THE EDUCATION FUND

www.educationfund.org

2014-2015

ideas with IMPACT

idea packet

Sponsored by: Humana Foundation

Food Forest

Food Forests

Presented by: Eduardo Recinos

erecinos@dadeschools.net

Twin Lakes Elementary #5601

For information concerning IMPACT II opportunities including Adapter and Disseminator grants, please contact:

The Education Fund

305-558-4544, Ext. 113

e-mail: IMPACT@educationfund.org

web site: www.educationfund.org

Table of Contents

Page 1: Goals and Objectives

Page 3: Course Overview

Page 4: Lesson Plans with Step by Step Guide

Page 11: Resource List

Goals and Objectives

Big Idea 17: Interdependence
SC.4.L.17.1 Compare the seasonal changes in Florida plants and animals to those in other regions of the country.
Cognitive Complexity: Moderate

Big Idea 16: Heredity and Reproduction
SC.4.L.16.2 Explain that although characteristics of plants and animals are inherited, some characteristics can be affected by the environment.
Cognitive Complexity: High
SC.4.L.16.3 Recognize that animals behaviors may be shaped by heredity and learning.
Cognitive Complexity: High
SC.4.L.17.4 Recognize ways plants and animals, including humans, can impact the environment. *Cognitive Complexity:* High

Big Idea 1: The Practice of Science
SC.4.N.1.1 Raise questions about the natural world, investigate them in teams through free explorations, and generate appropriate explanations based on those explorations.
Cognitive Complexity: High
SC.4.N.1.2 Compare the observations made by different groups using multiple tools and seek reasons to explain the differences across groups. *Cognitive Complexity:* High

Big Idea 2: The Characteristics of Scientific Knowledge
SC.4.N.2.1 Explain that science focuses solely on the natural world.
Cognitive Complexity: Moderate

LACC.4.W.3.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

LACC.4.SL.1.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.

MACC.4.MD.1.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.

MACC.4.MD.2.4 Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

Course Overview

The project is designed to be aligned with the Miami-Dade County Public Schools pacing guide for Grade 4 Science, Topic XII: Interdependence - Seasonal Changes in Florida's Plants and Animals. It takes 13 days to complete.

This is a cross curricular project that can be modified to include all grade levels. Students learn science, language arts and mathematics by designing and creating a food forest.

Students take on the challenge of planting edible crops while balancing them with a natural habitat. Through observation, they learn about the human impact on the environment. Through action, they learn about the value of land restoration and preservation of natural habitat. They do this by learning about native and invasive species. They also plant some native species in their food forest.

Students are introduced to the concepts of instinct, learned behavior and adaptations. They do research and set up habitat for birds based on their behavior and adaptations. They also set up composting and recycling bins to affect learned behavior by people.

The interaction of organisms is also covered in this project. Students learn about competition and learn how to share resources and live side by side with nature.

Lesson Plans

Procedures:

Day 1

Science

Discuss the interactions of organisms and the way they relate to the interactions of people.

Discuss the Interactions of people with animals and plants. Give examples of:
1. Competition
2. Sharing resources
3. Helping each other
4. Living side by side
5. Causing harm

Take students on a tour of the site for the future food forest and have them point out and create a list of examples of how people and animals interact with the space they see.

points of discussion can include:

Was the land cleared of trees for construction?
Is there a lot of habitat to support wildlife?

What animals and plants are present?

Divide students into five groups and assign a type of interaction for each group.

Have each group find an example of the type of interaction that they were assigned in the future site of the food forest.

Language Arts

The student categorizes the examples of the different types of interactions between people, animals, and plants into the five main types by creating a chart.

Day 2

Science

Introduce the concept of renewable resources by visiting the website for Recycling and Composting and opening the Composting Office as a class activity with the students.

Discuss reusing cardboard as mulch to prepare the food forest by using layers of cardboard,compost, and mulch to build healthy soil.

Prepare the site for planting by using the mulch layering technique.

Language Arts

Watch Nova video, “Decomposers”

Have students take notes on how decomposers create topsoil.

Students write an explanation of how soil is created and cite evidence from the video.

