



# THE SCHOOL FOOD AND NUTRITION GARDENS PROGRAMME (SFNG) ANGLO AMERICAN SOUTH AFRICA (AASA) EDUCATION PROGRAMME

SFNG Community of Practice GUIDELINE AASA Programme activities 2023



The following are acknowledged for their hard work in the AASA SFNGs component as well as their contributions in compiling this guideline.

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#### ABOUT THE AASA SFNGs PROGRAMME

The Anglo American South Africa (AASA) Education Programme is an initiative of the Anglo American Sustainability Strategy that aims to improve learner's educational outcomes. The School Food and Nutrition Gardens (SFNGs) programme is one of the programme components designed to assist in the establishment of sustainable school gardens that should be able to supplement the school meals provided by the National School Nutrition Programme (NSNP) and also serve as an educational resource to deliver quality education.





### SUPPLEMENTING THE NSNP SCHOOL MEAL

- Schools are able to feed learners from the garden produce.
- Schools are able to sell the surplus produce to raise funds.



### **EDUCATIONAL RESOURCE/CURRICULUM INTEGRATION**

- · All subjects can be taught in the garden.
- Meaningful learning occurs in the garden where learners are able to link classroom concepts with real life experiences<sup>1</sup> (Eugenio-Gozalbo et.al, 2020). For example:
  - Languages: Crops are labelled and learners are able to name them in both the language of learning and teaching (LOLT) and their mother tongue.
  - Mathematics: Crops are arranged in a manner that helps learners to practise multiplication.
     Knowledge content such as shapes, volumes and data handling can also be demonstrated in the school garden.
  - Life Skills and Natural Sciences: Knowledge areas such as food preservation and processing cannot be taught without SFNG produce.
  - **Technology:** Purification of grey water is a critical food garden skill that learners can also use in their households.

#### Further examples of curriculum activities conducted in the SFNGs programme:

Curriculum theme (Examples)	Curriculum activities (Examples)	
Liquids/soluble/insoluble/mixture	Mixing natural pesticides	
Food processing and preservation	Processing mango achar, beetroot preservation, Morula beer processing	
RRR (Reduce, Reuse & Recycle)	Use of recyclable materials such as toilet paper cores, egg trays, empty plastic bottles and milk cartoons	
Water filtration	Grey water filtration	
Soil	Classification of soil textures, types, colours and profiles	

<sup>1</sup> Eugenio-Gozalbo M, Aragón L, Ortega-Cubero I. 2020. Gardens as Science Learning Contexts Across Educational Stages: Learning Assessment Based on Students' Graphic Representations. Journal of Front Psychol. 10: 33-89.





#### **DESCRIPTIONS OF ACTIVITIES**



Making organic pesticides:
Natural method of pest control

#### Subject covered

 Natural Sciences and Technology, Grade 6

#### **Topics covered**

- Liquids Foundation phase
- Soluble and insoluble substances
  - Intermediate phase
- Mixtures Senior phase

#### **Preparation**

- · Crush garlic cloves and chili peppers
- Prepare 2 litres of warm water for the mixture to dissolve fast
- · Add 2 spoons (30ml) of a dish washing soap
- · Add 1 spoon (15ml) of crushed garlic
- · Add 1 spoon (15ml) of crushed peppers
- · Add one cup (250ml) of vinegar
- The concentration can be increased depending on the type of pests, for example, for nematodes
- · Allow the mixture to sit for 24 hours
- The strong smell of garlic is effective for repelling pests such as aphids, spider mites and whiteflies
- To be applied normally once a week and twice a week during rainy periods

#### Advantages of organic pesticides

- · Safe and non-toxic to primary school learners
- Ingredients accessible and cheap
- · Environment friendly
- · Improve the quality of produce



## Topic covered

Subject covered Natural Sciences and Technology, Grade 6

Food preservation

#### **Preparation**

- · Select beetroot at the peak of ripeness
- · Place the beetroots in a large pot and fill with cold water
- · Allow the pot to boil for 10 minutes
- · Remove the beetroots and allow them to dry
- Scrub and rinse beetroots under warm water
- · Cut/slice the beetroots into smaller pieces and place in jars
- · Boil a mixture of: 1 cup (250ml) water, 2 cups (500ml) white vinegar, ½ cup (125ml) white sugar and 1 teaspoon (5ml) dry mustard
- · Add the mixture to the jars with sliced beetroots
- · Tighten the lids and allow to stand for 7 days

