



# Occupational Training

Addressing critical workplace skills gaps

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# Sector Education Training Authority

# SETA



Funded by Skills Development Levy @ 1% of payroll



AGRICULTURAL SECTOR EDUCATION TRAINING AUTHORITY



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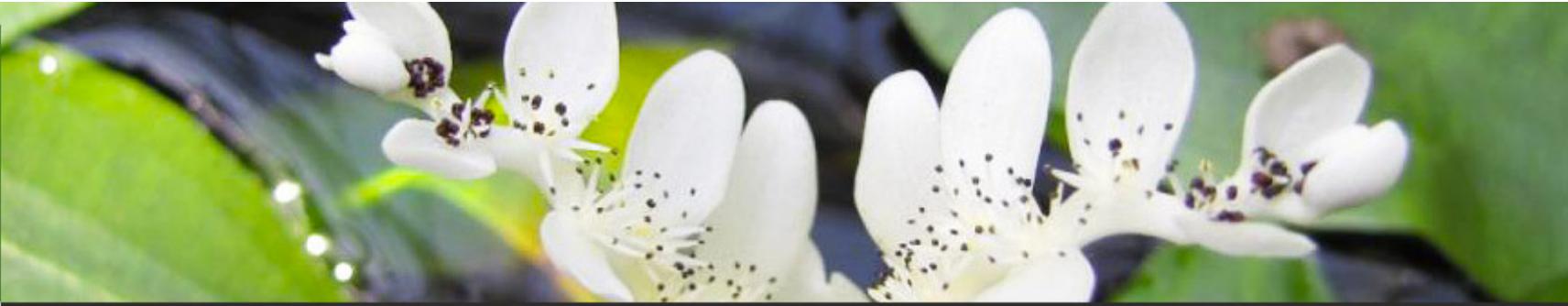
AgriSeta initiated

## Occupational Training Courses

developed by Industry subject matter experts

# South African Green Industries Council

## **SAGIC**



**THE SOUTH AFRICAN GREEN INDUSTRIES COUNCIL**

Representing Horticultural Industry sectors such as:

**Production Nurseries**

**Landscapers**

**Garden Centres**

*AgriSeta request:*

Identify critical skills gaps in Horticulture

& develop Occupational Training Courses to uplift the skills levels  
of employees with little or no formal horticultural training



Horticultural Industry identified a typical scenario & key skills gap:

**Manager/Owner** Manages business practices

Manager  
Production

# Gap!

Supervisor

?

*Critical skills gap:*  
Frontline Supervisors lack  
basic management  
& technical skills

