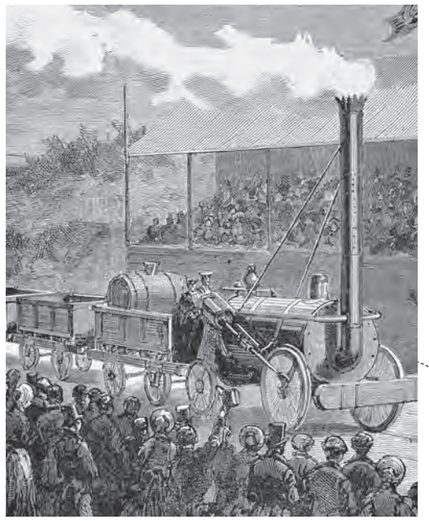
CHAPTER 2: THE INDUSTRIAL REVOLUTION

2.1 INNOVATIONS THAT LED TO A REVOLUTION

1 People and their inventions

The Industrial Revolution would not have occurred were it not for the people who developed new technologies and transformed the ways goods were produced.



SOURCE 2.1.1 A wood engraving of the steam locomotive design known as 'The Rocket', winner of a competition held in 1829 to decide on the locomotive to be used on the Liverpool to Manchester railway

a Match the inventor with their technological innovation by drawing a line between the two. List each invention and describe its importance in a written document.

James Watt	Water-powered spinning frame
Thomas Newcomen	Spinning jenny
James Hargreaves	Steam engine that produced rotary motion
Richard Arkwright	Flying shuttle
Samuel Crompton	Steamships
Abraham Darby	Powered weaving loom
George Stephenson	Use of coke to smelt iron
Isambard Kingdom Brunel	Steam locomotive
John Kay	Steam engine that produced vertical motion
Edmund Cartwright	Spinning mule

b Choose one inventor from Question **a**. Explain their technological innovation and its impact on the Industrial Revolution.

c Imagine a competition is being run by a national museum, asking the question: 'Which single person from the Industrial Revolution most deserves to be remembered, and why?' Select a person from the list of people in Question **a**, or anyone else you consider important, and create an annotated visual diagram (AVD) justifying your selection in the space below.

