Reel GARDENING™
THE PLANTING REVOLUTION

SAMPLE

CAPS-Aligned Worksheets and Lesson Plans for Incorporating a School Vegetable Garden into the Curriculum

SCHOOL WORKBOOK

GRADES 1, 2, 3, 4, 5, 6 AND 7

SECTION A

INTRODUCTION

Foreword

In an age of technology, in which learners are increasingly separated from nature, **a school garden is a powerful educational tool.** Many of your learners, when asked where food comes from, will say, "a shop"! It is as if young people have lost their connection to the natural world. **Through gardening, they develop an understanding of the natural world.** They learn to take care of it and, in so doing, they become more responsible citizens.

Many of your learners may live in an urban environment. The school garden may be their only experience with nature. Imagine the joy of a child digging the soil, for the first time, watching a plant grow, and then a few months later eating from it! This is the spirit in which the Reel Gardening Products especially the Grow Pod, and indeed this Educator Workbook, have been created. **Both the Grow Pod and the Workbook are designed to enhance the experience of creating a school garden by ensuring that not only do learners experience the joys of gardening, they also learn valuable life lessons.**

Gardening is hands-on learning. With careful lesson planning, it is possible to use an educational garden to teach concepts from a variety of subjects:

- **Maths:** A simple activity might include calculating the area of a rectangular garden bed. More complex operations might include measuring the rate of change in stem height.
- **History:** Learners can trace the geographic and cultural origins of foods such as corn (Central America), apples (western Asia), and potatoes (southern Peru).
- **Languages:** Introduce garden-related vocabulary words in a language class, or have learners write essays about observations or experiences in a garden.
- **Sciences:** Gardens are useful for teaching an array of concepts including the scientific method (e.g. form and test hypotheses about factors that promote plant growth), basic botany (e.g. plant anatomy and physiology), and environmental science (e.g. composting and the nitrogen cycle).
- **Life Skills:** Gardening is a particularly appropriate vehicle to teach nutrition and health. Several studies have shown that garden-based curricula encourage increased fruit and vegetable consumption in young children.

But you need not worry! We have taken care of the cross-curricular aspects of gardening for you. **This Guide contains grade-appropriate activity sheets, and detailed teacher notes to enhance the activity**. All activities are aligned to CAPS, with a specific emphasis on Life Skills/Orientation, Natural Sciences and English (First Additional Language). The Guide also contains extension activities, as well as opportunities for assessment.

Gardens also create opportunities for learners to work cooperatively and to take on responsibilities. They will quickly learn the negative consequences associated with forgetting to water their plants on a hot day and will work hard to make sure it does not happen again. Gardening also builds confidence, self-esteem, and pride as the learners watch their efforts turn into beautiful and productive gardens. It also teaches them patience as they wait for a seedling to sprout or a tomato to ripen.

Through a garden, learners help to beautify the school grounds. For many, it is their only chance to contribute positively to their environment. The praise they receive from other learners, parents, teachers and community members will create a sense of community spirit and introduce them to the benefits of volunteering.

Gardening is fun and is a skill that, once acquired, can be a lifelong hobby. **Spending time outside, exploring in the soil, watching seeds grow, and harvesting the bounty can be enjoyable and memorable ways for learners to spend their time.**

Beyond academics, the garden provides broader life lessons including contributing to learners' knowledge of how to maintain a healthy lifestyle. South Africa is experiencing a major health crisis as the number of overweight and obese youth is growing at an epidemic rate. **Garden programmes work to combat this epidemic by teaching youth about healthy lifestyles including proper nutrition and physical activity.** Through a gardening programme, learners gain first-hand experience with fresh fruits and vegetables. **They discover that produce does not magically appear on the supermarket shelves and learn about the important role of agriculture in our society**. Fruits and vegetables are an important part of the diet not only because they provide essential vitamins, but also because they are also linked to prevention of health problems like cancer and heart disease. Studies show that most children do not eat the recommended amount of fresh fruits and vegetables each day, and so they are missing out on these benefits. A garden programme increases produce availability and creates opportunities to teach learners what they should eat through fun, hands-on experiences.

A healthy lifestyle is more than just eating right though. Learners also need to adopt good exercise habits. **The garden provides a wide range of physical activity** through digging, planting and weeding. The garden activities are often so captivating that learners will not even realise they are exercising. Plus, it is an activity they can participate in for the rest of their lives.

Your learners will be growing up in an increasingly advanced world. It is important, therefore, to prepare them by introducing the skills that have become known as 2020 skills. The 2020 skills covered in this workbook include:

- **Complex problem solving**
- **Coordinating with others**
- **Critical thinking**
- **Judgment and decision-making**
- **Active listening**
- **Creativity**

We hope that you will enjoy using it as much as we have enjoyed preparing it for you.

Note to teachers:

- Plants are composed of cells, which make up tissues, which make up organs, which work together in systems.
- There are six basic plant organs:
  - Roots, stems, and leaves, which make up the root and shoot systems; and flowers, fruits, and seeds, which make up the reproductive system.
- Each organ has a specific structure and function. Roots for example, absorb water and minerals and store energy.
- Fruits develop around a fertilized egg (a seed) to protect it and help disperse it.
- The term "vegetable" is non-specific and merely refers to any edible plant part. For example, celery (stem), broccoli (flower), butternut (fruit), spinach (leaf) and carrot (root) may all be referred to as vegetables. The term "fruit" applies only to plant parts that develop around fertilized seeds, such as tomato, apple, peach, or squash. When learners aren't sure if a plant part is a fruit or a vegetable, encourage them to cut it open to see if it contains seeds or vascular bundles (for example, the stringy part of celery) that carry nutrients through a stem.

The Foreword is adapted from information at the following website:
http://www.csgn.org (The Collective School Garden Network, USA)