Team Leader

Worker

Does tasks when **instructed**

# No horticultural training



# They get the job done...



...with no formal skills training



# Proposed solution:

Develop an occupational training course for supervisors

**Manager/Owner** Manages business practices

Manager  
Production

**Supervisor**

**NQF 3**

National (vocational) Certificate  
Grade 11

Production Nursery Supervisor

Team Leader

**Worker**

# South African Qualifications Authority

## SAQA



Body responsible for training quality standards

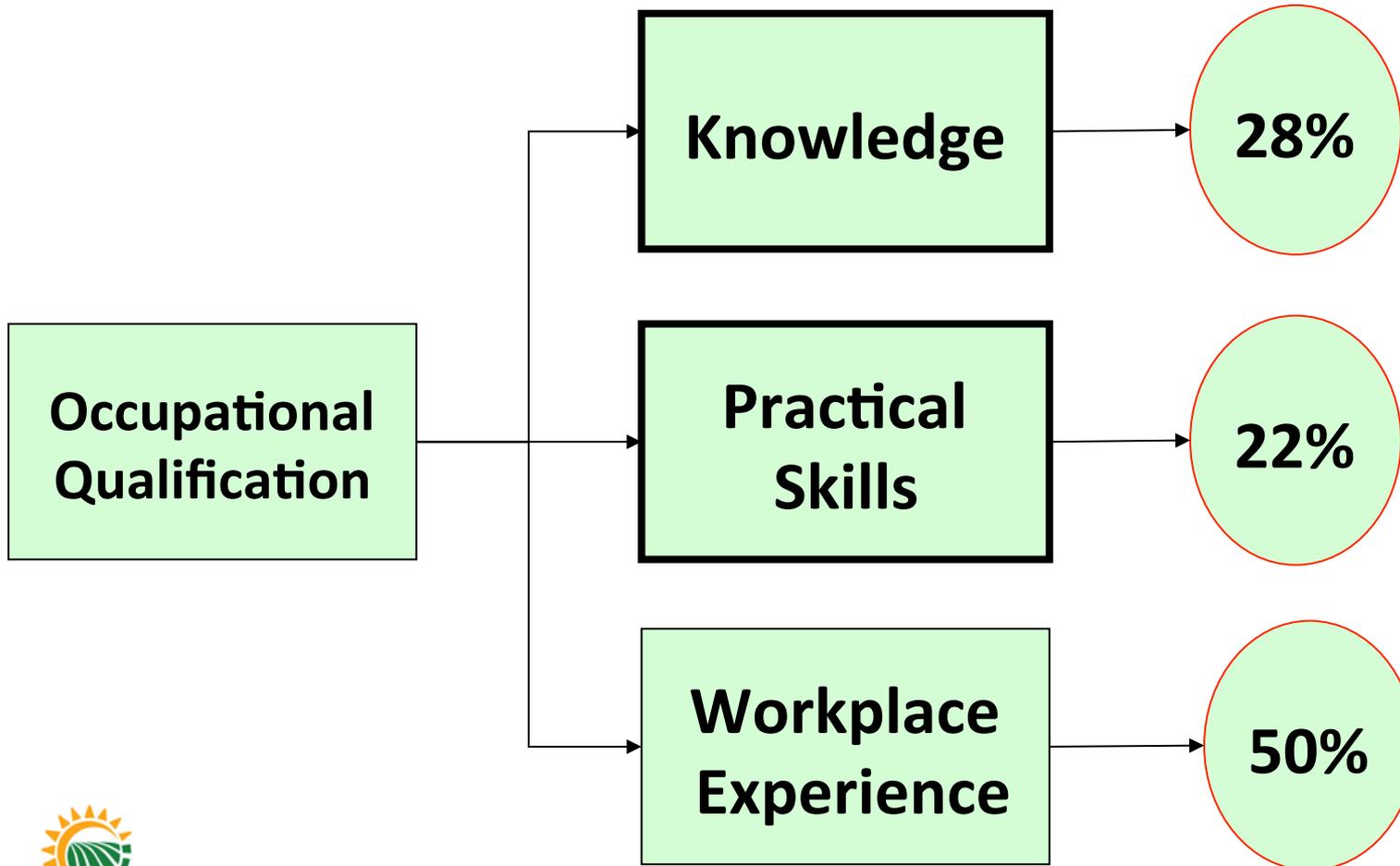
## National Qualifications Framework

### NQF Levels 1 - 10

1. Grade 9 & National vocational certificate
2. Grade 10 & National vocational certificate
- 3. Grade 11 & National vocational certificate**
4. Grade 12 & National Senior certificate
5. Higher certificate
6. Diploma
7. Bachelors degree
8. Honours
9. Masters
10. Doctors

# Occupational Qualification Specifications

## 3 Modules



# Nursery Person

## Specialization: **Production Nursery Supervisor**

The development of the course was based on defining:

### **The Occupational Profile**

of the Nursery Supervisor

- **Occupational Purpose?**
- **Occupational Tasks?**

# Occupational Profile of the Production Nursery Supervisor



## Occupational Purpose:

Implements the weekly production plan

to produce the right quantity

& the right quality plants

efficiently.

# Occupational Profile of the Production Nursery Supervisor



## Occupational Tasks

1. **Supervise** propagation & growing on activities
2. **Lead** motivated, efficient & effective teams
3. **Organize & control** processes, workflow & resources

# Production Nursery Supervisor



needs **Knowledge of:**

## **Work**

Technical Skills, how to do the work

## **Responsibilities**

What to do & when

## **Human Skills**

How to work with people

# An overview of the Occupational Profile



## The Supervisor

The principles used in the context of Horticultural Occupational Training

### Role of the supervisor:

First line manager responsible for achieving set targets by ensuring that employees perform their tasks correctly and on time.

