Grade 9 Integrated Science

Term 2 - 54 complete lesson plans

Ready to teach, in the KICD lesson-plan format | 40-minute lessons | PDF and editable Word

ABOUT THIS PACK

54 complete, ready-to-teach Grade 9 Integrated Science lesson plans for Term 2, covering nutrition in plants, nutrition in animals and reproduction in plants.

TOPICS IN THIS PACK

Topic	Name	Lessons
2.1	Nutrition in plants	18
2.2	Nutrition in animals	16
2.3	Reproduction in plants	20

INSIDE EVERY LESSON PLAN

- The specific learning outcomes, key inquiry question, core competencies, values and PCIs, and the resources needed.
- A timed lesson flow: what the teacher does and what the learners do, from introduction to summary.
- The key content (a worked example, notes or a practical with its expected results), then four practice questions with the answers for the teacher.
- The common mistake to watch for, and ideas for learners who need support and for those ready for more.
- A four-level CBC assessment rubric (EE, ME, AE, BE), homework, and a blank reflection space to fill in after teaching.

A TASTE OF LESSON 1

How plants get their food

By the end of the lesson, the learner should be able to: a) state that green plants make their own food; b) define photosynthesis in simple terms

> **Plants are food makers**
> Green plants make their own food from carbon dioxide (from the air) and water (from the soil), using energy from sunlight.
> This process is called photosynthesis ("making with light"). It happens mainly in the leaves.

You also receive this pack as an editable Word file, so you can change any lesson to suit your class before you print it. Lessons follow the order of the KICD curriculum design.

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How plants get their food

Strand 2.0 Living Things and their Environment > Sub-strand 2.1 Nutrition in plants | Lesson 1 of 18 | 40 minutes

SCHOOL	TEACHER	DATE
CLASS / STREAM	TIME	ROLL (B / G)

SPECIFIC LEARNING OUTCOME(S)

By the end of the lesson, the learner should be able to: a) state that green plants make their own food; b) define photosynthesis in simple terms

KEY INQUIRY QUESTION(S)

- What is the importance of photosynthesis in nature?

CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

COMPETENCY	**Learning to learn**	Learners say what they found easy or hard and decide their next step.
COMPETENCY	**Self-efficacy**	Learners attempt each task with confidence and see that effort improves results.
VALUE	**Social justice**	Every learner gets a turn and a fair chance to answer.
VALUE	**Integrity**	Learners record their own honest results and mark work truthfully.
PCI	**Environmental conservation**	Examples link to caring for the school and home environment.
PCI	**Safety**	Learners follow safety rules when using materials and moving about.

LEARNING RESOURCES

Fresh leaves of common plants (collect only what is needed) | Hand lenses | Charts or photomicrographs of leaf sections and chloroplasts | Learners' exercise books

ORGANISATION OF LEARNING

Whole class for the introduction and the summary; pairs or groups of four to five for guided practice; individual work for the independent tasks.

KEY WORDS

photosynthesis | chlorophyll | chloroplast | stomata | guard cells | palisade layer | spongy layer | grana | stroma | starch test | destarching

THE LESSON AT A GLANCE

Introduction	Teacher models	Guided practice	On their own	Wrap-up
6 min	9 min	10 min	9 min	6 min

LESSON FLOW

Stage	Minutes	The teacher	The learners
Introduction	6	Greet the class and ask: "Key question: what is the importance of photosynthesis in nature? A maize plant grows from a tiny seed into a tall plant. Where does all its new material come from?" Take two or three answers, link them to earlier work, then state today's outcome.	Answer the starter question, recall what they already know and read the outcome aloud.
Step 1: Teacher models	9	Take learners through "Plants are food makers" (key ideas on the next page), explaining as you go. Use fresh leaves of common plants (collect only what is needed), hand lenses, charts or photomicrographs of leaf sections and chloroplasts. Ask learners to predict what comes next before you show it.	Watch, predict the next step, ask questions and note the key steps in their exercise books.
Step 2: Guided practice	10	Give questions 1 and 2. Move round the groups, ask "How do you know?" and correct errors kindly on the spot.	Work in pairs or small groups, explain each step to a partner and check one another's answers.
Step 3: Independent practice	9	Set questions 3 and 4 for individual work. Mark as you walk round and note who needs help in the next lesson.	Work on their own, then swap books with a partner to check.
Summary and conclusion	6	Ask two or three learners to state the key idea in their own words. Give this exit question and check the answers: "Why do animals depend on plants?"	Say the key idea in their own words and answer the exit question in the exercise book.

KEY IDEAS

Plants are food makers

Green plants make their own food from carbon dioxide (from the air) and water (from the soil), using energy from sunlight.

This process is called photosynthesis ("making with light"). It happens mainly in the leaves.

Animals, including people, cannot do this, so they depend on plants for food, directly or indirectly.

PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

No.	Question	Answer
1	What is photosynthesis?	**The process by which green plants make food from carbon dioxide and water using light energy.**
2	Where does a plant get carbon dioxide?	**From the air**
3	Where does a plant get water?	**From the soil, through its roots**
4	Why do animals depend on plants?	**Animals cannot make their own food; plants are at the start of their food chains.**

WATCH OUT FOR

Learners think plants get their food from the soil. The soil gives water and minerals; the food (sugar) is made in the leaves.