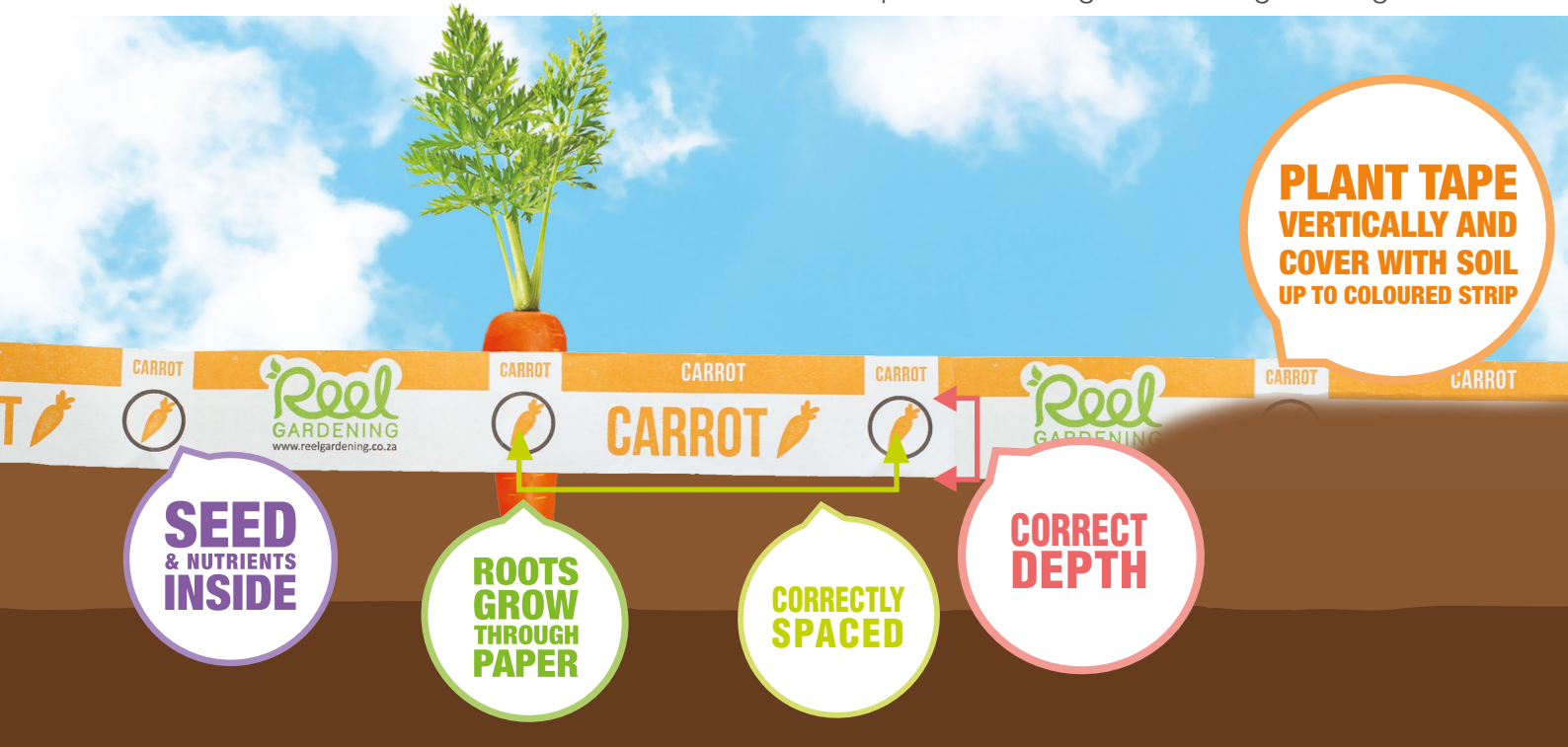
Reel Gardening

Reel Gardening is a South African Social Enterprise striving to get more people growing. **Reel Gardening makes starting a vegetable garden as simple, quick and fun as possible, enabling anyone to experience the simple joy of growing fresh, nutritious food for themselves and their families.**

Reel Gardening manufactures a patented, biodegradable seed tape that removes all confusion from the planting process. The unique product design enables anyone, from the expert gardener to young children, to start their own gardens.

All of our products, from the 1m² and 2m² Gardens in a Box, our Kids Get Growing Boxes, School and Community Gardens, and Grow Pods to our guides, workbooks and App, are designed to support you on your journey to starting a garden.

Visit our website and online store to learn more about our product offerings: www.reelgardening.co.za



Background and Context

The company began operation in 2010. Since then we have created more than **400 large school and community gardens.**

Reel Gardening is deeply passionate about capacitating the next generation to reconnect with nature, to understand where their food comes from and to respect and appreciate fresh, nutritious foods. We want to teach children about healthy food choices and enable them to access those foods through a garden.

In the past, we believed that we could achieve this goal only through large school gardens that can be used to supplement the foods supplied through the school feeding scheme. But through our years of experience, we have realised that **teaching each child about the importance of fresh vegetables in their diet goes hand in hand with teaching them how to grow those foods themselves.** We don't only need a large garden to feed the whole school, but we need to teach each child how to start a garden, in whatever small spaces they have available, to feed themselves for the rest of their lives.

This workbook has been designed to be used by teachers, in conjunction with a school garden. This may be a large garden, or a collection of smaller Grow Pods that can be placed outside the classrooms. Whatever the size garden, it is important to bring these lessons alive by including learners in the planting and growing process.

It is our hope that this workbook will help teachers instil some of the magic back into the growing process and encourage our learners to start gardens of their own.

Acronyms:

CAPS: Curriculum and Assessment Policy Statement

GET: General Education and Training

SECTION B

LEARNER ACTIVITIES AND HOW TO TEACH THEM

1. Foundation Phase

NAME OF LESSON: EATING FROM THE LAND	TIME: 2 HOURS
GRADE 1	SUBJECT: LIFE SKILLS, ENGLISH (FAL)

Curriculum Standards (CAPS)

Life Skills

Beginning Knowledge and Personal and Social Well-being.

Topic: Plants and seeds

- What plants look like.
- Seeds and where they come from.
- What plants need to grow.
- Growing a plant from a seed - such as a bean or a lentil.

Topic: Food

- Foods we eat.
- Where different foods come from: fruit; vegetables; dairy; meat.

English (First Additional Language):

Listening and Speaking:

- Builds an oral vocabulary using topics chosen by the teacher.
- Builds some conceptual vocabulary.
- Memorises and performs action rhymes, simple poems and songs.

OBJECTIVES

The learners will:

- Read and act out a poem of a seed becoming a flower.
- Draw pictures of the journey from seed to vegetable.
- Cut out and illustrate two gardening badges.
- Sing a song about different parts of vegetables, which we eat, in a garden.
- Cut out, paste and colour pictures of the different vegetables.

CONTENT	SKILLS	VALUES
Learner Activity 1: How do plants grow? • Plant life cycle **Learner Activity 2: We eat plants!** • Parts of plants • Vegetables	**Learner Activity 1: How do plants grow?** • Recitation skills • Creativity skills • Cutting skills **Learner Activity 2: We eat plants!** • Singing/Recitation skills • Creativity skills • Critical thinking skills	Learners appreciate the importance of caring for the natural environment as the source of all food.

RESOURCES NEEDED

Learner Activity 1: How do plants grow?

- Pens/pencils, crayons, scissors and glue.
- Safety pins for badges (optional).
- Photocopies of the Learner Activity (page 10 & 11 or 10 & 74) if you have access to a photocopier – if not, you can copy the Learner Activity on the board and learners can complete in their workbooks.

Learner Activity 2: We eat plants.

- Pens/pencils, crayons, scissors and glue.
- Photocopies of the Learner Activity (page 12 or 75) if you have access to a photocopier – if not, you can copy the Learner Activity on the board and learners can complete in their workbooks.

CURRICULUM LINKS

Learner Activity 1: Life Skills - Plants and Seeds; Grade 1, Term 3
Learner Activity 2: Life Skills - Plants and Seeds; Food: Grade 1, Term 3

TEACHER PREPARATION BEFORE STARTING

For both activities:

Read through the Learner Activities, familiarise yourself with them and what resources they require. Ensure that you are able to answer any questions that might arise.

LEARNER ACTIVITIES AND HOW TO TEACH THEM

Learner Activity 1: How do plants grow?

Ask:

- Have you ever planted a garden?
- What did you grow in your garden and why?

Explain:

- Every fruit and vegetable that we eat starts as a seed.
- When we plant a garden, we start by planting seeds.
- We put the seeds into soil.
- Soil is a special type of sand.
- The seeds grow in the soil.
- Plants grow from seeds.
- A baby plant is hidden inside a seed.
- The seed starts to get bigger and a small plant pops out of the soil.
- We eat many plants.
- Some vegetables are fruits of plants.
- Some vegetables are flowers of plants.
- Some vegetables are leaves of plants.
- Some vegetables are roots of plants.
- We eat some of them raw and some need to be cooked before we eat them.

Show learners the vegetables in the Harvesting Section of 'The Reel Easy Guide to Growing'. Let learners name each of the vegetables. They can also share the names of these vegetables in their first language (if not English) and teach other learners how to name the vegetables in these languages.

Let learners discuss which vegetables they enjoy eating and which they don't enjoy eating. Encourage reluctant vegetable eaters to try new vegetables.

Ask:

- What else do seeds need to grow?

Explain:

- Seeds need air, sunlight and water.

Introduce the Reel Gardening Grow Pod to the learners.

Use 'The Reel Easy Guide to Growing' to begin planting your class garden with your learners.

