

Unit 5 Why do our slopes collapse?

A What is a landslide?



What is the danger?

1 Study the photos below and fill in the following blanks.

Kotewall Road landslide killed 67 people



Two shipyards destroyed in Sum Wan landslide



Fig. 5.1 A danger in Kotewall Road

Fig. 5.2 A danger in Shum Wan

Tonnes of _____ and _____ fell down the steep _____ in a matter of seconds. The falling materials buried the road and some of the _____. These events may _____ and even kill some _____. This phenomenon is known as a _____. It is very common in the _____ season in Hong Kong.



For question 1

- houses
- landslide
- hurt
- slope
- rocks
- soil
- rainy
- people

2 Are there any steep slopes near your home or school? Identify some of the steep slopes.

3 How do you feel about the danger of landslides?



Ac-Focus

To describe the scene and the general characteristics of a landslide through photographs.

There are thousands of slopes in Hong Kong. Some of them are gentle and stable, but some are steep and dangerous.

The rapid fall of soil and rocks down a slope due to gravity is known as a **landslide**. In Hong Kong, during the rainy season, landslides are common on steep slopes that have a large amount of loose soil and rocks (Fig. 5.3).

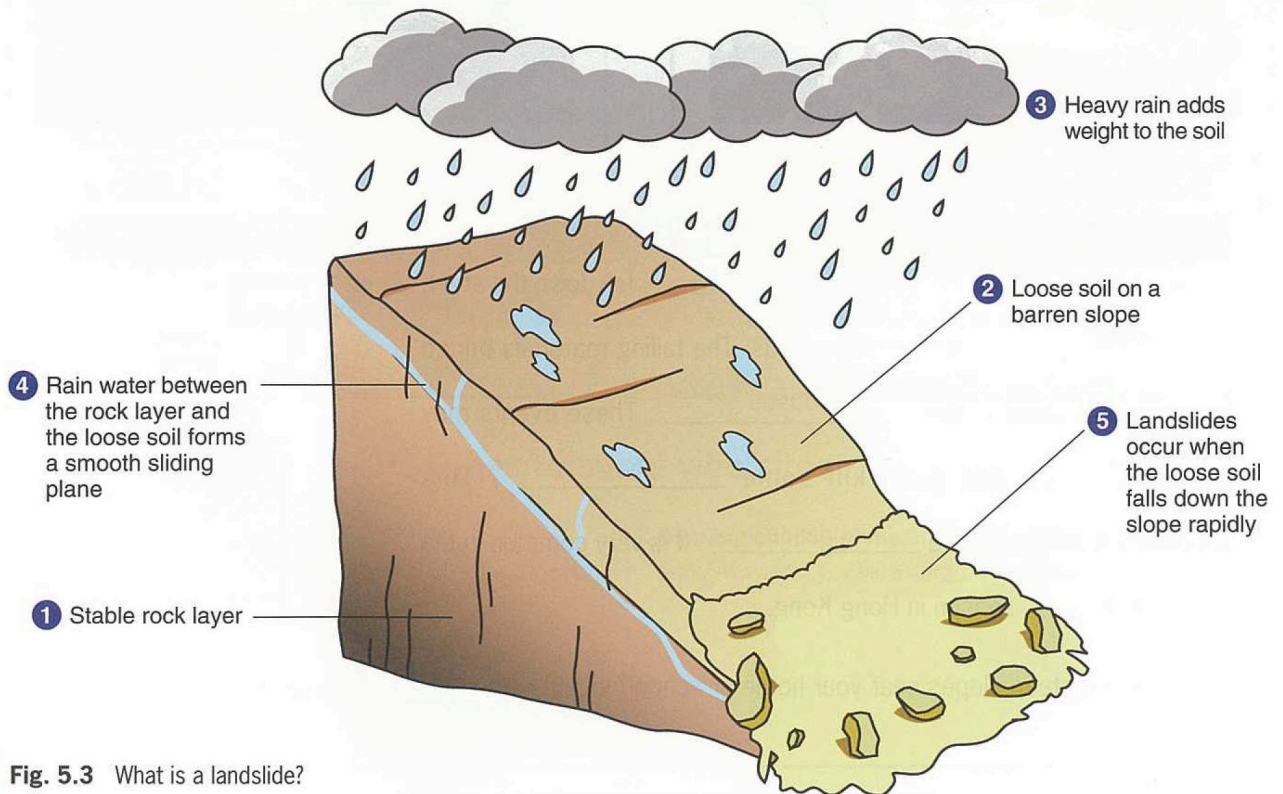


Fig. 5.3 What is a landslide?



B What are the major conditions needed for landslides to occur?

activity 5.2

Why do landslides occur?

