**KENYA JUNIOR *S*CHOOL EDUCATION ASSESSMENT**

**KEJSEA 2025**

**GRADE 9**

**905/1 INTEGRATED SCIENCE (THEORY)**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**School: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**

**Duration:** 1 Hour 30 minutes  
**Total Marks:** 60

**FOR FACILITATORS USE ONLY**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SCORE RANGE | 46-60 | 30-45 | 16-29 | 0-15 |
| LEVEL | EXCEEDING EXPECTATION | MEETING EXPECTATION | APPROACHING EXPECTATION | BELOW EXPECTATION |
| LEARNER’S SCORE |  |  |  |  |
| TICK LEVEL |  |  |  |  |

**Instructions:**

1. Read all questions carefully before answering.
2. Write your answers in the spaces provided.
3. Use clear and neat handwriting.
4. You may use a calculator where necessary.
5. Answer all questions.

**General Tips**

* Always write your answers clearly. Even if you’re unsure, try to explain your thinking!
* Show your working for calculations—you can earn marks even if your final answer isn’t correct.
* Be creative and give examples where possible.

**TURN OVER**

**Section A: Multiple Choice Questions (20 Marks)**

1. Which of the following is a non-renewable source of energy?  
   **A)** Wind  
   **B)** Solar  
   **C)** Coal  
   **D)** Biomass
2. What is the main gas released during photosynthesis?  
   **A)** Carbon dioxide  
   **B)** Oxygen  
   **C)** Nitrogen  
   **D)** Methane
3. Which of the following best describes osmosis?  
   **A)** Movement of water from a region of low concentration to high concentration.  
   **B)** Movement of water from a region of high concentration to low concentration through a semi-permeable membrane.  
   **C)** Movement of solutes from a region of high concentration to low concentration.  
   **D)** Movement of gases through a semi-permeable membrane.
4. The smallest unit of an element that retains its chemical properties is:  
   **A)** A molecule  
   **B)** A compound  
   **C)** An atom  
   **D)** An ion
5. Which process leads to the formation of clouds?  
   **A)** Evaporation  
   **B)** Condensation  
   **C)** Precipitation  
   **D)** Runoff
6. What is the main function of white blood cells in the human body?  
   **A)** Transporting oxygen  
   **B)** Fighting infections  
   **C)** Clotting blood  
   **D)** Transporting nutrients
7. Which simple machine is used to lift heavy objects with less effort?  
   **A)** Pulley  
   **B)** Inclined plane  
   **C)** Lever  
   **D)** Screw
8. The boiling point of water at sea level is:  
   **A)** 100°C  
   **B)** 80°C  
   **C)** 120°C  
   **D)** 90°C
9. What is the chemical symbol for sodium?  
   **A)** S  
   **B)** So  
   **C)** Na  
   **D)** N
10. Which part of the plant is responsible for absorbing water and nutrients?  
    **A)** Stem  
    **B)** Roots  
    **C)** Leaves  
    **D)** Flower

**Section B: Structured Questions (60 Marks)**

#### ****1. Introduction to integrated science****

**a.** What is the scientific method?

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b. List the steps involved in conducting a scientific investigation.(5 marks)

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#### ****2. Measurement and Scientific Units****

**a.** List the basic SI (International System of Units) units for the following quantities: (5 marks)

1. Length\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Mass.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Time\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Temperature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Volume\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* **b.** Convert the following units: (3 marks)
  + 1. 5 meters to centimeters
    2. 2.5 kilograms to grams
    3. 3.2 liters to milliliters
* **c.** A student measures the mass of a sample and obtains a value of 45.6 grams. What is the precision of this measurement if the instrument has an uncertainty of ±0.1 g? (2 marks)

#### ****3. Matter and Its Properties****

* **a.** Define matter and explain the three states of matter (solid, liquid, gas) with examples. (2 marks)

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* **b.** Differentiate between physical and chemical properties of matter with examples. (2 marks)

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* **c.** What is the difference between a physical change and a chemical change? Give one example of each. (2 marks)

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#### ****4. Structure of the Atom****

**a.** Draw and label the structure of an atom, including the position of protons, neutrons, and electrons. (2 marks)

**b.** Define an isotope and provide an example of an isotope of carbon. (2 marks)

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**c.** What is the atomic number and atomic mass of an element? How are they related? (2 marks)

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#### ****5. The Periodic Table****

**a.** Explain the organization of elements in the periodic table. What information can be obtained from an element’s position in the table? (2 marks)

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**b.** What are periods and groups on the periodic table? How are elements in the same group similar? (2 marks)

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**c.** Describe the properties of metals, non-metals, and metalloids. Provide one example of each. (2 marks)

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### ****MARKING SCHEME****

**Section A: Multiple Choice Questions (20 Marks)**

* **1 mark** for each correct answer.

1. c) Coal
2. b) Oxygen
3. b) Movement of water from a region of high concentration to low concentration through a semi-permeable membrane.
4. c) An atom
5. b) Condensation
6. b) Fighting infections
7. c) Lever
8. a) 100°C
9. c) Na
10. b) Roots

**Section B: Structured Questions (60 Marks)**

### ****1. Introduction to integrated science****

**a.** **Scientific method** is the systematic study of the natural world through observation, experimentation, and analysis. It helps solve real-world problems by providing insights, technology, and solutions based on evidence.

