Grade 10 Electrical Technology

Term 3 - 65 complete lesson plans

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

ABOUT THIS PACK

65 complete, ready-to-teach Grade 10 Electrical Technology lesson plans for Term 3, covering final circuits, semiconductor theory, semiconduc tor diodes and transistor.

TOPICS IN THIS PACK

Topic	Name	Lessons
3.3	Final Circuits	18
4.1	Semiconductor Theory	15
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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

Final circuits: what they are and the types

By the end of the lesson, the learner should be able to: a) define a final circuit and name the common types; b) explain why an installation is divided into several circuits

> **Final circuits**
> A final circuit is a circuit that goes from a protective device (an MCB or fuse) in the consumer unit to the electrical points it supplies, such as lamps, sockets and appliances. The installation is divided into several final circuits so that: a fault on one circuit cuts off only that circuit and leaves the others working; each circuit has a cable and protection to suit its own load; loads can be balanced; and circuits can be isolated for repair without cutting off everything.

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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Final circuits: what they are and the types

Strand 3.0 Electrical Installation > Sub-strand 3.3 Final Circuits | 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 a final circuit and name the common types; b) explain why an installation is divided into several circuits

KEY INQUIRY QUESTION(S)

- How are final circuits connected?
- Why are final circuits important?

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	**Creativity and imagination**	Learners make up their own examples, patterns or ways of showing 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	**Socio-economic and environmental issues**	Examples link to caring for the school and home environment.
PCI	**Life skills**	Learners practise decision making and working with others.

LEARNING RESOURCES

Samples of cables, switches, sockets, lamp holders, ceiling roses, junction boxes, conduit and clips | Charts of electrical symbols and of wiring diagrams | A chart of the cable colour code and current ratings | Calculators | Notebooks and pencils

ORGANISATION OF LEARNING

Whole class for demonstrations and diagrams; pairs for drawing and costing; groups of three or four for the installation practicals; every practical is on a dead board, supervised by the teacher, with tools checked and the work inspected before any test.

KEY WORDS

final circuit | radial | ring circuit | lighting circuit | socket outlet | switch | ceiling rose | conduit | bill of materials | wiring diagram

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

Inside this plan: the step-by-step lesson flow with what the teacher and learners do, the key content, practice questions with answers, a common mistake to watch for, an assessment rubric on the four CBC levels, support and extension ideas, homework and a reflection page.

LESSON FLOW

Stage	Minutes	The teacher	The learners
Introduction	6	Greet the class and ask: "When you switch on a light, a heater and a phone charger in your home, each one gets power through a different route from the box on the wall. Why not connect everything to one wire?" 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 "Final circuits" (key ideas on the next page), explaining as you go. Use samples of cables, switches, sockets, lamp holders, ceiling roses, junction boxes, conduit and clips, charts of electrical symbols and of wiring diagrams, a chart of the cable colour code and current ratings. 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 is the difference between a radial circuit and a ring circuit?"	Say the key idea in their own words and answer the exit question in the exercise book.

KEY IDEAS

Final circuits

A final circuit is a circuit that goes from a protective device (an MCB or fuse) in the consumer unit to the electrical points it supplies, such as lamps, sockets and appliances. The installation is divided into several final circuits so that: a fault on one circuit cuts off only that circuit and leaves the others working; each circuit has a cable and protection to suit its own load; loads can be balanced; and circuits can be isolated for repair without cutting off everything.

Main types: lighting circuits, for lamps controlled by switches, usually on 6 A protection with 1.5 mm2 cable; power circuits, for socket outlets, either a ring final circuit (32 A, 2.5 mm2) or a radial circuit (20 A or 32 A); a cooker circuit, for a cooker or oven, with a control unit (32 A or 40 A, 6 mm2 or 10 mm2 cable); water heating circuits, for immersion heaters and showers; and bell and alarm circuits, low-voltage circuits for doorbells, alarms and intercoms, supplied through a transformer. Others include air conditioning, pumps and gate motors.

Two ways of wiring: a radial circuit starts at the consumer unit and goes out to each point in a line, ending at the last point; a ring circuit starts at the consumer unit, goes round all the sockets and returns to the same terminals, so each socket is fed from two directions. Each point must comply with the wiring regulations, and the work must be done by a competent person, with correct cables, protection and earthing.

PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

No.	Question	Answer
1	What is a final circuit?	**A circuit from a protective device in the consumer unit to the points it supplies, such as lamps, sockets or appliances.**
2	Give two reasons for having several final circuits.	**A fault cuts off only one circuit, and each circuit can have a cable and protection suited to its load.**
3	Name four types of final circuit.	**Lighting, socket outlets (power), cooker, water heating, and bell or alarm circuits.**
4	What is the difference between a radial circuit and a ring circuit?	**A radial circuit runs out to its points and ends at the last; a ring circuit goes round the points and returns to the consumer unit, so each is fed two ways.**

WATCH OUT FOR

Learners think that all sockets and lights can share one big circuit. Separate circuits give safety, convenience and correct protection.

ASSESSMENT RUBRIC - THE FOUR CBC LEVELS

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

SUPPORT AND EXTENSION

Learners who need support	Give a plan of a house with boxes to mark the lighting, socket and cooker circuits in different colours.
Learners ready for more	Explain why a cooker needs its own circuit and not a share of the socket circuit. (Answer: A cooker takes a very large current, which would overload the socket circuit and its cable, so it needs its own heavier cable and breaker)
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 "final circuits: what they are and the types" 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.