

# Weather and Climate

### Explanatory Notes for Teachers

Level: S2

Topic: Weather and Climate

Supporting Teaching Materials: Textbook and Students' Activity Sheet

#### Students' Prior Knowledge

Before attempting this ELA unit, students should have learned about the weather and climate of Hong Kong through the medium of Chinese.

#### Aims and Objectives

##### I. Content Objectives

After completing this ELA unit, students should be able to use English to:

1. list and describe the weather elements;
2. describe the changes in weather elements in different extreme weather conditions; and
3. explain the formations of monsoons in Hong Kong with the use of a graphic organizer.

##### II. Language Objectives

After the ELA activities, students will be able to:

1. understand and use the English terms related to this topic (e.g., *weather, climate, atmospheric conditions, short period of time, weather elements, temperature, rainfall, humidity, air pressure, cloud cover, wind, extreme weather conditions, typhoon, rainstorm, thunderstorm, strong monsoon, frost, fog, weather map, cold weather, a fire danger, rainstorm, tropical cyclone*)
2. understand and use English expressions for discussing key concepts related to weather elements, e.g.
  - *Humidity tells how much water vapour is in the air and is measured in relative percentiles (%)*
  - *Temperature tells how cold or hot the air is and is measured in degrees celsius.*
  - *Rainfall is water droplets from the clouds and is measured in millimetres.*
  - *Wind is the movement of the air and is measured in km/h (kilometres per hour)*
  - *Pressure is the weight of the atmosphere and is measured in hectopascals (hPa)*
3. understand and use the English expressions for explaining when some warning signals are issued by the Hong Kong Observatory, e.g.,
  - *The Strong Monsoon Signal is issued when winds are expected to exceed 40 kilometres per hour near sea level anywhere in Hong Kong.*
  - *A Special Announcement on Flooding is issued when heavy rain and flooding is expected to occur, or is occurring in the low-lying areas.*
  - *The cold weather warning is issued when cold weather is expected to occur so as to warn people to beware of low body temperature.*

- *A fire danger warning is issued when the relative humidity of the atmosphere is below a certain level and when the vegetation is dry.*
  - *A tropical cyclone warning is issued when a tropical cyclone centred within 800 km of Hong Kong poses a threat to the territory.*
  - *When very hot and fine weather is expected to occur, a very hot weather warning is issued to warn people, particularly those engaging in outdoor activities, of the risk of heatstroke and sunburn.*
4. understand and use English expressions for explaining the formation of monsoons in Hong Kong, e.g.,
- *In summer, the Asian Continent is heated up by the sun and the temperature increases rapidly. When the hot air rises, a low pressure system is formed on the continent. Air moves from high pressure areas to low pressure areas. Therefore, onshore wind blows from the sea to the land. The onshore wind brings moisture from the sea, so the relative humidity on the land is high. As a result, there is abundant rainfall and a very strong southwest monsoon occurs.*
  - *In winter, the Asian Continent is colder than the sea. When the air cools and sinks, a high pressure system is formed on the continent. Air moves from high pressure areas to low pressure areas. Therefore, offshore wind blows from the land to the sea. The offshore wind absorbs water vapour until it reaches the sea, so the relative humidity on the land is low. As a result, the weather in Hong Kong may experience a very dry and strong northeast monsoon.*

Procedure:

1. The Teacher should first review weather and climate vocabulary orally and ask students to categorize the words into 2 groups: *weather elements* and *extreme weather conditions*. This helps student to find out the semantic relationships of the words. The table at the top of the ‘Weather and Climate’ worksheet can be used to consolidate.
2. Using the words in the table, students can then be asked to create sentences using the sentence frame on the worksheet. Students fill in the missing words in the sentences and practise describing the attributes of different weather elements under various extreme weather conditions.
3. In **Task 1**, students complete the table with the correct words by reference to the definitions of weather elements in the column labelled ‘What is it?’. **Variation 1** is designed for more able students and asks them to structure the words and definitions into sentences.
4. **Task 2** illustrates how the teacher can encourage students to give answers from word level to sentence level. **Task 2 – Variation 1 Pair Work Activity** *The teacher gets students to work in pairs. Student A reads the meanings of the warning signals used by the Hong Kong Observatory to another student (Student B). Student B listens to Student A’s reading and tells how the weather conditions of Hong Kong would be affected.*
5. In **Task 3**, the teacher asks students to refer to diagrams (from the textbook) explaining how winter and summer monsoons are formed. Using the flowchart in the student’s activity sheet, students complete the missing parts (e.g. verbs / adjectives) of the sentence to explain the formation of monsoons in Hong Kong.

