North East ISD School Garden Toolkit

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NEISD SCHOOL NUTRITION FEEDING the FUTURE

Thank you to the North East Independent School District's School Health Advisory Council for making this toolkit possible!

Dedicated to North East ISD students and parents.

Part 1:

Starting a School Garden

Timeline (Nine Months – One Year)

Step 1: Initial Planning/Things to Consider

- Primary purpose for the garden
- School garden or school/community garden?
- Who to involve?
- Is there broad support?
- How to connect the garden with curriculum?
- Campus Master Plan status
- Tour of other school gardens
- Alternative sites for the garden on your school grounds

Step 2: Project Assessment Meeting

- School administration: Principal
- Approval from Executive Director of Facility Maintenance

Step 3: Firm up Conceptual Plan

- Garden purpose
- Garden site selection
- Organize Planning Committee

Step 4: Project Planning & Development

A: Site Planning

- Master Plan
- Budget
- Work plan/Schedule
- Fundraising plan
- Soil test

B: Garden Organization

- Leadership
- Participant committees
- Guideline development

C: Programming

- Curriculum
- Customized programs

Design Considerations: prominent location, relationship to school facilities, garden size and features, water source and accessibility.

Step 5: Site Plan Approval

Step 6: Garden Construction

Initial Planning

Introduction

School district facilities represent a significant public investment as well as safe and effective places for education. Any work, which constitutes a modification, addition or improvement to school property, will require approval and oversight from various NEISD Departments such as Facility Maintenance, Engineering, Safety and Construction Management. The approval process may extend to every phase of the project and requires the final approval of the Associate Superintendent for Operations.

Facility Maintenance and/or Engineering provides project review, approval, and consultation at no charge to the campus. Funding may be required if maintenance technicians provide additional labor and/or materials. Any campus work will require an estimate and a transfer of funds, approved by a campus administrator, before the work is scheduled.

The Garden is NOT a District or Facility Maintenance responsibility:

The sponsor/campus *must* take responsibility for maintaining the common areas of the garden such as:
Tool sheds
Trees, flower beds and lawn
Pathways and courtyards
Trash containment areas
Street fronts and sidewalks

Garden Site Planning

Project Requirements:

Each project must have a school faculty member identified as the sponsor. The sponsor will be responsible for submitting the required documentation to campus administration. The campus administrator must enter this description and other pertinent information on a NEISD Work Order.

You may use the **Coordinated Project Approval Form** for informing the departments about their project. The form is located on the Safety Website under the Safety Coordinators and Fire Drill Coordinators page as a downloadable form.

If the project is structural or modifies any building systems, the administrator must contact the NEISD Engineering Department and Facility Maintenance and provide a drawing showing the project's location on the school site and the intended area where the work will occur on the site.

Planning Considerations

When choosing the site for your garden, there are many considerations, including:

Adequate Space Sun exposure Water Drainage Water access

Level ground/not sloped too much Water run-off is away from school buildings

Shade Structures: Must contact Construction Management for guidelines

Sheds: (required for tools if garden access will occur outside of school hours)
Typically anything over 120 sq. ft. requires a permit: check with Construction Management

Water: Any plumbing or electrical work may require a permit and must be performed by district plumbers and electricians. The campus administrator must submit a work order through the NEISD Work Order system.

Raised beds must be at least 15 feet from building foundations.

Initial site preparation:

Prior to construction/planting – Obtain final approval from Associate Superintendent for Operations

Campus administrator inputs Work order to have Facility Maintenance locate utilities and give estimate for relocate or reconfigure irrigation lines.

- School to appoint sponsor who will monitor and be responsible for garden condition.
- Maximum plot size 10' x 15'.
- Raise plot above grade using untreated cedar timbers.
- Provide and place topsoil, supplemented as required.
- During growing season maintain plot by removing dead material, weeds, selective pruning, etc.
- At the end of planting season, remove dead plant material off-site.
- Facility Maintenance will advise sponsor when irrigation will be activated and deactivated.
- **Should the plot or garden be abandoned or vacated the school shall be responsible for the cost of reclamation and restoration.**

Prohibited items and materials:
Railroad ties and other treated woods
Pig, dog and cat manures, and ALL untreated manures are prohibited
Wood and bark mulch
Non-Organic fertilizer
Tires
Scrap metals, plastics and broken bricks and pavers

Building your Garden:

Considerations based on your Garden Location:

- Sunlight
  - Location must be able to provide at least 6 hours of direct sunlight
- Water source nearby
  - Think about the distance from the hose bib to the garden
- Electricity, if needed
  - May be needed for automatic irrigation system
- Location of equipment storage
  - Where will all of your tools be stored?
  - Is there space and/or funding for a garden shed?
- ADA accessible
  - Can all students access the garden regardless of their physical limitations?
- Safety and Security
  - Make sure your garden is not next to a busy street. A fence could be an option to help protect the garden over weekends and school breaks.

