LEARNING IMPLEMENTATION PLAN

BIOLOGY SUBJECT CLASS X SCIENCE

" BIODIVERSITY"

Compiled by:

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DEPARTMENT OF BIOLOGY EDUCATION

FACULTY OF MATHEMATICS AND NATURAL SCIENCES

STATE UNIVERSITY OF MEDAN

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LEARNING IMPLEMENTATION PLAN

Education Unit : Senior High School

Subject : Biology

Class/Semester : X Science

Subject matter : Biodiversity

Time Allocation : 1 X 15 minutes (1 meeting)

A. Main Competencies

KI 1 : Respecting and practicing the teachings of the religion he adheres to.

KI 2: Develop behavior (honest, disciplined, responsible, caring, polite, environmentally friendly, gotong royong, cooperation, peace-loving, responsive, and proactive) and show an attitude as part of the solution to various national problems in interacting effectively with the social and natural environment. interacting effectively with the social and natural environment as well as in and in placing oneself as a reflection of the nation in the world.

KI 3: Understanding and applying factual, conceptual, and procedural knowledge in science, technology, art, and knowledge in science, technology, arts, culture, and humanities with insights into humanity, nationality, state, and humanity, nationality, state, and civilization related to phenomena and events, and apply procedural knowledge in specific fields of study in accordance with their talents and interests to solve problems. with his talents and interests to solve problems.

KI 4: Processing, reasoning, and presenting in the concrete realm and the abstract realm related to the development of what he has learned at school independently, and is able to use methods according to scientific principles.

B. Basic Competencies and Indicators of Competency Achievement

Basic Competencies	Competency Achievement Indicators (IPK)
3.2 Analyze the various levels of biodiversity in Indonesia and its threats	3.2.1 Observe various levels of biodiversity in Indonesia through pictures/photos/videos.

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and conservation	3.2.2 Identify biodiversity at the gene level, species level, and ecosystem level in Indonesia. 3.2.3 Explain to associate the understanding of taxon in classification and determination key. 3.2.4 Discuss the biodiversity of Indonesia based on the Wallace line and the Weber line. 3.2.5 Summarize the results of the discussion on Indonesia's biodiversity based on the Wallace line and the Weber line. 3.2.6 Identify the utilization of Indonesia's biodiversity that has been done. 3.2.7 Explain the utilization of Indonesia's biodiversity that has been done. 3.2.8 Discuss opportunities for sustainable utilization in the creative economy era. 3.2.9 Conclude the utilization of Indonesia's biodiversity that has been done and opportunities for its sustainable use in the era of creative economy.
4.2 Presenting the results of observations of various levels of biodiversity in Indonesia and proposals for conservation efforts	4.2.1 Identify biodiversity at the gene level, species level, and ecosystem level in Indonesia. 4.2.2 Classify biodiversity at the gene level, species level, and ecosystem level in Indonesia. 4.2.3 Discuss efforts to conserve biodiversity in Indonesia. 4.2.4 Communicate orally the biodiversity in Indonesia and the proposed conservation efforts.

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C. Attitude Aspects Developed

Scientific, critical, and curiosity attitude about biodiversity.

D. Learning Objectives

Through learning activities with a scientific approach using the Problem Based Learning (PBL) learning model, students can analyze various levels of biodiversity in Indonesia and their threats and preservation, and present the results of observations of various levels of biodiversity in Indonesia and proposed conservation efforts, so that students can build awareness of the greatness of God Almighty, foster disciplined, honest, active, responsive, polite, responsible, and cooperative behavior.

E. Learning Materials

Biodiversity

1. Concept of gene, species, ecosystem diversity.
2. Indonesian biodiversity, flora and fauna, and their distribution based on Wallace Line and Weber Line.
3. Utilization of Indonesia's biodiversity.
4. Causes of extinction that occur in biodiversity
5. Efforts to conserve Indonesia's biodiversity.