Study Fig. 5.4 and answer the following questions.



Fig. 5.4 Some serious landslides in Hong Kong

1 The slopes where the landslides occurred are rather (gentle / steep). They contain a large amount of loose _____ and small _____ .

2 Describe the rainfall conditions when the landslides occurred.

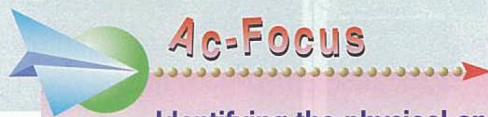
Source: JKP 6/1999

Fig. 5.7 The climatic graph of Hong Kong

3 Describe the human activities found at the site of the landslides.

4 In the table below, write down two physical factors and one human factor that causes landslides.

Two physical factors	One human factor
<ul style="list-style-type: none"> • Relief: 	
<ul style="list-style-type: none"> • Rainfall: 	



Identifying the physical and human factors that lead to landslides.

Landslides are very common in Hong Kong. In the rainy season, they can pose a great threat to people. The following are the factors which cause landslides.

Unstable slopes

Landslides occur easily on the slopes with:

- 1) a thick layer of loose soil and small rocks on the surface;
- 2) a steep gradient; and
- 3) little vegetation cover.

Weathering is serious in Hong Kong because of its hot and wet climate. The process can break down the rocks and produce a thick layer of soil on slopes.



According to the Slope Catalogue produced by the Geo-technical Engineering Office (GEO) in 1998, there are more than 54 000 man-made slopes and retaining walls in Hong Kong.





Fig. 5.5 An unstable slope in Castle Peak

If the slopes are barren and steep, there will be no vegetation roots to bind the soil together. As a result, the soil layer will be loose and unstable. It can slide down easily due to gravity (Fig. 5.5).

Heavy rainfall

Most of the landslides in Hong Kong occur in summer, especially when there is intense rain over a long period of time (Figs. 5.6 and 5.7).

Rain water adds weight to the soil and encourages downslope movement. This makes landslides occur more easily.

Torrential rain causes landslides and floods

The Hong Kong Observatory recorded more than 200 mm of rain yesterday in Hong Kong. Over 60 cases of landslides and flooding were reported.

Source: JKP 8/1999

Fig. 5.6 Heavy rainfall is a major cause of landslides

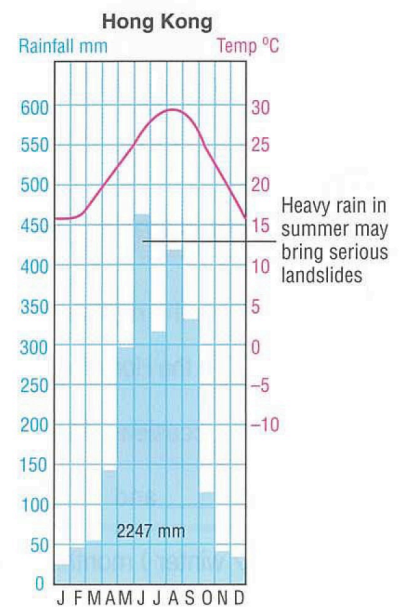


Fig. 5.7 The climatic graph of Hong Kong

Intense human activity on steep slopes

With limited lowlands and rapid urban development, many slopes in Hong Kong have been developed. Vegetation on them has also been cleared for building houses and roads. All these human activities make the slopes unstable and may cause serious landslides (Fig. 5.8).

