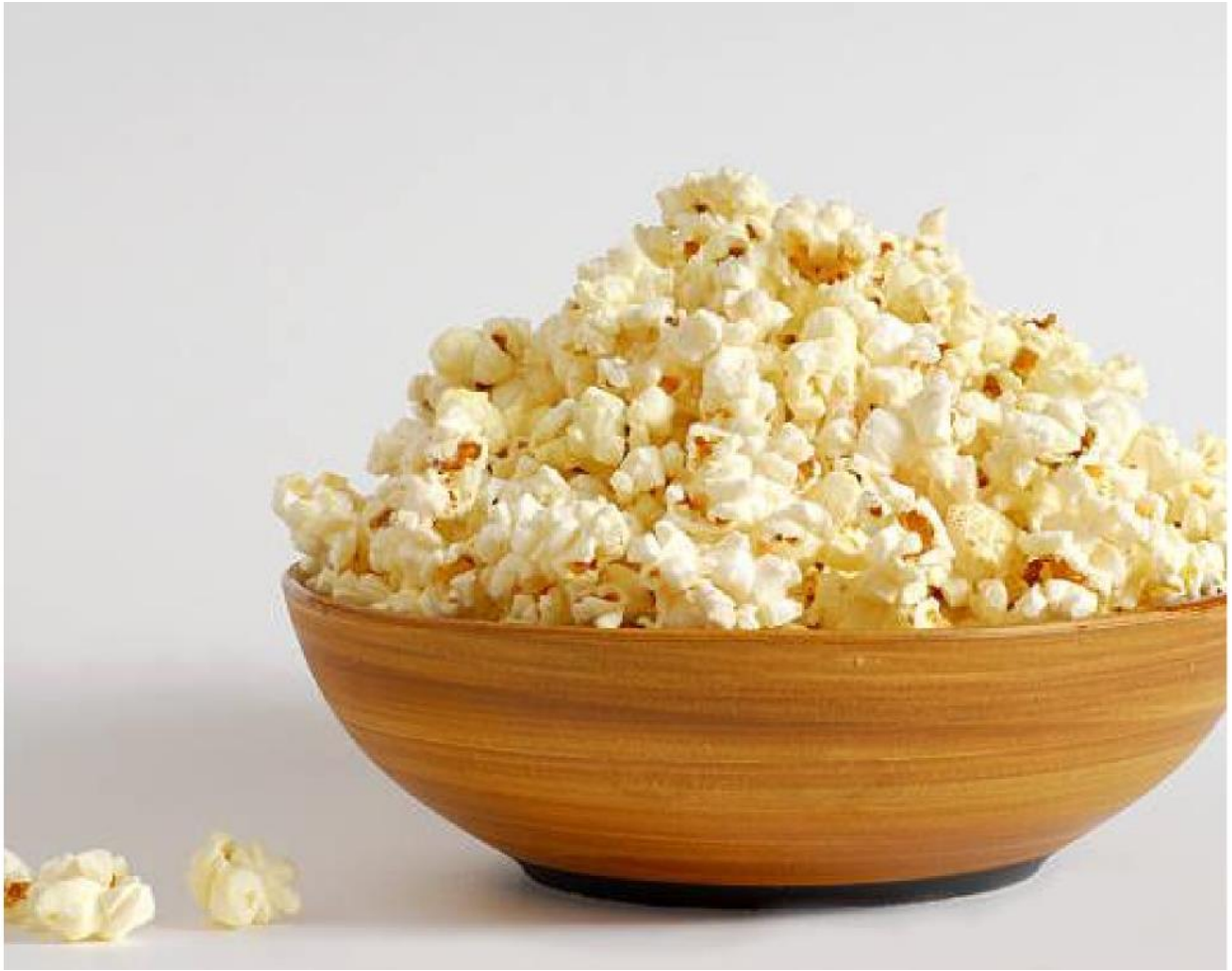
The Maize Project

Students grew maize in a garden...

The Maize Project

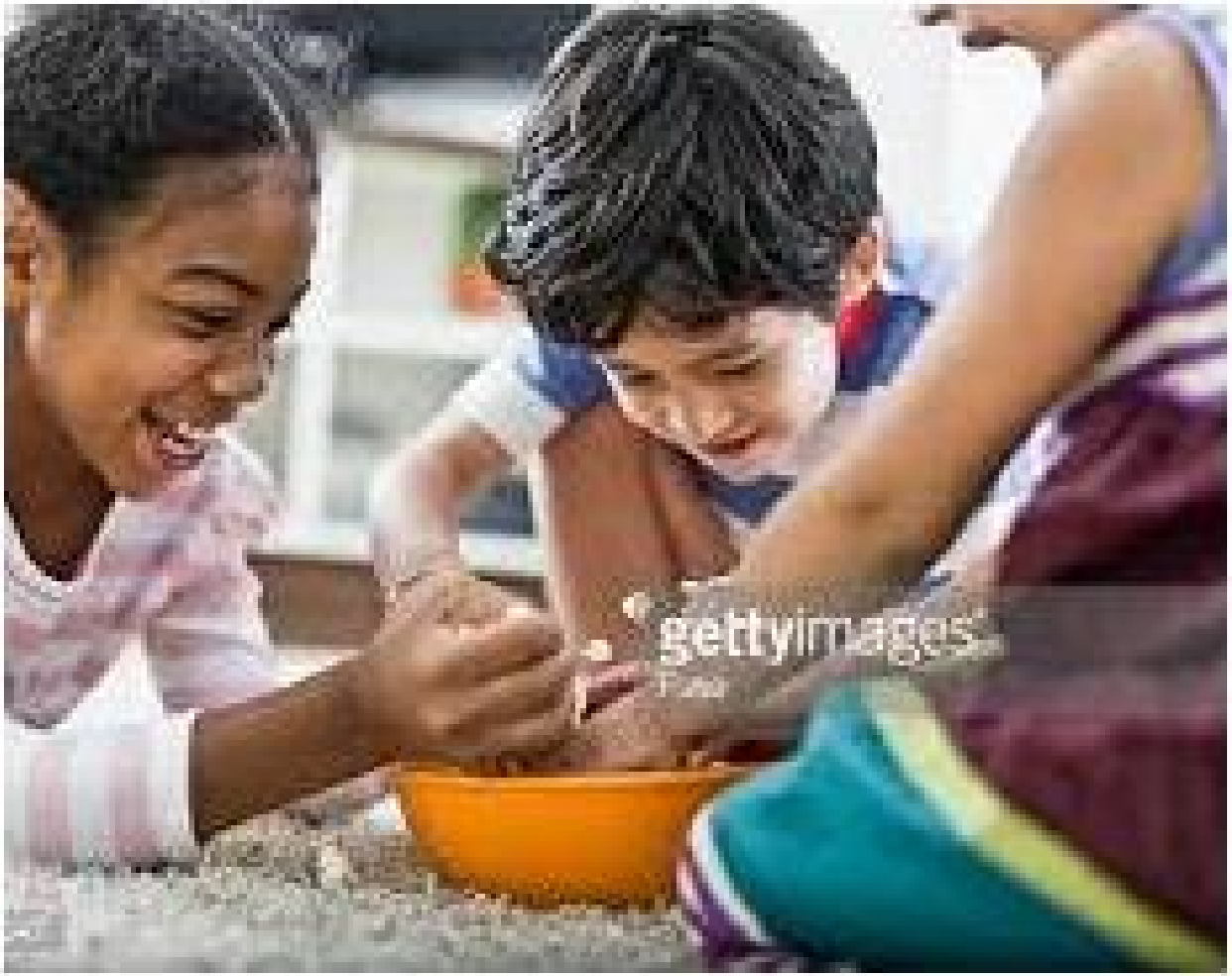
...harvested the maize...