Day 3

Science

Discuss Florida native plants and invasive species

Introduce students to a selection of native plants.

Demonstrate how to plant a tree or bush.

Have students space out plants along the perimeter of the food forest making sure to leave room for entrances.

Language Arts

Students explore these four resources:

1. Help Protect Florida's Natural Areas from Non-Native Invasive Plants
2. List and Description of Florida's Animals and Plants
3. Description of Plants and Animals of the Everglades
4. Forest Trees of Florida website and conduct research to find out about the characteristics that allow you to identify the plants.

Have students write a description of a native plant with identifying characteristics using evidence from the website.

Day 4

Science

Discuss the concept of competition for resources

Show the Discovery video, Monkeys Compete for Figs

Discuss human land use expansion and how we compete with animals for resources.

Students plant native plants along the edges of the food forest to provide some resources for native wildlife.

Mathematics

Students measure the dimensions of the food forest using a trundle wheel or tape measure.

Students draw a scale map of the site on graph paper.

Day 5

Science

Discuss the environmental factors that can affect plant and animal characteristics.

The food forest area is divided into quarters with rope and stakes.

Have them identify the direction and amount of sunlight and wind for different areas.

Divide students into groups and have students study the land for areas that may flood or be exposed to strong winds.
Suggestion:

Use an anemometer with students to measure wind speed and direction.

Search for high and low points to know where water might gather.

Look for exposed areas that might be vulnerable to wind.

Language Arts

Reading passage “Can a Plant Live Anywhere?”

Divide students into groups to discuss the passage and come up with a list of environmental factors that have an effect on plant growth.

Day 6

Science

Discuss plant adaptations and the environmental factors that affect their growth characteristics

Distribute a list of food forest plants with descriptions of growth characteristics and adaptations to shade or drought.

Take students to the site and have them place the plants in the quadrants where they will grow best.

Then arrange plants so that they are getting the right amount of light and space.

Mathematics

Have students create a line plot based on growth characteristics.

Have students compare the height of their plants on the line plot to the maximum growth size on the label and subtract to provide the difference in size.

Day 7

Science

Discuss forest restoration by humans and how it is an example of
1. reclamation
2. preservation

Discuss how planting trees can help restore the environment and reclaim land for wildlife.

Demonstrate how to plant a tree.

Help students dig holes and have students plant canopy trees in the food forest

Language Arts

Watch Discovery video, “Preserving and Protecting Habitats”

Students take notes on how to preserve habitats.

Students are divided into groups to discuss ways that a food forest preserves habitat.

Each group presents one example to the class.

Day 8

Science

Discuss the harmful effects of humans on soil pollution and erosion.

Discuss how groundcovers, and borders are an effective way to retain and build healthy soil.

Plant bushes for edges and borders and add ground covers.

Day 9

Science

Discuss instincts and inherited behavior

Have students watch the Discovery video: What are Instincts?

Discuss how birds use bird baths as an instinct.

Place bird baths in the food forest

Mathematics

Count the different species of birds that visit the bird bath.

Create a line plot using the final count

Day 10

Science

Watch Discovery video, “Adaptations: Features that Help Animals Survive”

Discuss bird adaptations and what they need for protection and survival

Add birdhouses to the food forest

Day 11

Science

Discuss restoration by humans by recycling

Set up a picnic area near the food forest with a recycling bin and a trash can

---

Day 12

Science

Discuss Learned behavior

Students visit the website: Inherited vs. Learned Behavior and take the assessment

Discuss examples of learned behaviors for people

Discuss how composting is an examples of learned behavior for people

Set up a composting bin in the food forest

Day 13

Science

Discuss harmful effects from humans on the environment
1. Polluted water
2. Ocean pollution

Locate sources of water for the food forest and set-up a rain barrel.

Language Arts

Take students through a walk of the school site and grounds. Tell them to focus on sources of pollution.

Students take notes during the tour

Students read ebook “Populations and Pollution”

Students categorize a list of sources of pollution by creating a chart.

