

**Fossil type: Plant – Tree  
fern**

**Official name:  
Lepidodendron  
aculeatum**



**Age: about 300,000,000  
years old**

- This fossil shows a piece of bark from a giant Lycopod, a Scale tree.
- These could be as large as 2 metres in diameter and around 30 metres high!
- Tree ferns only like to grow in hot, wet climates so finding this fossil gives us a good clue about the climate of Scotland 350 million years ago

### **Fantastic Fact!**

Fossils of soft organic materials like this bark are much rarer than fossils of bone, shell or teeth because they decay rapidly. Fossils of trees or plants require special conditions that quickly seal them into mud away from the elements to allow them to fossilise.

### **Activity Idea!**

On this fossilised bark you can see leaf scars where the leaves have dropped off. Pick a leaf off a tree and notice the mark that is left behind. Use a crayon and paper to rub over the surface of the bark to get an idea of what a fossil of that tree might look like.

## Piece of Coal



- Coal is the compressed and heated remains of ancient Carboniferous forests and is mined out of the ground where it has been buried for millions of years.
- Coal was central to every process of manufacturing raw materials in the Industrial Revolution. Coal was the fuel which powered the steam engines which drove the machines which wove material. It was the fuel (in the form of coke) which could provide a high enough temperature to smelt iron ore to make iron and steel.

### **Fantastic Fact!**

At the peak of coal production in Britain in 1913, 9% of the male population was employed in a coal mine. That is nearly 1 out of every 10 men!

### **Activity Idea!**

Because coal takes millions of years to form it is what we call a non-renewable resource. Can you think of some other non-renewable and renewable resources that we use for energy today?

## Piece of Cast Iron



- Iron exists in a rock called iron ore. In order to extract the iron, you need very high levels of heat. To make cast iron you must melt the iron. One way to get these extremely hot temperatures is to use a form of partially burned coal called coke.
- This piece of iron was called “pig” iron or “cast iron”. This was very strong iron which could take a lot of weight and withstand a lot of pressure, though it is generally brittle and cannot be worked very easily. It was used to make steam engines and parts for machines as well as support beams for buildings, factory buildings and bridges.

### **Fantastic Fact!**

Cast iron is formed by pouring molten iron into moulds. This type of iron is good for creating complex and repetitive patterns like detailed railings and garden trellises.

### **Activity Idea!**

Design a cast iron garden railing. Imagine the pattern will be repeated by casting many of the same railing and fitting them together. Use different shapes, flowers, or symbols.

## Pit Tokens



- These pit tokens have a number stamped on them. Each number matched up with a specific miner. Each miner would leave their token behind when they checked out their equipment for the day.
- If a miner did not come back at the end of his shift to return his equipment his token would be left behind and the other miners would know he was still in the mines and go looking for him.

### **Fantastic Fact!**

Many people collect miner pit tokens today. They often buy and trade them on the Internet and post stories about the tokens online. They signify an important and powerful time in the history of industrial Britain.

### **Activity Idea!**

Create your own miners pit token. Draw a token on a sheet of paper. Decide what shape to make your token and what the name of your mine will be. Were there any old mines near where you live? Make a hole in your token and thread it onto a string.

**Fossil type: Plant –  
fern**

**Official name:  
Alethopteris serli**

**Age: about  
300,000,000 years  
old**



- This fossil shows the end of a fern frond. It looks quite like ferns today.
- Ferns like to grow in warm, moist climates. Scotland still has many ferns today, though many are endangered due to a ‘fern craze’ in the Victorian era which wiped them out.
- The discovery of this fossil gives us a good clue that there were once tropical rainforests in Scotland.

#### **Fantastic Fact!**

Around 300 million years ago Earth had one giant super continent called Pangaea, rather than the smaller continents we have today. Scotland was part of Pangaea, which meant that it was closer to the equator and had a very different climate than it does now.

#### **Activity Idea!**

Ferns do not have flowers and so they reproduce differently from other plants. In fact ferns existed 200 million years before flowering plants evolved. Research the way in which these interesting plants reproduce.

## Brick Fragment



- Bricks are made from clay, which is dug out of the ground. Often the clay used to make bricks is found in the ground next to coal seams, which means that there is a ready source of fuel to heat the clay.
- Bricks were cheap to make and were used instead of stone to build houses and factories all over Scotland during the Industrial Revolution.
- Most bricks made during the Industrial Revolution were stamped with the makers name so people knew where the bricks came from.

### **Fantastic Fact!**

Bricks could take a long time to fire. Some firings took as much as 50 hours and needed people there all the time! Some kilns were so big they could fire 30,000 bricks in one go.

### **Activity Idea!**

Think about the buildings around where you live or go to school. Are any of them made out of old bricks? Can you find any that are stamped with the maker's name?

