

A STEM Integrated Native Pollinator Program:

An Innovative Idea

Miranda Furrer, Graduate Research Assistant

Hui-Hui Wang, PhD, Assistant Professor

John Orick, Purdue Master Gardener Coordinator

Karen Mitchell, Purdue Extension Educator



Introduction

- There is a continued need for more STEM educated employees in the US workforce (US News, 2015).
- STEM integration helps youth to apply STEM concepts to a real world problem by using design.
- In this program, youth learned the critical thinking skills to help them investigate the issue of pollinator decline (Pollinator, 2015)..

Program Objectives

- This program aims to increase STEM literacy in 4th-6th students that attend an afterschool program at the local YMCA.
- The objectives of the program include:
 - Measure STEM knowledge gained by youth in a pollinator afterschool program
 - Measure youth's abilities to construct evidence-based reasoning and utilization of metacognitive practices
 - Identify potential factors that influence volunteer educators' desire to teach the subject matter

How It Works

- Curriculum focusing on all areas of STEM has been developed, with specific lessons on:
 - Basic plant and soil science
 - Native pollinator identification
 - Weather and environmental impact on native pollinators
 - Engineering design
 - Designing and building nests for native pollinators
 - Creating a pollinator friendly garden
 - Skills for collecting data for monitoring native pollinators

September 2016
Develop Curriculum

November 2016
Master Gardener Training

February 2017
Begin Weekly Indoor Program

August 2017
Showcase Event

October 2016
Pilot Test Curriculum

December 2016
Recruit Students for Program at Local YMCA

May 2017
Begin Outdoor Program

Program Phases

- Purdue Master Gardeners were trained to teach the curriculum in Fall 2016 at a Professional Development (PD) event.
- Class began February 2017 and continued for 20 weeks.
- The summer portion of the program is a research project where students have developed research questions and are making observations on homemade solitary bee nests.
- No students from the YMCA are participating, but three from a private instructor are participating in the summer portion.



Picture 1. Sweat Bee

<https://www.ars.usda.gov/ARUserFiles/oc/graphics/photos/may00/k5400-1.jpg>

Results

- Master Gardeners (MG) that attended the PD event felt more comfortable teaching youth about the horticulture topics than before.
- The strongest motivational factors for MGs participating in the program were continued training, seeing results, and working with youth.
- Master Gardeners are being interviewed about their experience with the program.
- Students participating in the private lessons are being interviewed about their experience in the program and their summer research project.
- Student data analysis will take place late summer 2017.