E-WORKSHEET ACTIVITY 2

Waste Recycling

Student Identity



Group/Classs : .....

Name/Student ID : .....

1. .....
2. .....
3. .....
4. .....
5. .....

LIVEWORKSHEETS



Learning Activities II

Guiding Inquiry
Inference - Evaluation Indicators

Take a look at the following picture!



Domestic organic waste is often one of the biggest contributors to environmental pollution if not managed properly. One innovative solution that can be done is to utilize the waste into eco enzyme. Eco enzyme is a liquid fermented from organic waste, sugar, and water that has various benefits, such as being an organic fertilizer, natural cleaner, and waste decomposer.

1. What do you know about eco enzyme?

2. What type of waste is used and name the main ingredient in making eco enzyme?

3. How can eco enzyme help solve waste problems?

In this activity, we will conduct an eco enzyme making experiment to understand the fermentation process and how the results can be utilized in our daily lives. This activity will also encourage you to think critically about how to manage organic waste effectively and environmentally friendly!



Bio-Activity

Guiding Inquiry
Inference - Evaluation Indicators

ECO ENZYME PREPARATION EXPERIMENT

Preparation of Liquid Organic Fertilizer Made from Banana and Orange Fruit Peels





Based on previous research, it was found that a 4% yeast concentration resulted in the most optimal eco enzyme fermentation. At this concentration, the decomposition process of organic waste proceeds effectively.

Following this finding, you will carry out an eco enzyme production experiment using a 4% yeast concentration. The objective of this activity is to evaluate the quality of the resulting eco enzyme by observing several parameters, including pH, temperature, odor, color

Based on the statement above regarding organic waste, formulate at least 2 problem statements related to the production of eco enzymes! (Problem statements should be in the form of questions that arise from a particular issue)



ECO ENZYME PREPARATION EXPERIMENT

Guiding Inquiry
Inference - Evaluation Indicators

Before conducting the experiment, find from the internet or other sources the characteristics of a good eco enzyme in terms of pH, temperature, color, and smell!

Based on the parameters that you have searched for, write down the tools and materials that you will use in making eco enzyme!

Tools	Materials

After preparing the tools and materials, design a work procedure that the tester can do!



Work Steps

Write down the working steps of your experiment!

After doing the practicum activity of making eco enzyme, write down the results of the practicum in the tables and present them next week!

(**Observation of product results is carried out for 1 week**)



Experiment Results

Fill in the table with the results of your experiment during the 1 week observation!

Eco Enzyme Test Results Table (Chemical - Physical Parameters)

Day	pH	Temperature	Color	Odor
1				
2				
3				
4				
5				
6				
7				

Was your experiment successful and suitable?

☐ Yes ☐ No



Learning Activities III

Analyzing and Evaluating Self-Regulation Indicators

After conducting the practical activities, analyzing the data results and presenting the product, answer the questions below to help you reflect on the learning process.



REFLECTION ON THE PROCESS

Write down the problems you had during the experiment

Write down the evaluation of your experiment!

LIVEWORKSHEETS

Bio-Concept

Explanation Indicator

Efforts Against Environmental Change

Environmental conservation is carried out in order to create a balance between the development of human civilization and environmental preservation. These efforts are carried out by conservation, waste treatment and recycling, and the use of hazardous chemicals according to dosage and designation.

3asic principles in environmental conservation and pollution management

Administrative Countermeasures	Technological Countermeasures	Educational Countermeasures
Before building a factory or other project, the developer is required to conduct an environmental impact assessment.	Each industry is expected to have a waste management unit, for example a liquid waste management unit before being discharged into the environment.	Each individual should not pollute the environment by not disposing of household waste in any place, but in the trash bins provided.
If the negative impacts outweigh the positive impacts, the government does not issue a license to proceed with the project.	If the treatment uses microorganisms, it is called biological, i.e. using waste-degrading bacteria	Also, with food and drink wrappers, put them in your bag or pocket first if you can't find a trash can.
It's just that often the environment cannot be measured concretely		

Self Regulation Indicator

Bio-Exercise



Practice Questions

Do the exercise questions below to practice your critical thinking skills!

Read the text below to answer questions 1-2.

The Citarum River in West Java is known as one of the most polluted rivers in the world. Pollution in the river is caused by various sources, including industrial waste, household waste, and plastic waste. Industries around the river often discharge liquid waste directly into the river without proper treatment, causing the river water to have a dark color and pungent odor. In addition, many people living around the river dump household waste into the river, exacerbating the pollution and clogging the flow of the river.

