

## GRADE 10 BIOLOGY SCHEMES OF WORK FOR TERM 1

NAME OF THE TEACHER:.....

SCHOOL:..... YEAR:.....

| Week | LS N | Strand                                   | Sub-strand                         | Specific Learning Outcomes                                                                                                                                  | Key Inquiry Question(s)               | Learning Experiences                                                                                                                                                  | Learning Resources                           | Assessment Methods | Ref l |
|------|------|------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------|-------|
| 1    | 1    | <b>1.0 Cell Biology and Biodiversity</b> | <b>1.1 Introduction to Biology</b> | By the end of the lesson, the learner should be able to explain the application of Biology in everyday life.                                                | Why is it important to study Biology? | The learner is guided to search for information on the meaning and application of Biology in everyday life and share with peers <sup>8</sup> .                        | Digital devices, internet access, textbooks. | Oral questions     |       |
|      | 2    |                                          |                                    | By the end of the lesson, the learner should be able to relate fields of study in Biology to career opportunities (Botany, Zoology, Taxonomy).              |                                       | The learner is guided to collaboratively search for information on fields of study (Botany, Zoology, Taxonomy) and relate them to career opportunities <sup>9</sup> . | Print/non-print media, charts.               | Observation        |       |
|      | 3    |                                          |                                    | By the end of the lesson, the learner should be able to relate fields of study in Biology to career opportunities (Anatomy, Physiology, Ecology, Genetics). |                                       | The learner is guided to search for information on Anatomy, Physiology, Ecology, and Genetics and relate them to career opportunities <sup>10</sup> .                 | Textbooks, career brochures.                 | Written assignment |       |
|      | 4    |                                          |                                    | By the end of the lesson, the learner should be able to relate fields of study in Biology to career opportunities (Microbiology,                            |                                       | The learner is guided to search for information on Microbiology, Entomology, and Parasitology and relate                                                              | Digital devices, textbooks.                  | Oral questions     |       |

| Wee<br>k | LS<br>N | Strand | Sub-strand                                                      | Specific Learning<br>Outcomes                                                                                                        | Key<br>Inquiry<br>Question(s)                          | Learning Experiences                                                                                                                                                                   | Learning<br>Resources                                         | Assessme<br>nt<br>Methods | Ref<br>l |
|----------|---------|--------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------|----------|
|          |         |        |                                                                 | Entomology,<br>Parasitology).                                                                                                        |                                                        | them to career<br>opportunities <sup>11</sup> .                                                                                                                                        |                                                               |                           |          |
| 2        | 1       |        |                                                                 | By the end of the lesson,<br>the learner should be able<br>to discuss factors<br>influencing career<br>choices in Biology.           |                                                        | The learner is guided to<br>discuss factors like interest<br>and ability, and reinforce<br>those that should not<br>influence choice (gender,<br>stereotypes) <sup>12</sup> .          | Career guidance<br>charts.                                    | Discussion                |          |
|          | 2       |        |                                                                 | By the end of the lesson,<br>the learner should be able<br>to Illustrate the careers<br>related to fields of study<br>in Biology.    |                                                        | The learner is guided to<br>use locally available<br>material to design a career<br>wheel to relate fields of<br>study in Biology to careers<br>and make presentations <sup>13</sup> . | Manilla paper,<br>markers, scissors.                          | Project<br>assessment     |          |
|          | 3       |        | <b>1.2<br/>Specimen<br/>Collection<br/>and<br/>Preservation</b> | By the end of the lesson,<br>the learner should be able<br>to identify apparatus used<br>for collecting specimens.                   | How are<br>specimens<br>collected<br>and<br>preserved? | The learner is guided to in<br>groups search for<br>information on apparatus<br>for collecting specimens<br>(pooter, pitfall trap, sweep<br>net) <sup>14</sup> .                       | Textbooks,<br>images of<br>apparatus.                         | Observatio<br>n           |          |
|          | 4       |        |                                                                 | By the end of the lesson,<br>the learner should be able<br>to identify materials used<br>for processing and<br>preserving specimens. |                                                        | The learner is guided to<br>identify materials such as<br>forceps, light traps,<br>Tullgren funnel,<br>envelopes, labels, and<br>hand lenses <sup>15</sup> .                           | Lab<br>apparatus/charts.                                      | Checklist                 |          |
| 3        | 1       |        |                                                                 | By the end of the lesson,<br>the learner should be able<br>to improvise apparatus<br>for collecting specimens.                       |                                                        | The learner is guided to<br>improvise apparatus from<br>locally available materials<br>and use them for collecting<br>specimens <sup>16</sup> .                                        | Locally available<br>materials (plastic<br>bottles, netting). | Project<br>assessment     |          |
|          | 2       |        |                                                                 | By the end of the lesson,<br>the learner should be able                                                                              |                                                        | The learner is guided to<br>collect plant specimens                                                                                                                                    | Secateurs,<br>collecting bags.                                | Observatio<br>n           |          |

