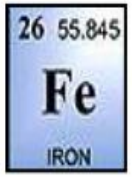
INDUSTRIAL REVOLUTION

IT ALL STARTS IN...

Great Britain

+



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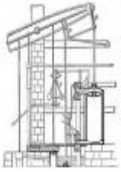


BRITISH ENCLOSURE SYSTEM

SOCIAL EFFECTS

INDUSTRIAL REVOLUTION

INNOVATORS OF THE INDUSTRIAL REVOLUTION

HARGREAVES→ SPINNING JENNY

JAMES WATT→ STEAM ENGINE

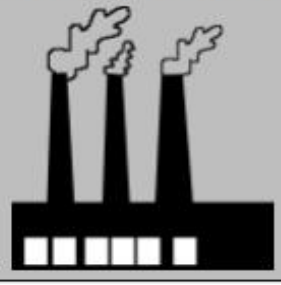
ELI WHITNEY→ COTTON GIN

JENNER→ SMALLPOX VACCINE

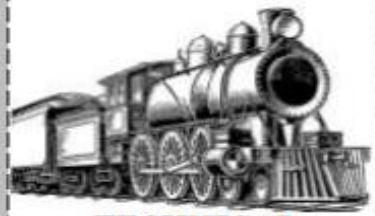
HENRY BESSEMER→ STEEL

LOUIS PASTEUR→ GERM THEORY

COMMON THEMES OF THE INDUSTRIAL REVOLUTION



WORLD POWERS TRY TO CONTROL RAW **M**ATERIALS & **M**ARKETS THROUGHOUT THE WORLD



TECHNICAL ADVANCES SPUR INNOVATION

RISE OF THE FACTORY SYSTEM

IMPROVED TRANSPORTATION

INCREASE IN:

POPULATION

POLLUTION

STANDARDS OF LIVING

LIFE IN THE FACTORY SYSTEM

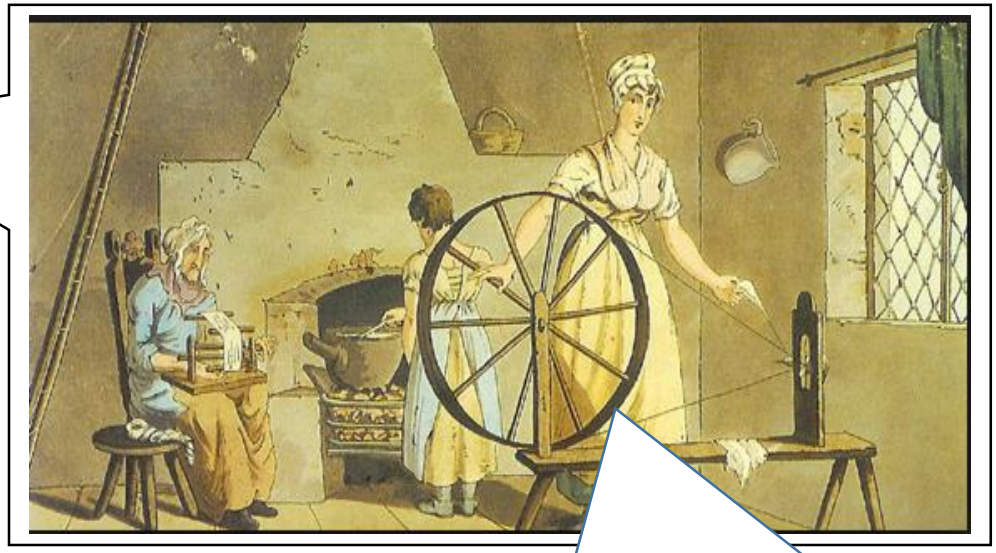
CHILD LABOR

WORKING CONDITIONS

RISE OF THE UNIONS

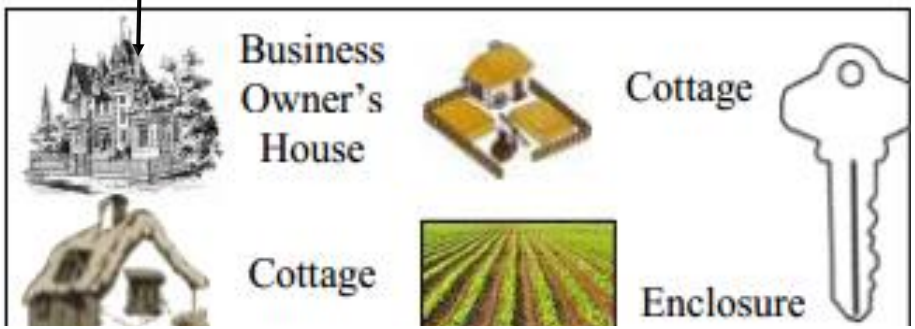
Life Before the Industrial Revolution

After the Revolutions in America, France, and Latin America changed the way the government worked, the **Industrial Revolution** changed the way people did work. This, of course, begs the question, ***"If this changed the way people worked… How did they work before the Industrial Revolution?"***