The Maize Project



...popped it into popcorn...

The Maize Project

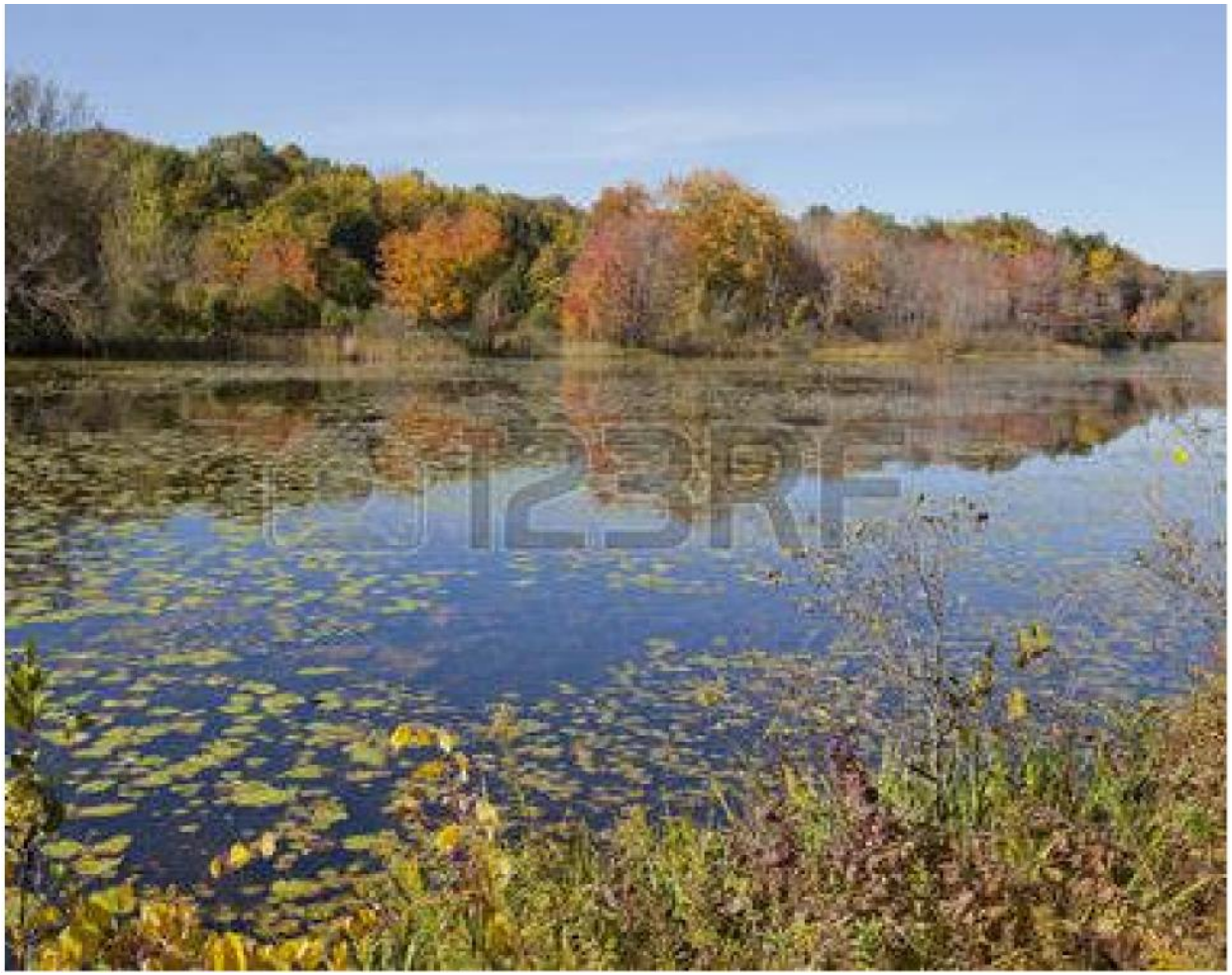


…and shared it!