| Week | LS N | Strand | Sub-strand | Specific Learning Outcomes                                                                                              | Key Inquiry Question(s) | Learning Experiences                                                                                                                        | Learning Resources                      | Assessment Methods   | Ref l |
|------|------|--------|------------|-------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------|-------|
|      |      |        |            | to collect plant specimens for preservation.                                                                            |                         | using appropriate methods (e.g., secateurs, collecting bags) <sup>17</sup> .                                                                |                                         |                      |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to make a herbarium to preserve specimens (Pressing).              |                         | The learner is guided to press plant specimens for a herbarium <sup>18</sup> .                                                              | Plant press, newspapers/blotting paper. | Observation          |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to make a herbarium to preserve specimens (Mounting and Labeling). |                         | The learner is guided to dry, mount, and label specimens including common/local name and locality <sup>19</sup> .                           | Mounting sheets, glue, labels.          | Product assessment   |       |
| 4    | 1    |        |            | By the end of the lesson, the learner should be able to collect small animals using appropriate apparatus.              |                         | The learner is guided to collect small animals using apparatus such as pooter, pitfall trap, sweep net, or light traps <sup>2020</sup> .    | Pooter, sweep nets, traps.              | Practical assessment |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to identify preservatives used in preservation of specimens.       |                         | The learner is guided to search for information on preservatives used in preservation of specimens and discuss with peers <sup>2121</sup> . | Textbooks, internet.                    | Oral questions       |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to process and preserve animal specimens (Ethanol/Wet).            |                         | The learner is guided to process and preserve animal specimens involving sorting and ethanol/wet preservation <sup>2222</sup> .             | Ethanol, specimen jars.                 | Observation          |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to process and preserve                                            |                         | The learner is guided to mount specimens on soft boards and label them appropriately <sup>2323</sup> .                                      | Soft boards, pins, labels.              | Observation          |       |

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|      |      |        |                                              | animal specimens (Mounting).                                                                                                            |                                                                  |                                                                                                                                                                         |                                 |                    |       |
| 5    | 1    |        |                                              | By the end of the lesson, the learner should be able to carry out a project on specimen collection (Planning).                          |                                                                  | The learner is guided to plan a project on collecting, processing, and preserving biological specimens, including budgeting <sup>2424</sup> .                           | Project planning templates.     | Portfolio          |       |
|      | 2    |        |                                              | By the end of the lesson, the learner should be able to carry out a project on specimen collection (Execution).                         |                                                                  | The learner executes the project, collecting and processing specimens while conserving the environment <sup>25252525</sup> .                                            | Field equipment.                | Observation        |       |
|      | 3    |        |                                              | By the end of the lesson, the learner should be able to appreciate the importance of collecting specimens (Presentation).               |                                                                  | The learner keeps a portfolio to document progress of the project and makes presentations <sup>26</sup> .                                                               | Portfolios, presentation tools. | Oral presentation  |       |
|      | 4    |        |                                              | By the end of the lesson, the learner should be able to demonstrate safety and security in specimen collection.                         |                                                                  | The learner is guided to observe safety precautions while collecting, processing, and preserving biological specimens <sup>27</sup> .                                   | Safety gear (gloves).           | Observation        |       |
| 6    | 1    |        | <b>1.3 Cell Structure and Specialization</b> | By the end of the lesson, the learner should be able to differentiate between light and electron microscope (Resolution/Magnification). | 1. Why do plant and animal cells differ?<br><br>2. How are cells | The learner is guided to search for information using print and non-print media on structural and functional differences (resolution and magnification) <sup>28</sup> . | Textbooks, internet.            | Written assignment |       |