## Weather and Climate

### 1. Vocabulary

We can arrange the vocabulary we learn in this unit like this:

A. Weather – atmospheric conditions of a place over a short period of time.			
Weather elements		Extreme weather conditions in HK	
temperature	rainfall	typhoon	strong monsoon
humidity	pressure	rainstorm	fog
cloud cover	wind	thunderstorm	frost

### 2. Useful sentences



When an (**extreme weather condition**) occurs, Hong Kong has (**weather element**).

	Extreme weather condition	occur	Hong Kong has	adjective	weather element
When a	 Typhoon	occurs	Hong Kong has	strong	
	 Red 紅 Rainstorm			heavy	
	Summer Monsoon  Monsoons Winter monsoon			heavy	
When	 Fog			cold & dry	
	 Frost			thick	
				low	

## Task 1 - Weather map and weather elements



We can get to know weather elements and their measuring units from reading a weather map.

		Weather element	What is it?	Unit of measurement
The weather map is used to show the weather condition of a place.			how cold or hot the air is	
			water droplets falling from the clouds.	
			the movement of the air.	
			the weight of the atmosphere.	
			how much water vapour is in the air.	

Task 1 – Variation 1 “Weather map and weather elements”

<u>Weather element</u>		<u>What is it?(meaning)</u>		<u>Unit of measurement (symbol)</u>
		◆ ..... tells how cold or hot the air is	and is measured in	
		◆ .....is the weight of the atmosphere		
		◆ .....is water droplets falling from clouds		
		◆ ..... tells the movement of the air		
		◆ .....tells how much water vapour is in the air		

Weather element	+ meaning	+ <i>and is measured in</i>	+ measuring unit.
 <b><u>Humidity</u></b>		_____ <i>and is measured in</i>	_____.
	_____	_____ <i>and is measured in</i>	_____.
	_____	_____ <i>and is measured in</i>	_____.
	_____	_____	_____.
	_____	_____	_____.

Task 2 - “Warning signals and weather elements”

(please refer to Aristo: Weather and Climate – do they matter? Workbook p. 7-1)

Match the weather element in column A with the extreme weather conditions in column B and the warning signals in column C

Column A		Column B		Column C
Weather elements		Extreme weather conditions		Warning signals
Wind		Rainstorm		 季候風 Monsoons
Rainfall		Drought		
Temperature		Strong monsoon wind		 冷 COLD
Humidity		Cold snap		 紅 Red

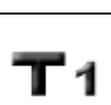
Ask your students to construct sentences by using the following expressions:

When the (warning signal) is issued, Hong Kong is affected by (extreme weather conditions). Hong Kong experiences high/low/strong/mild (weather element).

e.g. When a Special Announcement on Flooding in the northern New Territories is issued, Hong Kong is affected by a rainstorm. Hong Kong experiences strong winds and heavy rainfall.

## Task 2 – Variation 1 Pair Work Activity “Warning signals and weather elements”

Work in pairs. Student A reads the meanings of the warning signals used by Hong Kong Observatory to another student (Student B). Student B listens to Student A’s reading and tells how the weather conditions of Hong Kong would be affected.

