Grade 11 Chemistry

Term 2 - 48 complete lesson plans

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

ABOUT THIS PACK

48 complete, ready-to-teach Grade 11 Chemistry lesson plans for Term 2, covering salts and gas laws.

TOPICS IN THIS PACK

Topic	Name	Lessons
2.1	Salts	28
2.2	Gas Laws	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

Salts: meaning and types

By the end of the lesson, the learner should be able to: a) define a salt; b) classify salts as normal or acid salts

> **Salts**
> A SALT is a compound formed when the hydrogen ions of an acid are wholly or partly replaced by a metal ion or an ammonium ion. Example: HCl + NaOH -> NaCl + H2O.
> NORMAL SALTS: all replaceable hydrogen replaced (NaCl, Na2SO4, CaCO3). ACID SALTS: only part replaced (NaHCO3, NaHSO4). Salts are made of CATIONS (positive ions, e.g. Na+, Cu2+, NH4+) and ANIONS (negative ions, e.g. Cl-, SO4 2-, CO3 2-, NO3-).

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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Salts: meaning and types

Strand 2.0 Physical Chemistry > Sub-strand 2.1 Salts | Lesson 1 of 28 | 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 salt; b) classify salts as normal or acid salts

KEY INQUIRY QUESTION(S)

- How are salts important in our day-to-day life?

CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

COMPETENCY	**Critical thinking and problem solving**	Learners choose a method, check their answers and give reasons for their choices.
COMPETENCY	**Learning to learn**	Learners say what they found easy or hard and decide their next step.
VALUE	**Unity**	Learners share materials fairly and work as one team.
PCI	**Safety in the laboratory**	Learners follow safety rules when using materials and moving about.

LEARNING RESOURCES

Solubility tables and charts of solubility curves | Graph paper, rulers and calculators | Charts of qualitative analysis flow schemes | Notebooks and pencils

ORGANISATION OF LEARNING

Groups of three or four taking turns at the test-tube rack; pairs for graphs and equations; teacher demonstrations for toxic gases. Waste solutions go into labelled containers, never the sink, when they contain lead, barium or silver.

KEY WORDS

salt | thermal decomposition | anhydrous | solubility | saturated solution | solubility curve | crystallisation | fractional crystallisation | precipitate | precipitation | ionic equation | spectator ion | complex ion | qualitative analysis | cation | anion | flame test

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: "Is table salt the only salt? Name other salts you have seen at home or on a farm." 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 "Salts" (key ideas on the next page), explaining as you go. Use solubility tables and charts of solubility curves, graph paper, rulers and calculators, charts of qualitative analysis flow schemes. 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 salt used in agriculture."	Say the key idea in their own words and answer the exit question in the exercise book.

KEY IDEAS

Salts

A SALT is a compound formed when the hydrogen ions of an acid are wholly or partly replaced by a metal ion or an ammonium ion. Example: HCl + NaOH -> NaCl + H2O.

NORMAL SALTS: all replaceable hydrogen replaced (NaCl, Na2SO4, CaCO3). ACID SALTS: only part replaced (NaHCO3, NaHSO4). Salts are made of CATIONS (positive ions, e.g. Na+, Cu2+, NH4+) and ANIONS (negative ions, e.g. Cl-, SO4 2-, CO3 2-, NO3-).

Everyday salts: sodium chloride (food), sodium hydrogencarbonate (baking powder), calcium carbonate (limestone, chalk), copper(II) sulphate (fungicide), ammonium nitrate and CAN (fertilisers), magnesium sulphate (Epsom salts).

PRACTICE QUESTIONS - WITH ANSWERS FOR THE TEACHER

No.	Question	Answer
1	Define a salt.	**A compound formed when the hydrogen of an acid is replaced by a metal or ammonium ion.**
2	Is NaHCO3 a normal or an acid salt?	**An acid salt.**
3	Name the cation and anion in copper(II) sulphate.	**Cu2+ and SO4 2-.**
4	Give one salt used in agriculture.	**For example: ammonium nitrate, CAN, copper(II) sulphate.**

WATCH OUT FOR

Learners think "salt" means only sodium chloride.