Types of Gardens:

- In-ground Gardens
  - Traditional garden
  - Very affordable
  - Can take longer to successfully plant
- Raised Garden Beds
  - Great for schools with very rocky soil
  - Drain more efficiently
  - Require less watering
  - Should not be more than 4 feet wide for easy access to plants
- Container Gardens
  - Great option for schools without a lot of space for a garden
  - Low cost option
  - Dry out quickly, require frequent watering
  - Can transfer plants to larger garden with increased investment
- Hydroponic Gardens
  - Cost effective
  - Can be done inside
  - Yield larger produce faster
- Garden planters
  - Use untreated wood or cinderblocks to create garden beds
  - Do not use treated wood or railroad ties
- Keyhole Garden
  - Raised bed, shaped like a donut, with a compost basket in the middle
  - Ancient method, retains moisture well and generates heat during winter

Watering your Garden:

- Hoses and nozzles
  - Affordable, easy option for watering your garden
  - More time consuming that automatic watering system
- Watering cans and buckets
  - Great option for small container gardens
  - Must have water source nearby
- Drip irrigation
  - Manual version uses hoses with small holes to water plants. Can be hooked up to nearby water source and is relatively inexpensive.
- Automatic irrigation systems
  - Much more expensive that other options
  - Reduces the need for as many volunteers

Part 2:
Planting a School Garden

Deciding what to grow in your garden can be overwhelming, please consider the following when selecting vegetables:

- **Space available:** Some plants, such as watermelon, require a lot of room and may not be a good fit in your garden. Other vine crops such as cucumbers cantaloupes can be grown in small gardens by trellising them on a fence or some other structure.
- **Production:** It is important to have high production for each row of plants. Small, fast-maturing crops such as radishes, turnips and beets yield quickly and do not require much space. Tomatoes, bush beans, squash and peppers require more space but produce over a long season.
- **Cost:** Consider growing vegetables that are expensive to buy at the grocery store, such as broccoli.
- **Variety:** Some vegetables are more nutritious than others are so it is important to grow a variety. Consider having a themed garden, such as a taco garden, where you could grow tomatoes, green onion, cilantro and peppers.
- **Location:** Arrange vegetables in a way that makes the most efficient use of space and light. Taller vegetables, such as okra, corn and tomatoes should be grouped together on the north side of the garden where they won't shade shorter vegetables. Vine crops, such as tomatoes should be planted near a fence or trellis.
- **Timing:** Vegetables are divided into two groups-warm season and cool season. Cool-season crops can stand lower temperatures and can be harvested in the fall while warm-season crops cannot tolerate cooler temperatures and can be harvested in late spring to late summer (see chart below).

Cool season		Warm season	
Beet	Greens	Corn	Squash
Carrot	Radish	Bean	Cucumber
Cabbage	Turnip	Okra	Tomato
Broccoli	Lettuce	Pepper	Eggplant
Onion	Collard		

Special Considerations:

Rain Barrels:

Campuses that plan to use rain barrels for their gardens will be solely responsible for the installation, maintenance, mosquito control and any other safety and regulatory requirements.

Any tie-ins to the roof gutter and downspouts on campus buildings will need to be reviewed and approved by the Engineering Department.

For more information on rain water harvesting in Texas, visit:
http://catchtexasrain.com/index.php?page=resources

Contact Information:

Paul L. Raabe, P.E.
Energy Management Coordinator
North East I.S.D. Facility Maintenance Department
Office: 210-356-9339
Email: praabe@neisd.net

Part 3:
Sustaining a School Garden

Finding Volunteers

Suggested organizations to reach out to:

- PTA
- Create student garden club
- School Garden Class
- Local neighborhood associations
- Student organizations
- Green Spaces Alliance
- Nearby Faith organizations/churches
- School Faculty
- “Next Door” App
- Junior League of San Antonio
- Boy Scouts/Girl Scouts
- Local college horticulture/agriculture students

Getting students involved

Maintaining the garden can be as simple as a club that meets monthly. Assign the students in the club certain areas that need to be watered daily. At the monthly meetings discuss new gardening topics and eat the harvest. If the garden is set up as a class, the class will be responsible for maintaining the garden.

Fertilizer

Plants rely heavily on the nutrients found in soil for healthy growth and development. Before selecting your fertilizer:

- If you are planning an in-ground garden, it is highly recommended to perform a soil test from the Texas A&M Agri-Life Extension for $10.
- The results of this test will indicate what fertilizer would work best for your site.
- NEISD allows the use of synthetic and natural fertilizers.
- Fresh manure is not to be used as a fertilizer.
- Any fertilizer must be secured in custodial or flammable storage and should only be handled by an instructor.
- Moderation is key; too much fertilizer can be detrimental to your garden.