#### Mango achar/pickle processing

#### Subject covered

Natural Sciences and Technology, Grade 6

#### **Topic covered**

Food processing

Ingredients and measurements

- · Dried pieces of unripe mangoes (1 kg)
- Food colouring
- Cooking oil 2 cups
- · Spices (achar masala) 200g
- Garlic and chillies (optional)

#### Preparation

- · Collect, wash and cut unripe mangoes
- Extract water/dry them in the sun for a few days
- Mix the pieces of mangoes with the spices
- Spices may include salt, pepper, garlic etc.
- · Put the mango pieces in jars
- Add red oil (cooking oil with red food colouring)
- · Close the lids and store at room temperature
- Allow the mixture to stand for 14 to 21 days





#### **Grey water filtration**

#### Subject covered

Natural Sciences and Technology, Grade 7

#### **Topic covered**

Filtration

#### **Preparation**

- Water collected from showers, sinks and baths can be re-used for other domestic purposes such as laundry and gardening
- · Cut a 200mm length of a 20mm plastic pipe
- Punch a 20mm hole at the bottom of a 20l bucket
- Use Bostik glue to insert the plastic pipe into the bucket
- Pour 3kg of fine sand into the bucket
- · Add 3kg of river sand on top of the fine sand
- · Add the dirty water to the bucket
- Allow it to stand for 10 to 20 minutes for filtration to take place
- Filtered water is not healthy for human consumption

A learner recycles a 2-liter plastic bottle (RRR) and cuts it in half. The top, with a lid, becomes a filtration container; the bottom is a water reservoir. Punch a hole in the lid and insert an earbud then add the layers of soil. Pour dirty water, and observe clean water dripping into the reservoir via the earbud.

# SFNG ENVIRONMENTAL CALENDAR

Learners are engaged in various campaigns, awareness raising activities and demonstrations as a way of integrating sustainable environment awareness into the curriculum.



#### Examples

- International Mother Tongue Day (February)
- World Wetlands Day (February)
- World Water Day (March)
- International Day of Action for Rivers (March)
- · Earth Day (April)
- International Plant Appreciation Day (April)
- International Day for Biological Diversity (May)
- · International Compost Week (May)
- World Rivers Day (September)
- Arbor Week (1st Week Of September In RSA)
- World Food Day (October)
- Outdoor Classroom Day (May/November)
- World Soil Day (December)





### SFNG HOMESTEAD GARDENS INITIATIVE

Learners are encouraged to establish backyard gardens.

#### **Purpose**

- Provides a platform for parents to impart indigenous knowledge system (IKS) and related skills
- · Has a health benefit
- · Improves food security
- Inspires learners to take up careers in Agriculture
- Helps learners to earn extra money by selling surplus produce

#### SFNG FRUIT TREE PROPAGATION PROGRAMME

- · Learners are encouraged to plant as many trees as possible
- · Learners are equipped with various skills in propagation
- · The skills include cutting, layering, grafting and budding
- · The propagation skills and knowledge are part of the curriculum for certain grades

#### **Purpose**

- · To mitigate climate change
- · To ensure food security
- · To provide a platform for curriculum integration
- · To keep youth away from substance and alcohol abuse



- Land Most rural schools have large pieces of land. It is recommended that soil analysis be conducted in order to determine the crops most suitable for the specific type of soil. To know the nutrient status such as phosphorus. potassium, sodium, magnesium & calcium helps in determining the type of fertilisers to apply. Understanding the pH value for the garden soil helps to determine the type of crops suitable for the soil. Although a slightly acidic pH is ideal for the majority of crops such as carrots, tomatoes. onions, pumpkins, pepper and spinach some vegetables such as kale prefer alkaline soil. Universities and agricultural colleges might help with laboratories at which the schools can have their garden soil analysed.
- Gardeners usually provided by school governing bodies (SGBs), volunteering parents and also by the Expanded Public Works Programme (EPWP).
- SFNG Champion Educator one educator responsible for the garden per school.
- Facilitators/NSNP official SFNGs programme operates under the mandate of NSNP official who provides oversight and leadership.

- Gardening tools Schools are able to purchase the tools through norms and standard funding provided to every public school in South Africa.
- Seedlings schools that are provided with shade nets may prepare seedlings and share them quarterly
- Tunnels Apart from protecting the vegetables against excessive heat, tunnels or shade nets keep pests such as aphids and spider mites away. They also assist in water conservation.
- Water Grey water reuse and water saving techniques such as mulching and drip pipes are recommended. In some schools, hydroponic systems are set up to further conserve water. Grey water reuse technology is one of the curriculum activities in the subject of Technology.
- Technical knowledge Department of Agriculture and institutions of higher learning such as universities and colleges are open to assist the schools with regard to technical knowledge in maintaining the SFNGs.