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|      |      |        |            |                                                                                                                                      | specialized ?           |                                                                                                                                                    |                                             |                      |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to differentiate between light and electron microscope (Structure).             |                         | The learner is guided to compare the physical structure and operation of light and electron microscopes <sup>29</sup> .                            | Charts of microscopes.                      | Oral questions       |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to prepare temporary slides (Sectioning).                                       |                         | The learner is guided to carry out experiments on the procedures in preparation of specimen slides (sectioning) <sup>30</sup> .                    | Razors, plant stems, glass slides.          | Practical assessment |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to prepare temporary slides (Staining and Mounting).                            |                         | The learner is guided to carry out experiments on staining, mounting, and fixation of specimen slides <sup>31</sup> .                              | Stains (iodine/methylene blue), coverslips. | Practical assessment |       |
| 7    | 1    |        |            | By the end of the lesson, the learner should be able to estimate cell size using a light microscope.                                 |                         | The learner is guided to prepare temporary slides (onion bulbs/kales) and use them under a light microscope to estimate cell sizes <sup>32</sup> . | Light microscopes, onion bulbs, rulers.     | Practical assessment |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to describe the structure of plant cells as observed in an electron microscope. |                         | The learner is guided to use photomicrographs/charts to examine the structure of plant cells under an electron microscope <sup>33</sup> .          | Photomicrographs of plant cells.            | Observation          |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to describe the structure of animal cells as                                    |                         | The learner is guided to use photomicrographs/charts to examine the structure of                                                                   | Photomicrographs of animal cells.           | Observation          |       |

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|      |      |        |            | observed in an electron microscope.                                                                                                |                         | animal cells under an electron microscope <sup>34</sup> .                                                                                 |                                            |                    |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to draw and label plant cells as seen under an electron microscope.           |                         | The learner is guided to draw and label the structure of plant cells as seen under an electron microscope <sup>35</sup> .                 | Drawing books, pencils.                    | Portfolio          |       |
| 8    | 1    |        |            | By the end of the lesson, the learner should be able to draw and label animal cells as seen under an electron microscope.          |                         | The learner is guided to draw and label the structure of animal cells as seen under an electron microscope <sup>36</sup> .                | Drawing books, pencils.                    | Portfolio          |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to compare plant and animal cells.                                            |                         | The learner is guided to discuss the differences between plant and animal cells based on electron microscope observations <sup>37</sup> . | Comparison charts.                         | Discussion         |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to model the structure of plant cells.                                        |                         | The learner is guided to model the structure of plant cells as seen under an electron microscope <sup>38</sup> .                          | Modeling clay/locally available materials. | Project assessment |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to model the structure of animal cells.                                       |                         | The learner is guided to model the structure of animal cells as seen under an electron microscope <sup>39</sup> .                         | Modeling clay/locally available materials. | Project assessment |       |
| 9    | 1    |        |            | By the end of the lesson, the learner should be able to relate the structures of specialized plant cells to functions (Root hair). |                         | The learner is guided to discuss root hair cells and relate them to their function <sup>40</sup> .                                        | Charts/Slides of root hairs.               | Oral questions     |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to relate the structures of                                                   |                         | The learner is guided to discuss palisade cells and                                                                                       | Charts/Slides of leaves.                   | Oral questions     |       |