### Occupational Purpose:

Implements weekly & daily planned activities to achieve targets efficiently & effectively

### Occupational Tasks:

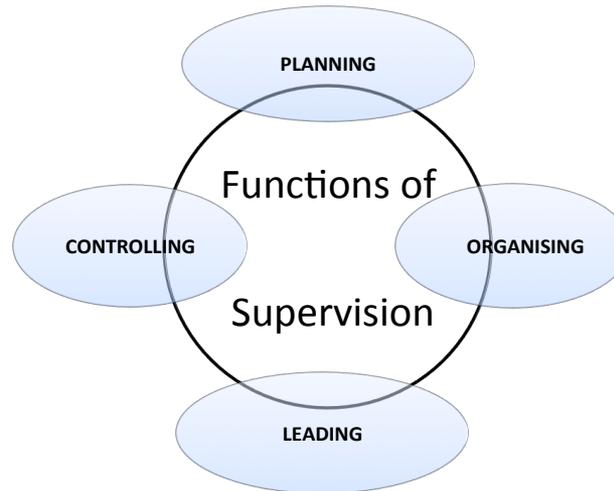
1. **Plan & Supervise** activities
2. Achieve targets by **organising** resources
3. Achieve team efficiency & effectiveness through **leadership**
4. Achieve consistent quality standards by **Controlling**, monitoring & adjusting work

### Knowledge Subjects:

1. Operational Systems, Processes and Projects
2. Supervision and Communication
3. Technical Principles & Best Practices
4. Equipment, Tools & Technology

### The Supervisor needs KNOWLEDGE of:

1. **WORK:** Technical skills, how to do
2. **RESPONSIBILITIES:** what to do and when
3. **HUMAN SKILLS:** how to work with people



# Knowledge Module: **Subjects**

Lectured in a classroom environment



<b>Responsibilities</b>	<b>Production Systems, Processes &amp; Projects</b>
<b>Human Skills</b>	<b>Supervision &amp; Communication</b>
<b>Work</b>	<b>Ornamental Plant Production Principles &amp; Cultivation Practices</b>
	<b>Plant Production Infrastructure, Equipment &amp; Technology</b>

# Example of lesson outlines: used to develop learner material



Topic	Topic elements	Assessment Criteria
1. Supervisory Principles	Planning, leading, organising and control	<ul style="list-style-type: none"> <li>Define the concepts of planning, leading, organising and control</li> <li>Describe the principles of planning, leading, organising and control</li> <li>Describe practices of planning, leading, organising and control</li> </ul>
	Leadership	<ul style="list-style-type: none"> <li>Define the concept of leadership</li> <li>List and discuss the characteristics of a leader</li> <li>Describe the principles of leadership</li> <li>Describe the practices of leadership</li> </ul>
	Team work and group dynamics	<ul style="list-style-type: none"> <li>Describe the composition of a team</li> <li>Describe the role of a team</li> <li>Describe the dynamics of a well functioning team</li> <li>Explain how the different team members will influence team performance</li> <li>Explain methods to encourage team cohesion</li> <li>Explain external factors which will impact on teamwork</li> <li>Explain internal factors which will impact on teamwork</li> </ul>
2. Supervision	Supervisory Styles	<ul style="list-style-type: none"> <li>List and explain different supervisory styles</li> <li>Compare and contrast different supervisory styles</li> <li>Explain the effect on team efficiency of different supervisory styles</li> </ul>