Student A		Student B
Warning signals	Meanings (www.hko.gov.hk)	Which of the weather element(s) will be affecting Hong Kong weather conditions?
 季候風 Monsoons Summer monsoon	The Strong Monsoon Signal is issued when <u>winds (associated with the summer or winter monsoon) are blowing in excess of, or are expected to exceed, 40 kilometres per hour</u> near sea level anywhere in Hong Kong.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	A <i>Special Announcement on Flooding in the northern New Territories</i> will be issued by the Hong Kong Observatory whenever <u>heavy rain affects the area</u> and flooding is expected to occur, or is occurring in the low-lying plains of the northern New Territories.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	The cold weather warning is issued whenever <u>cold weather is expected</u> in Hong Kong to warn people to beware of low body temperature.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	A fire danger warning is issued whenever <u>the relative humidity of the atmosphere is below a certain level</u> and when the vegetation is dry.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	The frost warning is issued whenever ground frost is expected to occur on high ground or inland in the New Territories.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	The rainstorm warning system is designed to alert the public about <u>the occurrence of heavy rain which is likely to bring about major disruptions</u> , and to ensure a state of readiness within the essential services to deal with emergencies.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	A tropical cyclone warning is issued by the Hong Kong observatory whenever <u>a tropical cyclone centred within 800 km of Hong Kong</u> poses a threat to the territory.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind
	When <u>very hot and fine weather is expected</u> , very hot weather warning is issued to warn people, particularly those engaging in outdoor activities, of the risk of heatstroke and sunburn.	<input type="checkbox"/> High / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind

Task 3: Monsoon in Hong Kong.



How a monsoon is formed and how it affects the weather of Hong Kong.  
 Look at the 2 diagrams on p.17 and 18 of the textbook and read about the formation of monsoons in Hong Kong. Then complete the chart below.

In summer, the continent is heated, so	
	The temperature _____
1. Air rises, then	
	_____ is formed.
2. Air moves from high pressure area to low pressure area. Therefore,	
	Onshore wind blows from _____ to _____.
3. Onshore wind brings moisture from the sea, so	
	Relative humidity is _____.
As a result, Hong Kong may experience extreme weather:	
	Black 黑 _____
	_____

How a monsoon is formed and how it affects the weather of Hong Kong



In winter, the continent is cooled, so	
	the temperature _____
1. Air cools and sinks, then	
	_____ is formed.
2. Air moves from low pressure areas to high pressure areas. Therefore,	
	offshore winds blow from _____ to _____.
3. Offshore winds take moisture from the land, so	
	relative humidity is _____.
As a result, Hong Kong may experience extreme weather conditions:	
	_____

Weather and Climate

3. Vocabulary

We can arrange the vocabulary we learn in this unit like this:

A. Weather – atmospheric conditions of a place over a short period of time.			
Weather elements		Extreme weather conditions in HK	
temperature	rainfall	typhoon	strong monsoon
humidity	pressure	rainstorm	fog
cloud cover	wind	thunderstorm	frost

4. Useful sentences



When (extreme weather conditions) occur, Hong Kong has (weather elements).

	Extreme weather conditions	occur	Hong Kong has	adjective	weather elements
When a	 Typhoon	occurs	Hong Kong has	strong	wind
	 Rainstorm			heavy	rainfall
	Summer Monsoon  Monsoons Winter monsoon			heavy	rainfall
When	 Fog			cold & dry	wind
	 Frost			thick	cloud cover
				low	temperature

Task 1 - Weather map and weather elements



We can get to know weather elements and their measuring units from reading a weather map.

		Weather element	What is it?	Unit of measurement
The weather map is used to show the weather condition of a place.		<u>temperature</u>	how cold or hot the air is	<u>degrees celsius</u> <u>(°C)</u>
		<u>rainfall</u>	water droplets falling from the clouds.	<u>millimetres</u> <u>(mm)</u>
		<u>wind</u>	the movement of the air.	<u>km/h</u> <u>(kilometres per hour)</u>
		<u>air pressure</u>	the weight of the atmosphere.	<u>hectopascals</u> <u>(hPa)</u>
		<u>humidity</u>	how much water vapour is in the air.	<u>relative humidity in percentage</u> <u>(%)</u>

Task 1 – Variation 1 “Weather map and weather elements”

