



**WATER WATCH
PROGRAMME**
FOR YOUNG LEADERS (WWP4YL)
MODULES SERIES – 1
UNESCO-IHP MALAYSIA

EDITORS
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MODULE 4

WATER QUALITY MONITORING USING PSYCHOCHEMICAL TESTS

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INTRODUCTION

This module is to expose the participants with the importance of river water quality by monitoring programme to determine the quality of river water and to detect any changes in quality of the river. The participants will also be exposed to the effects of pollution to the river water due to the excessive presence of physical and chemical constituents in river water. The participants will be taught on the basic steps of river water quality measurement to determine its physiochemical characteristics.

OBJECTIVES

This module is designed and developed to ensure participants will achieve the following objectives:

1. To practice the measurement of water quality by using Water Monitoring Kit.
2. To determine the water quality of the water sample.
3. To learn some of the water quality parameters.

LEARNING OUTCOMES

At the end of this module, participants should be able to:

1. Learn the tools and methods of water quality parameters measurement by using Water Monitoring Kit.
2. Measure the water quality of the water samples.
3. Understand some of the water quality parameters.



DURATION OF ACTIVITIES

Duration of activities as shown in Table 4.1.

Table 4.1: Duration of activities

No.	Activity	Duration
1.	Short briefing	30 minutes
2.	Hands-on training on the use of water sampling and analysis kit	45 minutes
3.	Discussion	15 minutes

Notes:

- Participants' level – Introductory (e.g., public, primary, or secondary schools' students, tertiary level student).
- Activity chosen must suit their level of understanding and availability to grasp the concept or knowledge delivered in the module.



MODULE ACTIVITIES AND PROCEDURES

ACTIVITY 1: SHORT BRIEFING ON WATER QUALITY MONITORING

The briefing will be delivered by the facilitators for about 30 minutes and followed by a question-and-answer session with students.

ACTIVITY 2: WATER SAMPLING AND ANALYSIS DEMONSTRATION AND PRACTICAL HANDS-ON



Figure 4.1: Water sampling tools

Materials:

- Water Monitoring Kit
- Polypropylene plastic bottle
- Stopwatch
- Rubber gloves

Procedures:

1. Get the participants to a natural water source such as the river.
2. Take sample of water from the source by using a polypropylene plastic bottle (2 litres).





Figure 4.2: Materials for testing



Figure 4.3: Preparation of water sample

3. Fill water samples from polypropylene plastic bottle into a test tube.



Figure 4.4: Water sample in test tube



- Analyze the water quality parameters with reference to the manual of Water Monitoring Kit as given.