The pollution of the Citarum River not only affects the environment, but also the health and livelihood of the local community, as the polluted water quality can affect their health. Many cases of skin diseases and digestive disorders have been reported among people who use the river water for their daily needs, such as bathing, washing, or even cooking. In addition, the river ecosystem is disrupted, and many fish and other aquatic animals die due to high levels of toxins in the water.

1. Explain the impact of the Citarum River pollution on the health of the surrounding community and the river ecosystem. Why is this pollution a serious threat to life around the river?

.....
.....
.....
.....
.....
.....
.....
.....
.....

2. If you live near the Citarum River, what actions can you take to support the cleanliness of the river? Explain the reason for your chosen action and how it can contribute to environmental sustainability.

.....
.....
.....
.....
.....
.....
.....
.....
.....

Evaluation

After following all the instructions well and completing each task that has been given, let's reflect together by opening the google form link below!!!





https://unesa.me/Refleksidirimateriperubahanlingkungan



Teacher's Assessment

No.	Rincian Penilaian			Skor Maksimal	Skor
Aspek Kognitif (Pengetahuan)					
1	a.	Interpretasi	Kemampuan peserta didik dalam menafsirkan, merumuskan, dan menyimpulkan berbagai informasi, data, peristiwa pada lingkungan	4	
	b.	Analisis	Kemampuan peserta didik dalam mengidentifikasi hubungan yang aktual dan kuat dari berbagai pertanyaan, konsep, dan deskripsi	4	
	c.	Inferensi	Kemampuan peserta didik dalam membuat dugaan, mempertimbangkan informasi yang relevan, membuktikan suatu konsep, prinsip, dan menarik kesimpulan	4	
	d.	Evaluasi	Kemampuan peserta didik dalam menyampaikan suatu gagasan dengan didukung oleh berbagai konsep, metodologi, penalaran, atau pertimbangan	4	
	e.	Eksplanasi	Kemampuan peserta didik dalam mengukur kredibilitas suatu gagasan, argumen, dan pernyataan	4	
	f.	Regulasi Diri	Kemampuan peserta didik menempatkan diri saat menghadapi suatu permasalahan lingkungan	4	



Teacher's Assessment

No.	Rincian Penilaian			Skor Maksimal	Skor
Aspek Afektif (Sikap)					
2	a.	Kerjasama	Menghargai perbedaan, mendukung anggota lain, dan menciptakan suasana yang positif	4	
	b.	Disiplin	Ketepatan dan kecepatan dalam melakukan dan mengumpulkan tugas sesuai dengan tenggat waktu yang ditentukan	4	
	c.	Tanggung Jawab	Kemampuan peserta didik yang bersedia mengerjakan tugas oleh guru secara lengkap dan selesai sesuai tenggat waktu yang ditentukan	4	
	d.	Komunikatif	Kemampuan dalam menyampaikan gagasan dengan baik, jelas, mudah dipahami (baik secara lisan maupun tertulis)	4	

No.	Rincian Penilaian		Skor Maksimal	Skor
Aspek Psikomotor (Keterampilan)				
3	a.	Kemampuan peserta didik dalam menyusun dan mempersiapkan alat bahan yang digunakan untuk praktikum	4	
	b.	Kemampuan peserta didik dalam menggunakan alat praktikum dengan baik	4	
	c.	Kemampuan peserta didik dalam mengamati hasil percobaan dan mengevaluasi hasil praktikum	4	
Jumlah Skor			52	

Penilaian

Nilai = Jumlah Skor/ 52 x 100

Nilai Maksimal = 100

References

- Kementerian Lingkungan Hidup dan Kehutanan. 2020. Panduan Pengelolaan Limbah. Jakarta: Kementerian Lingkungan Hidup dan Kehutanan.
- United Nations Environment Programme (UNEP). 2019. *Guidelines on Hazardous Waste Management. Nairobi*: UNEP.
- Wardani, A., Kusuma, R., & Fadhilah, N. 2021. Pengelolaan Limbah dan Dampaknya pada Kesehatan Lingkungan. Yogyakarta: Universitas Gadjah Mada Press.
- World Health Organization. 2018. *Waste and Health Guidelines*. Geneva: WHO Press.







UNESA

UNIVERSITAS NEGERI SURABAYA

Kampus Lidah Wetan
Jl. Lidah Wetan, Kec. Lakarsantri, Kota Surabaya, Jawa Timur 60213
Info@unesa.ac.id

LIVEWORKSHEETS