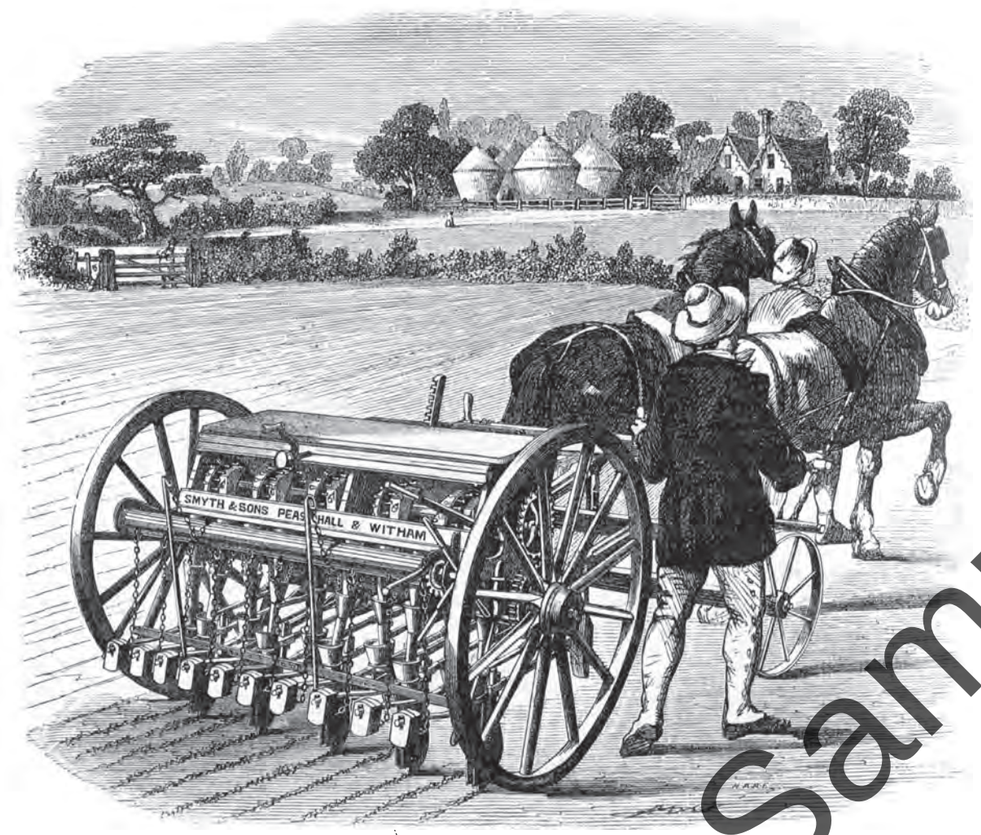
Sample pages

2.2 WHY DID THE REVOLUTION OCCUR?

1 Factors at work

For any major change to occur in history, certain conditions need to be present. In Britain prior to the Industrial Revolution there were the following: changes had occurred in farming practices and transport; the new urban workers became a cheap source of labour; there was a wealthy class of people willing and able to take advantage of new innovations; and there was access to raw materials (provided by an expanding empire). These factors combined to lead to significant change in how people in Britain lived and worked.

2 Changes on the land



SOURCE 2.2.1 An illustrated plate from a trade catalogue showing an example of Jethro Tull's seed drill, 1862

The Agricultural Revolution is one of the factors that led to the Industrial Revolution in Britain. Between 1700 and 1800, the population of Britain had almost doubled, increasing the demand for food and pushing food prices higher.

The need for greater and more efficient food production led to changes in how farms operated. Farmers moved from the Open Field System, (which produced sufficient food for the population but had little food left over) to the Enclosed System. In the Enclosed System of farming, the farms were fenced or walled and the amount of land in individual farms was increased. To farm these increased land plots, new methods and machinery were introduced, which increased food production.

There was both support and opposition for Enclosures. Opposition tended to come from those tenant farmers who lost their land to larger landholders. Some farmers also regarded the new machinery and practices with scepticism.

a Sketch the two types of farming systems—Open Field and Enclosed. Explain how the two were different.

b Jethro Tull was one agriculturalist who experimented with new ideas. Tull invented a horse-drawn seed drill and hoe. Examine Source 2.2.1. Describe how you think Tull's machine worked, including its advantages and disadvantages.

Sample pages

3 Researching key figures

On the internet or in your school library, research the following people and identify their contributions to the Industrial Revolution.

a Lord Townshend

b Robert Bakewell

c Thomas Coke

4 Changes in making a living

Many changes took place in the world of work during both the Agricultural Revolution and the ensuing Industrial Revolution. The Agricultural Revolution forced workers from country farms to towns and cities in search of work. There, they often had to sell their labour cheaply, as they were competing with many others for work. There was another group of people, though, who benefited from the changes taking place.

Imagine you are an entrepreneur living during the beginning of the Industrial Revolution. You have money and resources, and you are interested in a new invention that you have been shown. How can you capitalise on this new era? Write a letter to a friend outlining the way in which you intend to take advantage of the new conditions. Present your letter as a written document.

2.3 ON THE MOVE

1 From country to city and agriculture to industry

The Industrial Revolution meant a move from a largely agrarian (farming) society in Britain to an industrial one. Before the Industrial Revolution, the majority of the population lived in country areas. The development of new farming machinery and practices, lead to an increase in poverty and unemployment in rural areas and, people migrated from rural areas to the cities. This migration caused problems in the cities, such as overcrowding, pollution and outbreaks of disease.

2 Industrialisation and urbanisation

a Define the words 'industrialisation' and 'urbanisation' in the space below.

Industrialisation

Urbanisation

> The state of society now leads so much to great accumulations of humanity, that we cannot wonder if it ferment and reek like a compost dunghill. Nature intended that population should be diffused over the soil in proportion to its extent. We have accumulated in huge cities and smothering manufactories the numbers which should be spread over the face of a country; and what wonder that they should be corrupted? We have turned healthful and pleasant brooks into morasses and pestiferous lakes …

SOURCE 2.3.1 *The Journal of Sir Walter Scott*, on the Industrial Revolution, 20 February 1828

b What do you think Sir Walter Scott means by 'great accumulations of humanity'?

c What does Scott believe has caused this situation?

d How and why does Scott refer to a 'compost dunghill'?

e Summarise Scott's commentary in Source 2.3.1 on the urbanisation taking place in England.