Show them the writing on the Grow Pod package ('Just add soil, water and sun').

Learners complete part 1 of Learner Activity 1: Recite the poem, Little seed.

Refer learners to the poem on Learner Activity 1: How do plants grow?

Go outside and let learners recite the poem. Encourage them to make up actions to accompany the poem.

Check for understanding of the poem:

- Where was the seed planted? (in the ground)
- What was big and round? (the sun)
- What were soft and slow? (the raindrops)
- What came up? (a flower)

Learners complete part 2 of Learner Activity 1: How do plants grow? by drawing pictures in the blocks.

Ask:

- What is a badge?
- Why do people wear badges?

Explain:

- Sometimes we wear badges to show that we are proud of something we have done.
- We are going to make two badges.

Learners complete part 3 of Learner Activity 1: Making badges?

Read the sentences with the learners, and proceed with the lesson as follows:

- Learners draw pictures of each sentence.
- If learners can cut out the badges themselves, let them do so. Alternatively, cut them out for them.
- Provide learners with safety pins, after explaining that they are to be careful with the pins, and assist learners to pin the first badge on themselves.
- When the learners' vegetables have grown, they can proudly wear their second badge.

Extension Activity

This poem is slightly harder than the one on the worksheet. You may, if you wish, teach it to your learners, and let them act it out, copy it into their workbooks, and illustrate it with seeds, plants, raindrops and sunshine.

Little Plant

In the heart of a seed
Buried deep, so deep
A dear little plant
Lay fast asleep!
"Wake!" said the voice
Of the raindrops bright.
The little plant heard
And it rose to see what the wonderful outside world might be!

Grade 1

Learner Activity 1: How do plants grow?

Name: _____ Date: _____

1. Read, and act out, this poem with your teacher:

2. Draw pictures in the blocks.

1. I plant my seeds in the ground.	2. The sun shines on my seeds.
3. The rain falls on my small plant.	4. I eat my vegetables.

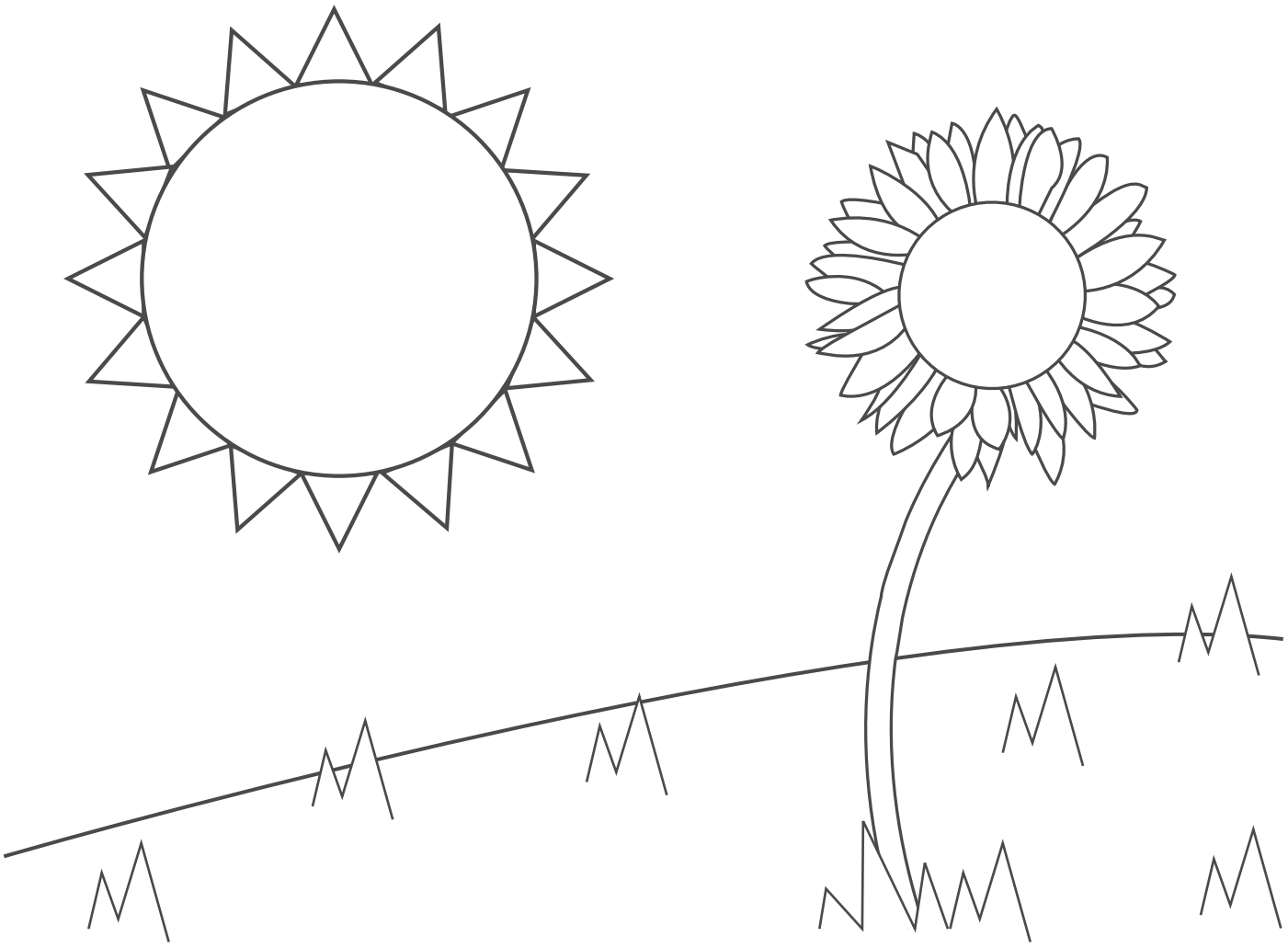
3. Cut out the two circles to make gardening badges. Draw a picture in each badge. Wear your badges proudly! (Find Badge templates for photocopying in the *Resource Section*)

I love being outside!

I love eating vegetables that I planted!

Did you know?

All plants need six hours of sunlight every day.



TEACHER PREPARATION BEFORE STARTING

For both activities:

Read through the Learner Activities, familiarise yourself with them and what resources they require. Ensure that you are able to answer any questions that might arise.

For Learner Activity 2:

Familiarize yourself with "Dirt Made My Lunch," a fun and educational song by 'Solar' Steve Van Zandt of the Banana Slug String Band. If there is a music teacher at your school, ask him/her to accompany you for the song element of this lesson. The song can also be treated as a poem.

LEARNER ACTIVITIES AND HOW TO TEACH THEM

Learner Activity 1: Seed to table

Ask:

- What is the weather like today?
- What season are we in?
- Do you know the names of the four seasons?

If possible, conduct this lesson outside and let learners identify what the plants and trees look like at this time of year.

Explain:

- The plants and trees look like that because of the season they are in. (please relate this to the season you are in when you teach this lesson).
- Every season has a different kind of weather.

Demonstrate:

- Select four volunteers to come to the front and represent each season with a prop. You could also represent the seasons with pictures on a wall:
  - Autumn (Brown, yellow, red or orange) leaves (Autumn)
  - Buds (Spring)
  - Flowers (Summer)
  - Bare stick (Winter)
- Give four learners each of the Season Cards and let them stand at the learner whose prop shows that season.

Discuss:

- The difference between the seasons, and how the environment changes throughout the year.

Ask:

- Do you think the seasons are important for farmers? (Yes)

Explain:

- Farmers plant seeds. The seeds grow into plants. We eat parts of the plant. They are called vegetables and fruits. The animals we eat, eat those plants too.
- Farmers plant seeds and water them. Then they start to grow.
- We can pick the plant and eat it. This is called HARVESTING.
- The fruit and vegetables that the farmer harvests are full of vitamins and minerals. You can't see vitamins and minerals but they are very important for your body. They keep you healthy and help your body to grow. For example, oranges and carrots give us Vitamin C, which helps us not to get sick.

