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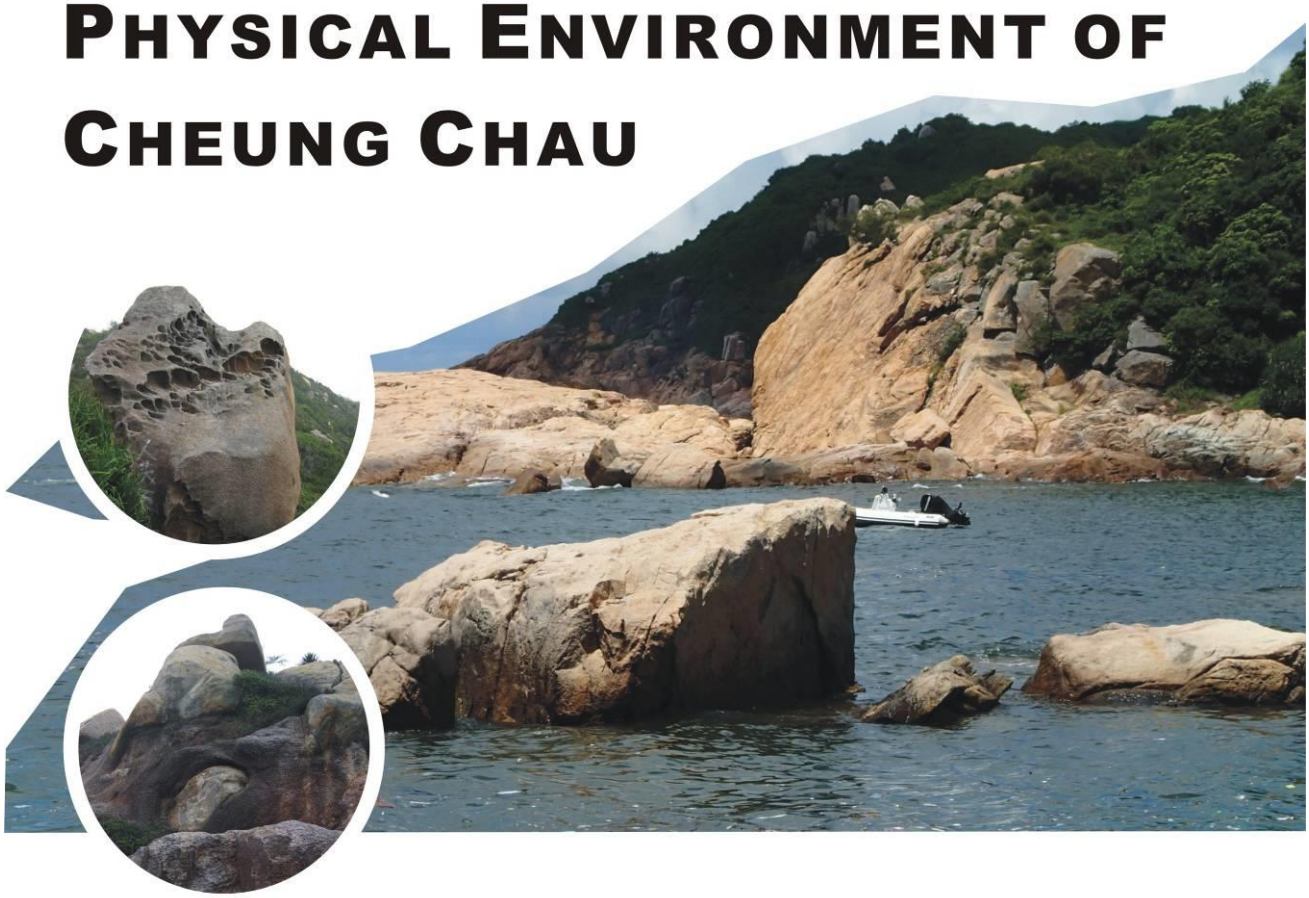
Caritas Chan Chun Ha Field Studies Centre

PHYSICAL ENVIRONMENT OF CHEUNG CHAU



- Name: _____
- Group number: _____
- Course Date: _____

COURSE OBJECTIVES:

Knowledge:
- To observe the geology in Cheung Chau
- To understand the physical landscapes along Little Great Wall to Nam Tum in Cheung Chau in relation to internal and external processes (weathering, erosion and mass wasting)