**b.** The **scientific method** involves these steps:

1. Observation
2. Question
3. Hypothesis
4. Experimentation
5. Data Collection
6. Analysis
7. Conclusion
8. Communication

**c.** It is important for scientific investigations to be reproducible so that other scientists can verify the results and ensure the accuracy of findings. Reproducibility increases the reliability of scientific knowledge.

### ****2. Measurement and Scientific Units****

**a.** The basic SI units:

* Length: meter (m)
* Mass: kilogram (kg)
* Time: second (s)
* Temperature: Kelvin (K)
* Volume: cubic meter (m³)

**b.** Conversions:

* 5 meters = 500 centimeters (1 m = 100 cm)
* 2.5 kilograms = 2500 grams (1 kg = 1000 g)
* 3.2 liters = 3200 milliliters (1 L = 1000 mL)

**c.** The uncertainty of the measurement is ±0.1g, so the precision is to the nearest 0.1g.

### ****3. Matter and Its Properties****

**a.** **Matter** is anything that has mass and occupies space. The three states of matter are:

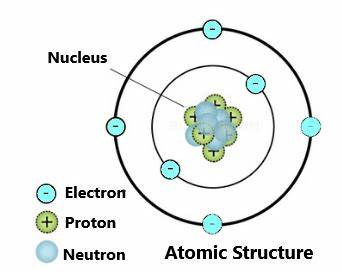
* **Solid:** Has fixed shape and volume (e.g., ice).
* **Liquid:** Has fixed volume but takes the shape of its container (e.g., water).
* **Gas:** Has neither fixed shape nor volume (e.g., air).

**b.** **Physical properties** (e.g., color, texture, boiling point) can be observed without changing the substance. **Chemical properties** (e.g., reactivity with acid, flammability) describe how a substance interacts with other substances to form new compounds.

**c.** **Physical change**: Change in appearance but not in composition (e.g., melting ice).  
**Chemical change**: A substance is transformed into a new substance (e.g., burning paper).

### ****4. Structure of the Atom****

**a.** An atom consists of:



* **Protons** (positive charge) and **neutrons** (neutral) in the nucleus.
* **Electrons** (negative charge) orbit the nucleus.

**b.** **Isotopes** are atoms of the same element with different numbers of neutrons.  
Example: Carbon-12 and Carbon-14 are isotopes of carbon.

**c.** The **atomic number** represents the number of protons in an atom, while the **atomic mass** is the total number of protons and neutrons. They are related because the atomic mass is approximately the sum of protons and neutrons.

### ****5. The Periodic Table****

**a.** The periodic table arranges elements by increasing atomic number. It also groups elements with similar properties in **columns (groups)** and organizes them in **rows (periods)**.

**b.** **Periods**: Horizontal rows, elements in the same period have the same number of electron shells.  
**Groups**: Vertical columns, elements in the same group have similar chemical properties due to the same number of valence electrons.

**c.** **Metals**: Good conductors, shiny, malleable (e.g., iron).  
**Non-metals**: Poor conductors, brittle (e.g., sulfur).  
**Metalloids**: Properties between metals and non-metals (e.g., silicon).

### ****SCORING RUBRIC:****

| **Criteria** | **EXCEEDING EXPECTATION (4)** | **MEETING EXPECTATION**  **(3)** | **APPROACHING EXPECTATION (2)** | **BELOW EXPECTATION (1)** |
| --- | --- | --- | --- | --- |
| **Understanding of Concepts** | Demonstrates clear and thorough understanding of all concepts. | Good understanding, with minor inaccuracies. | Basic understanding with some key concepts missing. | Lacks understanding of key concepts or contains significant errors. |
| **Accuracy of Answers** | All answers are accurate and show clear reasoning. | Most answers are accurate with a few minor errors. | Several answers are inaccurate or lack necessary explanation. | Many answers are incorrect or incomplete. |
| **Application of Knowledge** | Effectively applies knowledge to solve problems and explain real-world examples. | Applies knowledge to solve problems with minor difficulty. | Struggles to apply knowledge to real-world scenarios or problems. | Does not apply knowledge effectively to problem-solving or examples. |
| **Clarity and Organization** | Answers are well-organized, clear, and easy to understand. | Answers are mostly clear and organized. | Answers are somewhat unclear or disorganized. | Answers are unclear or poorly organized. |
| **Creativity and Critical Thinking** | Shows original thinking and creativity in problem-solving. | Demonstrates critical thinking and some creativity. | Limited critical thinking or creativity. | Lacks critical thinking or creativity. |

**Section A: Multiple Choice (20 Marks)**

* **1 mark**: Correct answer.
* **0 marks**: Incorrect or unanswered.

**Section B: Structured Questions (30 Marks)**

* Marks awarded based on clarity, accuracy, and relevance of the answers.

**Section C: Practical Application (30 Marks)**

* **6 marks**: For detailed, accurate procedures and explanations.
* **4 marks**: For diagrams and proper labeling.
* Emphasis on logical steps, critical thinking, and problem-solving.

**THEORY-60**

**PRACTICAL-40**

**Total: 100 Marks**

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