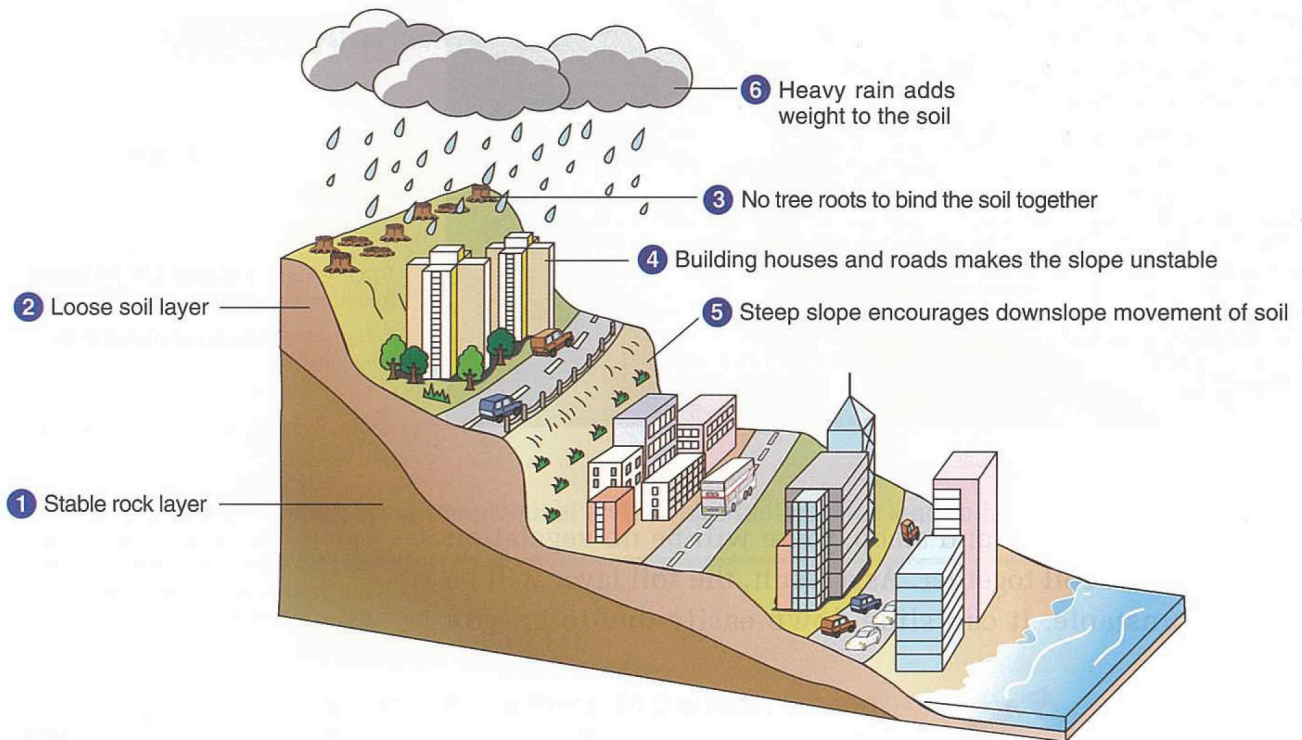


Fig. 5.8 Physical and human factors leading to landslides



more to learn

Study the table on the right and fill in the blanks.

In 2001 and 2002, the Hong Kong Observatory issued landslip warnings in four occasions. All of these warnings were issued in _____ and _____ which are the (summer / winter) months in Hong Kong.

Landslip warning			
Started at		Ended at	
Time	Date	Time	Date
15:30	30 Aug 2001	23:15	30 Aug 2001
22:45	01 Sep 2001	10:00	2 Sep 2001
03:30	08 Sep 2001	08:45	08 Sep 2001
11:00	10 Aug 2002	15:00	10 Aug 2002

C How do landslides affect us?

activity 5.3



What is the impact of landslides on us?

Study the newspaper reports below and answer the following questions.

Landslides at Sham Tseng San Tsuen

Four landslides occurred on the hillside above Sham Tseng San Tsuen. They demolished a house and its detached kitchen. One death and thirteen injuries were reported.

Source: JKP 23/8/1999

Landslide at Ching Cheung Road

A landslide led to closure of Ching Cheung Road. Traffic was seriously affected.

Source: JKP 3/8/1997

Fig. 5.9 Newspaper reports on the impact of landslides

1 Put a '✓' next to the effects that could be brought about by landslides.

Traffic congestion

Air pollution

Loss of life

Evacuation of residents

Damage to property

Flooding

2 Imagine you were the head of Sham Tseng San Tsuen. Suggest one way to reduce the impact of the dangers of landslides.



Ac-FOCUS

Landslides are a major danger in Hong Kong.

Landslides have long been a potential danger to Hong Kong people. They can affect our lives in the following ways:

Causing death and injury

Large-scale landslides can cause deaths and injuries. In June 1972, 148 people were killed in the Sau Mau Ping landslide.

Damaging property

Landslides can cause damage to buildings and roads (Fig. 5.10).

Traffic congestion

After a landslide, sand and rocks may block the main roads and cause serious traffic congestion (Fig. 5.11).



From 1945 to 1995, 470 people were killed in landslides.



Fig. 5.10 A temple in Sha Tin damaged by a landslide



Fig. 5.11 A road blocked by a landslide



more to learn

Go to the web site



<http://hkss.ced.gov.hk/hkss/eng/whatsnew/lic/index.htm>

and learn more about the impact of landslides on us.

*main points
to remember*



A

- 1 A landslide is the rapid fall of soil and rocks down a slope due to gravity.

B

- 1 Landslides occur on steep slopes which are barren and covered with a thick layer of soil.
- 2 Landslides occur frequently in summer when there is intense rain over a long period of time.
- 3 Intense human activity on steep slopes can cause serious landslides.

C

- 1 Loss of life, damage to property and serious traffic congestion are the potentially dangerous effects of landslides on us.