# Grade 9 Integrated Science

## Term 3 - 52 complete lesson plans

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

### ABOUT THIS PACK

52 complete, ready-to-teach Grade 9 Integrated Science lesson plans for Term 3, covering the interdependence of life, curved mirrors and waves.

### TOPICS IN THIS PACK

| Topic | Name | Lessons |
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| 2.4 | The interdependence of life | 18 |
| 3.1 | Curved mirrors | 18 |
| 3.2 | Waves | 16 |

### 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

**Ecosystems: living and non-living factors**

By the end of the lesson, the learner should be able to: a) define an ecosystem; b) distinguish biotic from abiotic factors

> **All parts work together**
> An ecosystem is a community of living things together with their non-living surroundings, all interacting (a pond, a forest, a farm, the Maasai Mara).
> Biotic factors are the living parts: plants, animals, fungi, bacteria. Abiotic factors are the non-living parts: temperature, light, water, wind, air pressure, pH and salinity.

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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# Ecosystems: living and non-living factors

Strand 2.0 Living Things and their Environment > Sub-strand 2.4 The interdependence of life | 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) define an ecosystem; b) distinguish biotic from abiotic factors

## KEY INQUIRY QUESTION(S)

- What is the role of living and non-living factors in environments?

## CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

| | | |
|---|---|---|
| COMPETENCY | **Citizenship** | Learners take turns, listen to others and link the work to life in their community. |
| COMPETENCY | **Critical thinking and problem solving** | Learners choose a method, check their answers and give reasons for their choices. |
| VALUE | **Patriotism** | Learners use Kenyan examples — shillings, local markets, familiar places. |
| VALUE | **Peace** | Learners settle differences calmly during group work. |
| PCI | **Environmental conservation** | Examples link to caring for the school and home environment. |

## LEARNING RESOURCES

Charts and pictures of Kenyan ecosystems and national parks | Hand lenses, notebooks | A thermometer, pH paper or a soil test kit (if available) | Cards with names of organisms for building food webs | 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

ecosystem | biotic | abiotic | predation | competition | decomposer | producer | consumer | food chain | food web | trophic level | poaching | invasive species

## 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 role of living and non-living factors in environments? List everything you can see in the school compound, living and non-living." 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 "All parts work together" (key ideas on the next page), explaining as you go. Use charts and pictures of Kenyan ecosystems and national parks, hand lenses, notebooks, a thermometer, pH paper or a soil test kit (if available). 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: "Give one example of an abiotic factor affecting a living thing." | Say the key idea in their own words and answer the exit question in the exercise book. |

## KEY IDEAS

**All parts work together**

An ecosystem is a community of living things together with their non-living surroundings, all interacting (a pond, a forest, a farm, the Maasai Mara).

Biotic factors are the living parts: plants, animals, fungi, bacteria. Abiotic factors are the non-living parts: temperature, light, water, wind, air pressure, pH and salinity.

Each part affects the others: rain (abiotic) makes grass grow, grass (biotic) feeds zebras.

## PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

| No. | Question | Answer |
|---|---|---|
| 1 | What is an ecosystem? | **A community of living things and their non-living surroundings interacting together.** |
| 2 | Is sunlight a biotic or an abiotic factor? | **Abiotic** |
| 3 | Name two biotic factors in a pond. | **For example fish, frogs, algae, water plants.** |

| | | |
|---|---|---|
| 4 | Give one example of an abiotic factor affecting a living thing. | **For example lack of rain causes grass to dry.** |

## WATCH OUT FOR

Learners call dead leaves abiotic. They came from living things and are part of the biotic (organic) material.

## ASSESSMENT RUBRIC - THE FOUR CBC LEVELS

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

## SUPPORT AND EXTENSION

| | |
|---|---|
| **Learners who need support** | Sort picture cards into "living" and "non-living" piles. |
| **Learners ready for more** | Describe one ecosystem near your home and list its biotic and abiotic factors. (Answer: Answers will vary) |
| **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 "ecosystems: living and non-living factors" 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.

**ELIMU254**

# Predation

Strand 2.0 Living Things and their Environment > Sub-strand 2.4 The interdependence of life | 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) define predation, predator and prey; b) give examples from the locality and from national parks

## KEY INQUIRY QUESTION(S)

- What is the role of living and non-living factors in environments?

## CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

| | | |
|---|---|---|
| COMPETENCY | **Citizenship** | Learners take turns, listen to others and link the work to life in their community. |
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## ORGANISATION OF LEARNING

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## KEY WORDS

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## 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: "A chameleon on a branch catches a fly with its tongue. What do we call this relationship?" 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 "Hunter and hunted" (key ideas on the next page), explaining as you go. Use charts and pictures of Kenyan ecosystems and national parks, hand lenses, notebooks, a thermometer, pH paper or a soil test kit (if available). 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: "What might happen to rat numbers if owls disappeared from a farm?" | Say the key idea in their own words and answer the exit question in the exercise book. |

## KEY IDEAS

**Hunter and hunted**

Predation: one animal (the predator) kills and eats another (the prey).

Local examples: chameleons and lizards eat insects; spiders trap flies; owls eat rats. In national parks: lions and cheetahs eat zebras and gazelles.

Predators keep prey numbers in check, and prey numbers limit predators: when prey is scarce, predators go hungry and their numbers fall.

## PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

| No. | Question | Answer |
|---|---|---|
| 1 | What is a predator? | **An animal that hunts and eats another animal.** |
| 2 | In "an owl eats a rat", which is the prey? | **The rat** |
| 3 | Give one example of predation in your locality. | **For example a spider catching flies, or a cat catching mice.** |
| 4 | What might happen to rat numbers if owls disappeared from a farm? | **Rat numbers would increase.** |