Vocabulary:

adaptation, inherited, trait, characteristic, learned behavior, heredity, species, hibernation, migration, ecosystem, environment, competition, interaction, balance, resources, recycle, environmental factors, plant characteristics, human impact, pollution

Resources

Plant Nurseries:

Going Bananas -
Tropical Plant Nursery
24401 SW 197 Ave
Miami, FL 33031

www.going-bananas@bellsouth.net
email: goingbananas@bellsouth.net
phone: (305)247-0397

Richard Lyon's Nursery -

Rare & Unusual Tropical

Trees & Plants
20200 SW 134th Ave

Miami, FL 33177

www.richardlyonsnursery.com
phone: (305) 251-6293

Flamingo Road Nursery -
Plants, Pottery, Plant Care, Garden Furniture
1655 S Flamingo Rd
Davie, FL 33325

www.flamingoroadnursery.com
Phone: (954) 476-7878

Miracle Fruit Farms -
Highest Quality Miracle Fruit
16300 SW 184th St, Miami, FL 33187

website: www.miraclefruitfarm.com
phone: (786)220-4135

Pine Island Nursery -
Finest Quality Fruit Trees
16300 SW 184 St, Miami, FL 33187

website: www.tropicalfruitnursery.com
Phone: (305) 233-5501

Little River Cooperative- *Local Perennials*

www.littlerivercooperative.com

Online Catalogs:

Bountiful Gardens - *Heirloom, Untreated, Open Pollinated Seeds*
www.bountifulgardens.org

Eden Organic Nursery Services Seeds - *Organic, Heirloom Seeds*
www.eonseeds.com

Molokai Seed Company -
Sustainable Agriculture
www.molokaiseedcompany.com

Mass Spectrum Botanicals - *Rare Live Seeds and Plants*
www.massspectrumbotainicals.com

Baker Creek Heirloom Seeds - *Rare, Non-GMO Seeds*
www.rareseeds.com

Contacts

Zarron Brown "The Worm Whisperer" - Compost Presentations, Worm Bin Installations
zbrown1906@hotmail.com

Terri Stephen - The Ladybug Project, Florida Master Gardener
terrisephen@mac.com

Deanna Sossin - Heal the Planet S.E.E.D. Program
deanna@healtheplanet.com, 954-565-2950 or cell phone: 954-632-6916

Baptist-Krista Yoder Latortue, Registered Dietitian, Can help with parent workshops, provide nutritionists for speakers
Direct: 786-596-2084, KristaY@BaptistHealth.net

Tiffany Noe- author of ***Forager: A Subjective Guide to Miami's Edible Plants***

Garden help, Food forest perennials
www.plantmatter.net; mango@plantmatter.net

Heather Hassandras - Garden Help, Agricultural Lesson Plans

Free Mulch

City of Hialeah, Solid Waste Mulch Program - Self Service, Available Daily
5601 East 8th Avenue, Hialeah, FL 33010
Phone: (305) 687-2625 or (305) 687-2630

Banyan Tree Service - Delivered Free
Village of Palmetto Bay, FL 33157
Phone: (305) 667-0073

Books:

Gaia's Garden by Toby Hemenway
Text Book: Scott Foresman pp. 26-33, 73-83, 105-131, 40, 104

Educational Websites:

Content	Title	
Inherited Traits	Examples of	http://www.sln.org/

	Inherited Traits	guide/knox/Traits/traitsexamples.pdf
Students investigate biodiversity in local ecosystems	Introducing Biodiversity	http://www.sciencenetlinks.com/lessons.php?BenchmarkID=5&DocID=440
Lesson plan with a variety of activities stressing recycling and a lab on composting	Recycling and Composting	http://www.teachersdomain.org/resource/ess05.sci.ess.earthsys.lp_recycle/
An assessment in which students will identify characteristics of organisms that are inherited from their parents and others that are learned from interacting with the environment	Inherited vs. Learned Behavior	http://www.floridastandards.org/Resources/PublicPreviewResource1898.aspx
This website provides identifications, descriptions, and biological classifications of Florida trees.	Forest Trees of Florida	http://www.floridastandards.org/Resources/PublicPreviewResource511.aspx
Identify the basic components necessary for biodiversity	Introducing Biodiversity	http://www.floridastandards.org/Resources/PublicPreviewResource4725.aspx
A list, description, and prevention guide for non-native invasive plant species in Florida.	Help Protect Florida's Natural Areas From Non-Native Invasive Plants	http://www.floridastandards.org/Resources/PublicPreviewResource1723.aspx