The Maize Project

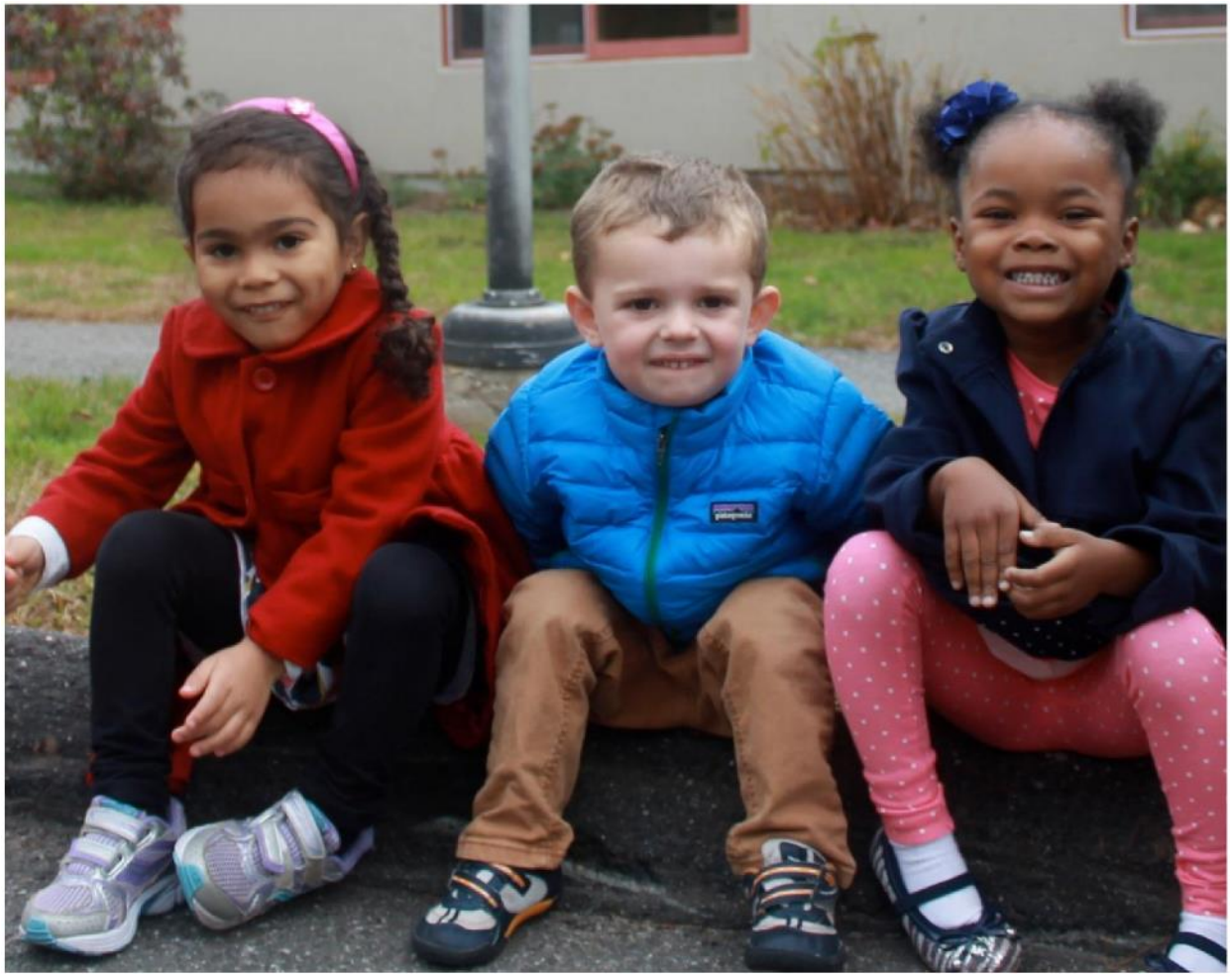
- How long did it probably take to complete this project?
- What is one math or science learning outcome that the teachers might have had when they developed this project?
- What sources of evidence might the teachers have used to determine if students achieved that learning outcome?

The Junior Naturalist Field Trip Project



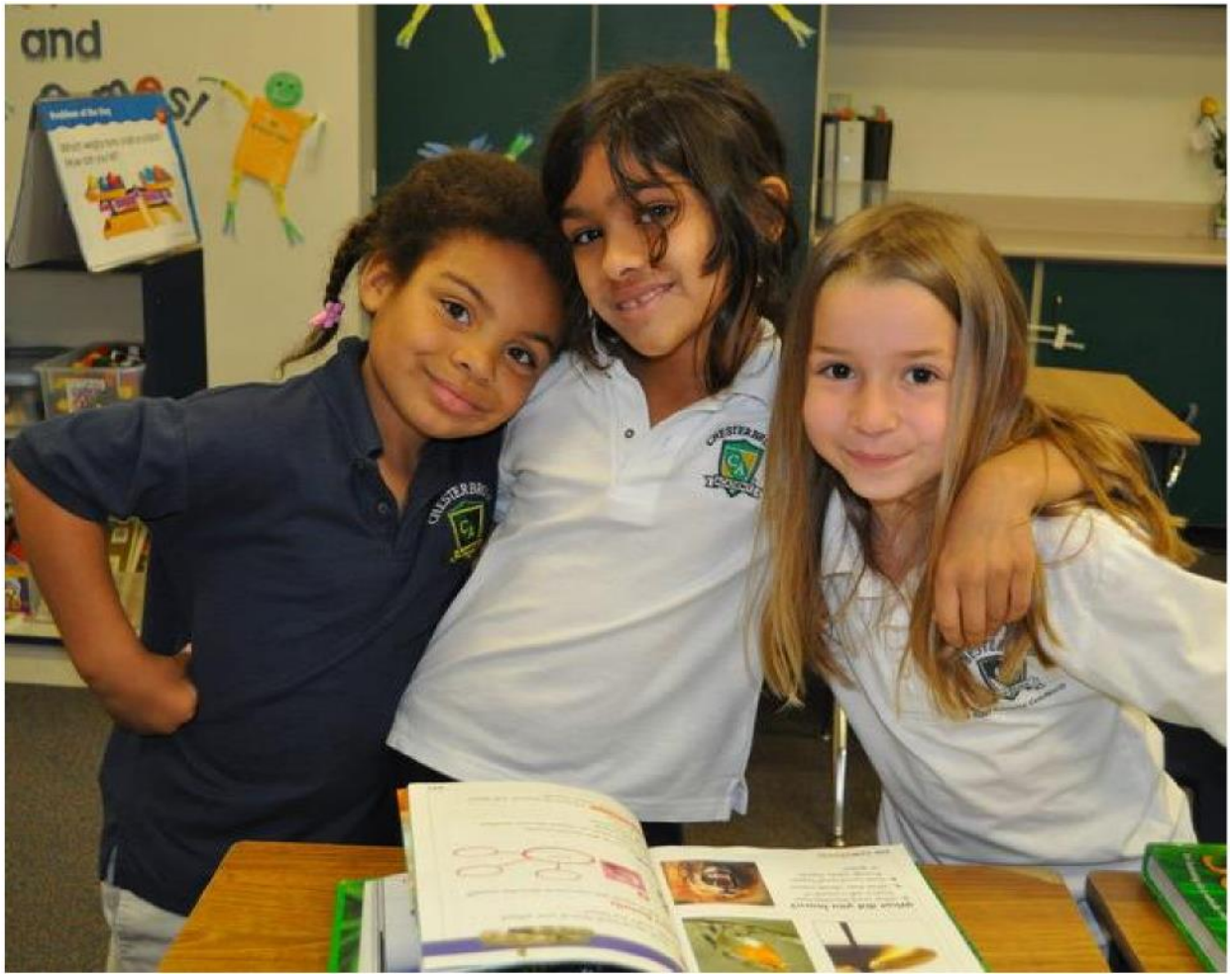
A school had a pond across the street from it.