# Example of lesson outlines: used to develop learner material

<p>3. Plant Propagation Basics</p>	<p>Identify, describe and explain:</p> <ul style="list-style-type: none"> <li>• Types of propagation</li> <li>• Propagation processes</li> <li>• Control measures</li> </ul> <p>Propagation requirements</p>	<p>Identify, describe and explain the impact of propagation techniques and control measures on the health and growth of the plant</p>
<p>4. Ornamental Plant Growth Requirements</p>	<p>Identify, describe and explain:</p> <ul style="list-style-type: none"> <li>• Plant growth requirements</li> <li>• Plant nutrition</li> <li>• Importance of water for plant growth</li> <li>• Substrates and growing media components</li> <li>• The role of light in healthy plant growth</li> <li>• Cultivation practices</li> </ul>	<p>Plant growth requirements to produce healthy plants identified, described and explained. Identify, describe and explain the impact of cultivation practices on the growth of the plant</p>
<p>5. Growing Medium Quality</p>	<p>Identify, describe and explain:</p> <ul style="list-style-type: none"> <li>• Chemical properties               <ul style="list-style-type: none"> <li>○ pH, EC, CEC, C:N ratio</li> </ul> </li> <li>• Physical properties               <ul style="list-style-type: none"> <li>○ AFP, WHC, Bulk density, Shrinkage, Wettability</li> </ul> </li> </ul>	<p>Identify, describe and explain the properties of growing medium and its components and the influence on plant growth and health</p>

# Practical Skills Module: **Activities**



Scenario & role play exercises done in a classroom environment

## 1. Supervise propagation & growing on activities

**Interpret the WEEKLY PLAN  
Formulate INSTRUCTIONS  
ALLOCATE tasks & resources**

**Plan and organize the WORKFLOW,  
And PRODUCTIVE use of  
Raw materials, time, labour & machines**

**Demonstrate the CORRECT USE  
& MAINTENANCE of machinery  
& equipment**

**Identify PROBLEMS & DEVIATIONS  
from production quality & quantity targets**

**Evaluate PROCEDURES  
to maintain production  
quality & quantity targets**

**CONTROL  
environmental & growing conditions  
According to plant specific requirements**

# Practical Skills Module: **Activities**



Scenario & role play exercises done in a classroom environment

## 2. Lead a motivated, efficient & effective team

**Observe worker skills**

**Coach workers**

**Apply disciplinary policies  
& procedures**

**Encourage interaction amongst  
team members**

# Practical Skills Module: **Activities**



Scenario & role play exercises done in a classroom environment

## 3. Organize & control processes, workflow & resources

**Coordinate production activities  
of teams**

**Organize resources  
(materials, equipment & labour)**

**Monitor & adjust work processes  
to achieve stable workflow**

# Work Experience Module **Activities**

Done in workplace guided by workplace mentor



## 1. Supervise propagation & growing on activities

Do tasks until proficient

**Oversee production activities  
of teams producing plants**

**Achieve quantity & quality  
production targets**

**Organize processes to achieve  
optimal workflow**

**Monitor climate control,  
pest control, raw material quality,  
& application of fertilizer**

# Work Experience Module **Activities**

Done in workplace guided by workplace mentor



## 2. Lead a motivated, efficient & effective team

Do tasks until proficient

**Ensure adherence to  
company policies, procedures  
& legislation**

**Motivate the team**

**Promote the well being  
of team members**

**Coach team members on  
production techniques  
& processes**

# Work Experience Module **Activities**

Done in workplace guided by workplace mentor



## 3. Organize & control processes, workflow & resources

Do tasks until proficient

**Communicate information  
between teams & processes**

**Coordinate flow of products  
& ensure efficient movement  
of plants**

**Minimize impact of unforeseen  
circumstances on  
quality & quantity of plants**

**Reduce wastage of resources  
by ensuring compliance  
to procedures**

# Workplace Mentors



1/2 day monthly workshops to assist workplace mentors





# Workplace Experience Logbook exercise example

**5. Participate in weekly production planning and supervision activities by assisting an experienced person**

Learner has to participate in all weekly production planning and supervision activities until proficient in all the main activities  
 Allocate activities on a weekly basis according to the learners ability and time permitting until the learner is proficient in all main processes and cultivation activities

**WEEK NO:** \_\_\_\_\_,      **Date of period:** \_\_\_\_\_

**List of weekly production activities:**

1.	2.
3.	4.
5.	6.

