Grade 10 Mathematics

Term 1 - 64 complete lesson plans

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

ABOUT THIS PACK

64 complete, ready-to-teach Grade 10 Mathematics lesson plans for Term 1, covering real numbers, indices and logarithms, quadratic expressions and equations 1, similarity and enlargement, reflection and congruence and rotation.

TOPICS IN THIS PACK

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1.1	Real Numbers	8
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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

Odd, even, prime and composite numbers

By the end of the lesson, the learner should be able to: a) classify whole numbers as odd, even, prime or composite; b) explain why 1 is neither prime nor composite and why 2 is the only even prime

> **Classifying whole numbers**
> A whole number is even if it is divisible by 2 (ending in 0, 2, 4, 6 or 8) and odd if it is not. A prime number has exactly two different factors, 1 and itself. A composite number has more than two factors.

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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ELIMU254

Odd, even, prime and composite numbers

Strand 1.0 Numbers and Algebra > Sub-strand 1.1 Real Numbers | Lesson 1 of 8 | 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) classify whole numbers as odd, even, prime or composite; b) explain why 1 is neither prime nor composite and why 2 is the only even prime

KEY INQUIRY QUESTION(S)

- How do we use real numbers in day-to-day activities?

CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

COMPETENCY	**Communication and collaboration**	Learners explain their thinking to a partner and report their findings to the group.
COMPETENCY	**Critical thinking and problem solving**	Learners choose a method, check their answers and give reasons for their choices.
COMPETENCY	**Digital literacy**	Learners use a phone, tablet or the class computer to explore or check the idea.
VALUE	**Responsibility**	Learners look after shared materials and finish every task.
VALUE	**Integrity**	Learners record their own honest results and mark work truthfully.
PCI	**Financial literacy**	Examples use shillings and cents, shopping, saving and simple budgets.
PCI	**Life skills**	Learners practise decision making and working with others.

LEARNING RESOURCES

Scientific calculators and four-figure mathematical tables | Charts of the number system and of prime numbers to 100 | Squared paper and manila paper | Digital devices with a calculator or graphing app (where available) | Chalkboard and chalk

ORGANISATION OF LEARNING

Whole class for the introduction and the summary; pairs for classifying and checking each other's answers; groups of four for the number-system chart; individual practice from the board.

KEY WORDS

prime number | composite number | rational number | irrational number | recurring decimal | real numbers | reciprocal | factor | integer | terminating

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: "List all the numbers from 1 to 20 that can be divided exactly only by 1 and by themselves. What do you notice about them?" 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	Work through the worked example on the next page, thinking aloud. Use scientific calculators and four-figure mathematical tables, charts of the number system and of prime numbers to 100, squared paper and manila paper. Ask learners to predict each step 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: "Is 91 prime? Give a reason."	Say the key idea in their own words and answer the exit question in the exercise book.

WORKED EXAMPLE

Classifying whole numbers

A whole number is even if it is divisible by 2 (ending in 0, 2, 4, 6 or 8) and odd if it is not. A prime number has exactly two different factors, 1 and itself. A composite number has more than two factors.

The number 1 has only one factor, so it is neither prime nor composite. The number 2 is the only even prime, because every other even number is also divisible by 2. The primes up to 30 are 2, 3, 5, 7, 11, 13, 17, 19, 23 and 29.

Sieve of Eratosthenes: write the numbers 1 to 100, cross out 1, then keep 2 and cross out its multiples, keep 3 and cross out its multiples, and so on. The numbers left are the primes. Example: 51 is odd, but 51 = 3 × 17, so it is composite; 53 has no factor except 1 and 53, so it is prime.

PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

No.	Question	Answer
1	Classify 27 as odd or even and prime or composite.	**Odd and composite, since 27 = 3 × 9.**
2	List all the prime numbers between 40 and 60.	**41, 43, 47, 53 and 59.**
3	Explain why 2 is the only even prime number.	**Every other even number is divisible by 2, so it has more than two factors.**
4	Is 91 prime? Give a reason.	**No. 91 = 7 × 13, so it is composite.**

WATCH OUT FOR

Learners think that all odd numbers are prime. Show 9, 15, 21, 27 and 51 as odd composites.

ASSESSMENT RUBRIC - THE FOUR CBC LEVELS

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

SUPPORT AND EXTENSION

Learners who need support	Give a printed hundred square and colour the multiples of 2, 3, 5 and 7 in different colours to find the primes.
Learners ready for more	Find two prime numbers that differ by 2 and that are greater than 40 (twin primes). (Answer: 41 and 43 (also 59 and 61))
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 "odd, even, prime and composite numbers" 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

Testing for primes and prime factorisation

Strand 1.0 Numbers and Algebra > Sub-strand 1.1 Real Numbers | Lesson 2 of 8 | 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) test whether a number is prime using divisibility rules; b) express a composite number as a product of prime factors

KEY INQUIRY QUESTION(S)

- How do we use real numbers in day-to-day activities?

CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

COMPETENCY	**Communication and collaboration**	Learners explain their thinking to a partner and report their findings to the group.
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