# ADVOCACY, KNOWLEDGE MANAGEMENT AND SHARING BEST PRACTICE ACTIVITIES

- · Meetings and joint programmes among the schools
- Meetings and workshops for the SFNGs Community of Practice (CoP)
- Monthly assessment to score the gardens from level 1 to 5
- Baseline survey (conducted at the start of the programme)
- Follow-up survey (to measure changes in indicators from the baseline)
- · Competitions and awards meetings
- Homestead programme assessment organisations such as the Limpopo Department of Economic Development, Environment and Tourism (LEDET) may offer assistance
- · Expos and symposia to showcase progress
- WhatsApp groups for SFNGs CoP members and parents involved in the Homestead Gardens initiative





#### SFNGs monthly assessment tool

1 point for each of the following:		
There are crops in the garden or evidence like soil preparation	1	
The garden is used as a learning laboratory (curriculum integration)	1	
The garden is maintained and productive (harvesting)	1	
The produce is supplementing the learners' meals	1	
The school is selling surplus produce or selling processed produce	1	
TOTAL	5	

#### STAKEHOLDER ENGAGEMENT

- · NSNP officials for monitoring and support
- Department of Agriculture for technical support
- · Parents to work in the garden and also provide IKS
- · Champion educators for oversight and management
- SGBs to provide for the SFNGs budget

# WORKSHOPS AND TRAININGS IDEAL FOR THE SFNGs PROGRAMME

- Tree propagation workshops for Homestead Garden initiative learners
- · Gardeners' training on various topics
- Food handlers' training on topics such as food preparation and hygiene

# MONITORING & EVALUATION OF THE SFNGs

- SFNGs monthly assessment tool used to score gardens on evidence of five aspects (see table below), which gives them a rating of 1 to 5
- SFNGs summative assessment tool used to assess the SFNGs quarterly and/or annually
- The school gardens and Homestead Garden initiative participants are assessed and prizes are awarded to competition winners
- Facilitators, NSNP officials and the Department of Agriculture usually assist with adjudication

#### **SEASONAL GROWING CHART**

- The seasonal growing chart shows the types of crops and the seasons when they should be planted in a particular area
- All the known names of the crops grown in the area are included - the local name, scientific name as well as the English name of species are included for teaching and learning of nomenclature
- Educators involve learners and parents in the development of the chart by inviting them to help to populate it.
- One growing chart is usually developed for each district but if there is wide cultural diversity within the community, there may be more than one chart developed at the circuit level

Below is an example of a seasonal growing chart for the Vhembe-East District. Additional columns may be added to include different cultivars of a crop.

Name of the	Name of the crop		Season
English name	Scientific name	Local name	
Cabbage	Brassica oleracea	Khavhishi	All seasons
Lettuce	Lactuca sativa	Tshilai	All seasons - best Spring
Mustard	Brassica rapa	Mutshaini	Winter
Spinach	Spinacia oleracea	Tshipinashi	All seasons

#### **SELLING THE PRODUCE**

- Schools are encouraged to sell surplus produce to supplement school funds
- Schools that sell their produce may be able to secure a gardener for the school
- Schools may also sell processed produce such as preserved or pickled beetroots, chili, mangoes etc.
- Food processing is one of the curriculum themes that can prepare learners to become engaged in a food processing enterprise.



## PREPARING COMPOST FOR THE SFNGs

There is consensus among agriculturalists that organic compost is better for our soil and environment than inorganic compost. Hu<sup>2</sup> (2020) argues that "recycling food and other organic waste into compost provides a range of environmental benefits, including improving soil health, reducing greenhouse gas emissions, recycling nutrients, and mitigating the impact of droughts". Therefore, schools are encouraged, as per Curriculum and Assessment Policy Statement (CAPS) requirements, to teach learners and gardeners how the composting cycle works.

Soil is a common theme in various school subjects such as Agriculture, Life Sciences, Natural Sciences and Geography, and a curriculum activity for learners is the preparation of trench composting. While there are various methods of composting, trench composting is recommended for SFNGs. Parents are invited to share their indigenous knowledge and skills in preparing the compost heap.



Hu, S. 2020. Composting 101. NRDC.org online publication. https://www.nrdc.org/stories/composting-101#whatis. Accessed 12 September 2022.



The following are a few steps to follow when preparing for trench composting:

#### Step 1: Identify an ideal spot in the garden

The spot should be easy to get to, free from bushes and preferably in a shady part of the garden. The ground should not be too rocky for digging.

