

H1

The Great Explosion

*Read the information sheet with a friend or as a group reading.
Have a go at the activity sheets that follow.*

INFORMATION SHEET

The story of the explosion

At about one o'clock on Sunday, 2nd April 1916, as families were sitting down to dinner in Faversham, there was a very loud explosionpeople ran out of their houses wondering what had happened The explosion was heard as far away as Norwich in Norfolk, and in France.

The site of the explosion was the Guncotton factory at Uplees on the River Swale estuary, 3 miles from Faversham. Guncotton is cotton soaked in a mixture of acids, which explodes when lit. The factory site was out on the marsh, and although fairly remote, had no trees or shrubs growing around the buildings which could absorb the impact blast of an explosion. Two companies shared the site on the marshes – the Cotton Powder Company and the Explosives Loading Company.

In 1916 England was fighting a war, but so important was the production of guncotton, distress signals, detonators and dynamite that many young men from as far away as Herne Bay came to work at the factory instead of going off to fight as soldiers. They were paid an extra 2 shillings (10p) a week 'danger' money.

Because of the high risk of explosions in the manufacture of both gunpowder and guncotton, many precautions were taken at the factory sites. No metal buttons were allowed on garments – buttons were all made of wood. There were no pockets on overalls in which items could be kept. No pipes, matches or cigarettes were allowed into the works – all of these had to put into pigeon holes by employees as they arrived for work. Tramway rails were made of wood close to buildings. Women were not allowed metal hairpins or grips, but had to have their hair tied up in a net. Even the horses had brass horseshoes instead of steel to reduce the risk of sparks. Buildings were constructed of wood and well spaced out. Not even metal nails were used. Security precautions were excellent – there was a military guard of 128 men and 24 patrolmen for the two factory sites.

The Cotton Powder Company had its own part-time fire brigade, plenty of hydrants and hoses and a pump always at the ready to raise extra water. The Explosives Loading Company had only one four-man pump, 100 or so chemical extinguishers and a supply of fire buckets. Water was available from the dykes. High Pressure mains water had been laid up to the factors and the hydrants were ready for installation; but contractors had failed to deliver the pumps..... Only three days before the explosion H.M. Chief Inspector of Explosives, Major A. Cooper-Key had carried out an inspection and noted the absence of hydrants and fire buckets in various buildings..... The nearest fire-brigade appliances were in Faversham.

Building no. 833 at the ELC had been licenced for the storage of TNT. It stood about 50 ft from a boiler house with three flues (chimneys) equipped with spark arrestors. In order to keep pace with the needs of the armed forces the factory was working overtime

and vast quantities of TNT and ammonium nitrate (saltpetre) had been delivered¹. Building no 833 had been used a store for ammonium nitrate – of which on 2nd April , it contained about 150 tons as well as about 15 tons of TNT, with more cases lying on the open ground beside it. Empty linen bags, which had been used to TNT and were awaiting return for refilling, were also resting against the match board walls of the building. The boiler house spark arrestors were not 100% efficient and on the night before the disaster, two patrolmen reported that sparks had started a small fire between the boiler-house and the Building 833, which had been put out.

The morning of Sunday 2nd April was dry and glorious. Just after many of the staff had stopped for lunch at 12.noon, Mr. Underwood, clerk of works to the building contractors noticed that some of the empty TNT bags stacked against wooden building no. 833 had caught fire. Flames were seen low down in one corner. He immediately gave the alarm at the office and the Assistant Manager called out the Works fire-brigade and the C.P.C brigade. The Manager and decided that the boxes of TNT needed to be moved away from the blazing sheds, and staff came to do this. Despite the efforts of the fire-brigade and the chain of people passing buckets of water filled from the dyke, the fire was getting out of control.....

At about 1.20pm ***up it went.*** The first explosion was followed by a tremendous burst of flame and then a second terrific explosion and then a third as two other process houses close to building 833 went up as well.

The damage done was severe and extensive. Of the five buildings blown up, there was not trace, and the first explosion left a crater 150ft in diameter and 10 – 15 ft deep. Within a 225 yard radius of the explosions, every building of conventional light construction was destroyed. Probably because the Ministry of Munitions were trying to keep details of the explosion a secret as it was war time, there are no photographs or illustrations of the devastation.

Although the actual number killed is not known for certain, it is likely that the death toll was 108. There were also large numbers of injuries; the number so great that the Cottage Hospital in Stone Street, Faversham could not cope and men had to be taken to two military hospitals and an Infirmary in the area. An account written by Dr. Evans who, with his driver reached Uplees after the first explosion, but before the second stated..."five of the National Guard who were on guard were killed instantly: of one, nothing but his rifle was ever found...a number of men 30 – 40 yards away from the explosion unharmed, while men 100 yards away were blown to pieces....; men had all their clothes blown off them and yet were unhurt." "Some were blown into dykes and were wringing wet and shivering with shock; others were bleeding and some had half their clothes torn or burnt off."