## Piece of Steel



- Steel is made by taking cast iron and melting it again. The process removes impurities from the iron and creates a strong solid structure.
- Because steel can be made in much larger quantities than wrought iron it quickly overtook wrought iron production when it was discovered. Steel is used today in things like cars and buildings.

### **Fantastic Fact!**

The Forth Rail Bridge was the first major structure in Britain to be constructed of steel when it opened in 1890. Steel for the bridge was provided by two steel works in Scotland, the Steel Company of Scotland at Hillside and the Dalziel Works at Motherwell, and one in Wales.

### **Activity Idea!**

Research bridges in your local area or from around Scotland and find out what type of materials they are made out of. Are they made from steel or something else?

**Fossil type: Organism – Spider**

**Official name: Chelicerate arthropod**

**Age: about 300,000,000 years old**



- Fossils are created by the imprint of a creature or plant. This fossil shows an external mould of the spider's complete dorsal surface it is about 300,000,000 years old
- What you can't see from the fossil, but has been recently discovered by scientists, is that the spider would have had defensive spikes on its back. It is thought that this was to stop it from being eaten by creatures who had newly emerged from the oceans to live on land
- This early spider is not so big and has its own special name. It is called *Eophrynus prestvicii*

**Fantastic Fact!**

Many insects which lived in the Carboniferous forest were a lot bigger than today. Dragonflies could have a wingspan of a meter! It may have been because the air was oxygen rich that they grew to such a size.

**Activity Idea:**

The fossil record tells us that not only insects, but mammals, fish, and other creatures used to be much larger than their ancestors are now. Draw a prehistoric scene with giant animals from the past. You might want to include animals from different time periods like dinosaurs or mammoths.

## Jute



- Textiles can be made out of many raw materials but the main ones which were used in the Industrial Revolution were wool (from a sheep), flax (from a plant that grows in Britain which makes linen) cotton (part of a plant that grows in places like America, Africa, and India) and jute (from a plant which is native to Bengal, modern day Bangladesh).
- Jute was used to make bags, ropes, sacks, carpets, sails and tents

### **Fantastic Fact!**

Jute mills employed large numbers of women and children. They worked in awful conditions and were often taken ill or injured while working. Children under nine would work as 'pickers', cleaning dust from beneath the machines.

### **Activity Idea!**

Find a tag in your shirt or trouser waistband. What does the tag say your clothes are made from? Many materials used in clothing today are synthetics like nylon and polyester instead of natural fibres like cotton or jute.

## Piece of Wrought Iron



- Iron exists in a rock called iron ore. In order to extract the iron, you need very high levels of heat. To make wrought iron you must first heat the iron, though not so hot that it melts. The iron can then be hammered into a block and transferred to a 'chaffey' to be heated again
- Unlike cast iron which is brittle, wrought iron can be worked or 'wrought' into different shapes. It is very strong and is used to make many things like railings and bridges

### **Fantastic Fact!**

Wrought iron has been used since medieval times to make intricate iron work to strengthen wooden doors. It is very strong and The Eiffel Tower, in Paris, was constructed from 1887-1889 from puddle iron which is a type of wrought iron.

### **Activity Idea!**

Many people today still use wrought iron to make things. Search for videos on the Internet to see the working of wrought iron with a hammer and forge in action.

## Carbide Lamp



- Coal miners worked underground for many hours of the day in the dark tunnels of the mines. Miners would use carbide headlamps like this one to light their way.
- Old miner's lamps like this could be very dangerous. They used an actual flame to light the tunnels instead of the battery powered headlamps we use today. The flame could cause explosions if it came into contact with certain types of gas that was trapped in the tunnels.

### **Fantastic Fact!**

The first battery powered helmet lamps were introduced in 1930. Helmet lamps now often use LED lights which are more energy efficient and give off clean bright light.

### **Activity Idea!**

Imagine what it would be like to be in a mine with only a lamp to light your way and write a short story about the experience. What if the flame in your lamp went out, how would you find your way out of the mine? Do you think it would be frightening?

## Miner's Boot



- This is the boot of a coal miner. Notice the thick rubber sole and the hard steel toe, these helped the miner to keep his feet safe from injury.
- Miners wear lots of heavy clothing when they enter the mines. They must protect all parts of their body by wearing full coveralls and a hard hat.

### **Fantastic Fact!**

Many miners today carry special pieces of kit that can detect dangerous gases in underground mines in order to keep them safe. Before the invention of these pieces of kit, miners would sometimes bring a canary down into the mine. Canaries would be affected by dangerous gases before the miners and the miners could move back to safety before breathing toxic gas.

### **Activity Idea!**

Draw a picture of a miner. Include all the protective gear they need to wear like a helmet, coveralls, boots and gloves and any kit that might keep them safe.