

A close-up photograph of a sunflower head, showing the intricate details of the dark brown and yellow seed heads. A grasshopper is perched on the right side of the flower head, its body and legs clearly visible against the textured background of the seeds. The background is a soft, out-of-focus yellow, suggesting the petals of the sunflower.

School Gardens as Outdoor Classrooms

Hands-On Critical Thinking

How Do You Start?



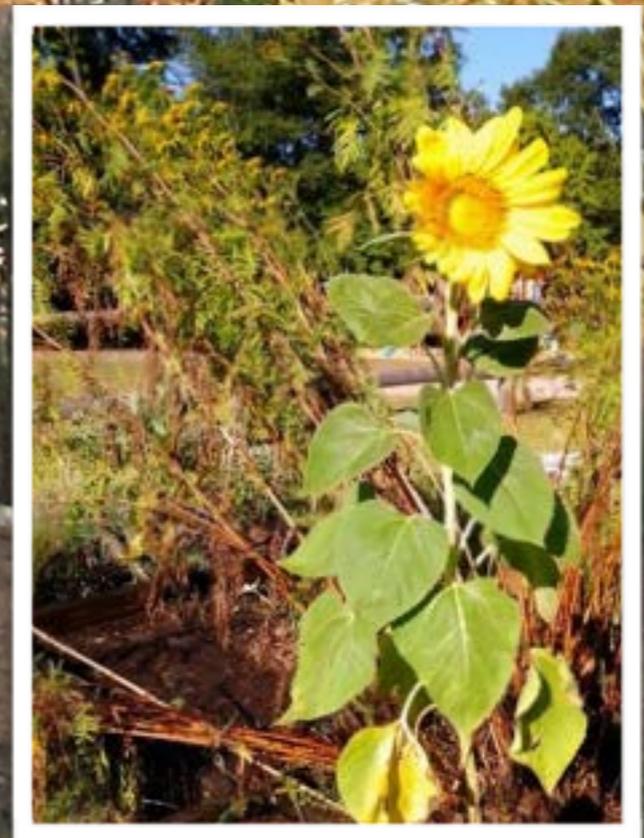
Site Survey: Beds vs. Ground
Soil Testing: PH and Contaminants
(UMass Amhearst, app. \$25)

Raised Beds: Pressure-treated contains arsenic and/or formaldehyde.
Treat raw pine with linseed oil and beds will last 5-10 years.