Skill:
- To practise geological fieldwork techniques
- To measure the weather conditions by field equipment

Value:
- To appreciate and cherish the invaluable geological resources

RELEVANCE TO DSE GEOGRAPHY CURRICULUM

- Dynamic Earth: The building of Hong Kong
- Managing coastal environments: A continuing challenge

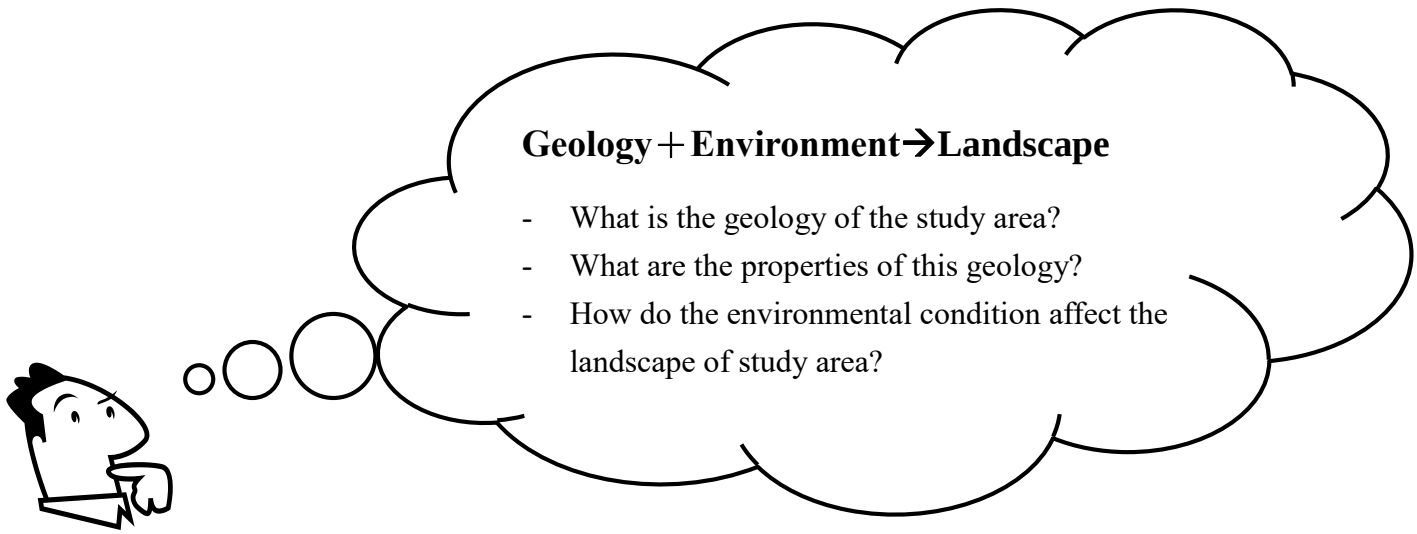
EQUIPMENT & MATERIALS

FIELDWORK

Equipment/ Materials	Quantity (for each group)	Check-in	Check-out
1. anemometer	1		
2. thermo-hygrometer	1		
3. compass	1		
4. steel screw	1		
5. magnifier	2		
6. Card for grain size classification of granitic rocks	1		
7. gloves	as needed		