Ask:

- Do you like vegetables?
- What vegetables do you eat?

- Do you like fruit?
- What fruit do you like?
- Why is it important to eat vegetables and fruits?

Explain:

- Imagine if your body was a car. What kind of fuel would you put in it? Would you give it the best fuel you could buy or poor quality fuel? Your body is a little like a car. When you give your body good food every day, you have energy to grow and play. Your body becomes healthier and fends off sickness. You grow and become strong. If you give your body poor food, it won't work as well. You might have less energy or get sick more often. Vegetables and fruit are the best fuel you can put in your car (body). Try to eat as much vegetables and fruits as you can!

Teach learners the following rhyme:

First the farmer sows his seed.
Next the farmer waters the seed.
Next the farmer removes the weeds.
Last the farmer harvests his seed.

Write these words on the board:

- Sow, Grow and Harvest.

Explain the words:

- Sow (Plant the seed)
- Grow (The seed gets light, water and food from the soil and so it grows.)
- Harvest (The plant is ready to be picked and eaten or used for food.)

Learners complete Learner Activity 1: Seed to table.

Learners must:

- Cut out the cards and stick them in the order from seed to table.
- Complete the sentence.

Note: Assist learners to complete the sentences as some of the words may be difficult for them to read.

Answers for this activity:
{This is the correct order the pictures should be cut and pasted into the learners workbooks.}
Pictures:

1. Packet of seeds	2. Farmer planting seeds
3. Growing carrot emerging from the ground	4. Farmer harvesting the carrot/s
5. Lady choosing carrots at market	6. Learner / Family sitting down to eat their meal (with carrots on the plate)

Sentences:

1: A carrot starts out as a seed.
2: The seed is planted in the ground.
3: The carrot grows under the ground.
4: The carrots are ready to be harvested.
5: The carrots are sold at the shop.
6: The woman is going to eat the root of the carrot.

Learner Activity 2: Dirt made my lunch

Ask:

- Who brought a sandwich to school today? (Ask the learners for one volunteer and if you can please see the volunteer's sandwich).
- Hold up the sandwich.

Ask:

- Who do you think made this sandwich? (Let learners share their ideas. Answer "No" to all of them - try to get them working towards it - they will usually guess up to farmer or gardener.)

Say:

- "I will tell you: DIRT made your lunch! (Let them respond; they usually respond with 'yuck'.)
- "That sounds crazy, right? How could dirt make your lunch?

Let learners pair and share how dirt could have made their lunch.

Explain:

- Dirt made your lunch because all our food comes from plants that grow in the dirt.
- "Dirt" is not a very nice word. The respectful word is "soil".

Write the word "soil" on the board.

Explain:

- Soil is made up of sand, air, water and dead plants.
- Everything we eat starts off, in some way, in the soil.
- Let's sing a song about this. It's called 'Dirt made my lunch'.

Refer learners to Learner Activity 2: Dirt made my lunch.

Teach them the song:
If possible, let learners watch the 'Dirt Made My Lunch' Song on Youtube.

Then teach the hand motions:

- Dirt: place hand under chin and wiggle fingers.
- Made: grind stacked fists together, like you're wringing out a towel.
- My: point to yourself.
- Lunch: Make an L with your right thumb and pointer.
- Thank you: Move palm of hand from chin forward 90 degrees.
- A bunch: Move both hands in a wide arc.
- Salad: toss a salad with scooping hands.
- Sandwich: hold up both hands and bite into an imaginary sandwich.
- Milk: pretend to milk a cow's udder.
- Munch: pretend to bite off of a large carrot.
  Practise a few times, then go outside to sing it to the garden.

Extension Activity:

Use the song to teach children about rhyming words:

- Which words rhyme?
- Can learners think of other words that rhyme with the rhyming words in the poem?
- Can learners write their own short rhymes?

Look at the cheeseburger on Learner Activity 2.2.

Ask:

- What is in a cheeseburger?

Explain:

- We are going to see how everything in a cheeseburger can be traced back to the soil.
- Use 'cheese' as the first example.
- Write 'cheese' on the board.
- Write each successive item across the page with arrows pointing LEFT. Circle "SOIL" when you get to it.
  - Example: cheese, milk, cow, corn/grass/hay SOIL.
  - Cheese comes from milk, which comes from a cow, which eats grass, which comes from the soil.

Learners complete part 2 of Learner Activity 2: Learners must complete the words and draw pictures of how the cheeseburger starts in soil.

Then let learners do the same process for the roll and the meat (burger patty) in their workbooks.
Correct order:

ROLL	BURGER PATTY
FLOUR	BEEF
WHEAT	COW
SOIL	GRASS
	SOIL

ASSESSMENT

Learner Activity 1: From Seed to table

- Could the learner sequence the pictures correctly?
- Could the learner complete the sentences correctly?
- Could the learner match the sentences to the correct picture?

Learner Activity 2: Dirt made my lunch

- Could the learner perform the actions of the song?
- Could the learner sequence the cheeseburger's ingredients correctly?
- Could the learner draw pictures of each of the ingredients?

Refer to the *Resource Section* of this book for the Assessment Rubric.

TEACHER REFLECTION

Is there anything you would do differently if you taught this unit again?

NAME OF LESSON: FOOD TO WASTE TO FOOD AGAIN!	TIME: 2 HOURS
GRADE 3	SUBJECT: LIFE SKILLS

Curriculum Standards (CAPS)

Life Skills

Beginning Knowledge and Personal and Social Well-being.

Topic: Products and Processes

Topic: Healthy eating

- Food Groups
  - Vitamins - vegetables and fruit.
  - Carbohydrates - bread and maize/mielie meal.
  - Proteins - eggs, beans, meat and nuts.
  - Dairy - milk, cheese and yoghurt.

- A balanced diet

Topic: Recycling

- What happens to our waste?
- Recycling (used things that can be made into something new).
- What cannot be recycled?
- Making compost out of things that rot.

OBJECTIVES

The learners will:

- Identify each of the nutrients in the 'nutrient' sandwich.
- Unscramble each of the nutrient words.
- Complete sentences on the nutrients.
- Match the nutrients to their functions.
- Identify things that can be recycled.
- Define composting.
- Understand that organic things can be composted.
- Differentiate between brown and green organic material.
- Identify what can and can't be composted.
- Learn how to make a compost heap.

CONTENT	SKILLS	VALUES
Learner Activity 1: We need nutrients • Food Groups • Nutrients • Balanced diet **Learner Activity 2: We don't waste** • Recycling • Composting	**Learner Activity 1: We need nutrients** • Active listening skills • Decoding skills • Matching skills • Complex problem solving skills • Critical thinking skills **Learner Activity 2: We don't waste** • Active listening skills • Sorting skills • Critical thinking skills • Judgement and decision-making skills	Learners appreciate the importance of healthy eating and not wasting food.

RESOURCES NEEDED

Learner Activity 1: We need nutrients

- Pens/pencils.
- Photocopies of the Learner Activity (page 28 & 29) if you have access to a photocopier – if not, you can copy the Learner Activity on the board and learners can complete in their workbooks.

Learner Activity 2: We don't waste

- Pens/pencils.
- Photocopies of the Learner Activity (page 30 & 31) if you have access to a photocopier – if not, you can copy the Learner Activity on the board and learners can complete in their workbooks.
- For the compost heap: a space to make the heap, garden waste, dry waste, kitchen waste and a watering can.