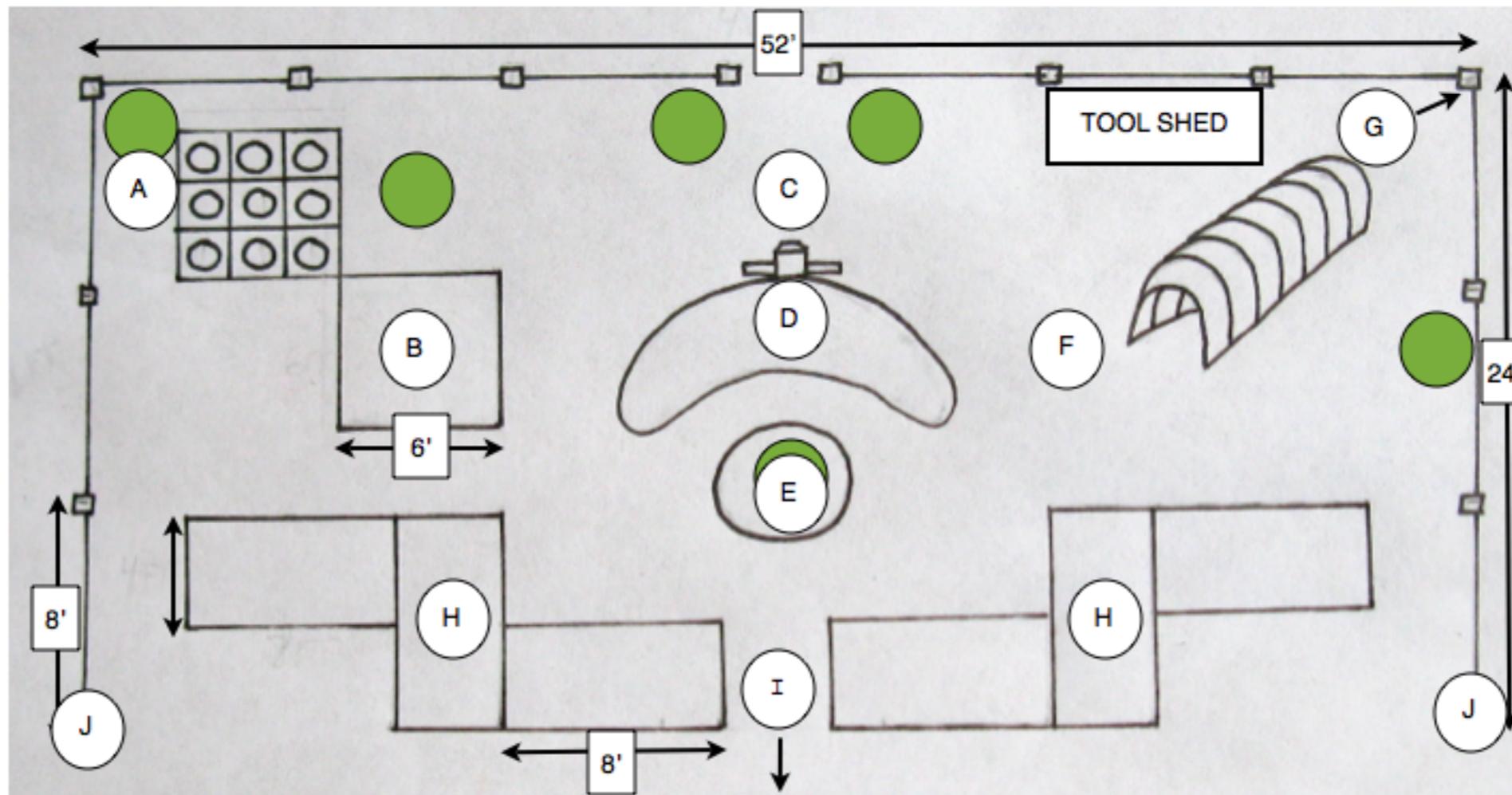
Containers and Pots: Great for when you're working over asphalt or concrete.
Place gravel on bottom for drainage. May be expensive.
May crack in winter cold.

Access to Water: School spigot, silcock key, rain barrel

Soil: from garden supply store or free city compost?



WADDINGTON EXPLORATION AND ENVIRONMENTAL SCIENCE GARDEN



A. Tic-Tac-Toe (Shells vs. Pine Cones, buried 12" pots)
B. Sand and Stone: Archeological Dig
C. Weather Station: Rain Gauges (2), Thermometer (2), Anemometer (Wind Gauge) (1)
 Mason Bee House
 Ladybird Beetle House

D. Pollinator Garden/Decomposers
 Ants, Bees, Butterflies/Beetles, Pill Bugs, Worms
E. Tree and Sun Dial
F. Tunnel (Rebar, Chicken Wire, Pea Plants)
G. Compost Bins (by fence)
H. Raised Beds

I. Rain Barrels (2) (beside school)
J. Fixed to Fence: Bird Houses, Rain Stick, Water Wheel, Embedded Insects in Lucite, Scavenger Hunt, Marimba (?)

 **Trees/Shrubs: Dogwood, Rose of Sharon, Dwarf Grafted Fruit**

Draw a Plan

October 20th, 10 a.m. Can You Dig It?

Waddington Garden

Discovery, Community, Education, Play, Leadership

Help us make our school garden great!



WE NEED YOU TO:

Build raised beds
Shovel dirt
Top with compost
Pick up sand
Paint rocks
Paint science visuals
Pull weeds
Bake goodies
Bring drinks/cups/napkins

WE NEED:

Play Sand
Wooden Electrical Spool
Extra shovels for the day
Smallish rocks for painting
Nine 12" terra cotta pots
Shrubs
Bicycle parts
Drills/Hardware



RSVP
mgullet@
epschoolsri
.com

Send Out Flyers:

- What you need (Materials)
- Job List (All skill levels. Delegate!)
- Time and Place
- Refreshments
 - Water

Community Resources

Create a Committee:

Labor

(List and divide tasks)

Supplies (shovels, rakes, buckets, hose, seeds, plants, materials for raised beds, containers, gloves)

Networking (PTA list, newsletter)

Food (donated by local restaurant?)