ASSESSMENT RUBRIC - THE FOUR CBC LEVELS

Level	What the learner can do
Exceeds expectations (EE)	Can state that green plants make their own food confidently and accurately, explain the method used, and apply the idea to new or unfamiliar problems.
Meets expectations (ME)	Can state that green plants make their own food accurately in familiar situations; notices and corrects slips without help.
Approaches expectations (AE)	Can partly state that green plants make their own food, or does so with prompts from the teacher or a partner; makes some errors.
Below expectations (BE)	Cannot yet state that green plants make their own food without direct help; needs the idea taught again with concrete objects.

SUPPORT AND EXTENSION

Learners who need support	Draw a large leaf with arrows: carbon dioxide in, water in, light in, sugar and oxygen out.
Learners ready for more	List five foods you ate this week and trace each back to a plant. (Answer: Answers will vary; even milk and meat come from animals that ate plants)
Inclusion	Seat learners with low vision near the board and read aloud whatever you write; use large, clear, tactile materials; allow extra time; pair with a patient partner; use gestures or Kenyan Sign Language for the key words.

HOMEWORK AND FOLLOW-UP

Redo questions 3 and 4 neatly in the exercise book. Then tell someone at home what you learned about "how plants get their food" and bring one question of your own to ask next lesson.

TEACHER SELF-CHECK

- Did every learner get a turn to handle materials or explain their thinking?
- Did most learners meet the outcome? Write down the names of those who did not.
- Was the pace right — did any step take too long or too short a time?
- Which competency and value did I see learners showing?
- What will I change the next time I teach this lesson?

REFLECTION ON THE LESSON / SELF-REMARKS

Write this after teaching - what worked, what to change, which learners need follow-up.

Practical: external parts of a leaf

Strand 2.0 Living Things and their Environment > Sub-strand 2.1 Nutrition in plants | Lesson 2 of 18 | 40 minutes

SCHOOL	TEACHER	DATE
CLASS / STREAM	TIME	ROLL (B / G)

SPECIFIC LEARNING OUTCOME(S)

By the end of the lesson, the learner should be able to: a) observe a fresh leaf with a hand lens; b) draw and label the external parts of a leaf

KEY INQUIRY QUESTION(S)

- What is the importance of photosynthesis in nature?

CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

COMPETENCY	**Learning to learn**	Learners say what they found easy or hard and decide their next step.
COMPETENCY	**Self-efficacy**	Learners attempt each task with confidence and see that effort improves results.
VALUE	**Social justice**	Every learner gets a turn and a fair chance to answer.
VALUE	**Integrity**	Learners record their own honest results and mark work truthfully.
PCI	**Environmental conservation**	Examples link to caring for the school and home environment.
PCI	**Safety**	Learners follow safety rules when using materials and moving about.

LEARNING RESOURCES

A potted plant (destarched) and a variegated plant | Aluminium foil or black paper and paper clips | Beakers, test tubes, a water bath (sufuria of hot water) | Methylated spirit (alcohol), iodine solution, a white tile, a dropper | A clear polythene bag; soda lime or potassium hydroxide (teacher only) | A water plant (for example pondweed), a funnel, a test tube, a wooden splint

ORGANISATION OF LEARNING

Whole class for the introduction and the summary; pairs or groups of four to five for guided practice; individual work for the independent tasks.

KEY WORDS

photosynthesis | chlorophyll | chloroplast | stomata | guard cells | palisade layer | spongy layer | grana | stroma | starch test | destarching

THE LESSON AT A GLANCE

Introduction	Teacher models	Guided practice	On their own	Wrap-up
6 min	9 min	10 min	9 min	6 min

LESSON FLOW

Stage	Minutes	The teacher	The learners
Introduction	6	Greet the class and ask: "Look closely at a leaf. What parts can you see without breaking it?" Take two or three answers, link them to earlier work, then state today's outcome.	Answer the starter question, recall what they already know and read the outcome aloud.
Step 1: Teacher models	9	Take learners through "Practical: leaf observation" (key ideas on the next page), explaining as you go. Use a potted plant (destarched) and a variegated plant, aluminium foil or black paper and paper clips, beakers, test tubes, a water bath (sufuria of hot water). Ask learners to predict what comes next before you show it.	Watch, predict the next step, ask questions and note the key steps in their exercise books.
Step 2: Guided practice	10	Give questions 1 and 2. Move round the groups, ask "How do you know?" and correct errors kindly on the spot.	Work in pairs or small groups, explain each step to a partner and check one another's answers.
Step 3: Independent practice	9	Set questions 3 and 4 for individual work. Mark as you walk round and note who needs help in the next lesson.	Work on their own, then swap books with a partner to check.
Summary and conclusion	6	Ask two or three learners to state the key idea in their own words. Give this exit question and check the answers: "Why collect only the leaves you need?"	Say the key idea in their own words and answer the exit question in the exercise book.

KEY IDEAS

Practical: leaf observation
Materials: fresh leaves, hand lens, pencil, paper.
Collect one or two leaves only (do not strip plants). Observe with a hand lens.
Parts: lamina (leaf blade), midrib, veins, petiole (leaf stalk), apex (tip), margin (edge).
Draw the leaf large and clear in pencil, with straight label lines that do not cross.

PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

No.	Question	Answer
1	What is the flat, broad part of the leaf called?	**The lamina (leaf blade)**
2	What attaches the leaf to the stem?	**The petiole (leaf stalk)**
3	What is the main vein down the centre of a leaf called?	**The midrib**
4	Why collect only the leaves you need?	**To protect the plants and conserve the environment.**