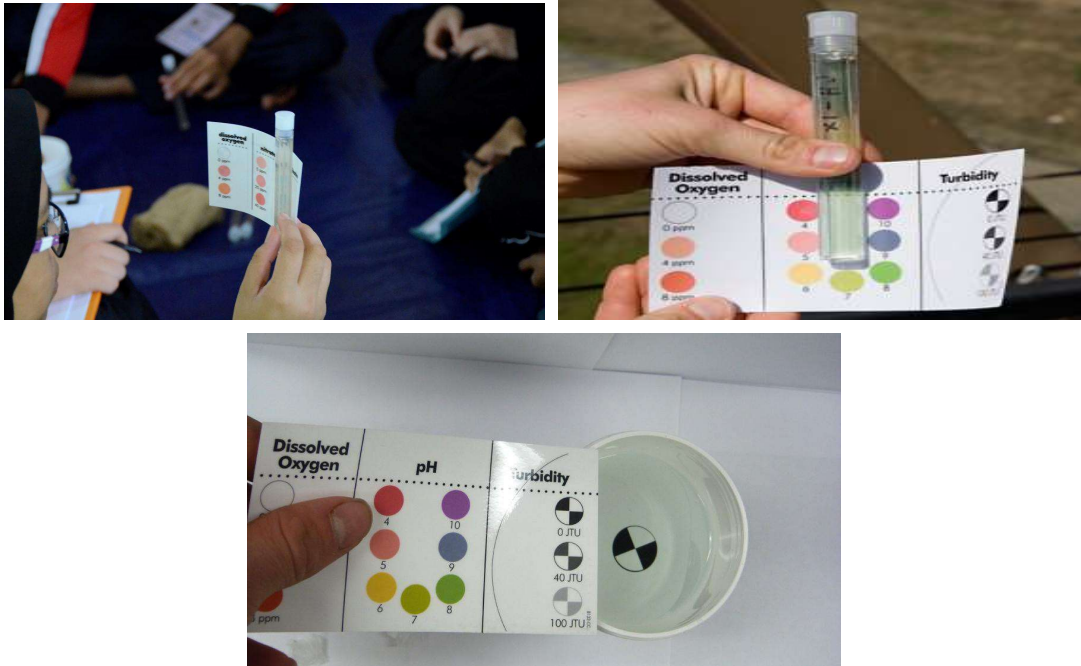


Figure 4.5: Compare water sample with manual of water monitoring kits

- Record the measurement reading.
- Repeat the above steps for other parameters analysis.
- Fill in the results in Table 4.2 below.

Table 4.2: Results of the analysis of water quality parameters

Parameters	Readings	Scales/Quality
Dissolved Oxygen (DO)		
pH		
Nitrate		
Phosphate		
Turbidity		



ACTIVITY 3: DISCUSSION

Based on the result on the sampling and analysis, the participants should discuss and determine the water classes and their uses. They should be able to identify the sources of the water pollution.

REFERENCES

DOE, Classification of Malaysian Rivers: Final Report on Development of Water Quality and Standards for Malaysia (Phase Iv- River Classification), Department of Environment, Kuala Lumpur, Malaysia, 1994.

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<http://www.doe.gov.my/portalv1/>

<https://enviro.doe.gov.my>



MODULE 5: MONITORING RIVER'S WATER QUALITY USING BIOLOGICAL INDICATORS

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INTRODUCTION

Many of us are aware of ponds and rivers near to us. Some of us know something about the animals and plants that live in them, but very few know how important these habitats are. This module will help us to be aware of the habitat in our ponds and streams. Besides, it will also help us gain information that can qualitatively indicates whether the stream is healthy or not.

Bio-indicator is a simple biological method used to quantify assessment of water quality and river health based on the availability of macro-invertebrates found in freshwater. This method has been proven for its ability to give quick estimation of water quality with application of basic household utensils and bio-indicator (macro-invertebrates) chart even for beginners. Water quality is estimated based on the collection and identification of various macro-invertebrates species mainly aquatic insects. Bio-indicator requires individual to undergo minimal training and supervision.

Most macro-invertebrates that live in the freshwater can serve as pollution indicators. Based on how the macro-invertebrates can tolerate pollution in the water, these so-called 'pollution indicators' can be grouped in three; namely, a) those that can only live in very clean water habitat; b) those that can live between dirty and clean water; and c) those can live in polluted (and very polluted) water.

The so-called 'pollution indicators' in rivers can be grouped into three groups based on the pollution tolerance, from those that can only live in the cleanest water to those that can put up with dirty and polluted water. For instance, stonefly nymphs, mayfly nymphs, caddisfly larvae, river prawns, water penny larvae, riffle beetles' larvae, and long-mouthed saucer bug are highly sensitive to pollution, thus they are categorized in the first group. Alderflies larvae, dragonflies and damselflies nymphs, whirligig beetles larvae, riffle beetles larvae, mollusks, beetles, flatworms, and water hoglouse are somewhat tolerant to pollutions which means that they are in the second group. Finally, the last group belongs to blackfly larvae, phantom midge



APPENDIX

INTRODUCTORY CHAPTER:

INTRODUCTION TO UNESCO-IHP MALAYSIA, JKPLPA AND WATER WATCH PROGRAMME FOR YOUNG LEADERS (WWP4YL)

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