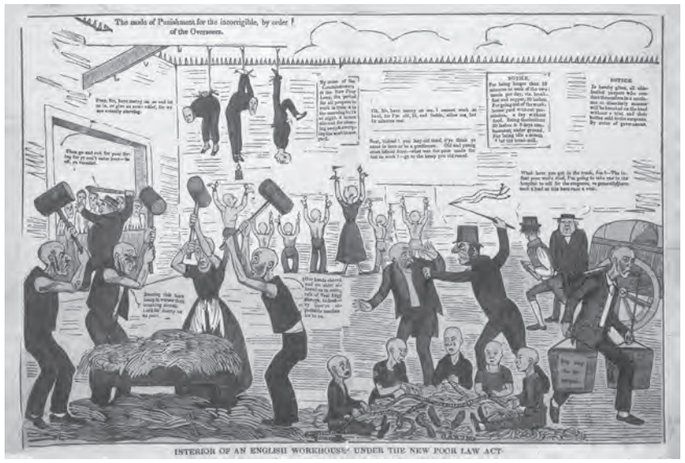
f Analyse Scott's metaphor in the last line of Source 2.3.1. What is he trying to say?

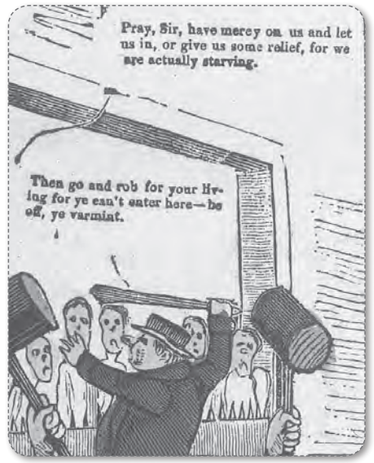
Sample pages

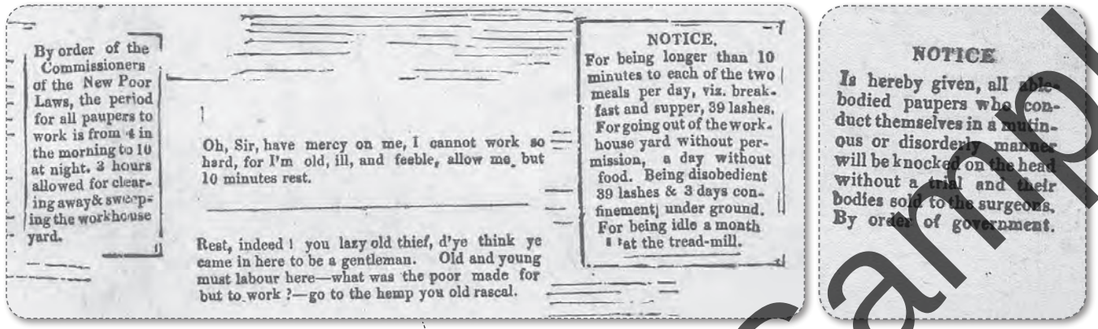
3 Poor Laws

Industrialisation and urbanisation resulted in the development of large cities where wealth was unevenly distributed. The number of poor and unemployed people in the cities began to increase greatly. These people survived by begging or by receipt of a payment similar to an unemployment benefit. The middle and upper classes, whose taxes paid for the benefits, viewed these people as a burden on society.

In 1834, the Poor Law Amendment Act was passed in Britain. This new law established Workhouses where the poor were housed, clothed and fed. In return poor people had to work several hours each day. The poor could only receive this government 'help' if they left their homes and lived in the workhouse. Conditions inside the workhouses were unpleasant. Families were split up, food was monotonous and strict rules were enforced. Not surprisingly, there was a great deal of opposition to the new Poor Law.







SOURCE 2.3.2 An anti-Poor Law poster, with details, 1837. Held at the National Archives, the United Kingdom

a Who are the people trying to get into the workhouse? Why are they trying to get in, and what is the response of the man in the hat?

b According to the poster, what were the hours of work in the workhouse?

c How were old people treated?

d What was the punishment for taking too long to eat meals?

e What was does the poster say would happen to anyone who objected to the conditions?

f Using Sources 2.3.1 and 2.3.2, write a letter to the government of the time either agreeing or disagreeing with the introduction of the new Poor Law. Present your letter as a written document.

