There was an old seawall at the bottom of the cliff in front of the hotel.	Heavy weight on the cliff top can cause the cliff to fail under the force of gravity.	Waves erode the base of the cliff by abrasion and hydraulic action.
Rainwater can get inside the cliffs through cracks.	The coastal defences at Scarborough are very expensive to maintain.	The Holbeck Hall Hotel is south of Scarborough.
There was a car park and hotel gardens at the top of the cliff.	There is a small sandy beach at the bottom of the cliff below the Holbeck Hall Hotel.	There was a big storm with lots of rain on the night of the 4th June.
The cliffs are made of glacial till, a type of clay.	The cliff face is very steep.	The longshore drift is from north to south.
Cracks form in clay when it gets very dry.	The Holbeck Hall Hotel was originally built in 1880.	Clay is a soft rock which erodes easily.
The Yorkshire coastline has the highest rate of coastal erosion in Europe.	About 2 metres of land along this coast is lost to the sea every year.	The Government is trying to reduce the amount of money spent by local councils.
Scarborough is a large town with a population of over 50,000 people.	The coast has a large fetch with powerful waves from the North Sea.	Scarborough is a very popular holiday destination.
A geologist said, *'We have to expect events like this to happen every now and again. We can build seawalls to protect the cliffs but, all we can do is delay the inevitable'.*	The breakwater in Scarborough may reduce the amount of material transported by longshore drift.	On 5th June 1993, a large area of cliff slid into the sea. Guests were evacuated from the Holbeck Hall Hotel as it began to slip down the cliffs.
Before 1993, there had been two very dry summers.	The Holbeck Hall Hotel was in a quiet area with only a few houses nearby.	Water can lubricate the clay in the cliff and cause it to slip.

Student tasks

1. Read the statements to each other.
   Ask your teacher if there are any words, you do not understand.

2. Classify the statements – put them into groups of similar information.

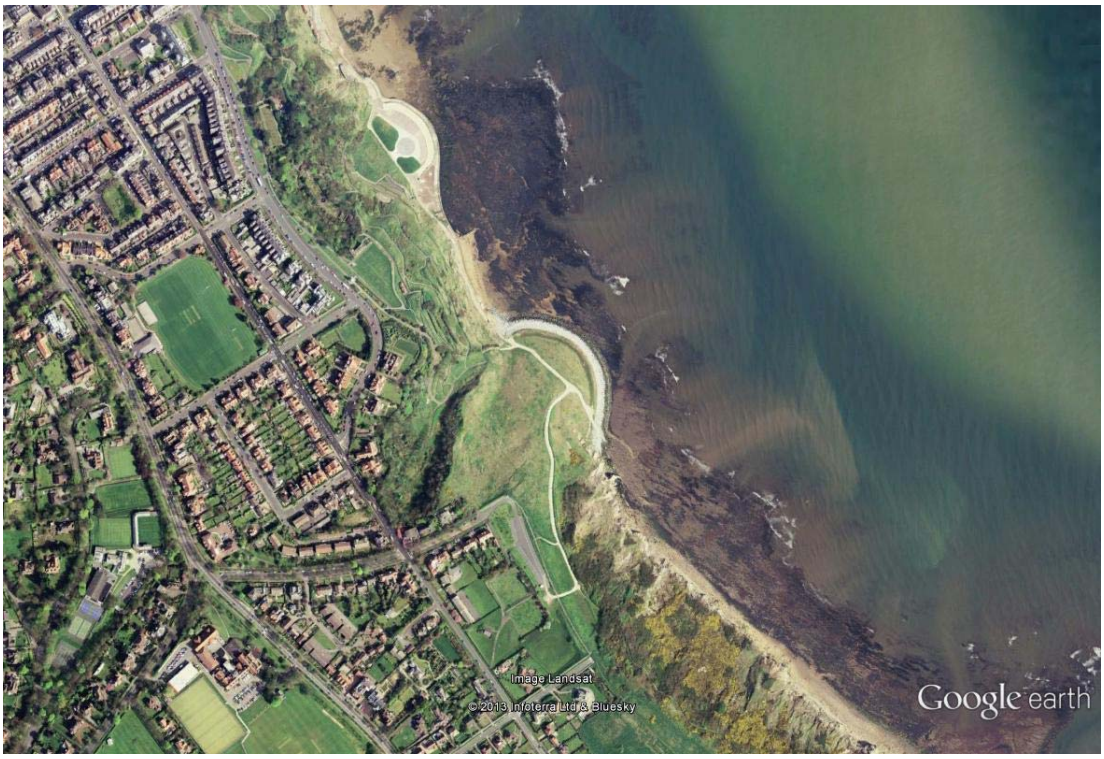
3. Try to create links of statements which go together to explain why something happened. Look for causes and effects.