There were so many to be buried in Faversham that a vast mass grave – for 69 coffins – had to be dug at the cemetery in Love Lane; another 6 victims were buried in private graves at the cemetery. All 75 were explosives factory employees. The two youngest victims were both aged 17, the oldest 61 and nearly half were in their 30s and 40s – a severe blow to family life. ²

¹ Note – TNT is expensive to produce, so, during World War 1 shells and bombs were loaded with amatols. This was a mixture of TNT and the much cheaper ammonium nitrate. It had the advantage that the mixture produced oxygen necessary for rapid combustion.

² All material adapted from The Great Explosion at Faversham 2 April 1916 by Arthur Percival (1985)

ACTIVITY SHEET - SO.....WHAT CAUSED THE EXPLOSION?

HERE IS YOUR CHANCE TO BE A DETECTIVE!

Major Cooper-Key. H.M. Inspector of Explosives who investigated the disaster, started off by listing all the *possible* causes, and gradually eliminating all those which did not seem likely, until he was left with the most *probable*.

Using the information you have been given about the guncotton works at Uplees, start off by writing down four *possible* ways in which the TNT and ammonium nitrate stored in building 833 could have been detonated (exploded).

1. _____

2. _____

3. _____

4. _____

Look carefully at your suggestions. Put a cross by the three that you think are **least likely** to have been the cause. Fill in the table below, giving your **reasons** why you think they were not likely causes. This should leave you with one suggestion that could probably have been the cause of the explosion. In the box suggest why this one is the most likely. When you have done this, you can ask your teacher for a copy of what Major Cooper-Key concluded and see if you are a good detective!

	Likely - ✓ Unlikely - X	Reasons
Suggestion 1		
Suggestion 2		
Suggestion 3		
Suggestion 4		

ACTIVITY SHEET - NEVER LET EXPLOSIONS HAPPEN AGAIN

Great, you have worked out what caused the explosion but, the factory owners want to know what they should do to make sure that such a disaster should **never be allowed to happen again**.

You have been asked to recommend what changes should be made at the Works to ensure that another disastrous explosion could not happen. At least seven things could be done. See how many you can think of.

- A. EITHER, design a poster showing factory owners and employees what they should do or not do to prevent a fire and risk of explosion

- B. OR Write a letter to the Manager of the Explosives Loading Company, Uplees, Faversham, Kent , giving your suggestions as to what you think could be done. You could either write by hand or use the computer.

You could start the letter like this.....

Dear Sir,

Following the Great Explosion on the 2nd April 1916, I am writing to you to suggest that you make the following changes to ensure that the Works never again suffers such a terrible disaster.

- 1.

- 2.

- 3.

- 4.

- 5.

- 6.

- 7.

I very much hope that you will seriously consider making these changes as soon as possible to ensure the safety of your workers and the protection of your business.

Yours faithfully,

(Your Name) _____, Class _____, _____ School

THE GREAT EXPLOSION – MAJOR COOPER-KEY'S FINDINGS

Here are the four suggested possible causes that Major Cooper-Key identified.

1. **Somebody could have thrown a cigarette- end or glowing match onto the heap of linen sacks.**
2. **The bags could have ignited on their own, being very dry and getting hot in the sun.**
3. **Someone could have deliberately put a match to the bags.**
4. **A spark from the nearby boiler flues (chimneys) could have been responsible.**

Major Cooper-Key discounted the first three.

Employees were not allowed to bring matches into the factory and they could only smoke in specially provided mess rooms. The fire had been noticed *just before* the lunch break, so there should not have been any workmen smoking at this time anyway, and therefore it was unlikely that a discarded cigarette end was responsible.

He thought it unlikely that the bags caught fire by themselves.

He also thought it unlikely that someone had deliberately started a fire in the bags as there were 128 military guarding the Works and a further 28 patrolmen. It would therefore have been difficult for someone to have had the opportunity of starting a fire without one of the guards noticing. No employee should have been carrying matches, and if someone had arrived at work carrying some, they would have been taken away when they were searched on arrival.

This left the final possibility – that a spark from the boiler started the fire which led to the explosion. This was even more probable as two patrolmen had reported such a fire the previous night and had put it out.

SO – HOW DID YOU DO?

*DID **YOU** REACH THE SAME CONCLUSION AS MAJOR COOPER-KEY?*

WELL DONE!