ROUTE

- Site 1: Nam Tum
- Site 2: Outside Lover's Cave
- Site 3: Human Head Rock

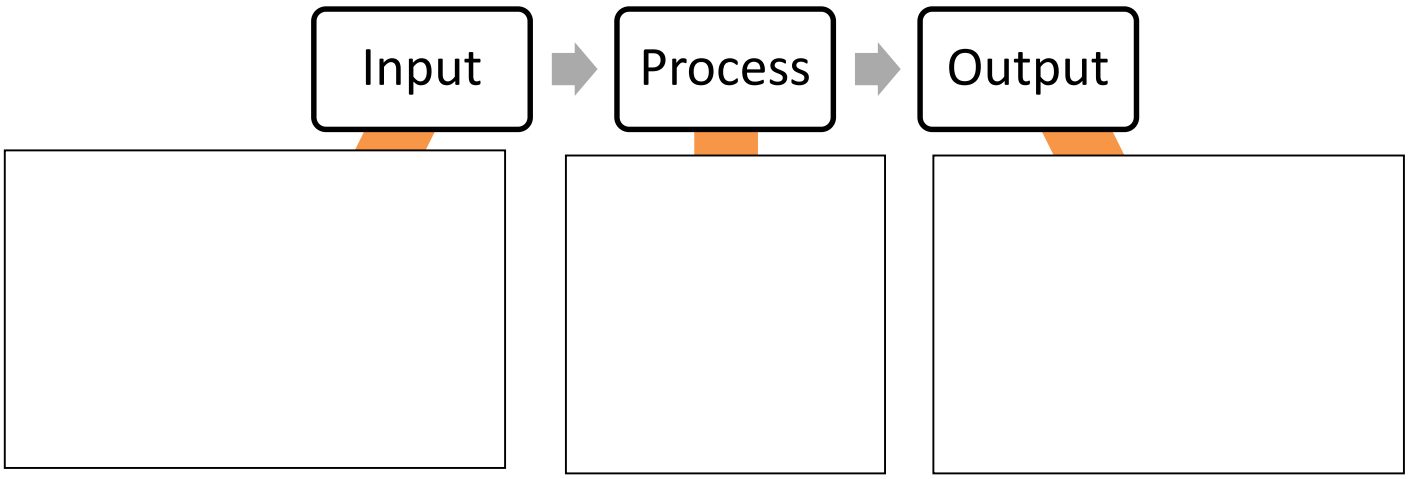


PLANNING & PREPARATION

1. When to collect data?

Date: _____	Time:_____ to _____

2. What data to collect? (Choose the words from the table below and fill in the boxes)



landform	weathered material	weathering	erosion	mass wasting
solar radiation	precipitation	vegetation	parent rock	time

DATA COLLECTION

Site 1 - Nam Tum

Measure the weather condition and fill in Table 1.

Weather condition	Air temperature:	Relative humidity:	Aspect:
	Wind direction:	Wind speed:	Altitude: 3 m
Other locational characteristics (if any):			
Tidal level	Time of fieldwork: _____ Tidal condition: flood/ stand of tide/ ebb		