CURRICULUM LINKS

Learner Activity 1: Life Skills - Food Groups; Grade 3, Term 2
Learner Activity 2: Life Skills - Recycling; Grade 3, Term 4

TEACHER PREPARATION BEFORE STARTING

For both activities:

Read through the Learner Activities, familiarise yourself with them and what resources they require. Ensure that you are able to answer any questions that might arise.

LEARNER ACTIVITIES AND HOW TO TEACH THEM

Learner Activity 1: We need nutrients

Note to teacher: The curriculum only mentions 4 food groups (carbohydrates, protein, dairy and vitamins). We have grouped vitamins & minerals as a food group for teaching purposes.

Ask:

- What do our bodies need to grow, stay healthy, learn in school, and play? (Take answers)

Explain:

- We need food, water, air, exercise and sleep.
- Today we are going to learn about one of these things: food.
- Most of our foods come from plants and animals.
- Why is food important? (Take answers)

Explain:

- Food gives our bodies nutrients.
- Write the word 'nutrient' on the board.

Ask:

- Does anyone know what a 'nutrient' is?

Explain:

- Nutrients are the things that our bodies absorb from food.
- They give our bodies energy, help us grow and keep us healthy.

Refer learners to Learner Activity 1: We need nutrients.

Show them the 'nutrient sandwich'.

As you explain each of the nutrients, let learners write the mixed-up nutrient word correctly.

Explain:

- The bread is a carbohydrate. Carbohydrates give us energy. Some carbohydrates are healthy (bread, vegetables and fruit). Carbohydrates are also called 'starch'.
- Sugar is also a carbohydrate. We need sugar but not too much. It is better to get sugar from healthy food like fruits. The sugar that we get from sweets and chocolates is not healthy. We must not eat a lot of sweets and chocolates.
- Meat is a protein. Protein keeps our muscles strong. We get protein from food made from animals (meat, chicken and fish). Beans, nuts and seeds also give us protein.
- Cheese is a dairy. Dairy keeps our bones strong. Milk, yoghurt, cheese and maas are examples of dairy
- Vitamins and minerals are special kinds of nutrients. They are found in vegetables and fruit. They help our bodies to grow and stay healthy;
  - Vitamin A helps us to see.
  - Vitamin C keeps us from getting sick.
  - Calcium is a mineral that keeps our bones and teeth strong.
  - Iron is a mineral that keeps our blood healthy.
- A healthy diet needs to include all the nutrients: carbohydrates, protein, dairy, minerals and vitamins.
- Our bodies also need water. Water is not a food group but water is very important. It cools our bodies when we sweat and it also moves the other nutrients through our body.
- A balanced diet means that we eat food from all the food groups.

Learners complete Learner Activity 1: We need nutrients. Complete the sentences and then match each nutrient to its function.

Answers
Sentences:

1. Calcium and iron are examples of MINERALS.
2. We need to eat PROTEIN to keep our body strong.
3. CARBOHYDRATES give us energy.
4. We need to drink a few glasses of WATER a day.
5. VITAMINS A and C are found in vegetables and fruits and help our bodies grow and stay healthy.
6. PROTEIN keeps our bones strong.

Matching:
1 -f; 2 -c; 3 -a; 4 -b; 5 -d; 6 -e

When the learners have completed Learner Activity 1, have a conversation with them about a balanced diet

Explain:

- Try to eat lots of different kinds of food every day. Brightly coloured vegetables and fruits are especially good for you. You also need milk, cheese, meat and some carbohydrates (rice, pap, samp).
- Try not to eat too many sweets, chocolates and cold drinks. They have added sugar in them which are not very good for growing bodies. They can cause your teeth to rot and also make you sick if you eat too much.
- The healthiest food comes straight from nature.

Extension Activity

Let learners bring various food labels into class. Analyse the nutrient information and discuss whether the food contains the essential nutrients. Bring some examples of snacks, sweets and chocolates and let learners analyse why they need to eat these foods sparingly.

Learner Activity 2: We don't waste

Ask:

- What things do you throw in the dustbin?
- Let each learner name one thing they throw away each day and write each item on half of the board.

Explain:

- Everything does not have to go into the dustbin.
- Some things can be recycled.

Write the word 'recycle' on the board.

Explain:

- When we recycle, we take something that has been used already and turn it into something else
- Examples of things that can be recycled:
  - Tin cans
  - Cardboard
  - Electronic equipment
  - Glass (particularly bottles and jars)
  - Magazines
  - Metal
  - Newspaper
  - Paper
  - Plastic Bags
  - Plastic Bottles
  - Steel Cans

Ask:

- Have you ever heard the word 'compost'?

Write the word 'compost' on the board.

Explain:

- Composting is a special kind of recycling.
- Not all things can be composted.
- We can only compost organic things.

Write the word 'organic' on the board.

Explain:

- Organic things are things that come from plants and animals.
- These things die, rot and breakdown after a period of time. This broken down organic matter makes food for plants. This food is called compost.
- Compost is filled with the nutrients that plants need to grow.
- Just like humans need nutrients, as we learned in Learner Activity 1, so too do plants need nutrients. Plants get their nutrients from the soil.
- When we compost, we put nutrients into the soil. This helps the plants grow better.
- We never put meat or dairy products into a compost heap. These include bones, milk, cheese and oils. You also can't put your pet's poop into a compost heap.

Ask:

- Why do you think this is?

Explain:

- Meat and dairy can rot, smell bad and attract maggots (these are the 'goggas' that come out of flies' eggs).
- We must only put egg shells, paper and things that come from plants onto our compost heap.

Explain:

- Organic material can be GREEN or BROWN.
- Brown stuff is dead, dried plant parts or pieces of cardboard.
- Green stuff is fresh living parts like grass cuttings, kitchen vegetable scraps, weeds and other plants

Refer learners to Learner Activity 2.

Explain:

- Compost needs water, light and air. It also needs brown and green material.
- Sort out all the materials on the worksheet into their correct columns.

Learners complete Part 1 of Learner Activity 2: We don't waste, by:

- Drawing the table in their workbook (Make sure that learners use the whole page so that there is enough space to draw the items.)
- Draw each of the pictures in the correct column in their workbook.

Learners complete Part 2 of Learner Activity 2: We don't waste.

Learners complete Part 3 of Learner Activity 2: We don't waste.

Learners must:

- Mark an X over the things that do not go in a compost heap.
- Circle the things that can go in a compost heap.

Answers:
Can be composted – Leaves, branches, banana peel, vegetable, newspaper, grass, hay, sticks and the apple core.
Cannot be composted – Oil, can, boots, cheese, bones, chicken and paint.

Extension Activity

Follow these steps to make a compost heap with your learners:

1. To make a compost heap, you will need:
    - A space in which to make the heap.
    - Garden waste – lawn clippings, dead plant growth and weeds.
    - Dry waste – straw, shredded newspaper and egg cartons.
    - Kitchen waste – fresh vegetable peelings, no meat and no dairy.
    - A watering can.
2. Collect your green and brown waste in separate refuse bags.
3. When you have enough waste, layer it on the ground – brown material and then green material from the kitchen and garden.
4. Make sure that you water each layer well.
5. Add a thin layer of soil. Repeat the layering process until the heap is 1m high.
6. Wait 2 weeks before giving the heap a good mix with a garden fork.
7. Your compost is ready when the waste has broken down completely and is dark and flaky.
8. Plants love compost! Add compost to the soil of your vegetable garden.

ASSESSMENT

Learner Activity 1: We need nutrients

- Could the learner unscramble the nutrient words?
- Could the learner complete the sentences?
- Could the learner match the nutrient to its function?

Learner Activity 2: We don't waste

- Could the learner identify the Brown material, Green material and Soil/Water/Air?
- Could the learner identify what we do and don't compost?
- Did the learner participate actively in making the compost heap?

