



Discover and Protect Hong Kong's Marine Life

**Teaching Pack
(Upper Primary)**

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LESSON OUTLINE (Upper Primary)

Topic: Marine Life in Hong Kong

Target: Upper Primary (P4 – P6)

Period: One 40 minute Lesson (plus 20 minutes advance preparation)

Subject: Science

Cross-curricular Links: Maths, English Language, PSHE.

Learning Objectives:

Knowledge (K)

After the lesson students should be able to:

1. Identify different types of marine life in Hong Kong;
2. Identify different marine habitat types in Hong Kong;
3. Identify the threats to marine life in Hong Kong;
4. Understand the concept of over-fishing;
5. Understand the concept of habitat destruction;
6. Propose solutions to the problems facing marine life in Hong Kong.

Skills (S)

After the lesson students should develop the following skills:

1. Collaboration
 - Work in groups to conduct the over-fishing experiment.
2. Communication
 - Comprehend instructions for setting up an experiment.
 - Communicate clearly with others to develop ideas.
 - Interpret the results of the experiment and draw a conclusion based on those results.
 - Use logical argument to persuade others of their beliefs.
3. Creativity
 - Think creatively about solutions to counter the threats to HK's marine life.

4. Critical Thinking

- Interpret the results of the experiment in such a way as to be able to devise a solution to the problems facing Hong Kong's marine life whilst being mindful of the needs of people.

Personal and Social Values/Attitudes (PV)

After the lesson students should be able to develop the following values/attitudes:

1. Caring and Concern;
2. Responsibility;
3. Commitment.

Advance Preparation – necessary as this 40-minute lesson is very full

You will need to ensure, prior to the lesson, that the desks are arranged in clusters to enable the students to work in groups of 5. For a class of 40 students you will need:

1. 40 pamphlets on marine life in Hong Kong (supplied with teaching pack)
2. 8 plastic buckets or large bowls each filled to the halfway mark with water (prepared in advance of the lesson)
3. 1 packet of frozen peas, defrosted and divided into:
 - 8 cups/bowls containing 30 peas each
 - 8 cups/bowls containing 24 peas each
5. 40 photocopies of worksheets 1 and 2
6. An acetate copy of the experiment set up guide supplied with the teaching pack.

Vocabulary

Artificial Reef	Disturbance	Fry	Nursery
Coral	Diversity	Habitat	Over-fishing
Crustaceans	Dweller	Juvenile	Reclamation
Current	Dynamite	Marine	Sheltered
Destructive	Estuarine	Mature	Spawning
Discarded	Exposed	Moratorium	Territorial

LESSON PLAN (UPPER PRIMARY)

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>Introduction</p> <p>What marine life does Hong Kong have?</p> <p>15 minutes</p>	<p>Active listening:</p> <ul style="list-style-type: none"> Listen to the presentation and be prepared to answer questions on each section. Ask questions for greater clarity. <p>Problem solving:</p> <ul style="list-style-type: none"> Participate in class discussion on threats to marine life in Hong Kong. Provide creative solutions to threats. 	<p>Hand out one pamphlet to each student.</p> <p>Ask students to think about the following issues while watching the PowerPoint presentation:</p> <ul style="list-style-type: none"> What sorts of marine habitats do we have in Hong Kong? What lives there? What threats are there to marine life in Hong Kong? <p>Stop the PowerPoint presentation after every habitat type and ask the students questions to enable them to verbally summarise the information given.</p> <p>Write up a list of threats on the board.</p> <p>Ask students to think of solutions to these threats.</p> <p>Explain the concept of a "moratorium" on fishing.</p> <p>Explain that the students are going to carry out some research on the effects of a moratorium on fishing.</p>	<p>Pamphlet</p> <p>PowerPoint presentation</p>	<p>K: 1, 2, 3, 4, 5, 6</p> <p>S: 2, 4</p> <p>PV: 1, 2, 3</p>

