

**CONTENT DEVELOPMENT AND CLASSIFICATION OF TEST ITEMS**  
**CONTENT AREAS FOR JHS INTEGRATED SCIENCE**

	Content Areas	Competencies	Descriptive statement
1	Nature of soil	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of soil formation (weathering)</li> <li>2. Demonstrate knowledge of the various properties of soil.</li> <li>3. Demonstrate knowledge of the soil profile</li> </ol>	<ol style="list-style-type: none"> <li>1. Illustrate with examples the process of soil formation.</li> <li>2. State the properties of soil.</li> <li>3. Use a well-labelled diagram to illustrate the components of the soil profile.</li> </ol>
2	Elements, compounds, and mixture	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the following concepts: elements, compounds, and mixtures.</li> <li>2. Demonstrate knowledge of the chemical symbols of elements.</li> <li>3. Demonstrate a good knowledge of atomic structure.</li> <li>4. Demonstrate an understanding of how ions are formed.</li> <li>5. Demonstrate knowledge of the electronic configuration.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use different elements to show the formation of compounds and mixtures.</li> <li>2. Illustrate with examples, some elements and their symbols.</li> <li>3. Illustrate the atomic structure.</li> <li>4. Use chemical equations to show how ions are formed in chemical reactions.</li> <li>5. Use examples to demonstrate the electronic configuration of elements.</li> </ol>
3	Acids, bases and salts	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the differences between acids and bases.</li> <li>2. Demonstrate skills in classifying acids and bases</li> <li>3. Demonstrate knowledge of the effects of acids and bases on the human body.</li> <li>4. Preparation of salts</li> </ol>	<ol style="list-style-type: none"> <li>1. State the differences between acids and bases.</li> <li>2. Illustrate the classification of acids and bases.</li> <li>3. Explain the effects of acids and bases on the human body.</li> <li>4. Use symbols and word equations to explain the process of salt preparation.</li> </ol>
4	Chemical compounds	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of chemical compounds.</li> <li>2. Demonstrate an understanding of the formation of chemical compounds.</li> <li>3. Demonstrate knowledge of the balancing of chemical equations.</li> </ol>	<ol style="list-style-type: none"> <li>1. Define and state the types of chemical compounds.</li> <li>2. Use different elements to illustrate the formation of chemical compounds.</li> <li>3. Use words and symbols to show how chemical equations are formed.</li> </ol>

5	Soil and water conservation	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of the causes and effects of soil erosion.</li> <li>2. Demonstrate an understanding of ways of maintaining soil fertility.</li> <li>3. Demonstrate an understanding of types of fertilizers and methods of fertilizer application.</li> <li>4. Demonstrate an understanding of the effects of chemical fertilizer on plants</li> </ol>	<ol style="list-style-type: none"> <li>1. Investigate the causes and effects of soil erosion.</li> <li>2. Analyze the process of maintenance of soil fertility.</li> <li>3. Identify and describe the types of fertilizers and their application.</li> <li>4. Assess the effects of chemical fertilizer on crops and the environment.</li> </ol>
6	The life cycle of flowering plants	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of the external features of a flowering plant.</li> <li>2. Demonstrate an understanding of the stages in the life cycle of flowering plants.</li> <li>3. Demonstrate knowledge of the factors that affect the life cycle of flowering plants.</li> <li>4. Demonstrate an understanding of the germination of plants.</li> </ol>	<ol style="list-style-type: none"> <li>1. Illustrate the external features of flowering plants.</li> <li>2. Explain the stages in the life cycle of flowering plants.</li> <li>3. State the factors that affect the life cycle of flowering plants.</li> <li>4. Examine the process of germination of plants.</li> </ol>
7	Vegetable crop production	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of climatic factors that enhance vegetable crop production.</li> <li>2. Demonstrate an understanding of the cultural practices in vegetable production.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain the climatic factors that enhance vegetable crop production.</li> <li>2. State and explain the cultural practices in vegetable production.</li> </ol>
8	Weather, season, and climate	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of weather, season, and climate.</li> <li>2. Demonstrate knowledge of weather conditions and their effects on living organisms.</li> <li>3. Demonstrate an understanding of human activities that contribute to climate change and ways of reducing them.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain the concepts of weather, season, and climate.</li> <li>2. State the weather conditions and explain how they affect living organisms.</li> <li>3. Examine the human activities that contribute to climate change and ways of reducing them.</li> </ol>
9	Farming systems	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of the farming systems and their application in Ghana.</li> </ol>	<ol style="list-style-type: none"> <li>1. Compare and contrast the different farming systems that are practised and their benefits to farmers.</li> </ol>
10	Heredity	<ol style="list-style-type: none"> <li>2. Demonstrate knowledge of heredity and the concept of inheritance</li> <li>3. Demonstrate an understanding of inheritable characteristics</li> </ol>	<ol style="list-style-type: none"> <li>1. State and explain the concepts of heredity and inheritance.</li> <li>2. Identify any inheritable characteristics in animals.</li> </ol>
11	Reproduction in humans	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of parts of the human reproductive system.</li> </ol>	<ol style="list-style-type: none"> <li>1. Illustrate the parts of the human reproductive system.</li> </ol>