F. Approach, Model, and Learning Method

Approach : Scientific Approach

Learning Model : Problem Based Learning

Learning Methods : Presentation, Discussion, quiz, Interactive Lecture

G. Learning Activities

Meeting I (1 X 15 minutes)

Stages Learning	Teacher Activities	Student Activities	Time Allocation
Introduction Activity	The teacher delivers the opening greeting.	Students answer the greeting	1 Minute

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3 Minutes	The teacher distributes groups, then directs students to sit according to their their groups each.	Students in groups according to groups obtained.	1 Minute
	Apperception: • Exploring learners' knowledge about biodiversity by conducting a discussion. • The teacher explains the benefits of studying biodiversity, so that the life of all living things on earth can continue well and there is no extinction that can occur due to human actions. • Teacher invites learners to identify the learning indicators.	Students pay attention to explanation from teacher and students answer questions from the the teacher.	1 Minute
Main Activities 10 Minutes			
Stage 1 Orient the learners to the problem	• The teacher explains the learning indicators and then provides the basic concepts, instructions or references needed in learning.	• Students watch the video video shown carefully • Students answer questions from the teacher in turn	2 Minute

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	• Conduct brainstorming where students are faced with observing images/video/animation of the diversity of types, genes and ecosystems. • Learners find various problems from the results of observing images/video/animation , such as questioning: ➢ What causes the extinction of some biodiversity in the world? ➢ How to overcome the possibility of extinction that can occur in biodiversity? ➢ What benefits can we feel with the existence of biodiversity?		
Stage 2 Organizing students	• The teacher helps learners define and organize learning tasks related to the problem of biodiversity in Indonesia. • Learners are grouped	• Students get into groups and discuss about the material that material that has been divided • Students collect information from	2 Minute

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	heterogeneously, each reviewing an activity sheet/non-experiment activity. • Learners discuss things to do, concepts to discuss and questions to answer to solve the problem.	relevant sources relevant sources	
Stage 3 Guiding individual and group investigations	• Learners discuss in groups to gather information to create and build their own ideas in formulating problems related to the material in the activity sheet/learning activity. • Learners identify alternative solutions to the problem formulated. • The teacher guides and facilitates learners in solving problems.	• Students find concepts to solve problems • Students are helped by input from teacher	2 Minute
Stage 4 Develop and present work	• Learners answer the questions in the learning activity sheet and present it in a written report. • Learners present the report discussing the findings and drawing conclusions.	• Students present in in front of the class take turns	2 Minute

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Stage 5 Analyze and evaluate process solving problem	• Learners are - - guided by the teacher to analyze the problem solving that they have found. • Discuss the results of observations by paying attention to the questions on the activity sheet. • Conclude: ➢ The diversity of flora in Indonesia. ➢ The diversity of fauna in Indonesia. ➢ Benefits of Indonesia's biodiversity in the fields of ecology, economy, and science. ➢ Efforts to conserve Indonesia's biodiversity. • Learners create and submit a report and conclusion of the discussion. • The teacher evaluates the learning outcomes regarding the material that students have learned.	• Students summa material with the help of teacher	2 Minute

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Closing **2 Minutes**	• Conduct feedback/reflection and review of the material that has been developed. • Learners answer questions/quizzes and collect the results of their learning activities. • The teacher gives awards to individuals/groups of learners who perform well and gives assignments to study the material for the next meeting, and says closing greetings.	• Students understand the material taught by being able to answer teacher's questions	2 Minute

H. Learning Resources

1. Videos, power point teaching materials, images and animations related to the topic of biodiversity.
2. Biology textbook :
   - Textbook of Biology SMA/MA class X, Compilation Moch Ansori & Djoko Martono. Publisher of the Center for Bookkeeping, Jakarta. Mathematics and Natural Sciences Program (MIPA), Chapter 2. Biodiversity.
   - Learning Module Biodiversity Biology SMA / MA class X, compiler Artanti. Publisher Ministry of Education and Culture, Jakarta.