Table 1

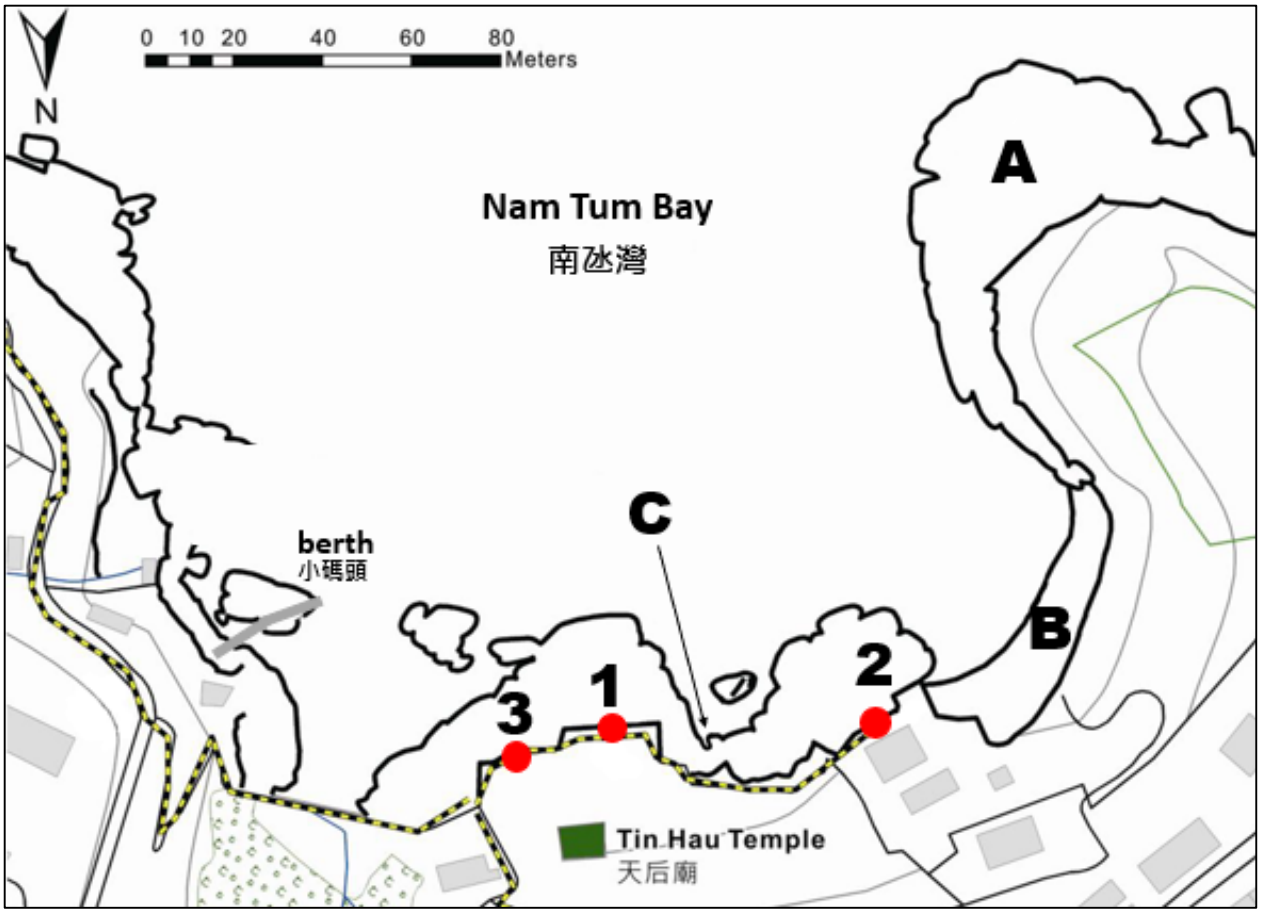


Figure 1: Sketch map of Nam Tum

POINT 1

a) Observe A, B and C, fill in the table below.

Location	A*	B	C
What are the coastal landforms?	(raised)		
What is the major process for the formation of respective landform?	**Erosion/ Deposition**	**Erosion/ Deposition**	**Erosion/ Deposition**
Is the coastal landform still developing?			

b) Face **SOUTH** and observe the rocky shore.
Fissures of different arrangements appear on the rocks. What are they and how they occur?

_____

_____

POINT 2

a) Observe the designated boulder.

i. Two contrasting sizes of mineral grains are observed on the rock surface. Use the field scale card to measure the size of these mineral grains.
Grain size: (left) _____ (right) _____

ii. Draw the boundary of the two contrasting sizes of mineral grains on Figure 2.

iii. Why the boundary occur on the rock?

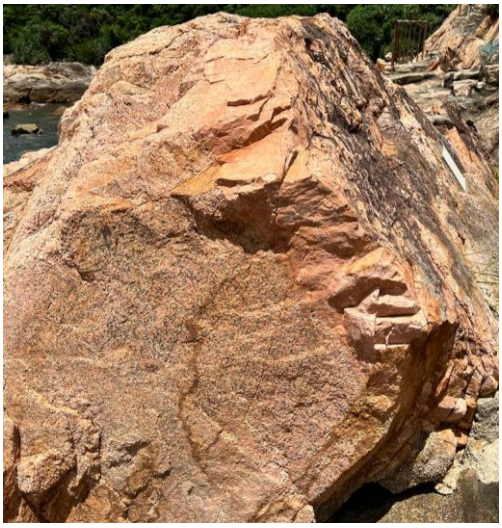


Figure 2

_____

_____

iv. Observe the rock with larger grain size, fill in the feature below:

Rock characteristics	Texture: phaneritic/ aphanitic	Grain size (mm):
	Minerals:	Colour: Light/ dark
	Rock type:	Rock name:

b) Observe the rock surface (Figure 3).

i. What is the colour of the rock surface? _____

ii. Describe the distribution that colour: _____

iii. What is it? How will it favour the weathering of rock?

