**e-RPH SCIENCE FORM 5**

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| **DAILY LESSON PLAN** |
| **CLASS** |  | **WEEK** |  |
| **THEME** | Maintenance and Continuity of Life | **DATE** |  |
| **CHAPTER** | 1.0 Microorganisms | **DAY** |  |
| **TITLE** | World of Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Communicate about the five groups of microorganisms.
2. Classify by comparing or identifying at least two common characteristics of each group of microorganisms.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
2. Students pay attention to the teacher's explanation about the world of microorganisms.
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| **Activities:**1. Students are given a diagram of microorganisms in nature consisting of five different groups.
2. Students identify and describe Fungi, Algae, Protozoa, Bacteria and Viruses based on the diagram given.
3. Students take turns responding to the tasks given in pairs.
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| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 pages 1 - 2. |
| **REFLECTION** |
| \_\_\_\_\_\_ / \_\_\_\_\_\_ students able to achieve the learning objectives.\_\_\_\_\_\_ / \_\_\_\_\_\_ students able to complete the exercises given.\_\_\_\_\_\_ / \_\_\_\_\_\_ students need extra training and teacher guidance.Note: Today’s lesson will be carried forward due to:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **TITLE** | World of Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Conduct an experiment to show the presence of microorganisms in three conditions of the fingers.
2. Predict by making a guess as to which finger (out of the three conditions of the finger) has the greatest number of bacterial colonies.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students conduct an experiment to show the presence of microorganisms. Students are asked to refer to Experiment 1.1 in the textbook on pages 17 and 18.
2. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
3. Students pay attention to the teacher's explanation about the world of microorganisms.
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| **Activities:**1. Students are divided into several groups.
2. Students conduct an experiment comparing the growth of bacteria on sterile nutrient agar streaked with:

(a) unwashed fingers(b) fingers that have been washed with water only(c) fingers that have been washed with soap and water1. Students take turns to give a response on the importance of washing hands with soap or hand sanitiser.
 |
| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 pages 3 - 5. |
| **REFLECTION** |
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| **CHAPTER** | 1.0 Microorganisms | **DAY** |  |
| **TITLE** | World of Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Conduct an experiment to investigate five factors that affect the growth of microorganisms.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students conduct experiments to investigate the factors that affect the growth of microorganisms. Students are asked to refer to Experiment 1.2 in the textbook on pages 20 - 27.
2. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
3. Students pay attention to the teacher's explanation about the world of microorganisms.
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| **Activities:**1. Students are divided into five groups. Each group was assigned to investigate a different factor that affects the growth of microorganisms (Bacillus sp.).

(a) Effect of nutrients on the growth of Bacillus sp.(b) Effect of humidity on the growth of Bacillus sp.(c) Effect of light on the growth of Bacillus sp.(d) Effect of temperature on the growth of Bacillus sp.(e) Effect of pH value on the growth of Bacillus sp.1. Students take turns to give a response to the factors that affect the growth of Bacillus sp..
 |
| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 pages 6 - 11. |
| **REFLECTION** |
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| **CLASS** |  | **WEEK** |  |
| **THEME** | Maintenance and Continuity of Life | **DATE** |  |
| **CHAPTER** | 1.0 Microorganisms | **DAY** |  |
| **TITLE** | Useful Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Justify the application of useful microorganisms in three main fields, namely medicine, agriculture and industry.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students present the application of useful microorganisms in class.
2. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
3. Students pay attention to the teacher's explanation about useful microorganisms.
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| **Activities:**1. Students are divided into three groups to find information about the application of microorganisms in:

(a) Medicine(b) Agriculture(c) Industry1. Students discuss and present the following information in the form of Microsoft PowerPoint. Each presentation should include:
2. Group and name of microorganisms
3. The uses of selected microorganisms used in the field
4. Students present the results of the discussion in class.
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| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 pages 12 - 14. |
| **REFLECTION** |
| \_\_\_\_\_\_ / \_\_\_\_\_\_ students able to achieve the learning objectives.\_\_\_\_\_\_ / \_\_\_\_\_\_ students able to complete the exercises given.\_\_\_\_\_\_ / \_\_\_\_\_\_ students need extra training and teacher guidance.Note: Today’s lesson will be carried forward due to:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **CHAPTER** | 1.0 Microorganisms | **DAY** |  |
| **TITLE** | Useful Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Generate ideas for the potential of two uses of microorganisms in biotechnology and sustainability of the environment, namely eco enzyme cleaning solution and *Lactobacillus* sp. bacterial serum.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students understand and share information about the potential uses of microorganisms in the field of biotechnology and the sustainability of the environment in class.
2. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
3. Students pay attention to the teacher's explanation about useful microorganisms.
 |
| **Activities:**1. Students are divided into two groups to find information about:

(a) Eco enzyme cleaning solution(b)  *Lactobacillus* sp. bacterial serum 1. Students study and discuss information related to each group's assignment.
2. After the discussion period, students return to the main group to share the information obtained.
 |
| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 page 14 - 15. |
| **REFLECTION** |
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| **THEME** | Maintenance and Continuity of Life | **DATE** |  |
| **CHAPTER** | 1.0 Microorganisms | **DAY** |  |
| **TITLE** | Prevention and Treatment of Diseases Caused by Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Explain five aseptic techniques to control the spreading of microorganisms, namely sterilisation, boiling, the use of antiseptics, the use of disinfectants and the use of radiation.
2. Identify the five methods of sterilisation, which are heat, chemical substances, radiation, high pressure and filters.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students are selected from each group as 'experts' to share information about aseptic techniques to control the spreading of microorganisms.
2. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
3. Students pay attention to the teacher's explanation about the prevention and treatment of diseases caused by microorganisms.
 |
| **Activities:**1. Students are divided into several groups.

(a) Group A: Sterilisation and its method(b) Group B: Boiling and autoclave(c) Group C: The uses of antiseptics and disinfectants(d) Group D: The uses of radiation(e) Group E: The uses of pressure cookers and micron filters1. Students are given 10 minutes to do the research.
2. Students are chosen from each group to be 'experts'. The 'expert' will come forward and sit on a chair to share information and answer any questions posed during the 3 minute period.
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| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 pages 16 - 17. |
| **REFLECTION** |
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| **TITLE** | Prevention and Treatment of Diseases Caused by Microorganisms | **TIME** |  |
| **LEARNING OBJECTIVES** |
| By the end of the PdPc, students will be able to:1. Understand the two terms, namely 'Antibiotics' and 'Antibiotic Resistance'.
2. Conduct an experiment to study the effect of antibiotics on bacterial growth in two concentrations of antibiotics, namely high concentration and low concentration.
3. Communicate about the three methods of treatment of infectious diseases, namely antibiotics, antifungalsand antivirals.
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| **TEACHING AND LEARNING ACTIVITIES** |
| **Introduction:**1. Students conduct experiments to study the effect of antibiotics on bacterial growth. Students are asked to refer to Experiment 1.3 in the textbook on pages 37 - 39.
2. Students and teachers do questioning and answering (Q&A) sessions to test the level of students' existing knowledge.
3. Students pay attention to the teacher's explanation about the prevention and treatment of diseases caused by microorganisms.
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| **Activities:**1. Students carry out activities by preparing materials and equipment.
2. Students record the area of the clear region of the filter paper disc with distilled water, the filter paper disc with low concentration of antibiotic and the filter paper disc with high concentration of antibiotic after one day.
3. Students discuss the experimental findings and make the conclusion.
 |
| **Closure:**Students answer the questions in Target PBD Sains Tingkatan 5 pages 17 - 20. |
| **REFLECTION** |
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