The Junior Naturalist Field Trip Project



The school had young students.

The Junior Naturalist Field Trip Project



And the school had older students.

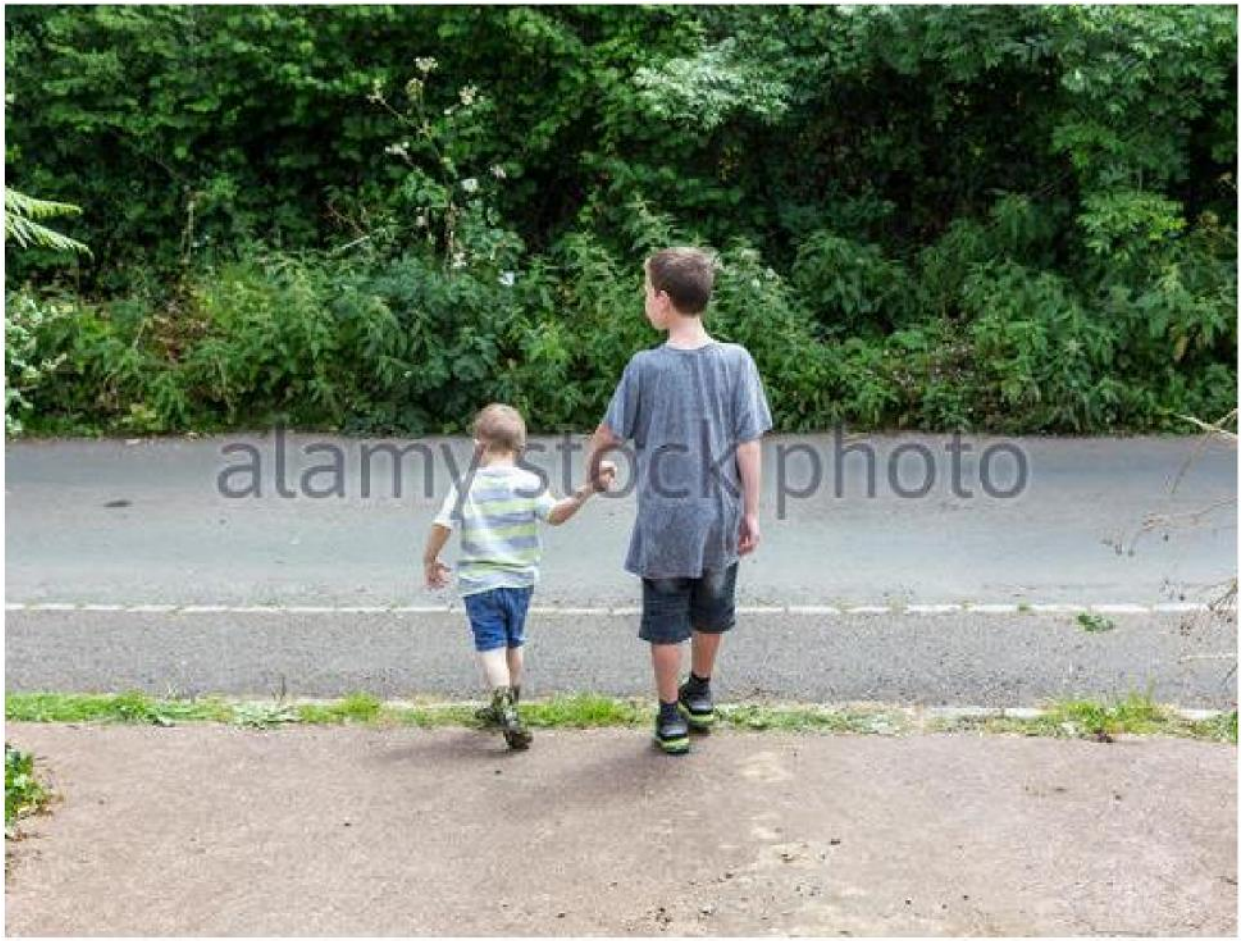
The Junior Naturalist Field Trip Project

The older students planned a field trip to the pond for the younger students.

