

# CROSS-CURRICULAR A HOLE LOT OF FUSS



## STUDENT INFORMATION SHEET



### SECTION 1

#### AGGREGATE EXTRACTION

Aggregates form an essential part of our environment and modern life style. Because we do not physically buy them, perhaps we are unaware as to how much we actually rely on them.

#### WHAT ARE AGGREGATES?

AGGREGATES are crushed minerals which have been extracted from the ground. Some examples of aggregates are granite, chalk, limestone, sand, gravel and slate.

#### WHAT IS AGGREGATE EXTRACTION?

Aggregate minerals can only be extracted or QUARRIED where they are found and certain aggregates are only found in certain areas of the country.

Quarrying has been taking place in Britain for over 4,000 years. Currently, there are 1,600 quarries in the United Kingdom, all providing a valuable raw material for the construction industry. Although this sounds a lot, only about 0.2% of the surface of England is being actively worked.

Aggregate extraction is only a temporary process lasting from 5 to approximately 100 years, depending on the mineral. Two types of quarries include those for sand and gravel, usually called a pit, and those for harder rock. Not all aggregates are taken from the land, there are also some sources in the sea.

## PRINCIPAL DIVISION OF AGGREGATES WITHIN THE UK



### AGGREGATE EXTRACTION

Sand and gravel are sedimentary rocks and usually quarried for a relatively short period of time, about 10 years. The pit is quite shallow at 5 to 10 metres.

Before extraction begins, bore holes are used to confirm the presence of the sand/gravel.



**Bore hole**



**Depth of sand/gravel pit**

Then the **OVERBURDEN** is removed. This is the soil and material that lies on top of the sand or gravel. Once this has been removed it is often used to screen the quarry or pit from the surrounding area.

Extraction of the aggregate then begins using a **DRAGLINE**, a mechanical bucket used to scoop up the material. When the material has been dug out it is loaded onto trucks which take it to a different area of the site to a **SCREENING PLANT** where it is washed and sorted according to size.



**A screening plant**

Similar size aggregates are then put into stock piles and transported, usually by rail or road, to different areas of the country, for sale.

Often, a sand or gravel pit also has a concrete plant on the site which ready-mixes sand, gravel, cement and water for the customer.

## **ROCK QUARRY**

Igneous rock, such as granite, is much harder than sedimentary rock. This type of rock can be quarried for many years, sometimes more than 100. The quarry is also much deeper.

Again, the overburden must be removed before any of the aggregate can be extracted. This can involve the removal of millions of tonnes of soil. To loosen the rock and break it up into smaller pieces, explosives are used. It takes about 1kg of explosives to bring down 10 tonnes of rock. This broken rock is then loaded onto trucks by mechanical shovels and transported to a **CRUSHING PLANT**.

Here the rock is crushed into a number of sizes which are then sorted and prepared for transportation to customers.



Removing the overburden

## **REGULATION**

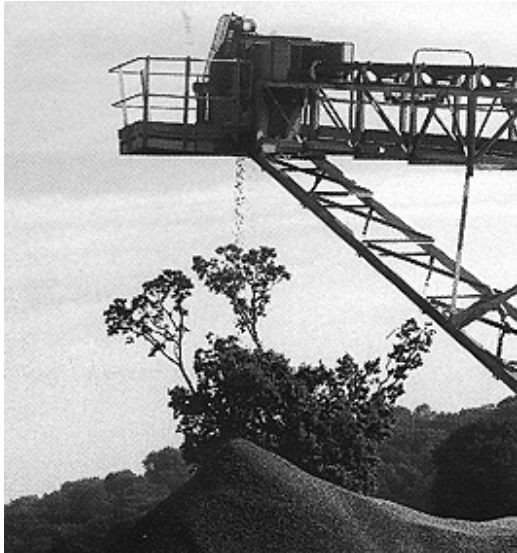
Quarrying is subject to strict regulations both before and after the extraction has taken place.

The planning stages of the quarry are very time consuming as permission must be granted by the County Council before any extraction can take place. This preparation can take as long as 5 years, during which time the quarry company must consult local landowners, local residents and any other interested groups.

Planning is crucial to the success of the quarry, both before extraction begins and also after the process has finished. The quarry company must provide a detailed plan for after-use of the land once the extraction has finished. The land must not be left undeveloped after quarrying.

Once the quarry is being worked, it is also subject to County Council regulations, including restrictions on working hours and noise control.

Although large mineral resources exist throughout Britain, the actual area of land under which these minerals are found is limited. The majority of the country is not affected by the industry. In 1988 only 0.75% of the surface area of England was under quarrying use.



Aggregates in stock piles

## **WHY QUARRY?**

Aggregates are essential to everyday living and the country's economy, the sale of aggregates being worth £300 million to Britain's economy each year. In 1990, 270 million tonnes of aggregates were used in the UK, 90% by the construction industry. New buildings and roads would not be possible without quarry products.

Materials such as sand, gravel, limestone and other rocks are necessary for all types of construction. For example, they are used for building houses, schools, factories and shops. Transport links, road, rail and air are all dependent on aggregate materials. For example, 1km of motorway uses 125 thousand tonnes of aggregates, while 10 million tonnes were used in the building of the Channel Tunnel. Fifty to sixty tonnes of aggregates are required to build an average size house.



**125,000 tonnes of aggregate required per kilometre**

**50/60 tonnes of aggregate required**



Aggregates are also important to other less obvious industries and are used in the production of paints, medicines, plastics, glass and even cosmetics. The purification of your drinking water is even dependent on aggregate materials.

Demand for aggregates is linked to the country's economy. Economic growth can mean more construction, which results in a higher demand for aggregates. New developments, such as the Channel Tunnel can also bring an increase in demand.

## **FURTHER INFORMATION**

Further useful information on aggregate extraction is available from:

**The Quarry Products Association  
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**Tel: 020 7730 8194, Fax: 020 7730 4355.**

**E-mail: [info@qpa.org](mailto:info@qpa.org)**

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