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>Research on Overfishing</p> <p>15 minutes</p>	<p>Follow experiment set up instructions on OHP.</p> <p>Each group collects:</p> <ul style="list-style-type: none"> • One bucket of water • One net • One cup A <p>Place peas from cup A into the water.</p> <p>Each student has a turn at "catching" the peas.</p> <p>Students complete Worksheet A</p> <p>Place peas from cup A and cup B into the water.</p> <p>Each student has a turn at "catching" the peas.</p> <p>Students complete Worksheet B</p>	<p>Place experiment instructions acetate on OHP.</p> <p>Split class into 8 groups of 5</p> <p>Ask students to empty their cup of frozen peas into the water.</p> <p>Ask students to proceed with experiment and complete Worksheet A.</p> <p>Explain to students that the 2-month moratorium has enabled fish fry numbers to increase.</p> <p>Hand out:</p> <ul style="list-style-type: none"> • One cup B to each group. <p>Ask the students to place the original peas back in the water along with the peas in cup B.</p> <p>Ask students to proceed with experiment and complete Worksheet B.</p>	<p>Experiment Instructions Acetate</p> <p>40 photocopies of Worksheets A and B</p> <p>8 buckets half filled with water</p> <p>8 small fishing nets</p> <p>8 cups/bowls "A" containing:</p> <ul style="list-style-type: none"> • 30 peas <p>8 cups/bowls "B" containing:</p> <ul style="list-style-type: none"> • 24 peas 	<p>K: 4 S: 1, 2 PV: 1, 2, 3</p>

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>Analysis of Results</p> <p>5 minutes</p>	<p>Respond to questions.</p>	<p>In relation to the first experiment ask students:</p> <ul style="list-style-type: none"> • Did fish numbers increase or decrease as they went through the experiment? • How many fish do they expect to catch next week? Why? <p>In relation to the second experiment ask students:</p> <ul style="list-style-type: none"> • What happened to fish numbers when we imposed the moratorium? • Did fish numbers increase or decrease as they went through the experiment? • How many fish do they expect to catch next week? Why? <p>NOTE: The experiment should allow students to deduce not only that the moratorium has a positive effect, but also that the moratorium alone is not enough. If we revert to over-fishing after the moratorium we will still deplete fish stocks to dangerously low levels. What is needed is fisheries management.</p>		<p>K: 3, 4 S: 2 PV: 1, 2, 3</p>

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>Is the moratorium enough?</p> <p>5 minutes</p>	<p>Give suggestions on other methods to enable sustainable fishing.</p>	<p>Ask students to give suggestions as to:</p> <ul style="list-style-type: none"> • Other methods that might allow sustainable fishing. 		<p>K: 4, 6 S: 2, 3, 4 PV: 1, 2, 3</p>
<p>Evaluation</p>	<p>Plotting figures on graph.</p>	<p>Assign Homework - preparing graph using figures from experiment</p>	<p>Pamphlet</p>	<p>K: 3, 4, 6 S: 2, 3, 4 PV: 1, 2, 3</p>

Name: _____

Worksheet A - Primary

(Before a 2 month fishing moratorium)

Results of Experiment

1. How many “fish” have you caught?

Trawl 1		Trawl 6	
Trawl 2		Trawl 7	
Trawl 3		Trawl 8	
Trawl 4		Trawl 9	
Trawl 5		Trawl 10	

2. How many “trawls” did your group do? _____
3. How many “fish” were left at the end of the exercise? _____

Analysis of results

1. Did the numbers of fish caught increase or decrease as you went through the experiment? _____
2. How many “fish” do you expect to catch next week? Give reasons for your answer.

Name: _____

Worksheet B

(after a 2 month moratorium on fishing over the summer months)

Results of Experiment

1. How many “fish” have you caught?

Trawl 1		Trawl 6		Trawl 11	
Trawl 2		Trawl 7		Trawl 12	
Trawl 3		Trawl 8		Trawl 13	
Trawl 4		Trawl 9		Trawl 14	
Trawl 5		Trawl 10		Trawl 15	

4. How many “trawls” did your group do? _____
5. How many “fish” were left at the end of the exercise? _____

Analysis of results

1. Did the numbers of fish caught increase or decrease as you went through the experiment? _____
2. How many “fish” do you expect to catch next week? Give reasons for your answer.