The Junior Naturalist Field Trip Project

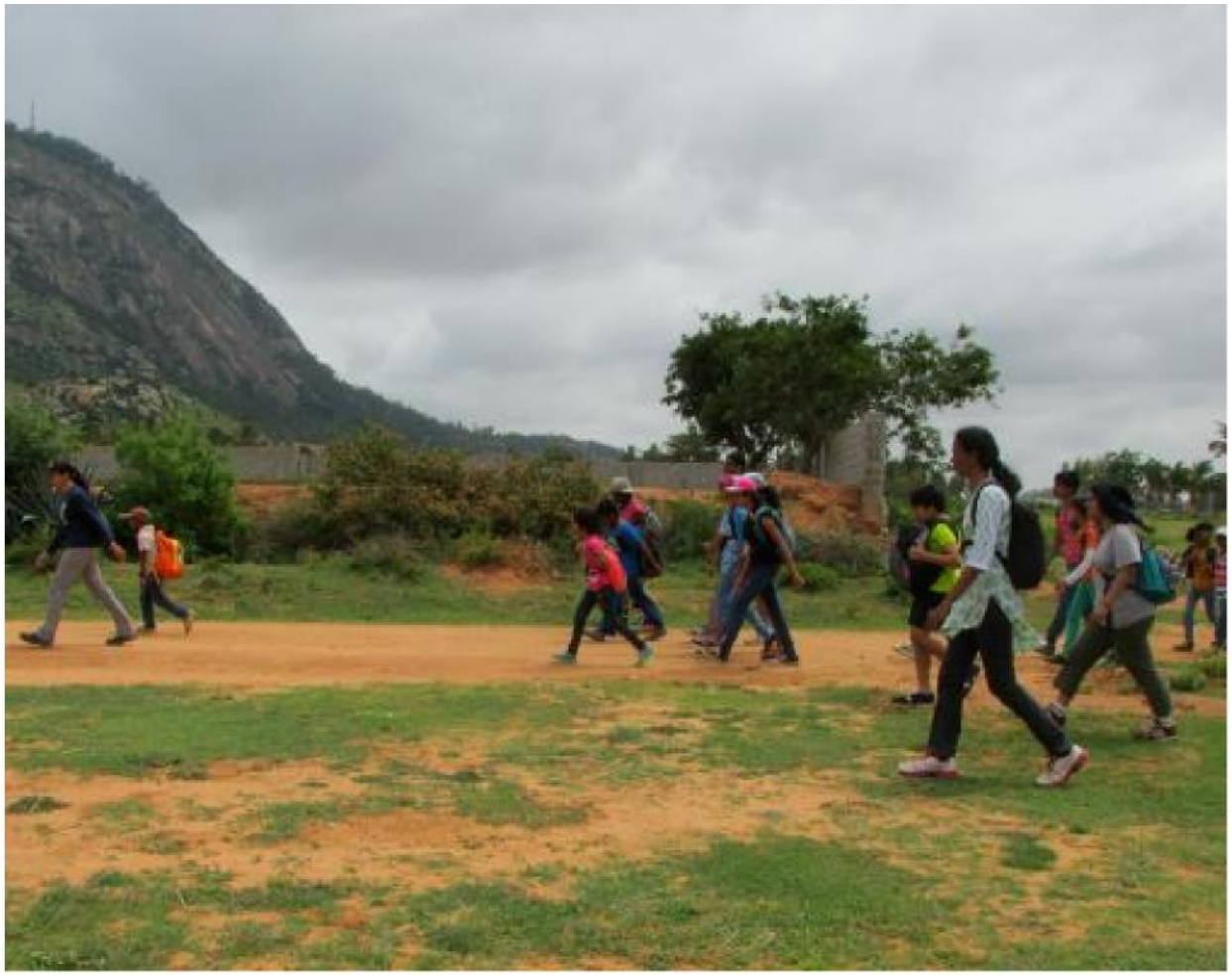
They spent a lot of time planning.

The Junior Naturalist Field Trip Project



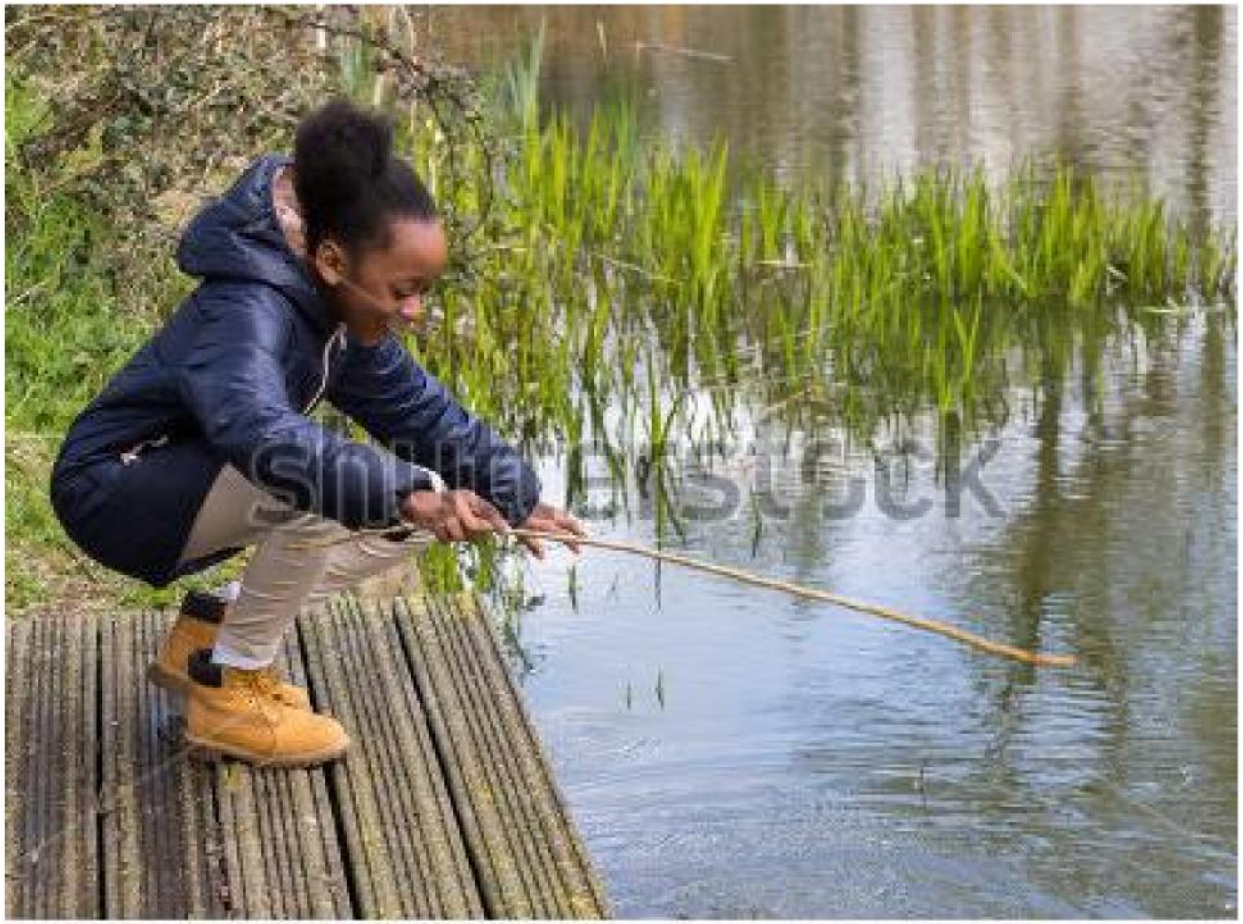
On the day of the field trip, the older students paired up with the younger students.