Drinks (keep hydrated!!)



The Results?

- Teach health eating
- Teach how to cook
- Teach how to can food (pickles are easy)
- Grow a theme, like a pizza or salsa garden
- Grow a theme, like fairy tales (Jack and the Bean Stalk, Cinderella's pumpkin) and tie to reading
- Measure and track for math
- Donate to food pantry
- Make dyes from flowers, beets, etc.
- Make art from seed pods and dried flowers
- Draw and paint what you see in the garden





Water Pollution Kit: As Shown, \$700-\$1500

- Make your own by painting plastic with acrylic.
- Pesticide/Herbicide: Colored Sprinkles
- Animal Waste: Chocolate Sprinkles
- Oil: Food Coloring
- Model Houses, Trees, Animals, and Car/Tractor: Savers/Modeling Clay
- Root Layer/Coastal "Sponge": Cut Sponge
- Rain: Spray Bottle
- Car Wash: Foaming Soap Dispenser



Shopping at Job Lot, Savers, etc.

Less Than \$20

Eco-Systems





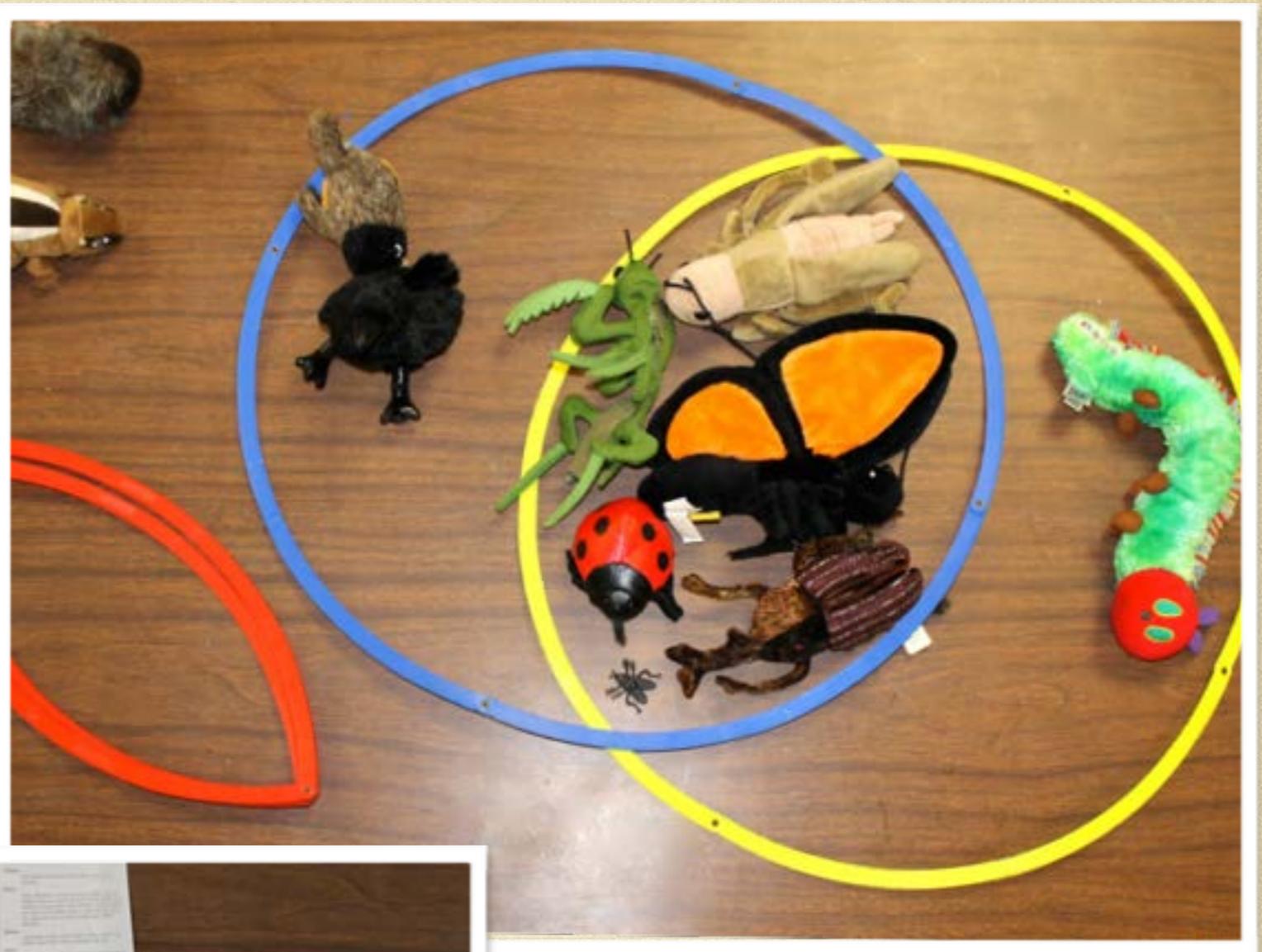
Deadly Links

Food Chain Game of Tag:
Collect as many colored sticks (seeds/energy) as you can without getting tagged by someone higher up the food chain. Tagged participants must give up seeds. Chose color to be poisoned by pesticide and see which animals get highest amount of toxin. Rotate roles.

Materials: Colored
Craft Sticks

Three Roles:
Grasshopper
Vole
Hawk

**Define characteristics of animals:
Use puppets and plays to explain camouflage, armor, defense, ability to feed, move, stay warm, etc.**



Animal Adaptation

Insect Kit



- Books
- Specimens
- Puppets
- Magnifiers