4 Poets and authors

Literature written during the Industrial Revolution can also be a source of information about life during the period.

a Outline how literary material could be used as a source of historical information.

b Research one of the Romantic poets, such as William Blake, Robert Burns or Percy Shelley, or a writer such as Charles Dickens. Find a quote from their work to illustrate their opinion on the changes occurring during the Industrial Revolution. Write and analyse the quote in the space below.

Sample pages

2.4 EXPERIENCES DURING THE REVOLUTION

1 Living conditions

The Industrial Revolution raised the standard of living for many people in the middle and upper classes in Britain. For working class people, however, life was a continual struggle. Wages were low, working conditions were very poor, there was little job security and life in the cities was unpleasant, unhygienic and often dangerous. Many poor children had to work for their survival and that of their family. Children were often given hazardous jobs.

> After as careful an examination of the evidence collected as I have been able to make, I beg leave to recapitulate the chief conclusions which that evidence appears to me to establish …
>
> …That the various forms of epidemic, endemic, and other disease caused, or aggravated, or propagated chiefly amongst the labouring classes by atmospheric impurities produced by decomposing animal and vegetable substances, by damp and filth, and close and overcrowded dwellings prevail amongst the population in every part of the kingdom, whether dwelling in separate houses, in rural villages, in small towns, in the larger towns—as they have been found to prevail in the lowest districts of the metropolis.
>
> That such disease, wherever its attacks are frequent, is always found in connexion with the physical circumstances above specified, and that where those circumstances are removed by drainage, proper cleansing, better ventilation, and other means of diminishing atmospheric impurity, the frequency and intensity of such disease is abated; and where the removal of the noxious agencies appears to be complete, such disease almost entirely disappears.
>
> That high prosperity in respect to employment and wages, and various and abundant food, have afforded to the labouring classes no exemptions from attacks of epidemic disease, which have been as frequent and as fatal in periods of commercial and manufacturing prosperity as in any others.
>
> That the formation of all habits of cleanliness is obstructed by defective supplies of water.
>
> That the annual loss of life from filth and bad ventilation are greater than the loss from death or wounds in any wars in which the country has been engaged in modern times.

SOURCE 2.4.1 Extract from Edwin Chadwick's 'Report on the sanitary condition of the labouring population of Great Britain: A supplementary report on the results of a special inquiry into the practice of interment in towns', written for the Poor Law Commissioners Inquiry, 1842

a Examine Source 2.4.1. According to Chadwick, what is it that causes or aggravates epidemics and diseases among the labouring classes?

b How does the writer of the source believe the circumstances causing the diseases can be altered?

c What does the writer of the source believe the Industrial Revolution has done for the labouring classes?

d In your opinion, how useful is this source for studying the living conditions of poor people during the Industrial Revolution?

2 Medicine

Going to the doctor in 1800 was likely to be a scary experience. Most medicines were simply plant-based, and other cures doctors recommended included bleeding, leeches, a change of air, mercury and vomiting. People also commonly relied on prayer to cure them of illnesses.

The Industrial Revolution's rapid population growth, urbanisation and increased poverty led to overcrowded and unhygienic conditions in which disease flourished. Death rates from diseases such as smallpox, tuberculosis, cholera and typhus were high. Due to inventions such as the steam train and steam ship, there was increased contact between towns and country areas which lead to the spread of such diseases.

However, with the increase in disease, came developments in the area of medicine. Improvements included the introduction of nitrous oxide (laughing gas), anaesthetic, hand-washing and disinfectants. By 1900, hygiene and medical knowledge had greatly improved.

SOURCE 2.4.2 Cocaine tooth drops advertisement, circa 1885

a Examine Source 2.4.2. According to the source, what is an 'Instantaneous Cure'?

b Judging from the picture, by whom would the toothache drops be used, and how much do they cost?

Sample pages

c Investigate a disease that was common during the Industrial Revolution, such as smallpox, tuberculosis, cholera, diphtheria, poliomyelitis or typhus. Find out what people of the time believed caused the disease and how they attempted to cure it. Create an advertisement for one of the cures using Source 2.4.2 as a guide to advertisement formats of the time.

3 Disease and invention

a Examine the list of inventions and medical innovators below and complete the table.