The Junior Naturalist Field Trip Project



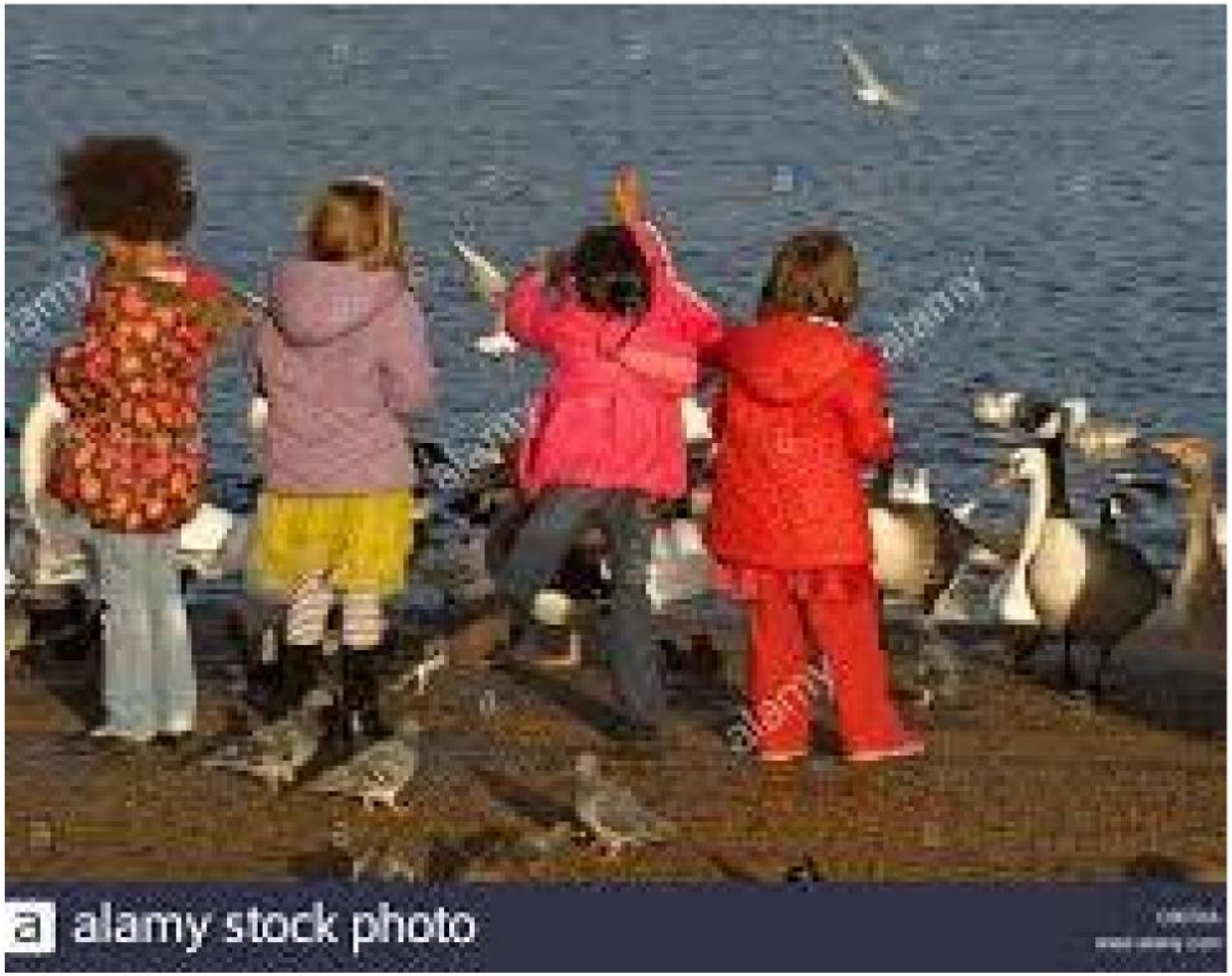
And they all took a walk together to the pond.

The Junior Naturalist Field Trip Project



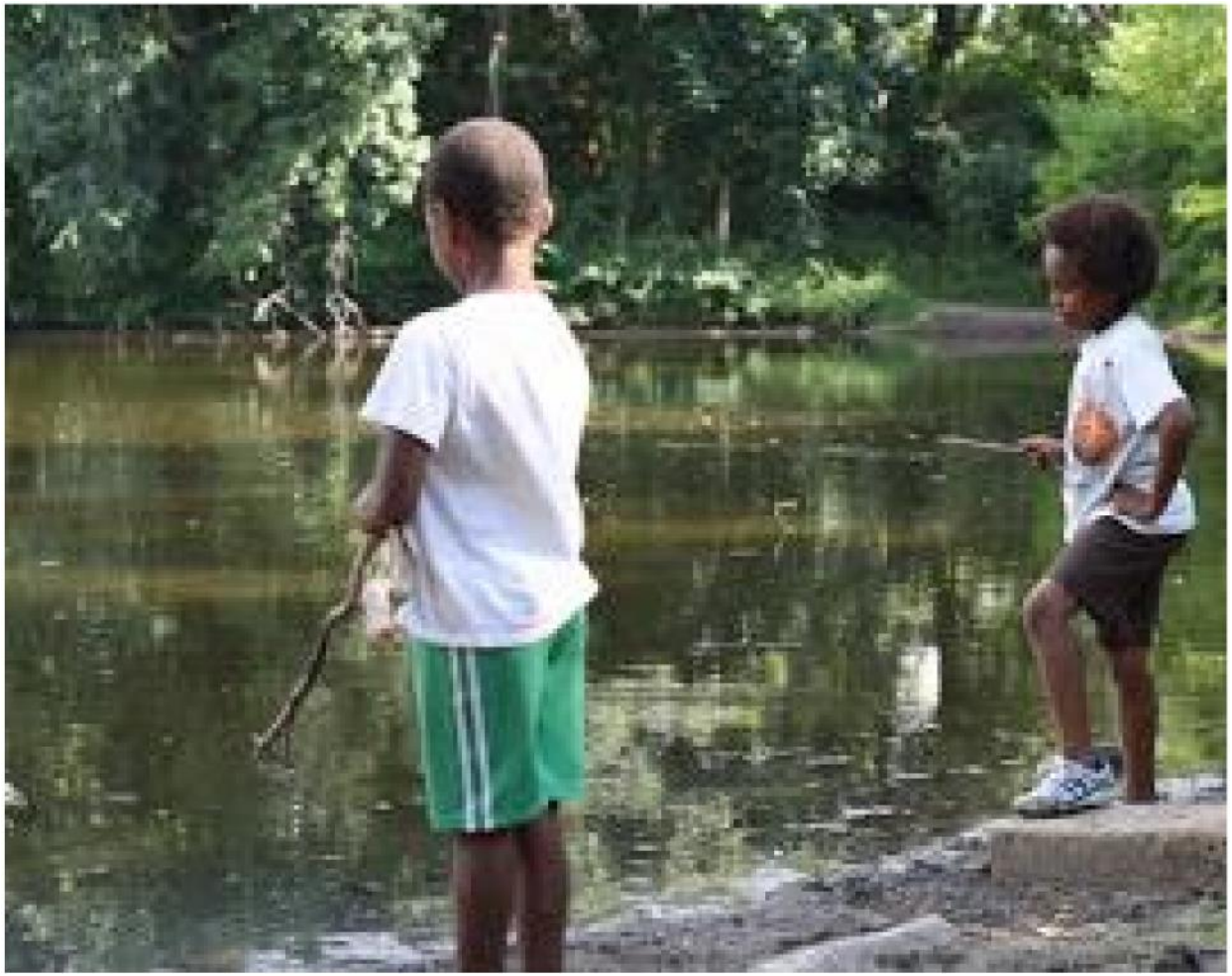
The older students guided the younger students.