- Insect Stages
- Bug Bingo
- Scavenger Lists

Pollinators



Attracting Pollinators

- Provide blooms early spring until late fall
- Spring blooms can include dead nettle, heather, red-flowering currant, rockcress/creeping phlox, English lavender, and muscari.
- Late fall plants include many herbs (borage, oregano and sage are favorites in my garden), aster, mums, sedum, and pansies.
- Attract butterflies by planting host plants





**Monarch from pupa found in garden.
We also raise swallowtail caterpillars. Maria Sybilla Merian
is a great woman scientist/artist to explore!**

Host Plants

Monarchs: Milkweed

Swallowtail: Dill, Carrot, Fennel

Silkworm: Mulberry

Zebra Swallowtail: Pawpaw

Also include:

- Borage
- Grasses
- Hollyhocks
- Lupine
- Nettle
- Thistle
- Willow



Attracting Butterflies

- Bee Balm
- Butterfly Bush
- Butterfly Weed
- Carrot/Dill/Fennel/ Queen Anne's Lace
- Lavender
- Liatris
- Nasturtium
- Oregano
- Yarrow

- Butterflies prefer clustered umbrels or flowers with flat tops.

- Adults prefer red, yellow, orange, pink and purple blossoms.

- Butterflies only drink in the sun, so plant flowers in sunny spot.

- Plant for continuous blooms.



Butterflies and moths need “puddling” areas for water and minerals. Place small rocks or sand in a shallow container and just cover with water. Males especially get needed minerals from rocks as they place feet in water while they drink.





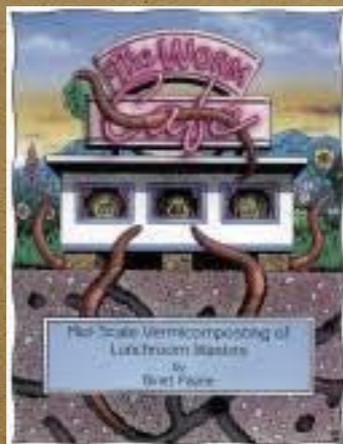
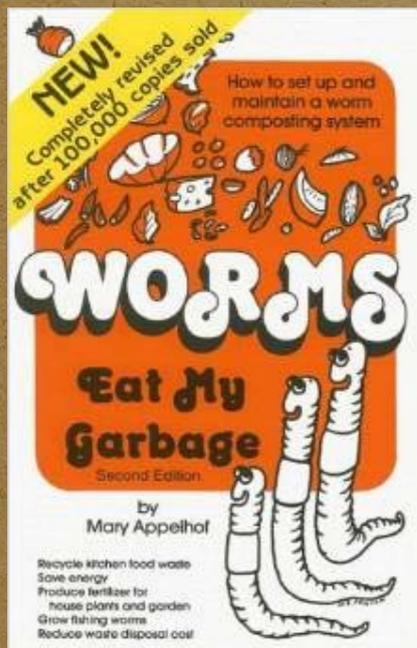
Outdoor Study