4. Produce a mind map to show why the Holbeck Hall Hotel fell into the sea. Use colours in your mind map to represent different links of information.

5. The owners of the Holbeck Hall Hotel are seeking damages from the local council because the council failed to prevent the landslide. Do you think they should win their case?

6. The Google Earth satellite image below shows the coastline in 2013. Draw a circle to locate the location of the main landslide.

7. Locate an earlier smaller landslide on the Google earth image.



An aerial view of the landslide – June 1993
© 2013 Google earth

Teaching notes

This is a 'thinking skills' mystery activity based on a card sorting exercise.

As a trigger activity, you could show a picture of the landslide on a projector for students to discuss as they enter the classroom (see links below).

1. It is suggested that the students are placed into groups of 3 or 4 and each group given one pack of mystery statement cards (the first page of the resources). Students can then check the statements for any problems with the vocabulary.

2. Students then classify the statements into groups – they should come up with the group headings themselves.

3. It may be necessary to explain **cause** and **effect** to the students. This could be by using the cliff cracks as an easy example. Students then link together chains of statements to explain why Holbeck Hall Hotel slid into the sea. The statements should help them to develop their explanations and to consider human as well as natural causes.

   Examples of two possible cause and effect chains are:

   - The dry summer weather caused cracks in the clay cliff, which filled with water during the storm. This increased the weight of the cliffs. Heavy weight on the cliff can cause the cliff to fail under the force of gravity.

   - Waves erode the base of the cliff by abrasion and hydraulic action. About 2 metres of land along this coast is lost to the sea every year. The high rate of coastal erosion causes the land in front of the hotel to be lost over time. This left the hotel dangerously near the top of a steep cliff.

4. Students create a mind map to show why the Holbeck Hall Hotel fell into the sea. They should be encouraged to simplify statements, by putting them in their own words and using colour to collate information having similar themes. This activity could also be completed as a class activity on an IWB as this has the advantage of being able to save the mind map for later.

5. After the disaster, the owners of the Holbeck Hall Hotel attempted to seek damages from the local council blaming them for not preventing the landslide. They initially won the case although after an appeal, the local council were found not to be responsible.
   Students could be asked to write about their opinion of this result.

   To extend activity 5, it is suggested you do not reveal the outcome of the court case but have the students re-enact the process themselves, by presenting information from the various parties involved e.g. hotel owners, geologists and the local council. The real life outcome can then be compared to the class decision.

Additional information

- Two excellent before and after images of the site of the Holbeck Hall Hotel are available on page 19 of the Geotechnical study of Scarborough by le Pôle Alpin d'études et de recherche pour la prévention des Risques Naturels:
  http://www.risknat.org/projets/riskydrogeo/docs/guide_pratique/Acivite1_Ateliers/Presentations%20Atelier1/A1P13-Coastal%20changes/vol2/g14.pdf

- Two additional images of the Holbeck hall Hotel collapse are available in the PDF, which accompanies this resource.

- Google map reference for area
  https://maps.google.com/maps?ll=54.279057,-0.397654&spn=0.025507,0.084543&t=h&z=14

- Court case result
  http://www.catererandhotelkeeper.co.uk/articles/2/3/2000/16871/holbeck-hall-loses-seven-year-fight-for-compensation-in-the-last-round.htm

- British Geological Survey site on the Holbeck Hall Hotel landslide
  http://www.bgs.ac.uk/landslides/holbeckHall.html

- BBC news video on the landslide
  http://news.bbc.co.uk/2/hi/uk_news/england/7438211.stm

- Private video and news clips
  http://www.youtube.com/watch?v=Irio374T5gE
  The final six minutes of the YouTube video includes several news reports.