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|----------|---------|--------|------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------|----------|
|          |         |        |            | specialized plant cells to functions (Palisade).                                                                                            |                               | relate them to their function <sup>41</sup> .                                                                     |                                 |                           |          |
|          | 3       |        |            | By the end of the lesson, the learner should be able to relate the structures of specialized plant cells to functions (Guard cells/Pollen). |                               | The learner is guided to discuss guard cells and pollen grains and relate them to their functions <sup>42</sup> . | Charts/Slides.                  | Written quiz              |          |
|          | 4       |        |            | By the end of the lesson, the learner should be able to relate the structures of specialized animal cells to functions (Muscle).            |                               | The learner is guided to discuss muscle cells and relate them to their function <sup>43</sup> .                   | Charts/Slides of muscle tissue. | Oral questions            |          |
| 10       | 1       |        |            | By the end of the lesson, the learner should be able to relate the structures of specialized animal cells to functions (Nerve).             |                               | The learner is guided to discuss nerve cells and relate them to their function <sup>44</sup> .                    | Charts/Slides of neurons.       | Oral questions            |          |
|          | 2       |        |            | By the end of the lesson, the learner should be able to relate the structures of specialized animal cells to functions (Blood).             |                               | The learner is guided to discuss blood cells (RBC, WBC) and relate them to their function <sup>45</sup> .         | Charts/Slides of blood smear.   | Written quiz              |          |
|          | 3       |        |            | By the end of the lesson, the learner should be able to relate the structures of specialized animal cells to functions (Reproductive).      |                               | The learner is guided to discuss reproductive cells and relate them to their function <sup>46</sup> .             | Charts of sperm/ovum.           | Oral questions            |          |
|          | 4       |        |            | By the end of the lesson, the learner should be able to observe specialized                                                                 |                               | The learner is guided to observe photomicrographs/permanent slides of specialized                                 | Permanent slides, microscope.   | Practical assessment      |          |

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|      |      |        |            | cells using photomicrographs.                                                                                          |                         | plant and animal cells, draw and label <sup>47</sup> .                                                                    |                                 |                    |       |
| 11   | 1    |        |            | By the end of the lesson, the learner should be able to discuss cell organization (Organelles to Cells).               |                         | The learner is guided to discuss levels of organization starting from organelles to cells <sup>48</sup> .                 | Flow charts of organization.    | Discussion         |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to discuss cell organization (Tissues).                           |                         | The learner is guided to discuss the organization of cells into tissues <sup>49</sup> .                                   | Charts of tissues.              | Oral questions     |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to discuss cell organization (Organs).                            |                         | The learner is guided to discuss the organization of tissues into organs <sup>50</sup> .                                  | Models of organs (heart, leaf). | Oral questions     |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to discuss cell organization (Organ Systems).                     |                         | The learner is guided to discuss the organization of organs into organ systems <sup>51</sup> .                            | Charts of human body systems.   | Written assignment |       |
| 12   | 1    |        |            | By the end of the lesson, the learner should be able to appreciate the cell as the basic unit of life.                 |                         | The learner is guided to consolidate understanding of the cell as the fundamental unit of life <sup>52</sup> .            | Review materials.               | Reflection         |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to demonstrate appropriate waste management during cell modeling. |                         | The learner is guided to appropriately dispose of waste materials generated from modeling cell structures <sup>53</sup> . | Waste bins.                     | Observation        |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able                                                                   |                         | The learner uses digital tools to search for information on microscope                                                    | Computers/Tablets.              | Observation        |       |

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|      |      |        |            | to demonstrate digital literacy in cell biology.                                                      |                         | differences and specialized cells <sup>54</sup> .                  |                      |                    |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to review Cell Biology concepts.                 |                         | Review of Strand 1.0 concepts (Cell Structure and Specialization). | Past papers/Quizzes. | Written test       |       |
| 13   | 1    |        |            | By the end of the lesson, the learner should be able to demonstrate understanding of Term 1 concepts. |                         | End of Term 1 Assessment Administration.                           | Exam papers.         | Written Exam       |       |
|      | 2    |        |            | By the end of the lesson, the learner should be able to demonstrate understanding of Term 1 concepts. |                         | End of Term 1 Assessment Administration.                           | Exam papers.         | Written Exam       |       |
|      | 3    |        |            | By the end of the lesson, the learner should be able to demonstrate understanding of Term 1 concepts. |                         | End of Term 1 Assessment Administration.                           | Exam papers.         | Written Exam       |       |
|      | 4    |        |            | By the end of the lesson, the learner should be able to reflect on Term 1 performance.                |                         | Closing of the term and reflection on performance.                 |                      | QA / Reflection    |       |