Magnifiers, sketch pads, pre-sharpened pencils, sharpener, erasers, colored pencils, bug guides, clip boards, bug catchers, rulers, dry-erase markers, laminated scavenger lists. Keep an inventory list with kit!

Dirt!



- What is compost?
- Identify decomposers
- Keep a worm bin
- Go on a “Compost Critter” scavenger hunt
- Build a pillbug habitat
- Draw an underground maze



Dirt Kit

“Do the Rot Thing” Compost Activities:

http://www.cvsmd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvsmd1.pdf



Vermicompost:

[http://monroe.ifas.ufl.edu/pdf/Hort/Composting/Worms Eat My Garbage.PDF](http://monroe.ifas.ufl.edu/pdf/Hort/Composting/Worms_Eat_My_Garbage.PDF)

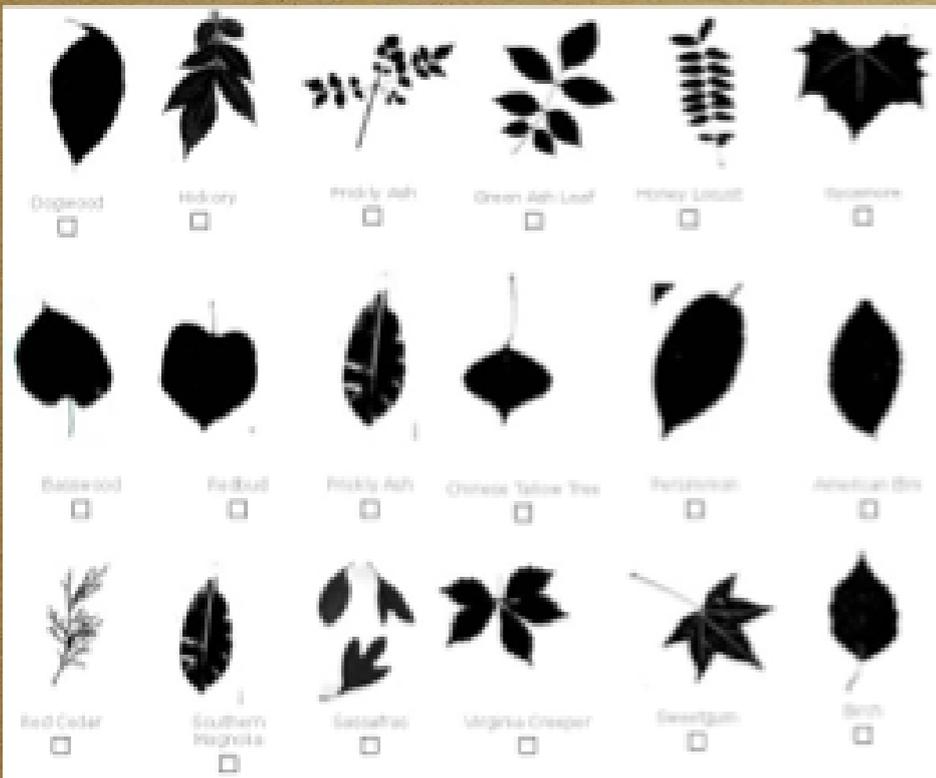
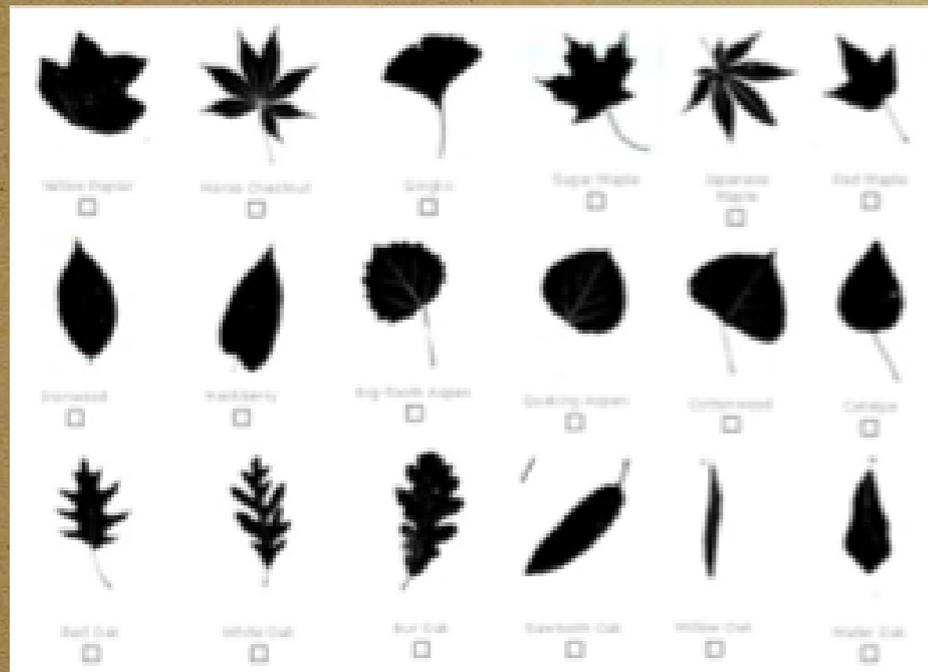
Compost Critters