		<ol style="list-style-type: none"> <li>Demonstrate an understanding of the functions of the human reproductive system.</li> <li>Demonstrate knowledge of human reproductive stages.</li> </ol>	<ol style="list-style-type: none"> <li>Explain the functions of the human reproductive system.</li> <li>Examine the stages of human reproductive stages.</li> </ol>
12	Digestion in humans	<ol style="list-style-type: none"> <li>Demonstrate knowledge of the parts of the human digestive system.</li> <li>Demonstrate an understanding of the functions of the human digestive system.</li> <li>Demonstrate knowledge of the processes of digestion of food substances.</li> <li>Demonstrate an understanding of the causes and effects of ingestion in humans.</li> </ol>	<ol style="list-style-type: none"> <li>Illustrate the parts of the human digestive system.</li> <li>State and explain the functions of the human digestive system.</li> <li>Examine the processes of digestion of food substances in humans.</li> <li>State the causes and effects of ingestion in humans.</li> </ol>
13	Light energy	<ol style="list-style-type: none"> <li>Demonstrate knowledge of sources of light</li> <li>Demonstrate knowledge of the rectilinear propagation of light</li> <li>Demonstrate an understanding of the formation of shadows.</li> <li>Demonstrate knowledge of eclipse</li> <li>Reflection and refraction of light</li> </ol>	<ol style="list-style-type: none"> <li>Explain the main sources of light.</li> <li>Illustrate how rectilinear propagation of light occurs.</li> <li>Analyse the formation of shadows.</li> <li>Explain how different eclipses occur.</li> <li>Illustrate how reflection and refraction of light take place.</li> </ol>
14	Energy and conservation of energy	<ol style="list-style-type: none"> <li>Demonstrate an understanding of renewable and non-renewable sources of energy.</li> <li>Demonstrate an understanding of the various forms and transformations of energy.</li> <li>Demonstrate knowledge of energy conservation practices in our homes.</li> </ol>	<ol style="list-style-type: none"> <li>State some renewable and non-renewable sources of energy.</li> <li>Explain the forms and transformations of energy.</li> <li>What are some of the energy conservation practices in our homes?</li> </ol>
15	Photosynthesis	<ol style="list-style-type: none"> <li>Demonstrate an understanding of the word and symbol definitions of photosynthesis.</li> <li>Demonstrate knowledge of the factors necessary for photosynthesis.</li> <li>Demonstrate knowledge of the importance of photosynthesis to plants and animals.</li> </ol>	<ol style="list-style-type: none"> <li>Use words and symbols to express the definitions of photosynthesis.</li> <li>Explain the factors necessary for photosynthesis.</li> <li>State the importance of photosynthesis to plants and animals.</li> </ol>
16	Food and nutrition	<ol style="list-style-type: none"> <li>Demonstrate an understanding of the various food items.</li> <li>Demonstrate an understanding of and effects of malnutrition.</li> <li>Demonstrate knowledge of a balanced diet and its importance.</li> </ol>	<ol style="list-style-type: none"> <li>Illustrate the various food types.</li> <li>State the meaning and effects of malnutrition.</li> <li>State the composition of a balanced diet and its importance to humans.</li> </ol>