Composting

Another way plants can get added nutrients is through composting. Composting is:

- A process that uses decomposition to create nutrients for the soil by breaking down organic waste.
- Affordable and sustainable way to provide necessary nutrients
- Can be a freestanding pile or a freestanding compost bin.
- Use discarded weeds, plant trimmings, dead crops, cafeteria food and paper waste.
- Make sure your compost pile remains moist to attract decomposers

Mulching:

Adding mulch to your outdoor garden beds will provide a number of benefits to your plants' growth, including:

- Helps retain water
- Maintains soil temperature
- Reduces erosion
- Creates barrier to weeds
- Prevents soil borne diseases from spreading
- NEISD allows the use of environmentally friendly, dye-free mulch

Pests

Your garden is going to be a home for many organisms beyond the plants. The presence of insects or other creatures is not an inherently harmful thing. In fact, only a few varieties are likely to be harmful to your garden and warrant intervention. Regarding pest control measures:

- Only NEISD pest control operators are permitted to apply pesticide, herbicide or fungicide
- Non-toxic insecticidal soaps may be used
- All pest control measures must comply with NEISD Integrated Pest Management program

Many insects can be managed without using pesticides, but this cultural control requires extra time and effort. It may also result in slight damage to your plants. Some of the cultural methods you can use to prevent or control insect damage are:

1. Keep weeds and grass pulled out of the garden. Mow the area around the garden.
2. Plant varieties that grow well in your area.
3. Apply the correct amount of fertilizer and water when needed.
4. When you have picked all the fruit, destroy the old plants by removing them or plowing them under.
5. You can wash off some insects, such as aphids and spider mites, with a water hose.
6. You may hand-pick some insects or egg masses from the plant to prevent damage.
7. *Chemical control* of insects often may be necessary. For best results, treat insects before large numbers build up in the garden. Dusts or sprays provide good control.

Before you buy a pesticide, read the label to see if it is recommended for the pest and plants you want to treat. Before you use a pesticide, read the label to see how much you should use and follow all directions. All insecticides are poisonous, so handle them with care and keep them away from children. Some insecticides recommended for home vegetable gardens:

Conventional insecticides	Organic insecticides
Dibrom®	azadirachtin
endosulfan	*Bt* (*Bacillus thuringiensis*)
Kelthane™	garlic juice extract
malathion	neem oil
naled	pyrethrin
Sevin®	spinosad
sulfur	

School Garden Food Safety:

Remember, before harvesting your produce, to teach your students about food safety. Ensuring that all students, volunteers, and faculty members involved in the garden receive basic food handling and garden safety training will reduce the chance of contamination, and allow you to utilize your garden's produce in safe ways.

Here are some more tips to keep your harvest safe:

- Harvest produce regularly and pick up and remove rotting vegetables.
- Use clean containers that are made from materials designed specifically to safely hold food. Examples include paper grocery bags, 5-gallon food-grade buckets (that held pickles or other food products), colanders or plastic kitchen bowls.
- Plastic garbage bags, trash cans, and any containers that originally held chemicals such as household cleaners or pesticides are not food-grade and should NEVER be used for the purpose of holding or transporting food.
- Wash hands before and after picking produce.
- Use clean gloves (that have not been used to stir compost or pull weeds) or clean hands when picking produce.
- Brush, shake or rub off any excess garden soil or debris before putting the produce into the harvest container or bringing produce into the kitchen.
- Do not work in the garden when suffering from vomiting and/or diarrhea.
- All tools used in the garden must be used solely in the garden and cleaned regularly.
- If you eat produce in the garden just after picking it, be sure it is washed first.
- If you choose to store food without washing, shake, rub or brush off any garden soil with a paper towel or soft brush while still outside. Store unwashed produce in plastic bags or containers. Be sure to label the container in a way that makes it clear to others that it must be washed prior to use.
- If you choose to wash them before storing, use cool, running tap water and be sure to dry the food thoroughly with a clean paper towel or air dry. Produce with thick skins, like potatoes, can be scrubbed with a vegetable brush to remove excess dirt and bacteria. Wash berries immediately before eating or cooking. Berries that are washed and then stored in the refrigerator will soon become moldy.

- Keep fruit and vegetable bins in the refrigerator clean.

- Bruised or damaged parts of fruits and vegetables should be cut away before eating or preparing. Throw moldy produce away.

- When washing produce fresh from the warm outdoors, the rinse water should not be more than 10 degrees colder than the produce. If you are washing refrigerated produce, use cold water.

- Fresh fruits and vegetables needing refrigeration (melons, cut leafy greens, and cut tomatoes) can be stored at 45° F or less.

- Fresh fruits and vegetables stored at room temperature (onions, potatoes, and whole tomatoes) should be in a cool, dry, pest-free, well-ventilated area separate from household chemicals.