“Do the Rot Thing” Compost Activities:

[http://www.cvswmd.org/uploads/6/1/2/6/6126179/do the rot thing cvswmd1.pdf](http://www.cvswmd.org/uploads/6/1/2/6/6126179/do_the_rot_thing_cvswmd1.pdf)



Leaf Detective!



Plants



Plant Part Bingo



Harvesting, Plant Pests, Plant Helpers, Seed Collections

- Life Cycle
- Seed Types and Dispersal
- Plant Parts
- Harvest Rituals
- Healthy Eating





Seed Hunt!



- Best done in the fall, from mature plants
- Discuss how seeds “move” (wind, dropped by bird, buried by squirrels, stuck to animal fur or pant legs, gravity)
- Plants great for seeds: Dill, lettuce, sunflower, dried pea pods, dandelion, allium (onion and garlic), milkweed
- Math Connection: Estimate seeds on sunflower and count by tens

Nutrition

- Introduce new foods by having students grow and eat them!
- Ideas: “Pizza” garden with tomatoes, basil, oregano; “Taco” garden with tomato, lettuce cilantro, peppers; “Fairytale”: Beanstalks, pumpkins
- Explore five senses (herbs are great for tasting and smelling)



Must-Have Plants

A photograph of four children in a garden. Three girls and one boy are leaning over a raised garden bed, examining plants. The girl on the left has long brown hair and is wearing a light blue shirt. The girl in the middle has brown hair in a bun and is wearing a light green shirt. The girl on the right has brown hair and is wearing a light green shirt with a pink headband. The boy on the far right is wearing a black and white camouflage t-shirt. In the foreground, several large, orange carrots are visible in the soil. An orange text box is overlaid on the bottom right of the image.

Perennials: Strawberries, hyssop, mint, oregano, sage
Annuals: Carrots, dill, kale, lettuce, nasturtium, sunflowers
Over the Summer: Cucumbers, pumpkins, squash,
tomatoes (can salsa and pickles for fall)

Energy



- Do a recycling audit
- Recycle in the cafeteria and classrooms
- Collect juice pouches, candy wrappers, old toothbrushes, and more for cash for your school through Terracycle
- Invite Max from RIRCC
- Use RIRRE for school supplies
- Tour the RIRCC