Comments:

a. Do the daily planning for the listed production activities according to the weekly production plan:	Attach planning lists, production schedules and work sheets for each production activity	Supervisor name & signature:	Date
b. Calculate and allocate correct quantities of raw materials to each activity	Attach materials requirements lists	Supervisor name & signature:	Date:
c. Allocate team members to each activity according to skills and production process requirements	Attach position diagram for each assigned process showing allocated team members names	Supervisor name & signature:	Date:
d. Evaluate daily results of each assigned production activity and report actual results to management	Attach production schedules and work sheets with daily actuals recorded	Supervisor name & signature:	Date:

Mentor name & signature:	Date:	Comments:
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Examples of concepts taught:

## LEVELS OF RESPONSIBILITIES



**Manages business practices / STRATEGIC FOCUS**

Production planning – Annual & Seasonal



Responsible for the work of others

**Implements** seasonal production plan – **Monthly** planning

### **TACTICAL FOCUS / TECHNICAL WORK**



**Implements** weekly production plan – **Weekly** planning



**Coordinates** Tasks, - **Daily**  
works within a process/team

### **PROCESS**

Consists of STEPS

Each STEP has TASKS

START – STEPS - FINISH

Needs a **TEAM** = Leader & Workers  
to execute the PROCESS.



**Does** tasks when instructed



# Examples of concepts taught: How to apply technical knowledge

HOW pH AFFECTS PLANT NUTRIENT UPTAKE REGULAR & HIGH CEC SOILS				EXPERIMENTAL AVAILABILITY OF NUTRIENTS WATER CULTURES			
strongly acid	moderately acid	slightly acid	strongly alkaline	strongly acid	moderately acid	slightly acid	strongly alkaline
NITROGEN				NITROGEN			
PHOSPHORUS				PHOSPHORUS			
POTASSIUM				POTASSIUM			
CALCIUM				CALCIUM			
SULPHUR				SULPHUR			
MAGNESIUM				MAGNESIUM			
IRON				IRON			
MANGANESE				MANGANESE			
BORON				BORON			
COPPER & ZINC				ZINC			
MOLYBDENUM				COPPER			

4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0

pH OF SATURATED SOIL  
(pH below 5.5 cuts primary nutrients)

4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0

pH OF NUTRIENT WATER OR SATURATED SOILLESS MEDIUMS  
(pH above 5.5 cuts phosphorus & manganese)



pH = Nutrient availability

*Examples of concepts taught:*

# The principles of growing quality plants



Reviewing quality standards.  
What is quality?

# Examples of concepts taught: The effect of pH

<b>&lt;5.5</b>	<b>5.5      Acceptable pH range for most plants      6.5</b>			<b>&gt;6.5</b>
<b>Nutrient elements readily available</b>				
<b>Low pH:</b>	<b>PETUNIA GROUP</b>	<b>GENERAL GROUP</b>	<b>GERANIUM GROUP</b>	<b>High pH:</b>
<p><b>Micronutrients very soluble</b></p> <p><b>Excess - Toxicities</b> Iron (Fe) Manganese (Mn) Boron (B) Copper (Cu) Zinc (Zn) Sodium (Na) Nitrogen (NH<sub>4</sub>)</p> <p><b>Deficient</b> Calcium (Ca) Magnesium (Mg) Phosphorous (P) Potassium (K) Sulfur (S) Molybdenium (Mo)</p>	<p><b>pH 5.4 - 6.2</b> <b>Iron-inefficient Group</b> Crops prone to micronutrient <b>deficiency</b> (particularly iron) when grown at high media pH</p> <p>Azalea                      Laurentia Bacopa                      Nemesia Begonia                      Pansy Brachyscome              Petunia Calibrachoa              Salvia farinacea Dianthus                      Snapdragons Dascia                      Verbena Gazania                      Vinca    Viola</p>	<p><b>pH 5.8 - 6.4</b> Crops not generally affected by either micronutrient deficiencies or toxicities</p> <p>Angelonia Chrysanthemum Cineraria senecio Cyclamen Impatiens Osteospermum Pelargonium peltatum Poinsettia Salvia</p>	<p><b>pH 6.0 - 6.6</b> <b>Iron-efficient Group</b> Crops prone to micronutrient <b>toxicity</b> (particularly iron and manganese) when grown at low media pH</p> <p>Marigolds New Guinea Imp Seed Geraniums Zonal Geraniums (P zonale) Lisianthus</p>	<p><b>Micronutrients less soluble</b></p> <p><b>Excess</b> Calcium (Ca) Nitrogen (NH<sub>4</sub>)</p> <p><b>Deficient</b> Manganese (Mn) Iron (Fe) Boron (B) Copper (Cu) Zinc (Zn) Magnesium (Mg) Phosphorous (P)</p>
<b>&lt;5.5</b>	<b>5.5</b>		<b>6.5</b>	<b>&gt;6.5</b>