INVENTION OR PERSON	WHY THE PERSON OR INVENTION WAS IMPORTANT
Marie Curie	
Stethoscope	
Louis Pasteur	
Florence Nightingale	
Joseph Lister	
Medical imaging (x-rays)	
Elizabeth Blackwell	

b Write a paragraph summarising disease, health and medicine during the Industrial Revolution.

Sample pages

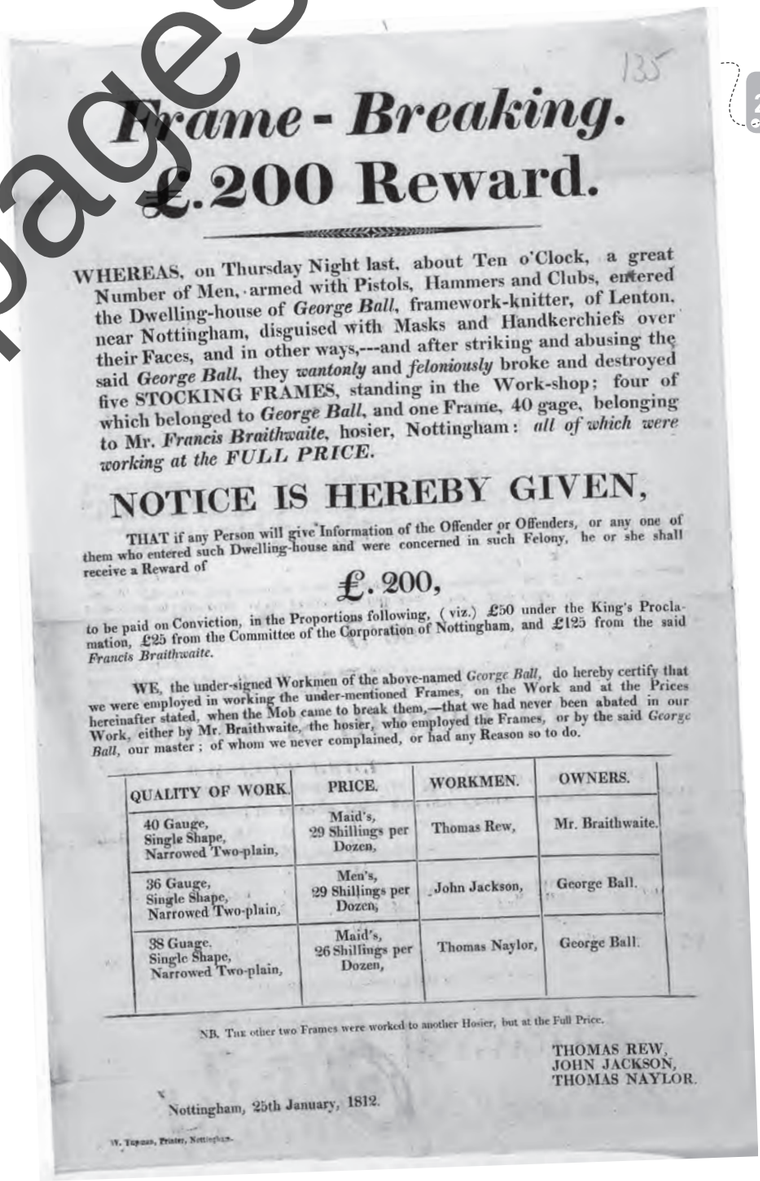
2.5 RESISTING THE REVOLUTION

1 The Luddites

Not everyone was in favour of the technological changes that occurred during the Industrial Revolution. The term 'Luddite' refers to a person opposed to technological change, and comes from a group of workers of the early nineteenth century who protested against industrialisation.

The Luddites originated in Nottinghamshire in 1811. They were believed to have been led by a mythical figure named Ned Ludd, who, like Robin Hood, lived in Sherwood Forest in Nottingham, England. From Nottinghamshire, the movement quickly spread throughout England to places such as Yorkshire and Lancashire.

Luddites attacked factories and machinery, such as the new wide-framed weaving looms, which they viewed as threats to their jobs and the cause of rising unemployment. They also sent threatening letters to employers, and sometimes assaulted employers and merchants. Guards were often posted at factories to try to prevent attacks and catch the culprits. In 1812, machine breaking became a crime punishable by death.



135

Frame - Breaking.

£.200 Reward.