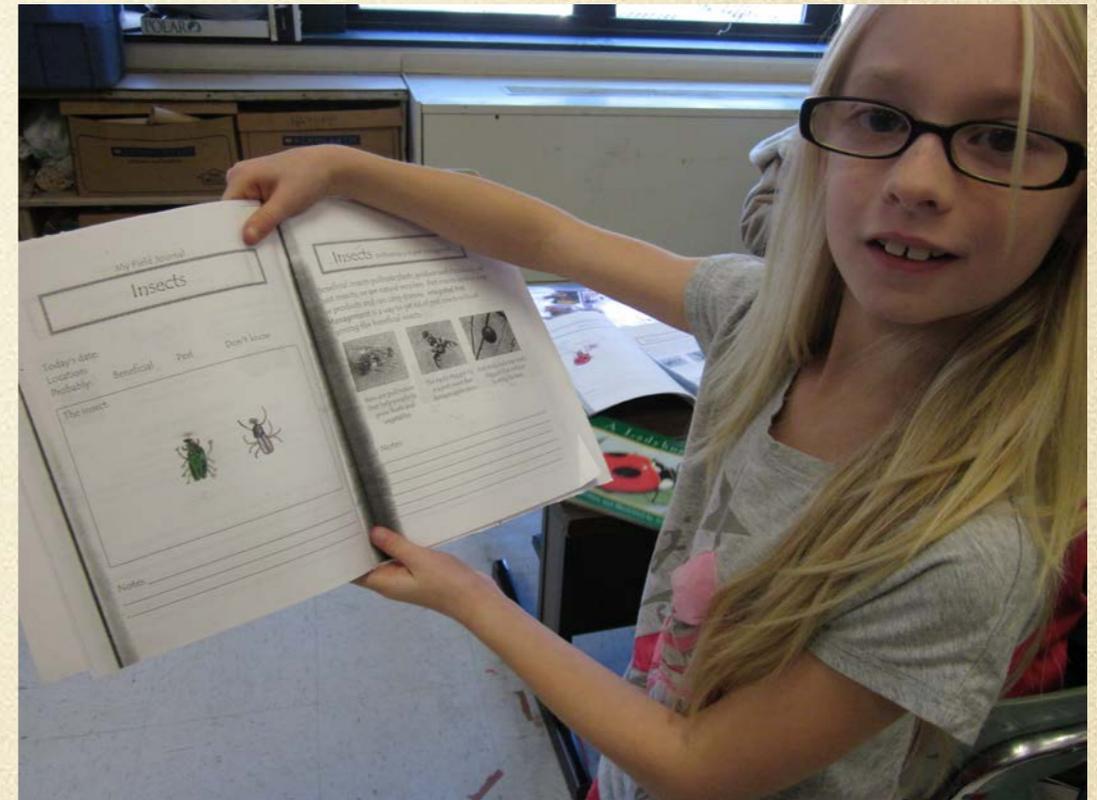
Terracycle

Send in juice pouches, candy wrappers, empty toothpaste tubes, etc. for cash! Set up your school as the charitable entity you wish to donate to.

PEOPLE
COLLECTING
TRASH:
29,439,446
WASTE UNITS
COLLECTED:
2,660,292,801
MONEY FOR
CHARITY:
\$7,187,370.00



Citizen Scientists



Birds

- Winter birds (report to Cornell University as Citizen Scientists)
- Bird beak adaptation
- Migration
- Bird behavior scavenger list
- Raptors (Audubon Raptor weekend, owl detectives, owl pellets)

BACKYARD ECOSYSTEMS: WINTER BIRD CHECKLIST

 CHICKADEE <input type="checkbox"/>	 JUNCO <input type="checkbox"/>	 BLUE JAY <input type="checkbox"/>
 TUFTED TITMOUSE <input type="checkbox"/>	 WHITE-BREASTED NUTHATCH <input type="checkbox"/>	 CARDINAL <input type="checkbox"/>
 <input type="checkbox"/>	 <input type="checkbox"/>	 NORTHERN FLICKER <input type="checkbox"/>
HAIRY AND DOWNY WOODPECKERS <input type="checkbox"/>		



Bird Kits:

- Bird Feeder/Winter Bird Checklist: Cornell University
- Bird/Owl Detectives (reading skills):
 - <http://www.whatbird.com/>
 - Build a Nest: Harvard Natural History Museum
 - Owl Pellets: \$3 ASRI