Experiment Guidelines

1. Collect water bucket and carry it back to your working area WITHOUT spilling the water!
2. Collect cup A (containing peas) and take it back to your working area.
3. Peas = Fish
4. Place the “fish” in the water.
5. Take turns at using the fishing net to “trawl” through the water for “fish”
6. PLEASE NOTE moving the fishing net once across the water counts as one trawl!
7. Place collected “fish” back in the cup that they came in and count how many are collected in each “trawl”
8. Note the number of “fish” collected and number of trawls made on your worksheet.

FOLLOW-UP ACTIVITIES

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>In-depth analysis of results</p> <p>10 minutes</p>	<p>Sit in original groups from over-fishing experiment.</p> <p>Group volunteer plots figures from Worksheet A onto graph.</p> <p>Look at graph and respond to questions.</p> <p>Group volunteer plots figures from experiment B onto graph.</p> <p>Analyse graph and respond to questions.</p>	<p>Sit students in original groups from over-fishing experiment.</p> <p>Ask a volunteer from one group to plot figures from Worksheet A onto graph</p> <p>Ask whether other groups had similar results.</p> <p>Ask students to report back:</p> <ul style="list-style-type: none"> • What the graph tells us about fish numbers after the same area is fished again and again. • What happened to fish numbers when we imposed the moratorium? <p>Ask a volunteer from another group to plot figures from Worksheet B onto graph</p> <p>Ask students to report back:</p> <ul style="list-style-type: none"> • What the second graph tells us about fish numbers after the area is fished again and again. 	<p>Graph paper copied onto acetate for use on an overhead projector</p>	<p>K: 3, 4 S: 2 PV: 1, 2, 3</p>

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>Is the moratorium enough?</p> <p>20 minutes</p>	<p>Write suggestions on other methods to enable sustainable fishing.</p>	<p>Ask students to write down suggestions as to:</p> <ul style="list-style-type: none"> • Other methods that might allow sustainable fishing. <p>Ask groups to write a list of:</p> <ul style="list-style-type: none"> • Individual action they can take to make fishing more sustainable. • Collective action that can be taken to make fishing more sustainable. 	<p>Paper to write up ideas on sustainable fishing for display in the classroom.</p>	<p>K: 4, 6 S: 2, 3, 4 PV: 1, 2, 3</p>
<p>Community Meeting Preparation</p> <p>20 minutes</p>	<p>As part of the role play students brainstorm on:</p> <ul style="list-style-type: none"> • Why their group is interested in the problem of over-fishing. • What sort of solution to the problem of over-fishing their group would like. <p>Scientists:</p> <ul style="list-style-type: none"> • Examine the results of the experiment. • Propose a solution to the problem of over-fishing <p>Other interest groups:</p> <ul style="list-style-type: none"> • Think of questions you would like answered by the scientists. 	<p>Divide the class into different interest groups for example:</p> <ul style="list-style-type: none"> • Scientists • Fishermen • A Green NGO • Shoppers • Fish traders • LegCo members 	<p>Results of over-fishing experiment from earlier lesson</p> <p>Pamphlet</p>	<p>K: 4, 6 S: 1, 2, 3, 4 PV: 1, 2, 3</p>