17	Heat energy	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the effects of heat on substances.</li> <li>2. Demonstrate knowledge of the mode of heat transfer.</li> </ol>	<ol style="list-style-type: none"> <li>1. Explain the effects of heat on substances.</li> <li>2. Illustrate the mode of heat transfer.</li> </ol>
18	Physical and chemical change	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the meaning of physical and chemical changes.</li> <li>2. Demonstrate knowledge of physical and chemical changes.</li> </ol>	<ol style="list-style-type: none"> <li>1. State, with examples, some physical and chemical changes</li> <li>2. Illustrate and state examples of physical and chemical changes</li> </ol>
19	Ecosystem	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the food chain and food web.</li> <li>2. Demonstrate knowledge of the transfer of energy in the ecosystem.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use diagrams to illustrate the food chain and food web.</li> <li>2. Describe the process of energy transfer in the ecosystem</li> </ol>
20	Force and pressure	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of the frictional force.</li> <li>2. Demonstrate an understanding of surface tension.</li> </ol>	<ol style="list-style-type: none"> <li>1. State the definition of frictional force.</li> <li>2. Explain surface tension.</li> </ol>
21	Infectious diseases of humans and plants	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of the infectious disease.</li> <li>2. Demonstrate knowledge of various ways of preventing infectious disease.</li> <li>3. Demonstrate knowledge of the factors that promote good health.</li> </ol>	<ol style="list-style-type: none"> <li>1. Illustrate some examples of infectious diseases and describe their effect on humans.</li> <li>2. State ways of preventing infectious disease.</li> <li>3. State factors that promote good health.</li> </ol>
22	Magnetism	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of magnetic and non-magnetic substances.</li> <li>2. Demonstrate an understanding of electromagnetism.</li> <li>3. Demonstrate the application and uses of magnets</li> </ol>	<ol style="list-style-type: none"> <li>1. State the applications of magnetic and non-magnetic substances.</li> <li>2. Explain the application of electromagnetism.</li> <li>3. State some uses of magnets</li> </ol>

## DEVELOPING TEST BLUEPRINT

### INTEGRATED SCIENCE (JUNIOR HIGH SCHOOL)

		<b>Subject Outcomes (Depth of Knowledge)</b>				
THEMES	CONTENT AREAS	Level 1 Remembering (Recall)	Level 2 Understanding (Skills/Concepts)	Level 3 Applying (Strategic Thinking)	Level 4 Analyzing/Evaluating/ Creating (Extended Thinking)	Total
<b>Diversity of matter</b>	Nature of soil		1	2	-	<b>22</b>
	Elements, compounds and mixture	1	1	2	1	
	Acids, bases and salts	1	1	2	-	
	Chemical compounds	1	1	2	2	
	Soil and water conservation		1	2	1	
<b>Cycles</b>	The life cycle of flowering plants	1	1	2	1	<b>11</b>
	Vegetable crop production			1	-	
	Weather, season and climate	1	1	2	1	
<b>Systems</b>	Farming systems	1	1	1	2	<b>20</b>
	Heredity		1	2	1	
	Reproduction in humans	1	1	2	1	
	Digestion in humans	1	2	2	1	
<b>Energy</b>	Light energy	1	1	1	1	<b>24</b>
	Energy and conservation of energy	1	1	1	2	
	Photosynthesis		1	1	2	
	Food and nutrition	1	2		2	
	Heat energy	1	2	1	2	
<b>Interaction of matter</b>	Physical and chemical changes	1	1	1	2	<b>25</b>
	Ecosystem	1	1	-	2	
	Force and pressure		2	1	2	
	Infectious diseases of humans and plants	1	1	1	2	
	Magnetism	-	1	1	2	
<b>TOTAL</b>		<b>15%</b>	<b>25%</b>	<b>30%</b>	<b>30%</b>	<b>100%</b>