Appendix

Resources:

Books:

Kraus, Sibella. *Kids Cook Farm-fresh Food: Seasonal Recipes, Activities & Farm Profiles That Teach Ecological Responsibility*. 2002. California Dept. of Education.

Center for Ecoliteracy, *Big Ideas: Linking Food, Culture, Health, and the Environment*. 2008.

Jaffe, Roberta, and Gary Appel. *The Growing Classroom: Garden-Based Science.* 2007. South Burlington, VT, National Gardening Association.

Websites:

edWeb. Join the Growing School Gardens Community: www.edWeb.net

California School Garden Network: www.csgn.org

The Center for Ecoliteracy: www.ecoliteracy.org

The Edible Schoolyard Project: www.edibleschoolyard.org

Getting Started: A Guide for Creating School Gardens as Outdoor Classrooms: www.ecoliteracy.org/downloads/getting-started

Life Lab: www.lifelab.org

The National Gardening Association: www.garden.org and www.kidsgardening.org

School Garden Wizard: www.schoolgardenwizard.org

Slow Food USA: slowfoodusa.org

Slow Food USA Ark of Taste: www.slowfoodusa.org/index.php/programs/details/ ark_of_taste/

Helpful Contacts

Steven Sumrow
Aquaponic Systems USA
210-461-2309
www.aquaponicsystemsusa.com

Ruby Zavala
Youth Gardens Coordinator
Texas A&M AgriLife Extension
210-631-0413

Miranda Stone
San Antonio Food Bank
210-431-8330

Margaret Lamar
Director of Strategic Initiatives
Children & Nature Network
979-551-0585
margaret@childrenandnature.org
www.childrenandnature.org

Gardopia Gardens
Stephen Lucke
210-478-7292

Green Spaces Alliance of South Texas
Chris Babis
210-222-8430
chris@greensatx.org

School Garden Curricula:

JMG School Garden Curriculum
About: an excellent curriculum for a class or club. After completion, the students will receive a Junior Master Gardener Certificate. There are 2 different curriculums that can be used together or every other year; Operation W.A.T.E.R. and Operation THISTLE.
www.jmgkids.org

Available Grants and other funding:

Grant Program	Grant Amount	Requirements
Whole Kids Foundation	$2,000	• Community partner • Signed letter from Principal • Garden Photos
Chef Ann Foundation	$2500	
Lowe's	$5,000	• K-12 School • Provide detailed description of the project • Budget for resources needed
Home depot	$5,000	• Tax-exempt public agency • Project must be completed in 6 months • Willing to share results
Samull Classroom Herb Garden	$200	• 3rd-6th grade class with at least 15 students
Greenworks Grants	$1,000	• Attend online training • Involve one community partner • Secure at least 50% match funds
GRO1000 Grassroots Grant	$1,500	• Community garden

STEM Grants
http://www.cesa2.org/programs/stem/STEMgrants.cfms

Learning First
http://www.learningfirst.org/what-stem-education-public-schools-can-look

NEA Foundation
http://www.neafoundation.org/

STEM Grants
http://stemgrants.com/ and http://www.ed.gov/stem

Go Fund Me grants
https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5487

Texas Agrilife Extension
About: Classroom Garden Matching Funds grant and mini grant ($200) offered through AgriLife by the SA Livestock Expo. Be sure to check out the Bexar County Youth Gardens Program Facebook and the Bexar County Youth Gardens Blog for more updates and garden tips.

Whole Kids Foundation
https://www.wholekidsfoundation.org/landing-pages/school-gardens-landing

Chef Ann Foundation
http://www.chefannfoundation.org/

Annie's Homegrown Grants for School Gardens
http://www.annies.com/giving-back/school-gardens/grants-for-gardens

Education Outside
https://www.educationoutside.org/

Real School Gardens
http://www.realschoolgardens.org/

Kids Gardening
Kidsgardening.org

Green Spaces Alliance San Antonio
https://www.greensatx.org/

Food Corps
https://foodcorps.org/

American Community Gardening Association
https://communitygarden.org/resources/

Mantis Tiller Awards (equipment)
https://mantis.com/

NEISD Foundation
http://www.northeastfoundation.org/education-projects/grant-request/

Works Cited

Denver School Garden Coalition Operating Manual 2012, School Garden Toolkit, viewed 5 May 2017. https://dug.org/app/uploads/2015/04/DSGC_Manual.pdf

Masabni, J., & Lillard, P. (n.d). Planning A Garden. Retrieved May 31, 2017, from https://agrilifeextension.tamu.edu/browse/featured-solutions/gardening-landscaping/planning-a-garden/

Masabni, J., & Lillard, P. (n.d). Insect Control. Retrieved May 31, 2017, from https://agrilifeextension.tamu.edu/browse/featured-solutions/gardening-landscaping/insect-control/