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>Community Meeting</p>	<ul style="list-style-type: none"> • Scientists present results and suggest solutions. • Question the scientists. • Each community group presents concerns and proposes a solution. • Question the different groups. • Everyone votes for a solution to the problem of overfishing. 	<ul style="list-style-type: none"> • First have scientists present their results and make suggest solutions to over-fishing. • Allow other groups to question the scientists. • Have each group present its concerns on over-fishing to the class. • Allow other groups to ask questions. • Every group proposes a solution – write these on board. • Class votes which solution it wants to adopt. 	<p>Ideas discussed in the preparation session.</p>	<p>K: 4, 6 S: 1, 2, 3, 4 PV: 1, 2, 3</p>
<p>Create a campaign poster 40 minutes</p>	<p>Design a poster to let other people know about the problems of over-fishing or habitat destruction.</p>	<p>Have students create a poster to make other people aware of the problem of over-fishing or habitat destruction.</p> <p>Keep the information in the poster simple and clear.</p>	<p>'Getting Heard' – A Handbook for Hong Kong Citizens written by Christine Loh and Civic Exchange.</p> <p>Marine pamphlet</p>	<p>K: 4, 6 S: 1, 2, 3, 4 PV: 1, 2, 3</p>

Teaching Point Timing	Student's Activity	Teacher's Activity	Resources	Objectives Check
<p>A Letter writing workshop</p> <p>40 minutes</p>	<p>Write a letter to a Legislator asking them to support sustainable fishing.</p>	<p>Locate address of local LegCo representative.</p> <p>Write a sample letter to show students.</p> <p>Letters should be:</p> <ul style="list-style-type: none"> • Clear • Succinct • Deal only with the one subject <p>You should:</p> <ul style="list-style-type: none"> • Back up your argument with facts • Include your contact details - name/address. <p>Ask students to think about what they have learned in the lesson and what they would like the government to do to resolve the problem of over-fishing.</p> <p>Eg. support a moratorium on fishing during summer months.</p> <p>Eg. support a system of fisheries protection areas.</p>	<p>'Getting Heard' - A Handbook for Hong Kong Citizens written by Christine Loh and Civic Exchange.</p> <p>Marine pamphlet</p>	<p>K: 4, 6 S: 1, 2, 3, 4 PV: 1, 2, 3</p>

Useful Website Addresses

Marine Life in Hong Kong

Artificial Reef Programme:

www.artificial-reef.net/main2.htm

Hong Kong Fishnet:

www.hk-fish.net/

Marine Parks:

www.afcd.gov.hk/parks/parks_e.htm

Marine Life Conservation and Habitat conservation:

www.afcd.gov.hk/conservation/con_e.htm

Hong Kong

Civic Exchange

www.civic-exchange.org

Hong Kong Government

Agriculture, Fisheries and Conservation Department:

www.info.gov/afcd

Clean Hong Kong Campaign:

www.info.gov.hk/cleanhongkong

Education Department:

www.info.gov/ed

Education Department - Teaching Resources

<http://resources.ed.gov.hk/envir-ed>

Environmental Protection Department:

www.info.gov/epd

Marine Department:

www.info.gov/mardep

Hong Kong Green Groups



Friends of the Earth:

www.foe.org.hk

Green Power:

www.greenpower.org.hk

Greenpeace China:

www.greenpeace-china.org.hk

Kadoorie Farm

www.kfbg.org.hk

The Conservancy Association

www.home.netvigator.com/~cahk

Worldwide Fund for Nature:

www.wwf.org.hk

International

Ocean and Marine Organisations

International Marinelife Alliance

www.marine.org

The Ocean Conservancy

www.oceanconservancy.org

WildAid's Shark Conservation Programme

www.acapworldwide.com/shark1.htm

The Philippe Cousteau Foundation

www.cousteaufoundation.org

Wildlife

Wildlife Conservation Society

www.wcs.org

Worldwide Fund for Nature

www.panda.org

Non-profit Organisations

The Nature Conservancy

www.tnc.org

Conservation International

www.conservation.org

Forum for the Future

www.forumforthefuture.org.uk

Greenpeace

www.greenpeace.org

Environmental Education

Council for Environmental Education

www.cee.org.uk

Education for a Sustainable Future

www.csf.concord.org/esf

North American Association for EE

www.naaee.org

OECD Environment and School Initiatives Project

www.ensi.org

UNESCO

www.unesco.org/education

UNED Forum

www.unedforum.org

Environmental Footprints

Global Footprints Project

www.globalfootprints.org