_____

Figure 3

POINT 3

a) Observe the white lines on rock (Figure 4).

i. Refer to Mohs' Scale of Mineral Hardness, what kind of mineral do these white lines belong to?
(Hints: Talc 滑石/ Calcite 方解石/ Flourite 螢石/ Quartz 石英)

ii. Therefore, the white lines formed by this process are called talc vein / calcite vein / fluorite vein / quartz vein .

iii. Comparing the rock with this mineral, which one is more resistant? _____

iv. These white minerals are in liquid state during the formation. Think about the processes of how the lines changed from liquid to solid state. *(Hints: Melting point of this substance is 500-600℃)*

_____

_____

_____

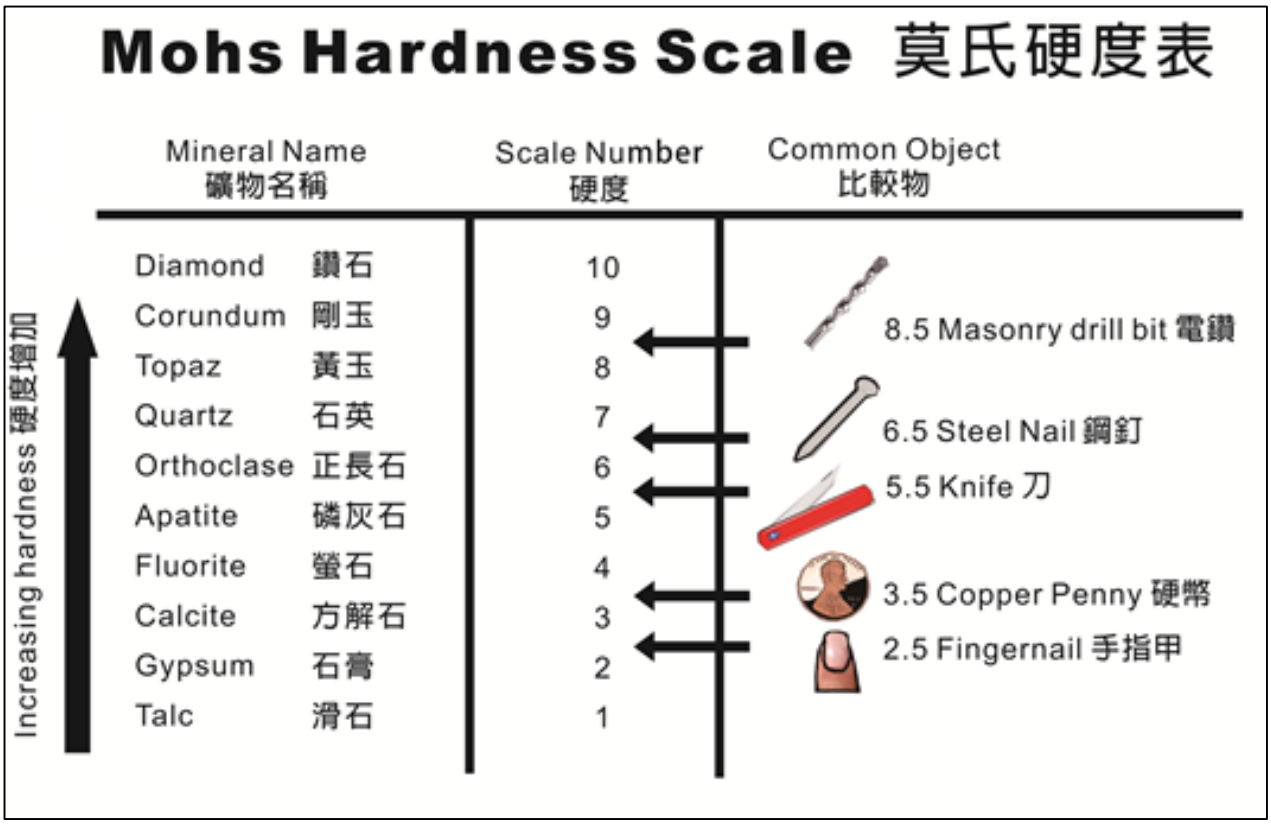


Table 2

Figure 4

v. The structure looks similar to that of Figure 4, what is it?

_____

vi. Use a compass and measure the trend of this structure.

_____

Site 2 – Outside Lover's Cave

Measure the weather condition and fill in table below.

Weather condition	Air temperature:	Relative humidity:	Aspect:
	Wind direction:	Wind speed:	Altitude: 51 m
Other locational characteristics (if any):			

a) Grab the grains from the bottom of the rock wall and answer the followings.

i. What kind of minerals can you find? _____

ii. Where are the minerals from? _____

iii. What kind of weathering process has been taking place? _____

iv. Which kind of minerals has the largest proportion? Why?

_____

b) Observe the figure below.