WHEREAS, on Thursday Night last, about Ten o'Clock, a great Number of Men, armed with Pistols, Hammers and Clubs, entered the Dwelling-house of *George Ball*, framework-knitter, of Lenton, near Nottingham, disguised with Masks and Handkerchiefs over their Faces, and in other ways,---and after striking and abusing the said *George Ball*, they *wantonly* and *feloniously* broke and destroyed five STOCKING FRAMES, standing in the Work-shop: four of which belonged to *George Ball*, and one Frame, 40 gage, belonging to Mr. *Francis Braithwaite*, hosier, Nottingham: *all of which were working at the FULL PRICE.*

NOTICE IS HEREBY GIVEN,

THAT if any Person will give Information of the Offender or Offenders, or any one of them who entered such Dwelling-house and were concerned in such Felony, he or she shall receive a Reward of

£. 200,

to be paid on Conviction, in the Proportions following, (viz.) £50 under the King's Proclamation, £25 from the Committee of the Corporation of Nottingham, and £125 from the said *Francis Braithwaite*.

WE, the under-signed Workmen of the above-named *George Ball*, do hereby certify that we were employed in working the under-mentioned Frames, on the Work and at the Prices hereinafter stated, when the Mob came to break them,—that we had never been abated in our Work, either by Mr. Braithwaite, the hosier, who employed the Frames, or by the said *George Ball*, our master; of whom we never complained, or had any Reason so to do.

QUALITY OF WORK.	PRICE.	WORKMEN.	OWNERS.
40 Gauge, Single Shape, Narrowed Two-plain,	Maid's, 29 Shillings per Dozen,	Thomas Rew,	Mr. Braithwaite.
36 Gauge, Single Shape, Narrowed Two-plain,	Men's, 29 Shillings per Dozen,	John Jackson,	George Ball.
38 Guage. Single Shape, Narrowed Two-plain,	Maid's, 26 Shillings per Dozen,	Thomas Naylor,	George Ball.

NB. The other two Frames were worked to another Hosier, but at the Full Price.

THOMAS REW,
JOHN JACKSON,
THOMAS NAYLOR.

Nottingham, 25th January, 1812.

W. Tupman, Printer, Nottingham.

SOURCE 2.5.1 Reward poster for the arrest and conviction of men who destroyed three knitting machines, 25 January 1812. Held at the National Archives, United Kingdom

a Examine Source 2.5.1. Is this a primary or secondary source? Explain.

b In your own words, describe the incident referred to in the poster.

c What was destroyed in the attack?

d What reasons might the intruders have had for destroying the machinery?

e What methods are used in the poster to prevent further attacks and destruction?

f Why do you think the poster includes details about the stockings produced on the frames, including their prices?

g As an extension activity, conduct further research on the Luddites and the Luddite riots. Locate at least one primary source and one secondary source. Using the information you find, create a wiki page about the Luddites.

h Luddites opposed new technologies primarily because they replaced people in many jobs. Consider technologies that have been developed since the Luddite movement. List three examples of technology that you think Luddites would object to, and explain your reasoning for each choice. Use the information to construct a blog.

Sample pages

2.6 IMPACT OF A REVOLUTION

1 What did the Industrial Revolution do for us?

The events of and changes during the Industrial Revolution shaped many aspects of the modern world: travel, working life, city living, attitudes towards and use of resources, climate change, the growth of the middle class and the development of trade unions.

a Use the table below to complete a PMI (Plus, Minus and Interesting) chart on the impact that the Industrial Revolution had on the world. You may need to complete some additional research.

IMPACT OF THE INDUSTRIAL REVOLUTION

AREA OF IMPACT	PLUS	MINUS	INTERESTING
Transport			
Resource use			
City living			
Communication			
Environment			
Population			
Middle class			
Trade unions			
Modern medicine			
Working life			

b Select one or two areas from the table above and use the information to write a postcard or letter to a child living in the Industrial Revolution. In your postcard, explain what life is like as a result of the Industrial Revolution. For example, you could write about modern air transport and the frequency with which it is used today, and then compare this to the introduction of steam trains.

c Conduct research on either India or China. Describe the Industrial Revolution of the country you have chosen in the form of a recipe. The ingredients will be the conditions that allowed the revolution to transpire, and the method will be the events that occurred during the revolution.

2 Recipe for a revolution

Some nations experienced the Industrial Revolution later than others. What conditions are needed for revolution to occur and what needs to happen during the revolution for it to continue?