ASSESSMENT RUBRIC - THE FOUR CBC LEVELS

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

SUPPORT AND EXTENSION

Learners who need support	Give an ion card set to pair into salts.
Learners ready for more	Why can sulphuric acid form an acid salt but hydrochloric acid cannot? (Answer: Sulphuric acid has two replaceable hydrogens; hydrochloric acid has only one)
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 "salts: meaning and 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.

Practical: action of heat on carbonates

Strand 2.0 Physical Chemistry > Sub-strand 2.1 Salts | Lesson 2 of 28 | 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) investigate the effect of heat on carbonates; b) write equations for the decompositions

KEY INQUIRY QUESTION(S)

- How are salts important in our day-to-day life?

CORE COMPETENCIES, VALUES AND PCIS IN THIS LESSON

COMPETENCY	**Critical thinking and problem solving**	Learners choose a method, check their answers and give reasons for their choices.
COMPETENCY	**Learning to learn**	Learners say what they found easy or hard and decide their next step.
VALUE	**Unity**	Learners share materials fairly and work as one team.
PCI	**Safety in the laboratory**	Learners follow safety rules when using materials and moving about.

LEARNING RESOURCES

Test tubes, boiling tubes, test-tube holders, racks, spatulas, Bunsen burners or spirit lamps, droppers | Solid salts: sodium carbonate, sodium hydrogencarbonate, zinc carbonate, copper(II) carbonate, sodium nitrate, potassium nitrate, hydrated copper(II) sulphate, sodium chloride | Teacher only: copper(II) nitrate, lead(II) nitrate, iron(II) sulphate (heating in a fume cupboard) | Lime water, wooden splints, litmus paper, filter paper, funnels | Thermometers, beakers, evaporating dishes, balance, water bath | Dilute solutions (about 0.1-0.5 M): sodium hydroxide, aqueous ammonia, dilute hydrochloric and nitric acids, barium nitrate or chloride, silver nitrate, lead(II) nitrate, potassium iodide, sodium sulphate, calcium chloride, magnesium sulphate, zinc sulphate, aluminium sulphate, copper(II) sulphate, iron(II) sulphate, iron(III) chloride | Nichrome wire loops or wooden splints for flame tests; lithium, sodium, potassium, calcium and barium chlorides | Goggles, gloves, labelled waste containers

ORGANISATION OF LEARNING

Groups of three or four taking turns at the test-tube rack; pairs for graphs and equations; teacher demonstrations for toxic gases. Waste solutions go into labelled containers, never the sink, when they contain lead, barium or silver.

KEY WORDS

salt | thermal decomposition | anhydrous | solubility | saturated solution | solubility curve | crystallisation | fractional crystallisation | precipitate | precipitation | ionic equation | spectator ion | complex ion | qualitative analysis | cation | anion | flame test

THE LESSON AT A GLANCE

Introduction	Teacher models	Guided practice	On their own	Wrap-up
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LESSON FLOW

Stage	Minutes	The teacher	The learners
Introduction	6	Greet the class and ask: "Limestone is heated in kilns to make lime. What happens to 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 the key ideas on the next page, explaining as you go. Use test tubes, boiling tubes, test-tube holders, racks, spatulas, Bunsen burners or spirit lamps, droppers, solid salts: sodium carbonate, sodium hydrogencarbonate, zinc carbonate, copper(II) carbonate, sodium nitrate, potassium nitrate, hydrated copper(II) sulphate, sodium chloride, teacher only: copper(II) nitrate, lead(II) nitrate, iron(II) sulphate (heating in a fume cupboard). 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 is the delivery tube removed before heating stops?"	Say the key idea in their own words and answer the exit question in the exercise book.

KEY IDEAS