Refer to the *Resource Section* of this book for the Assessment Rubric.

TEACHER REFLECTION

Is there anything you would do differently if you taught this unit again?

Grade 3

Learner Activity 1: We need nutrients

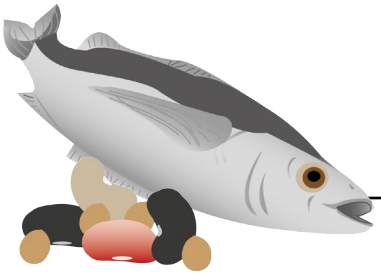
Name: _____ Date: _____

Nutrients are the things in food that our bodies need to help us grow, play and stay healthy. There are 6 main nutrients.

1. **Look at these pictures. They explain the different nutrients, but their names have been scrambled up below. Unscramble them and write them in the space provided.**

_____

Y A D I R keeps our bones strong



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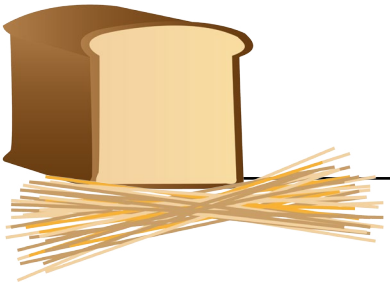
N R O T I E P keeps our bones strong



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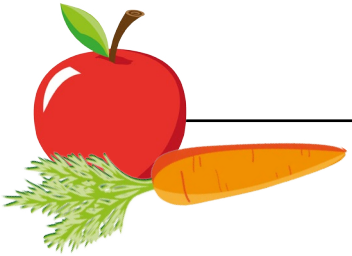
R A C B H Y O D A T E R S

gives us energy



_____

S T M V I A S N and M A L S I N R E

help our bodies to grow and stay healthy.

_____

We need to drink T W R A E every day.

2. Now complete each of the following sentences with one of the nutrient words:

a) Calcium and iron are examples of _____.

b) We need to eat _____ to keep our muscles strong.

c) _____ give us energy.

d) We need to drink a few glasses of _____ a day.

e) _____ A and C are found in fruits and vegetables and help our bodies grow and stay healthy.

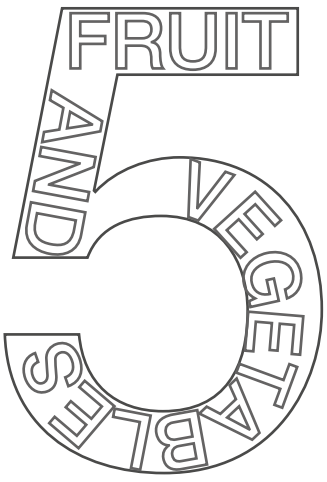
f) _____ keeps our bones strong.

3. Now draw a line from each nutrient to its correct function:

1	CARBOHYDRATES	a	Gives us energy and helps to build and fix our muscles.
2	DAIRY	b	Helps you to see better.
3	PROTEIN	c	A mineral that helps you to build stronger bones and teeth.
4	VITAMIN A	d	Keeps our teeth strong.
5	CALCIUM	e	Moves nutrients through the body.
6	WATER	f	Give us energy.

Did you know?

You should eat 5 fresh fruits and vegetables everyday!



NAME OF LESSON: PLANTING AND EATING	TIME: 2 HOURS
GRADE 5	SUBJECT: NATURAL SCIENCES; LIFE SKILLS

Curriculum Standards (CAPS)

Natural Sciences: Life and Living

Topic: Plants and Animals on Earth

- Many different plants and animals.
  - There are many different plants and animals living in different habitats on earth (South Africa has a wide variety of indigenous plants and animals and their habitats).

- Inter-dependence.
  - Plants and animals depend on each other.
  - They also depend on the resources available (such as air, water, soil, food and places to hide) in their own habitats.

Life Skills: Health and Environmental Responsibility

- Healthy eating for children:
  - South African Food-Based Dietary Guidelines.
  - Dietary needs of children.

English (First Additional Language):

Writing and presenting:
- Writes a personal recount of events.

Reading and viewing:
- Reads and solves a word puzzle.

OBJECTIVES

The learners will:

- Discuss the different parts of plants and the difference between plants and animals.
- Practise a rap on the different parts of a plant, and present it to their classmates.
- Complete a crossword puzzle on plants and humans.
- Read a mock interview with a vegetable.
- Compose their own interview with a vegetable.
- Identify various gardening tools (pictures and uses).
- Write a short story on creating a vegetable garden.

CONTENT	SKILLS	VALUES
Learner Activity 1: Together we make a plant. • Parts of a plant • Functions of the plant parts • Edible parts of different plants **Learner Activity 2: In the garden.** • Health and benefits of various vegetables • Gardening tools	**Learner Activity 1: Together we make a plant.** • Active listening skills • Recitation skills • Critical thinking skills • Teaching skills (optional) • Complex problem-solving skills **Learner Activity 2: In the garden.** • Active listening skills • Creativity skills • Critical thinking skills • Coordinating with others • Writing skills	Learners appreciates where food comes from and the value of treating food with respect by not wasting it.

RESOURCES NEEDED

For Activity 1:

- Pens/pencils.
- Photocopies of the Learner Activity (page 46 & 47) if you have access to a photocopier – if not, you can copy the Learner Activity on the board and learners can complete in their workbooks.

For Activity 2:

- Pens/pencils.
- If you have access to real garden tools, bring them in to make the lesson more tangible.
- Photocopies of the Learner Activity (page 48 & 49) if you have access to a photocopier – if not, you can copy the Learner Activity on the board and learners can complete in their workbooks.

CURRICULUM LINKS

Learner Activity 1: Natural Sciences - Plants and animals on earth; Grade 5, Term 1
Learner Activity 2: Life Skills - Healthy Eating for children; Grade 5, Term 3

TEACHER PREPARATION BEFORE STARTING

For both activities:

Read through the Learner Activities, familiarise yourself with them and what resources they require. Ensure that you are able to answer any questions that might arise.

LEARNER ACTIVITIES AND HOW TO TEACH THEM

Learner Activity 1: Together we make a plant

Explain:

- All living things depend on one another for their survival.
- Birds and some animals live on trees. They eat fruits. They may drop some seeds.
- New plants grow from these seeds. Some grow into big trees and some give fruits.
- Trees give shelter to birds, animals and human beings.
- Waste from animals mixes with the soil and adds extra nutrients to it.
- Plants get nutrients from this soil.

Write the word “interdependency” on the board.

Ask:

- Can you say this big word?
- Does anyone know what it means?

Show learners that “depend” is found within the word.

Explain:

- When you depend on someone, you need that person to take care of you.
- Things that are interdependent depend on each other to satisfy their needs.
- For example: Animals depend on plants for healthy food.

Ask:

- For what else do humans depend on plants? (oxygen, shelter)
- What else besides healthy food do humans need to survive? (water, sleep, exercise)
- Do plants depend on humans and animals? (Yes)

Explain:

- Animals and humans breathe out carbon dioxide which plants need to make food.
- Some plants depend on animals to carry their seeds.

- We say that plants and animals are interdependent.
- Animals and humans use plants in many different ways.

Explain:

- Just as there are many kinds of animals in the world, so too are there many kinds of plants. They may all look different, but all plants have the same parts.
- Each part has a different job.

Ask:

- Where do plants come from?

Explain:

- All plants start as a seed.
- The seed grows into a new plant. That is its job.

Ask:

- What other plant parts do you know?
- Write the words on the board and show learners the picture on Learner Activity 1: Together we make a plant.