The Junior Naturalist Field Trip Project



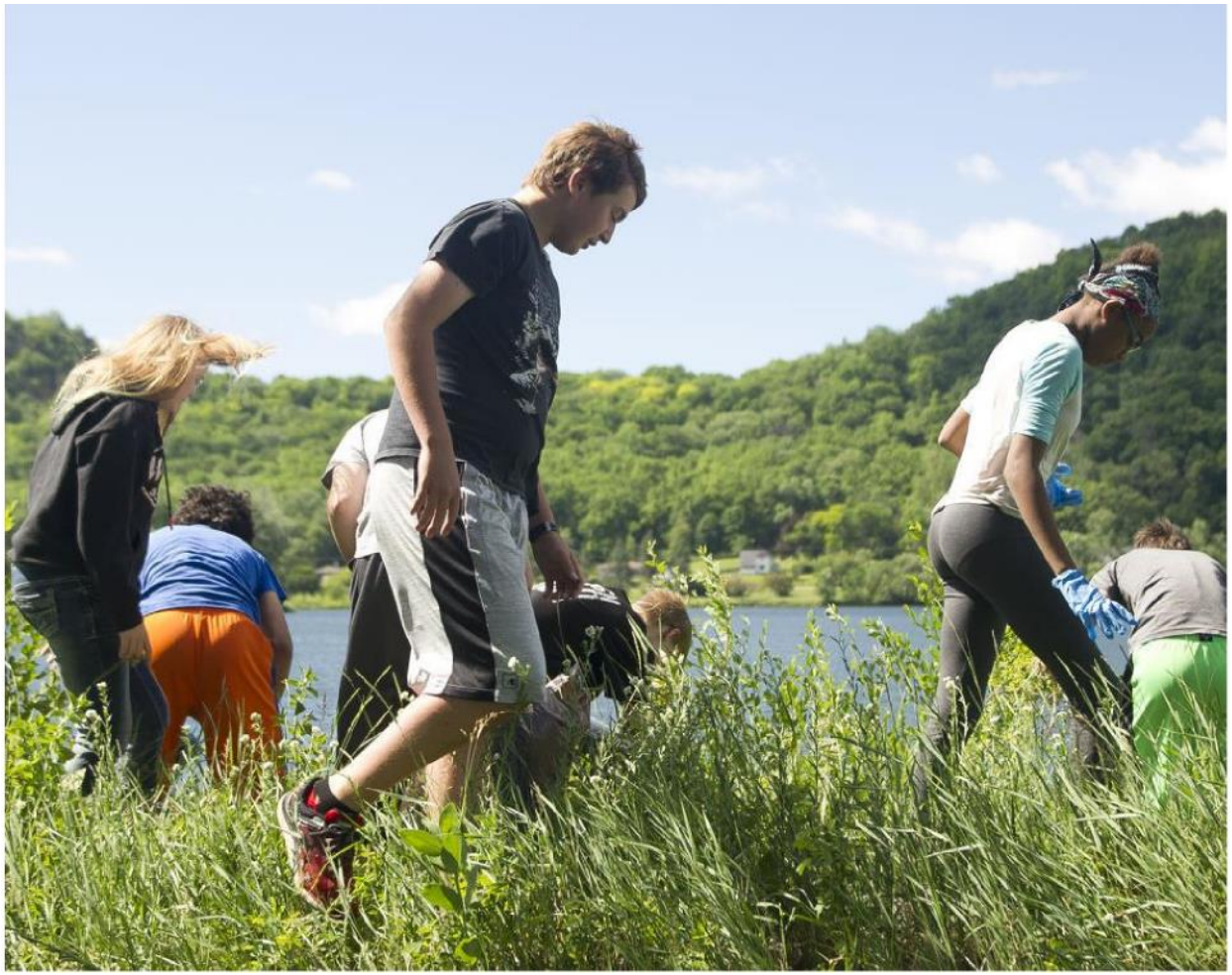
And the younger students learned…

The Junior Naturalist Field Trip Project



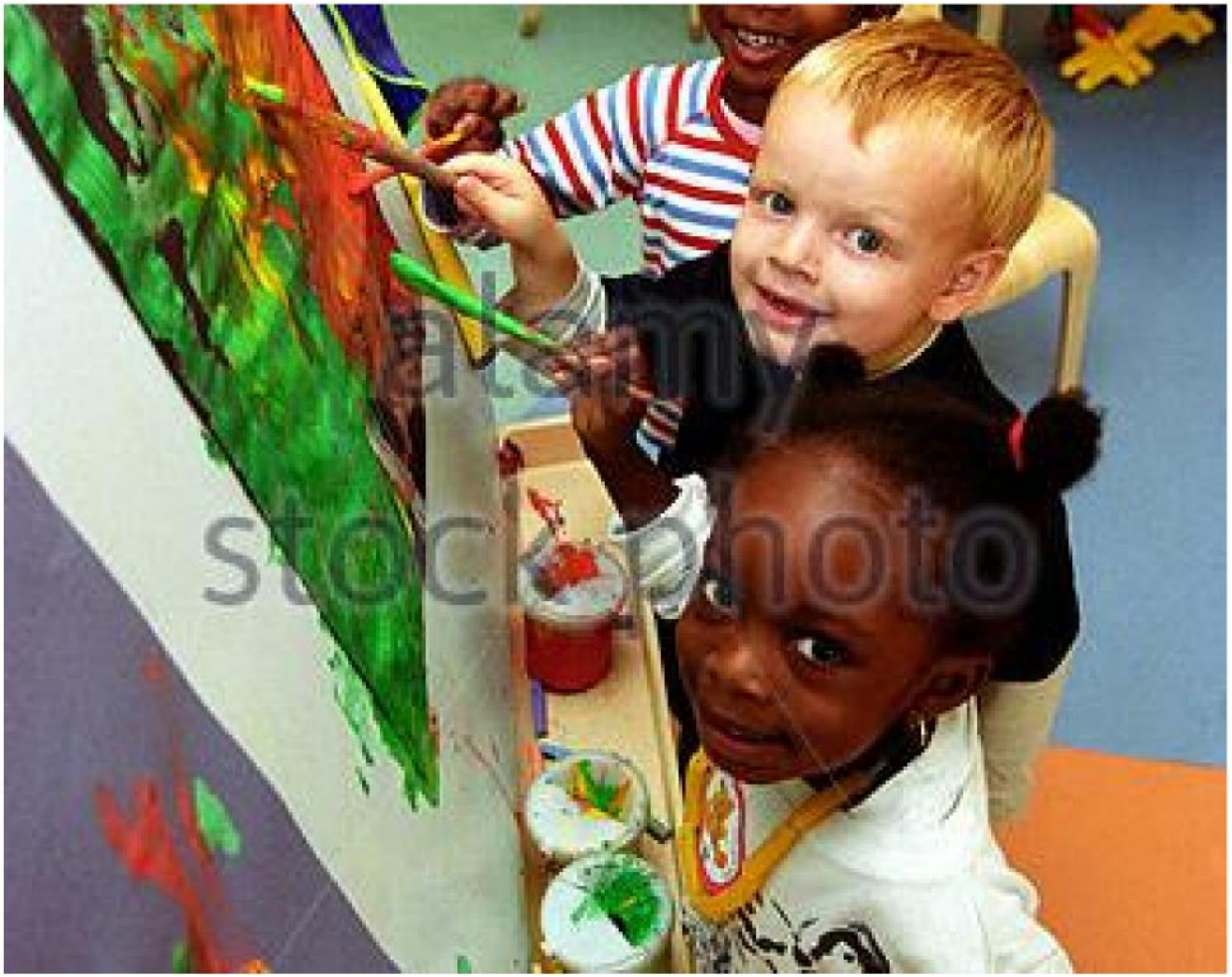
...and learned from the older students.

The Junior Naturalist Field Trip Project



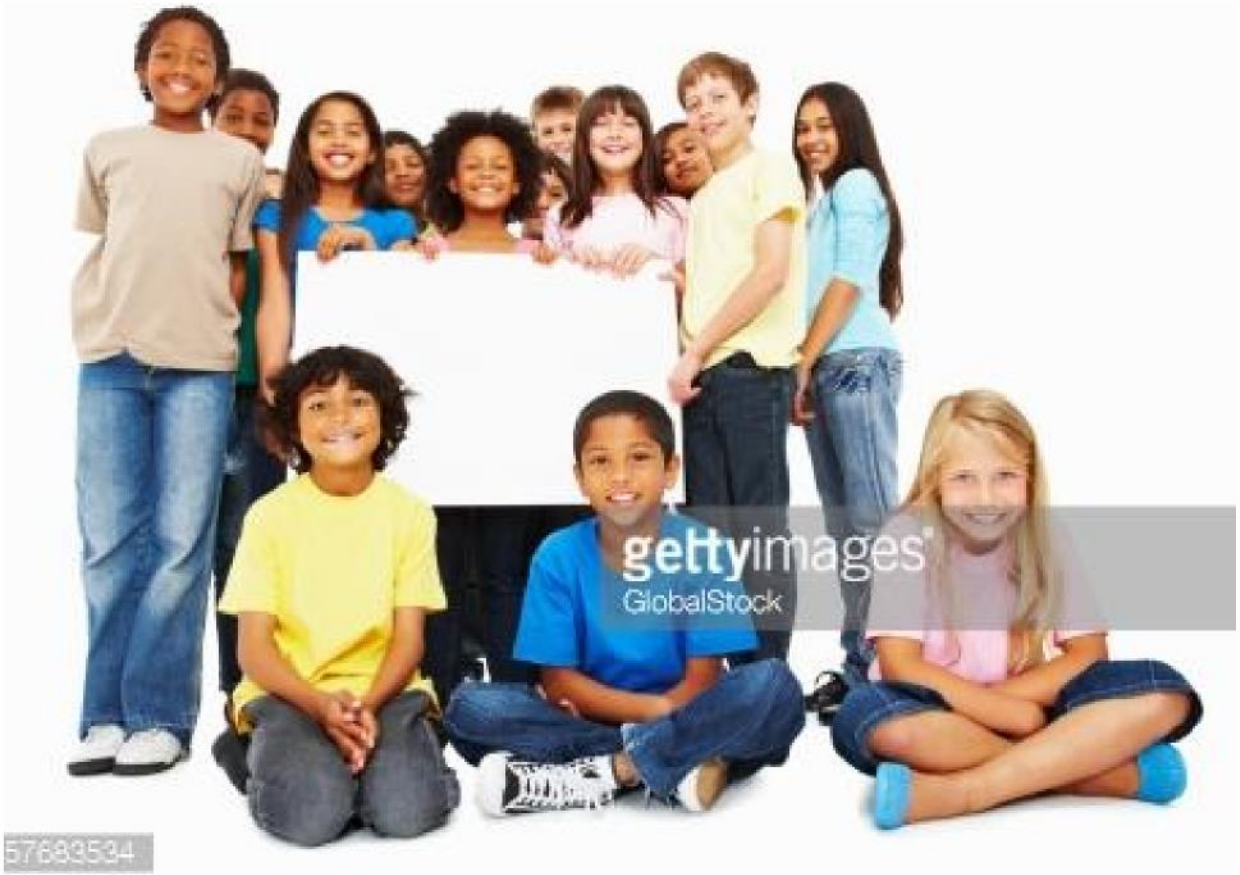
And the older students learned, too.

The Junior Naturalist Field Trip Project



And after they all got back, the younger students...

The Junior Naturalist Field Trip Project



...and the older students shared their experiences with others who did not go on the field trip.

The Junior Naturalist Field Trip Project

- How long did it probably take to complete this project?
- What is one math or science learning outcome that the teachers might have had when they developed this project?
- What sources of evidence might the teachers have used to determine if students achieved that learning outcome?

Learning Outcomes, Rubrics, and Projects

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What are your ideas about using these types of projects in your schools?

Thank You!