#### Step 2: Prepare a hole

The size of the hole depends on the size of the garden and the amount of composting material available. A depth of 2 to 4 metres is recommended, with an ideal size of 4 to 16 square metres. Longer trenches rather than square trenches are recommended. Do not take away the soil that is removed - it will be used to cover the waste material.

## Step 3: Collect only biodegradable waste for composting

Do not just throw the waste into the trench but arrange it in layers.

Avoid using the following in the composting heap.

- Remains of animals that eat meat (e.g., cats and dogs)
- Meat or fats
- · Meat and fish scraps
- Dairv and oils
- Processed foods (they take longer to break down)
- · Plants or wood treated with pesticides
- Diseased or insect-infested plants
- · Weeds that have seeds
- Charcoal ash

## Step 4: Cover the biodegradable material with a layer of soil

A compost pile is made up of many layers of biodegradable material and soil which are arranged one on top of another

Step 5: Water the compost pile every three to seven days

Step 6: Cover the pile to retain its moisture

Step 7: Turn the pile upside down within a two-week interval

Step 8: Ready to use in 6 to 8 weeks or longer

**NB:** Remove the compost to make space for new waste material.





#### **IDEAL LOCATION OF THE SFNGs**

- The size of the garden: The size of the garden should correspond with the size of the school.
   However, small gardens are recommended in areas where there is water scarcity. Preferably, a garden of 100m² is a good start.
- The sunlight: crops require adequate sunlight. The space should be able to provide for the maximum of six hours of sunlight per day. Most of the gardeners prefer the garden to face south. The space should not be shaded by trees to allow for maximum sunlight.

When planting under a shade net, make sure there is enough sunlight getting through. Only use shadenets that have 40-60% UV block. Most of the shade nets that are used for car ports are more than 60% in concentration and therefore they are not recommended for growing vegetables.

- Avoid water logged and flooded areas: Though
  plants require water, excess water reduces oxygen
  in the soil which may lead to root decay and
  subsequently death.
- Water: the garden should be positioned close to a water source so that irrigation can take place easily.
- Fence/security: It is important for the SFNGs to be secures against domestic animals such as goats, cattle and sheep which feeds mainly of plants.

### **DEALING WITH PRIMATES, BIRDS AND DOGS IN THE SFNGs**

Apart from pests that were discussed in 4.1 above, primates such as monkeys and baboons as well as strange birds are common threats to SFNGs. The following measures were tested and successful in managing this:



#### **Primates**

- Diamond mesh wire: The strategy of using a diamond mesh-wire to fence the garden top has produces results in schools in the Blouberg area. It is believed that the same strategy can be used in all the schools that are challenged by primates.
- Human model: Creating human models such as scarecrows to scare primates was one of the strategies used by schools in the Amandabelt area. Though this strategy is cost effective as compared to the diamond-mesh wire strategy it has proved to be less effective as some baboons were able to walk pass the models with no fear.
- Chemical repellents: Some schools in the Vhembe East District used chemicals such as Butanethiol purchased from agricultural pharmacies to repel primates from the gardens.
- Electronic devices: In one of the workshops, the agricultural extension officer had suggested the use of modern technologies available to repel the primates.

#### **Birds**

- Aluminium foil: Placing a piece of aluminium foil under some plants will bother birds and keep them away from the gardens.
- Plastic film inside the cassette /fishing wire: Stretch
  the plastic film or the fishing line over the crops. The
  vibration of the film is enough to scare the birds away.
  However, large birds are not easily scared by the
  small cassette film
- Plastic flag in the garden: A plastic is attached to a long stick to make a flag which is raised in the garden.
   The plastic on the stick is blown by wind to keep it in motion. Thus, the large birds are scared to land on the garden. The method was successfully used by the schools in the Greenside of Mpumalanga Province.

#### Dogs

- Garlic and pepper around the SFNGs: Some gardeners grow garlic and pepper around their crops to repel dogs from spoiling their gardens. Dogs dislike the smell of garlic and pepper
- Water-filled bottles to deter dogs: The practice of placing water-filled bottles in the garden is practiced in the Vhembe East District. It is believed that water in the bottle creates a shimmer that irritates the pets vision. This practice still require scientific validation.

### THE GARDENER'S FILE

#### The following items are included in the gardener's file:

- · Daily activities register
- · An inventory of all the gardening equipment and tools
- · Seasonal crop cultivation and harvest record
- SFNGs and curriculum activities schedule
- SFNGs environmental calendar and the annual activity plan
- · Seasonal growing chart