Explain:

- We are going to learn a rap that explains the jobs that the different parts of the plant have.
  Read through the rap with the learners and elaborate on the different functions of the plant parts:
- Roots—absorb water and nutrients; hold the plant in place.
- Stems—transport water and nutrients up and down the plant; hold the plant upright.
- Leaves—make food for the plant.
- Flowers—make the plant's seeds and attract pollen carrying insects.
- Fruits—contain seeds; some can be eaten to assist in seed dispersal.
  Source for rap: www.doe.virginia.gov

Learners complete part 1 of Learner Activity 1: Together we make a plant! Let learners practise and perform their raps outside, as close to the garden area as possible.

Ask:

- Where do seeds come from?

Explain:

- Vegetables produce seeds from either their fruit of their flowers.

Show learners the vegetables in the Harvesting Section of **'The Reel Easy Guide to Growing'**. Let learners guess which part of the plant they are eating when they eat each of the vegetables pictured.

Explain:

- We are going to grow our own vegetables.

Introduce the Reel Gardening Grow Pod to the learners.

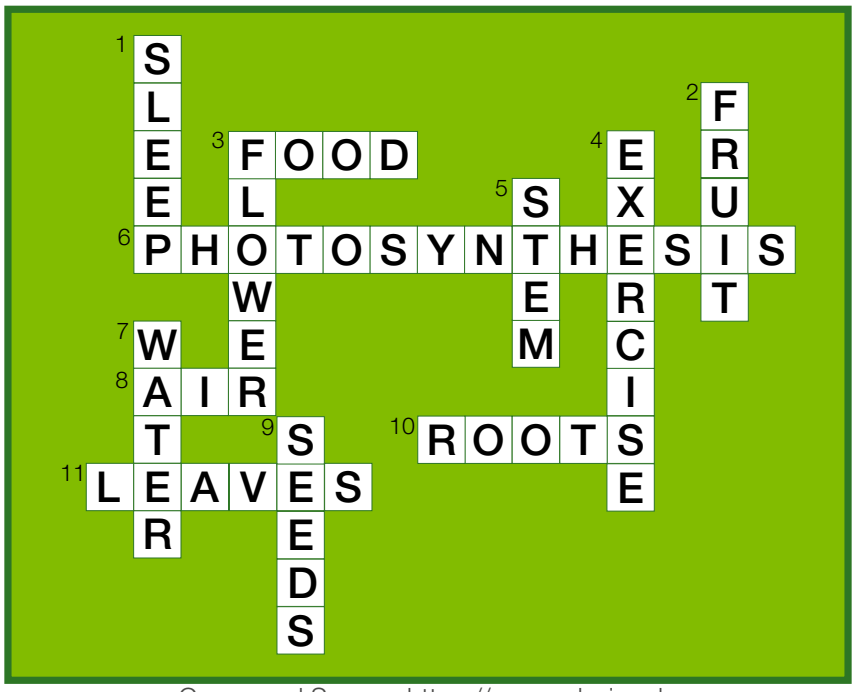
Explain:

- We will plant these seeds, and soon we will be able to see all the parts of the plant that we have learned about.

Use 'The Reel Easy Guide to Growing' to guide you as you begin planting your class garden, with your learners.

Let learners complete the crossword in part 2 of Learner Activity 1: Together we make a plant.

Answers to the crossword:



Crossword Source: https://cns.ucdavis.edu

Note:

This lesson does not specifically cover photosynthesis (6 across). Either provide this answer to your learners and/or explain the process simply:

- Through photosynthesis, plants capture the sun's energy to make their food.
- Plants take water and nutrients from the soil, along with carbon dioxide from the air, and convert them into the food they need to grow and be healthy.
- Sunlight is needed for this process to take place.
- We all depend on plants for survival, without them there would be no life on Earth!
- All the food we eat and the oxygen we breathe can be traced back to plants.
- Think of leaves as the plant's kitchen. This is where sunlight is captured to give the plant the energy to mix carbon dioxide and water together to make the food the plant needs to grow and reproduce.

Conclude this lesson with a walk in nature (if possible). Let learners point out as many plants as possible and take note of their different shapes and the colours of their leaves, flowers and fruits.

Let learners share what they noticed about the many differences between plants.

Extension Activity:

Write these vegetables, and draw the table, on the board – without the answers.

Explain to the learners that these vegetables are different parts of a plant that we eat.

Have a competition in which learners must guess where each vegetable fits. Give the winning learner or team a prize. (Optional)

Apple	Asparagus	Beetroot
Broccoli	Cabbage	Carrot
Cauliflower	Grapes	Mielie
Celery	Rice	Spinach

Answers:

Roots	Steams	Leaves	Flowers	Seed	Fruits
Beetroot	Asparagus	Cabbage	Broccoli	Mielie	Apple
Carrot	Celery	Spinach	Cauliflower	Rice	Grapes

Grade 5

Learner Activity 1: Together we make a plant!

Name: _____ Date: _____

1. In your groups, go outside and practice this rap and make up actions for it. Then, find a space close to your vegetable garden, and present it to your class.

"We are the roots that suck up the juice.
Water and nutrients—we won't turn them loose!"

"We are the stems standing upright.
In sun, wind, and rain, we reach for the light!"

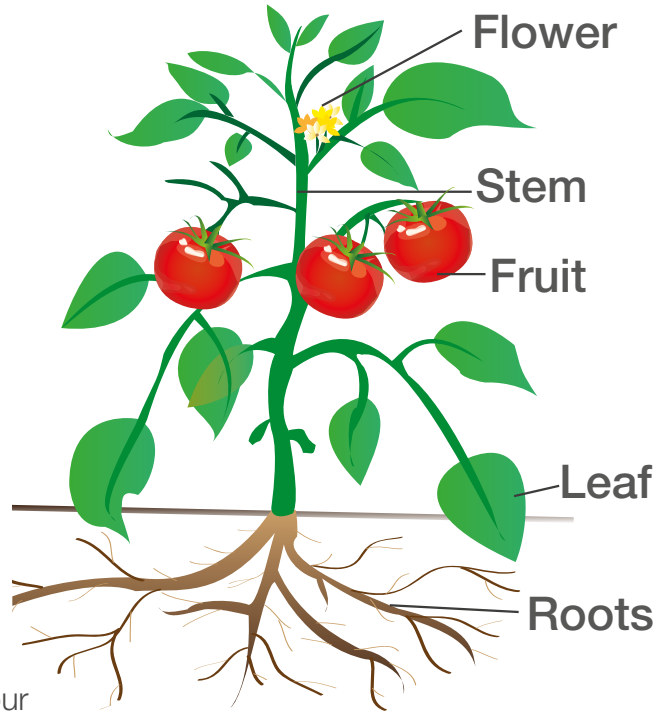
"We are the leaves creating the food.
When blown by a breeze, we're in a good mood!"

"We are the flowers making the seeds.
We're pretty to see and important in deeds!"

"We are the fruits containing the seeds.
When we are eaten, we become needs!"

"We are the seeds that make the new plants.
When blown by the wind, we really can dance!"

"Together we make a plant. We hope you enjoyed our chant!"