<u>Weather element</u>		<u>What is it?(meaning)</u>		<u>Unit of measurement (symbol)</u>	
		◆ ..... tells how cold or hot the air is	and is measured in	<u>degrees celsius</u>	<u>(°C)</u>
		◆ .....is the weight of the atmosphere		<u>Hectopascals</u>	<u>hPa</u>
		◆ .....is water droplets falling from clouds		<u>percentages (relative humidity)</u>	<u>(%)</u>
		◆ ..... tells the movement of the air		<u>kilometres per hour (wind speed)</u>	<u>km/h</u>
		◆ .....tells how much water vapour is in the air		<u>millimetres</u>	<u>(mm)</u>

Weather element	+ meaning	+ <i>and is measured by</i>	+ measuring unit.
 <b>Humidity</b>	<u>tells how much water vapour is in the air and is measured in relative percentage (%)</u>		
 <b>Temperature</b>	<u>tells how cold or hot the air is and is measured in degrees celsius.</u>		
 <b>Rainfall</b>	<u>is precipitation of water droplets and is measured in millimetres.</u>		
 <b>Wind</b>	<u>tells the movement of the air and is measured in km/h (kilometres per hour)</u>		
 <b>Low pressure system</b>	<u>means the atmospheric pressure over a region is lower than its surroundings and is measured in hectopascals (hPa)</u>		

Task 2 - “Warning signals and weather elements”

(please refer to Aristo: Weather and Climate – do they matter? Workbook p. 7-1)

Match the weather element in column A with the extreme weather conditions in column B and the warning signals in column C

Column A		Column B		Column C
Weather elements		Extreme weather conditions		Warning signals
Wind		Rainstorm		
Rainfall		Drought		
Temperature		Strong monsoon wind		
Humidity		Cold snap		

Ask your students to construct sentences by using the following expressions:

When the (warning signal) is issued, Hong Kong is affected by (extreme weather conditions). Hong Kong experiences high/low/strong/mild (weather element).

e.g. When a Special Announcement on Flooding in the northern New Territories is issued, Hong Kong is affected by a rainstorm. Hong Kong experiences strong winds and heavy rainfall.

Task 2 – Variation 1 Pair Work Activity “Warning signals and weather elements”

Work in pairs. Student A reads the meanings of the warning signals used by Hong Kong Observatory to another student (Student B). Student B listens to Student A’s reading and tells how the weather conditions of Hong Kong would be affected.

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	When <u>very hot and fine weather is expected</u> , very hot weather warning is issued to warn people, particularly those engaging in outdoor activities, of the risk of heatstroke and sunburn.	<input checked="" type="checkbox"/> <b>High</b> / low temperature <input type="checkbox"/> Heavy / low rainfall <input type="checkbox"/> High / low relative humidity <input type="checkbox"/> Strong / mild wind

Answers

Task 3: Monsoon in Hong Kong.



How a monsoon is formed and how it affects the weather of Hong Kong.  
 Look at the 2 diagrams on p.17 and 18 of the textbook and read about the formation of monsoons in Hong Kong. Then complete the chart below.

In summer, the continent is heated, so	
	The temperature <u>increases.</u>
1. Air rises, then	
	<u>a low pressure system</u> is formed.
2. Air moves from high pressure area to low pressure area. Therefore,	
	Onshore wind blows from <u>sea</u> to <u>land.</u>
3. Onshore wind brings moisture from the sea, so	
	Relative humidity is <u>high.</u>
As a result, Hong Kong may experience extreme weather:	
	The <b>black rainstorm signal</b> may be hoisted.
	A special announcement on Flooding in the northern New Territories may be issued.

How a monsoon is formed and how it affects the weather of Hong Kong



In winter, the continent is cooled, so	
	the temperature <u>falls / drops</u>
1. Air cools and sinks, then	
	<u>a high pressure system</u> is formed.
2. Air moves from low pressure areas to high pressure areas. Therefore,	
	offshore winds blow from <u>land</u> to <u>sea.</u>
3. Offshore winds take moisture from the land, so	
	relative humidity is <u>low.</u>
As a result, Hong Kong may experience extreme weather conditions:	
	The cold weather warning may be issued.