

CONFIDENTIAL GUIDE FOR TEACHERS

THE KENYA NATIONAL EXAMINATION AND ASSESSMENT PREDICTION SERIES

Teacher's Name		TSC NO.	
School Name		School Code	
Teacher's Signature		Date	

KENYA JUNIOR SCHOOL EDUCATION ASSESSMENT

905/2 INTEGRATED SCIENCE

PAPER 2 (*practical*)

TERM 2 ENDTERM 2025

Experiment: Separation of a Mixture (Sand, Maize Flour, Salt)

Overall Guidance for Teachers:

- This experiment reinforces concepts of mixtures, solutions, and various separation techniques.
- Ensure all listed apparatus and materials are prepared.
- Emphasize careful execution of each separation step to minimize loss of material.
- Safety with heat source is critical.

Preparation of Materials (Prior to Exam):

- ⊕ **Mixture of Sand, Maize Flour, and Salt:** Prepare a homogenous mixture in advance. Ensure sand is visibly coarser than maize flour.
- ⊕ **Water:** Tap water.
- ⊕ **Sieve:** A sieve with mesh size that retains sand but allows maize flour and salt to pass.
- ⊕ **Beaker:** For dissolving and filtering.
- ⊕ **Filter Funnel:**
- ⊕ **Filter Paper:** Appropriate size for the funnel.
- ⊕ **Evaporating Dish:** Heat resistant.
- ⊕ **Source of Heat:** Bunsen burner, spirit lamp, or hot plate.
- ⊕ **Tripod Stand and Wire Gauze:** For heating.

Question One (20 marks)

Procedure Monitoring:

- ⊕ **Step 1 (Initial Observation):**
 - ✦ **Teacher's Role:** Guide learners to describe the mixture's appearance.
- ⊕ **Step 2 (Sieving):**
 - ✦ **Teacher's Role:** Ensure gentle shaking to effectively separate.
 - ✦ **Expected Outcome:** Sand remains on the sieve; maize flour and salt pass through.
- ⊕ **Step 3 (Adding Water and Stirring):**
 - ✦ **Teacher's Role:** Ensure adequate stirring for salt to dissolve fully.
 - ✦ **Expected Outcome:** Salt dissolves, maize flour forms a suspension/settles, sand settles at the bottom.
- ⊕ **Step 4 (Filtration):**

- ✱ **Teacher's Role:** Guide learners on proper filter paper folding and pouring techniques to avoid spillage or tearing the filter paper.
- ✱ **Expected Outcome:** Filtrate (salt solution) is collected; residue (maize flour and possibly some fine sand) remains on the filter paper.
- ⊖ **Step 5 (Evaporation):**
 - ✱ **Teacher's Role:** Emphasize gentle heating to avoid splattering and burning the salt. Monitor flame size.
 - ✱ **Expected Outcome:** Water evaporates, leaving behind solid salt crystals.

Recording Observations and Materials Separated/Recovered in Table (12 marks):

- **Marking Guidance:**
 - ⊕ 1 mark for each accurate observation (6 marks total).
 - ⊕ 1 mark for each correct material separated/recovered (6 marks total).
 - ⊕ **Row 1 (Initial Observation):**
 - ✱ Observation: "Heterogeneous mixture, visible particles of different sizes/colors."
 - ✱ Material: N/A
 - ⊕ **Row 2 (Sieving):**
 - ✱ Observation (remains on sieve): "Larger, granular particles."
 - ✱ Material (remains on sieve): "Sand."
 - ✱ Observation (passes through sieve): "Fine powder."
 - ✱ Material (passes through sieve): "Maize flour and salt."
 - ⊕ **Row 3 (Adding Water):**
 - ✱ Observation: "Some solid dissolves, some settles/suspends."
 - ✱ Material: (Implied separation of salt from insoluble components).
 - ⊕ **Row 4 (Filtration):**
 - ✱ Observation (filtrate): "Clear liquid."
 - ✱ Material (residue): "Maize flour (and possibly fine sand)."
 - ✱ Observation (residue): "Solid residue on filter paper."
 - ⊕ **Row 5 (Evaporation):**
 - ✱ Observation (remains in dish): "White solid crystals."
 - ✱ Material (remains in dish): "Salt."

Analysis of Results:

(a) Separation Technique in Step 2 (1 mark):

- ⊖ **Marking Guidance:** 1 mark for "Sieving."
- ⊖ **Expected Answer:** "Sieving."

(b) Separation Technique in Step 4 (1 mark):

- ⊖ **Marking Guidance:** 1 mark for "Filtration."
- ⊖ **Expected Answer:** "Filtration."

(c) (The question seems cut off, but assuming it asks for another separation technique or skill, or perhaps identifying the components of the filtrate/residue).

- ⊖ **If it asks for another separation technique (e.g., evaporation):** 1 mark for "Evaporation" or "Distillation."

- ⊖ **If it asks for components of filtrate:** 1 mark for "Salt solution (dissolved salt and water)."
- ⊖ **If it asks for components of residue:** 1 mark for "Maize flour (and sand)."
- ⊖ **If it asks for a science skill:** 1 mark for "Observing," "Measuring," "Filtering," etc.

General Notes for Exams:

- ☞ **Teacher Supervision:** Continuous supervision is crucial, especially for practical aspects involving tools, heat, and chemicals.
- ☞ **Differentiation:** For group projects, encourage varied roles for learners with different strengths.
- ☞ **Record Keeping:** Ensure learners are diligently recording their observations and data as they go.
- ☞ **Post-Practical Discussion:** A follow-up discussion helps reinforce the concepts and correct any misconceptions.
- ☞ **Cleanliness:** Emphasize keeping the workspace clean and tidy throughout and after the practical.
- ☞ **Fairness:** Ensure equal access to materials and tools for all groups/learners.