Figure 5 Round boulder outside Love's Cave

i. On the rock wall outside Lover's Cave, can you find the boulder as shown in Figure 5?
The boulder is called _____.

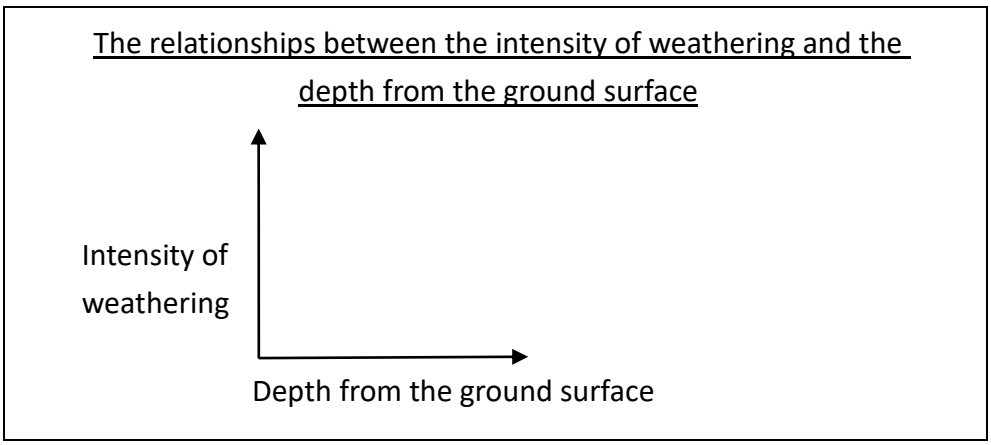
ii. Thus, what kind of weathering has been taking place? _____

iii. Referring to Figure 6 and evidence from the rock wall, draw annotated diagrams to show the **past appearance** and predict the **future appearance** of the boulder.

Figure 6 Present appearance

Past appearance (Hints: Observe the bottom part of the rock wall.)	**Future appearance** (Hints: Observe the top of the rock wall.)

iv. From Figure 6 and field observation, complete the graph below to show the relationships between the intensity of weathering and the depth from the ground surface.



v. The likelihood of mass wasting in this slope is _uncommon / common / very common ._

vi. What kind of mass wasting is likely to take place if intense weathering continues affecting the boulder? _____

c) Observe the path you passed through.

i. It is a physical landscape called _valley / rapid / badland / gully_ which is caused by erosion.

ii. List **THREE** conditions which leading to the formation of this landscape.

❶ ❷ ❸

_____

Site 3 - Human Head Rock

Measure the weather condition and fill in table below.

Weather condition	Air temperature:	Relative humidity:	Aspect:
	Wind direction:	Wind speed:	Altitude: 30 m
Other locational characteristics (if any):			
Tidal level	Time of fieldwork: _____ Level: _____ (high/ average/ low)		

a) Observe the rock near the cliff and fill in the table below.

Location	Human Head Rock
What kind of biological weathering agents can be found on the rock?	
How do the living organisms facilitate weathering on the rock?	
Is it a kind of physical or chemical action?	Physical / Chemical

a) Are the tanfoni <u>evenly distributed</u> on the Human Head Rock? <u>Yes / No</u> Why?

_____

_____

_____

_____

b) Observe the Human Head Rock.

i. What kinds of weathering has been taking place on this rock?

_____

_____

ii. Infer how weathering processes lead to the formation of tanfoni.

_____

_____

_____

_____

iii. What are the favourable factors for the above weathering processes?