Bird Beak Adaptation

Blue Jay:

Beak: Pliers

Food: Sunflower Seeds

Habitat: Field

Mallard:

Beak: Craft Sticks/Elastic

Food: Floating Straws/Styrofoam

Habitat: Marsh

Pelican:

Beak: Salad Tongs

Food: Sunk Modeling Clay

Habitat: Lake

Woodpecker:

Beak: Tweezers

Food: Styrofoam in Log Holes

Habitat: Forest



Community Work



Badges



Choose a *Learning Concept*
List 1-3 activities
to earn badge
Have adult sign to verify



BIRD DETECTIVE:
Between November and February, set aside at least 15 minutes to look outside for birds. A bird feeder will attract more to your yard. Note the birds sighted below.

BACKYARD ECOSYSTEMS: WINTER BIRD CHECKLIST



CHICKADEE



JUNCO



BLUE JAY



TUFTED TITMOUSE



WHITE-BREASTED NUTHATCH



CARDINAL



HAIRY AND DOWNY WOODPECKERS



NORTHERN FLICKER



Adult Signature: _____



Allow Time for Wonder

Tips:

- Laminate EVERYTHING
- Have multiples
- Label Kits
- Keep Inventories of Kits (i.e. 12 magnifiers)
- Use bright colors
- Rotate groups of 6-12



School Garden Funding:



"Schoolyard Science for the Urban Ecosystem"

FREE Educational materials for
taking course through ASRI

Grants: GEF, KGI, Home
Depot, Lowes, Whole Foods,
more!

Recycling: Terracycle

Donations: Community

Grants:

Look at past winners. Be very specific in goals. Will others match part of grant? Consider what you will need in the future to keep the garden going. Is program sustainable? Cite evidence!

Helpful tips here: <http://www.fns.usda.gov/farmentoschool/census/#/toolkit/module/11>
<http://www.gardenabcs.com/uploads/nativeplantgrantadvice.pdf>

January Deadline \$300-\$500

Kitchen Gardens International/ SowItForward.org

http://kgi.org/grants?gclid=CjwKEAiAodOIBRDCjr-UIJDjtVUSJABR7fxyGTPpfYDT0XQB976-ZUNGW2fKI-is0cn42TZnOt8NIhoC5prw_wcB

February/October Deadline \$2000-\$5000

Lowe's

<http://www.toolboxforeducation.com/>

April \$20,000

Farm to School (requires matching 25% of funds)

<http://www.fns.usda.gov/farmentoschool/farm-school-grant-program>

September \$500

Green Thumb Challenge

<http://www.greeneducationfoundation.org/greenthumbchallengesub/green-thumb-challenge-winners/712-green-thumb-challenge-grant.html>

October \$2000

Whole Kids Foundation

RI Recipients (including Waddington): <https://www.wholekidsfoundation.org/about/grant-recipients/>

December \$500 to use in online store

Kids Gardening

<http://grants.kidsgardening.org/2015-youth-garden-grant-1>

Even More Grants:

<http://www.gardenabcs.com/Grants.html>

http://www.creec.org/grant_opps/79

Donations:

City compost

Free rain barrels for attending workshops

Free paint from Home Depot/Lowes (ask for abandoned mixed paint and tell them it's for a school)

Feinstein Good Deeds (Use money for seeds, then "seed money" to donate some produce to local food banks)

Parents and local community:
Plants, tools, labor, refreshments

Networking:

ASRI (school workshops for \$\$)

Community Gardens in your area

EdibleSchoolyard.org

Farmers' Market (ask for school visits)

Revive the Roots

Rhode Island Healthy Schools Coalition
www.rihsc.org/home

RWPZoo

Southside Community Land Trust

URI Master Gardeners

Recommended Reading:

- The Nature Connection by Clare Walker Leslie (focusing on writing and drawing)
- How to Grow a School Garden by Arden Bucklin-Sporer and Rachel Kathleen Pringle
- Hands-On Nature by the Vermont Institute of Natural Science (featuring great puppet show scripts)
- No Student Left Indoors by Jane Kirkland (creating field guides)
- NFW's activity-focused Access Nature.