

## 2016 Q 1.C

### **Explain one process of physical weathering and one process of chemical weathering.**

Freeze thaw action is a physical process of weathering. This type of weathering can be seen in mountain areas or colder areas. Where temperatures frequently rise and fall below freezing point and precipitation falls providing water for ideal conditions for freeze thaw action to occur. Areas of bare rocks with cracks are greatly affected. Porous rocks that were formed in strata with many vertical and horizontal fissures are especially affected. Such rocks include sedimentary rocks such as limestone and sandstone. During the day when temperatures are above zero, precipitation fills these cracks. At night temperatures fall below zero degrees, the water in the cracks freezes and expands by up to ten percent. Once the ice melts the pressure is released. The continuous freezing and thawing weakens the rocks until tiny fragments start to break off it. These fragments are known as scree. These are pulled down to the bottom of the mountain by gravity. They accumulate in small heaps at the bottom of the slopes. These heaps can be seen in the Comeragh mountains in County Waterford.

Carbonation is a process of chemical weathering. Chemical weathering is the breakdown and weakening of rock through reacting with another reagent to form a completely new substance. In regards to carbonation, it is the breakdown of limestone rock or chalk. Limestone is an alkaline rock with a component called calcium carbonate within it due to the seashell fragments that help form the rock. As rainwater falls it absorbs carbon dioxide that is in the atmosphere. It turns into a weak carbonic acid that reacts with the alkaline calcium carbonate within the limestone rock. The reaction forms calcium bicarbonate that is soluble that can be easily washed away by the rainwater. The removal of dissolved calcium bicarbonate by rainwater is called solution. As limestone is a permeable rock composed of layers and vertical joints, water often soaks within the rock and weathers it to form features. These features are grikes, clints and karrens which can be seen in the karst landscape of the limestone pavement in the Burren Co. Clare. If the carbonic acid in the rain enters rivers or streams, it can often result in the formation of underground

caverns due to the formation of swallow holes due to carbonation of the limestone rock it flows over, such as the Crag cave County Kerry. The process of carbonation speeds up with a decrease in temperatures as colder water holds more carbon dioxide gas.