Condense basic concepts to one page info sheets

# Info sheet: GROWING MEDIUM MANAGEMENT

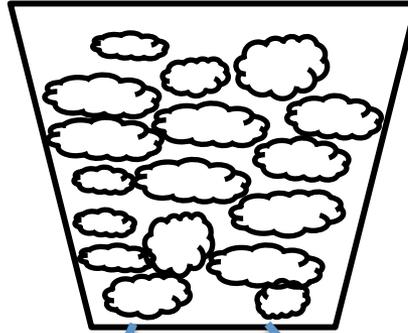
## Components

1. Coir
2. Peat
3. Perlite
4. Vermiculite
5. Composted Pine Bark
6. Saw Dust
7. Compost
8. Peanut shells
9. Sand
10. Top soil

## Mixing factors

1. Mix thoroughly, don't over mix
2. Uniformity of mix
3. Don't damage components
4. Moisture content: 60 – 75%

**POTTING MIX**  
Must be **STABLE & CONSISTENT**



**Bulk Density**  
(solids)  
30 - 50%

**Total Porosity**  
(empty spaces)  
50 – 70%

**Ratio of AIR:WATER**

**AIR**  
AFP  
10-25%

**WATER**  
WHC  
20-60%

## Key properties of a mix

	AFP	pH	EC ms/cm
<b>Plugs/ypf's</b>	8 - 12	5.5 -6 - 65	< 0.5
<b>6P/4P small pots</b>	12 - 16	5.5 -6 - 65	0.5 – 0.8
<b>Big pots 16cm +</b>	16 - 25	5.5 -6 - 65	0.8 – 1.0

## Physical Properties

1. TP Total porosity
2. BD Bulk density
3. AFP Air filled capacity
4. WHC Water holding capacity
5. Texture (particle size distribution)
6. Shrinkage
7. Wettability

## Chemical Properties

1. pH potential hydrogen (H+)
2. EC Cation exchange capacity
3. C:N Carbon:Nitrogen ratio
4. CEC Cation exchange capacity

## Phyto-hygienic Properties

1. No weeds
2. No diseases
3. No toxins

# Group practical activities



# Active learner participation



# Group discussions



# Nursery visits





**The Production Nursery Supervisor Course** was developed by Dr. Di Goodwin and Hans Sittig, assisted by a professional skills development consultant, Beatrice Enslin.

The course was successfully rolled out as a pilot project in 2012, with 15 learners qualifying.

The course has been adapted to include:  
**Landscaping Supervisors & Garden Centre Supervisors**

For 2014, 60 learners have enrolled.



# Knowledge & Practical Skills Modules

- Presented by private horticultural training service providers
- 6 x 3 day sessions, 1 session per month

# Workplace Experience Module

- 8 Months in the workplace, guided by a mentor appointed by the workplace management
- Mentors attend 6 x 1/2 day mentor training sessions, 1 per month
- Workplace must adhere to basic minimum standards to make workplace learning meaningful

# Learner selection:

- Learner must have worked 2 years in a nursery and show leadership ability
- Must be able to speak, read and write English

# The first group of learners...



part of the 2012 pilot project