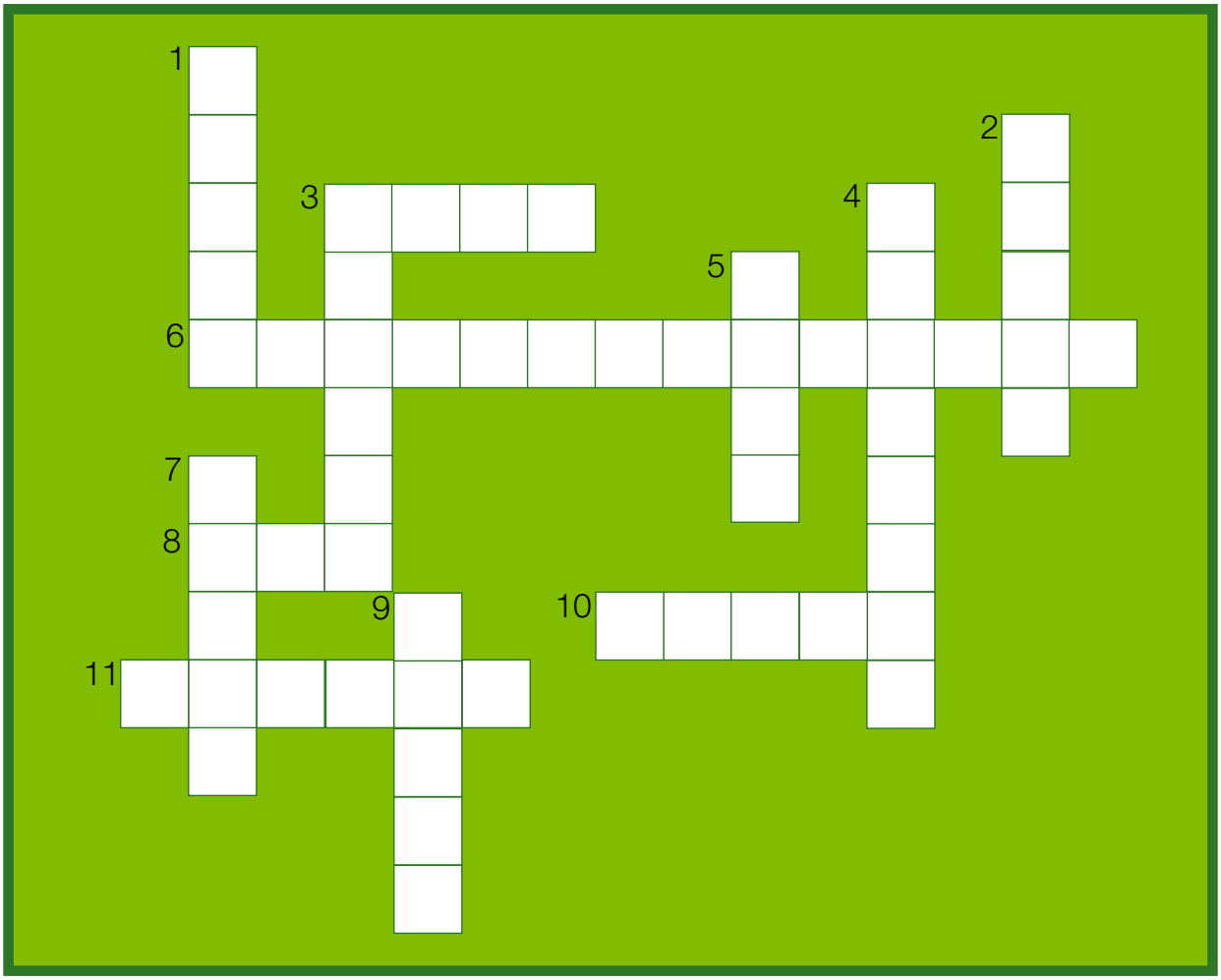
2. Complete the crossword on the following page using the missing words or answers to the clues and questions below.

Across

3. You need to eat _____ every day for energy.
6. How do plants make their own food using water, air, and sunlight?
8. The _____ you breathe gives your body the oxygen it needs.
10. _____ usually grow underground and take up water from the soil.
11. _____ are the part of the plant where photosynthesis takes place.

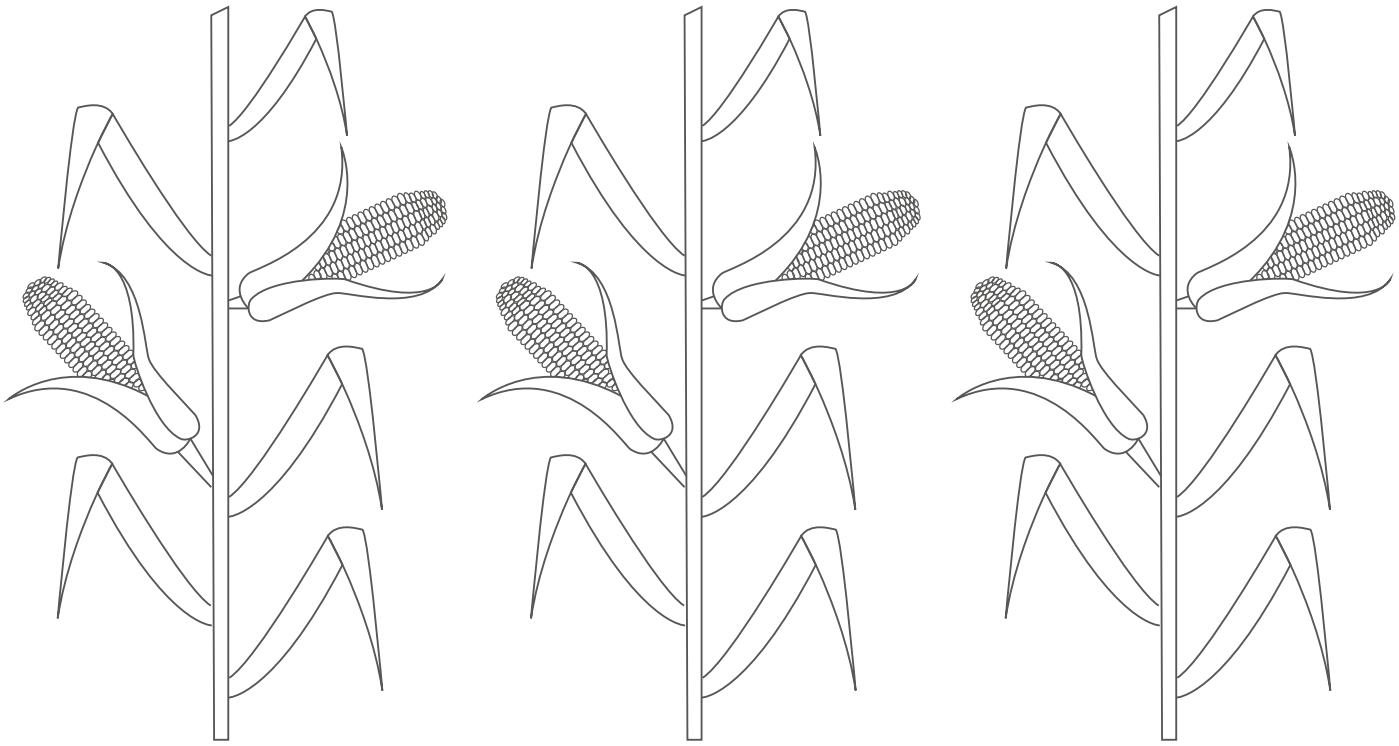
Down

1. What must you do every night to prepare for the next day?
2. The part of the plant that holds and protects the seeds of some plants.
3. The part of the plant that attracts pollinators.
4. A little of this every day will help keep your muscles strong.
5. The part of the plant that moves water and other nutrients from the roots to the leaves.
7. You need to drink this every day so that you stay cool and do not get dehydrated.
9. Mealies and peas are examples of this plant part.



Did you know?

In other countries, mielies are called “corn on the cob”! In Afrikaans, “popcorn” is called “jumping mielies” (“springmielies”).



Reel Gardening is a South African Social Enterprise striving to get more people growing. Reel Gardening makes starting a vegetable garden as simple, quick and fun as possible, enabling anyone to experience the simple joy of growing fresh, nutritious food for themselves and their families.

For any questions or advice please contact Reel Gardening on 011 782 0661 or info@reelgardening.co.za