_____

_____

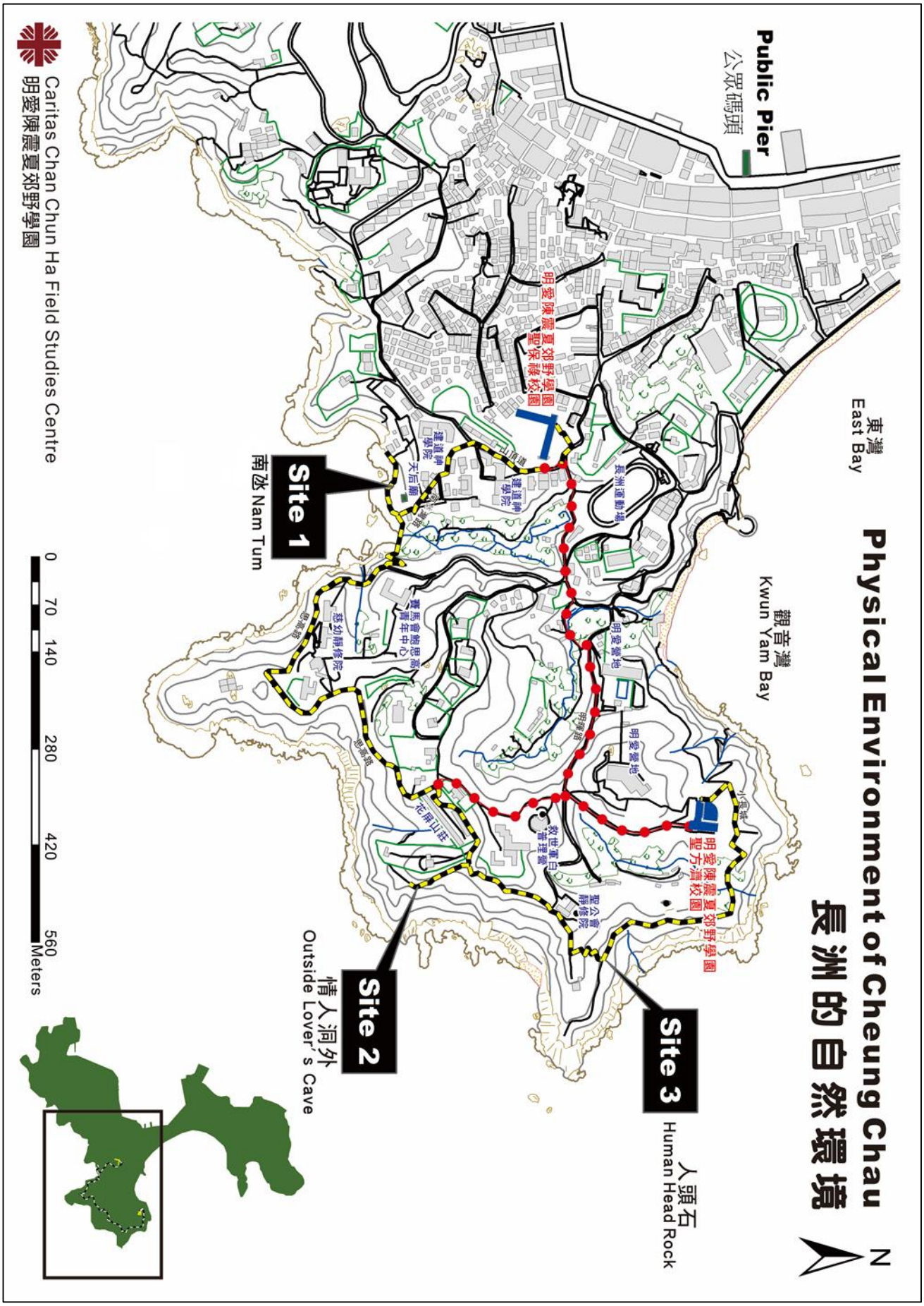
DATA PROCESSING, PRESENTATION AND ANALYSIS

Complete the observation summary below.

		Landforms/ structures	Major weathering or erosion agents	Locations	Environmental factors
Evidences of external processes	Types of weathering				
				Outside Lover's Cave	
				Human Head Rock	
	Landforms formed by erosion	Geo			
		Wave-cut platform			
		Sea cliff			
			Rainsplash		
		Tafoni		Human Head Rock	
Evidences of internal processes					

DISCUSSION QUESTIONS

1. With reference to the field evidences, what are the factors affecting the intensity of weathering of landforms in Cheung Chau?
2. Comparing different types of weathering / erosion agents, which one has the greatest impact on the development of erosional landforms in Cheung Chau?
3. 'Volcanism was common in Cheung Chau in the past.' Discuss the validity of this statement with reference to the field evidence.


Physical Environment of Cheung Chau
長洲的自然環境
Caritas Chan Chun Ha Field Studies Centre
明愛陳震夏郊野學園
Public Pier
公眾碼頭
東灣
East Bay
觀音灣
Kwun Yam Bay
Site 1
南丫 Nam Tum
Site 2
情人洞外
Outside Lover's Cave
Site 3
人頭石
Human Head Rock
N
0 70 140 280 420 560
Meters