Students learn about the value renewable resources	Recycling and Composting	http://www.floridastandards.org/Resources/PublicPreviewResource4559.aspx
This video segment from the *Race to Save the Planet* teaching module "Saving the Diversity	Amazon Rainforest	http://www.floridastandards.org/Resources/PublicPreviewResource5331.aspx
This video segment from *Interactive NOVA:* "Earth" describes the role of decomposers in the living world	Decomposers	http://www.floridastandards.org/Resources/PublicPreviewResource5276.aspx
Florida Animals and Plants	List and description of Florida Animals and Plants	http://www.floridaplants.com/young_animals.htm http://www.landscope.org/florida/plants-animals/
Plants and Animals of the Everglades	Description of Plants and Animals of the Everglades	http://www.evergladesplan.org/facts_info/sywtkma_animals.aspx
GIZMOS – Online Inquiry Interdependence	Forest Ecosystem	http://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=639

Discovery Videos	Adaptations: Features That Help Animals Survive Plant Adaptation: Succession in the Forest System Natural Selection, Adaptations, and Environmental Changes Examples of Animal Adaptations Physical and Behavioral Adaptations Monkeys Compete for Figs What are Instincts? Climate Impact of Humans on Our Environment Human Activities Pollute Our Environment Pollution Problem How the Actions of Humans Threaten Our Oceans Pollution Pollution Water Pollution Preserving and Protecting Habitats

eBooks	Types of Behaviors Populations and Pollution Human Effects on Ecosystems
Reading Passages	Can a Plant Live Anywhere? Organisms and Seasonal Change Human Effects on Ecosystems Populations and Pollution
Exploration	Competition for Resources Pollution Solutions
Animation	instinct pollute

THE EDUCATION FUND

FOR EXCELLENCE IN MIAMI-DADE PUBLIC SCHOOLS

APPLY FOR AN IMPACT II ADAPTER GRANT!

M-DCPS teachers, media specialists, counselors or assistant principals may request funds to implement an IMPACT II idea, teaching strategy or project from the Idea EXPO workshops and/or curriculum ideas profiled annually in the ***Ideas with IMPACT*** catalogs from 1990 to the current year, 2014-15. Most catalogs can be viewed at The Education Fund web site at www.educationfund.org under the heading, "Publications."

- Open to all K-12 M-DCPS teachers, counselors, media specialists
- Quick and easy reporting requirements
- Grants range from $150 - $400
- Grant recipients recognized at an Awards Reception

To apply, you must contact the teacher who developed the idea before submitting your application. Contact can be made by attending a workshop given by the disseminator, communicating via email or telephone, by visiting the disseminator in their classroom, or by having the disseminator visit your classroom.

Project funds are to be spent within the current school year or an extension may be requested. An expense report with receipts is required by June 15th.

APPLICATION DEADLINE:
December 10, 2014

Apply online at www.educationfund.org

For more information, contact:
Edwina Lau, Program Director
305.558.4544, ext. 113
elau@educationfund.org

THE EDUCATION FUND
FOR EXCELLENCE IN MIAMI-DADE PUBLIC SCHOOLS

Contributors with IMPACT

Platinum Star

Florida Matching Grants Program

Gold Star

TD Bank
America's Most Convenient Bank®

Ford
Ford Motor Company Fund

FLORIDA 123 ABH SUPPORT EDUCATION

Humana Foundation

Silver Star

Rod and Lucy Petrey

NEXT GEN

Robert Russell Memorial Foundation

PEREZ TRADING COMPANY

FPL

Bronze Star

original IMPRESSIONS™
Your Marketing Communications Partner®

The Jack Chester Foundation

Yamaha Contender
Miami Billfish Tournament

Raj Rawal and Anne Marie Miller

Jonathan Symons