I. Assessment

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a. Assessment technique: Written Test

b. Aspect of Assessment: Cognitive

c. Instrument Form : Description test

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Attachment 1: Student Worksheet

STUDENT WORKSHEET

OBJECTIVE :

- Explain the kinds of biodiversity
- Identify gene, species and ecosystem diversity
- Differentiate between gene, species and ecosystem diversity
- Explain the benefits of biodiversity

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Biodiversity is the diversity in living things that show variations in shape, appearance, size, and other characteristics. Biodiversity is also known as biodiversity, which includes the overall variation found at the gene, species, and ecosystem levels in an area. This diversity occurs due to the influence of genetic and environmental factors that affect phenotypes. This diversity occurs due to the influence of genetic factors and environmental factors that affect phenotypes (gene expression). broadly speaking, biodiversity is divided into 3 levels, namely as follows:

1. Gene Diversity

Gene diversity is the diversity of individuals in one type or species of living things. species of living things. Gene diversity causes variations in genetic makeup that affects the genotype (traits) and phenotype (external appearance) of a living creature. (external appearance) of a living creature. There are variations in the arrangement of genes in similar individuals.

2. Species Diversity

Species diversity shows all the variations found in living things between species. Differences between species in living things that belong to one family (family) are more striking so that they are easier to observe than individual differences within one species.

3. Ecosystem Diversity

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Ecosystem diversity is the diversity of a community consisting of animals, plants, and microorganisms in a habitat. Ecosystem diversity occurs due to gene diversity and species diversity.

The Distribution, Conservation and Benefits of Biodiversity

The flora of Indonesia includes the flora of the Malesiana region which includes Malaysia, the Philippines, Indonesia, and Papua New Guinea. In 2009, Van Welzen and Silk, botanists from the Netherlands, conducted research that explained the distribution of Malesian flora. According to both of them, Malesian flora is divided into Sunda plain flora, Sahul plain flora, and flora in the middle area (transition) which is very distinctive and endemic. typical and endemic.

Based on its geographical location, Indonesia is crossed by two imaginary lines, namely the Wallace Line and the Weber Line. These two imaginary lines cause differences in the distribution of animals (fauna) Indonesia. The distribution of fauna in Indonesia is influenced by aspects of geography and geological events of the Asian and Australian continents. Zoologists argue that the type of fauna in the western part of Indonesia is similar to the fauna in Southeast Asia. similar to the fauna in Southeast Asia (oriental), while the fauna in the eastern part of Indonesia is similar to the fauna in Southeast Asia. eastern Indonesia is similar to the fauna of the Australian continent (australis) The faunal regions in Indonesia can be divided into three regions, namely the western Indonesian region, the transitional region (Wallacea), and the eastern Indonesian region.

QUESTION

1. Observe the picture below





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Through the following picture, explain what you think if it is related to biodiversity?

2. Consider the following animals/plants:
   a. Grapefruit, kaffir lime, tangerine
   b. Rice, corn, sugarcane
   c. Chicken, penguin, duck
   d. Guava, cashew, red guava

Based on the data, explain why these animals/plants are classified as gene, species or ecosystem diversity!

3. List the benefits of biodiversity for human survival along with examples!

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Attachment 2. Assessment Sheet

MULTIPLE CHOICE WRITTEN TEST

1. On a farm, Mr. sandiaga has five racehorses. Two of the five horses have basic black hair color. However, the hair color of the two horses is not exactly the same, there are some parts of the body that are unevenly colored black so that they can be distinguished. The difference between the two racehorses shows the diversity of levels ....
   A. Gene
   B. community
   C. Species
   D. ecosystem
   E. Individual

2. Species diversity can be seen from the differences....
   A. Shape, color, size and appearance
   B. Shape, color, number, size and factors carrying descending traits
   C. Morphology and anatomy
   D. Behavior and genes
   E. Morpholophy and behavior

3. Organisms that exhibit a wide range of variation in communities, ecosystems and species can cause ?
   A. Variety
   B. New species
   C. Population
   D. Biodiversity
   E. New habitat

4. The highest species diversity is found in ecosystems....
   A. Desert
   B. Tropical rainforest
   C. Rice field
   D. Mangrove
   E. Savanna

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