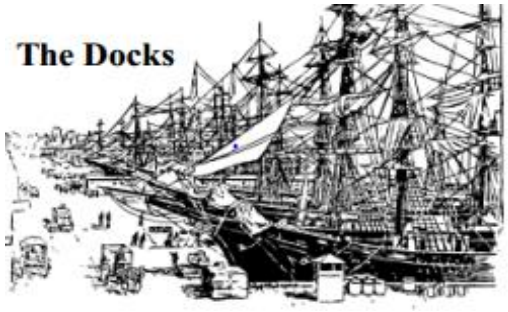
ENCLOSURE MOVEMENT

- Rich landowners brought up the lands of the village farmers.
- They enclosed them in large fields where they experimented "Scientific Farming"
- Former farmers either worked on the farm or moved to the City



COTTAGE INDUSTRY

It is a system of production where a wealthy business owner contracts business out to local people to complete in their home



The harbors (docks) helped transport produced goods to different destination for profit

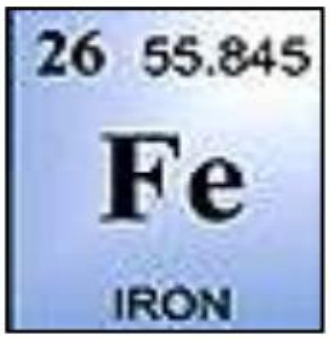
ALL THE ABOVE PROCESS WAS SLOW, HENCE LEADING TO SLOW GROWTH OF WEALTH FOR THE RICH BUSINESS MEN

Why Great Britain?

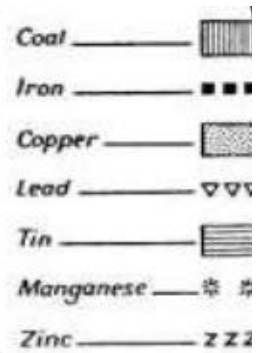
OK. Now that you know what life was like before the Industrial Revolution, let's focus in on where it began… **GREAT BRITAIN**. British people aren't better than anyone else on the planet (*see* **1776**), they're not smarter, stronger, or faster. So *WHY DID THE MOST IMPORTANT ECONOMIC CHANGE SINCE THE AGRICULTURAL REVOLUTION BEGIN ON THIS ISLAND IN THE NORTH ATLANTIC?*

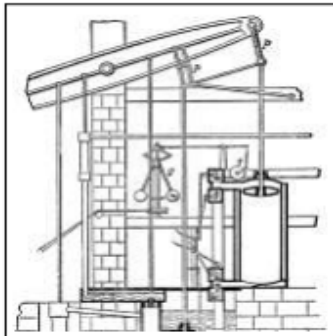
- **THE FUEL** of the IR used to power the Steam Engines.
- **Coal is:**
  - Cheaper
  - More Efficient than wood

Abundant in N. England and Wales



- **The FOUNDATION** of the IR
- The IR was built on Iron
  - RR, Bridges, Buildings, Trains, etc.
- Later replaced by the much stronger Steel





- **The MACHINERY** of the IR
- Vastly improved by **James Watt**
- Created a power source
  - Heat water with Fire
  - Use steam/pressure to drive pistons
  - This creates energy
- No longer needed to be near moving water (rivers/water wheels)

Map 2 - British Coalfields

Innovation Spurs Progress...

So the Industrial Revolution changed the world. So, it began in Great Britain. But what exactly happened to make things better? Below are some of the technical advances that spurred innovation in two of the major areas of the Industrial Revolution: **Agriculture & Textiles.**

AGRICULTURE

ADVANCEMENTS MADE BY THE "SCIENTIFIC FARMERS"

TEXTILES

"SPINNING JENNY" LED TO MORE AND MORE INNOVATION

CROP ROTATION

The process of crop rotation proved to be one of the best developments of the scientific farmers. The process improved upon older methods like the three field system. One year a farmer might plant a field with wheat which exhausted soil nutrients. The next year he planted a root crop like turnips, to restore nutrients. This might be followed in turn by barley, then clover.

HOW DID THIS

HELP

AGRICULTURE?

SEED DRILL

Jethro Tull was one of the first of these scientific farmers. He saw that the usual way of sowing seed by scattering it across the ground was wasteful. Many of the seeds failed to take root. He solved this problem with an invention called the seed drill in about 1701. The seed drill allowed farmers to sow seeds in well-spaced rows at specific depths. A larger share of the seeds germinated boosting crop yields.

HOW DID THIS

HELP

AGRICULTURE?

SELECTIVE BREEDING

Livestock breeders improved their methods, too. In the 1700s, for example Robert Bakewell increased his mutton output by allowing only his best sheep to breed. Other farmers followed Bakewell's lead. Between 1700 & 1786, the average weight of r lambs climbed from 18 to 50 pounds!

HOW DID THIS

HELP

AGRICULTURE?

WATER FRAME

After James Hargreaves (Spinning Jenny), people began producing new machines that improved textile production. In 1769, Richard Arkwright invented the Water Frame. The machine used the water-power from rapid streams to drive spinning wheels.

HOW DID THIS

HELP

TEXTILE PRODUCTION ?

SPINNING MULE

In 1779, Samuel Compton combined the features of the SPINNING JENNY with the WATER FRAME to produce the SPINNING MULE. The SPINNING MULE made thread that was stronger, finer, and more consistent than earlier spinning machines.

HOW DID THIS

HELP

TEXTILE PRODUCTION ?

POWER LOOM

Edmund Cartwright introduced the power loom in 1787 to speed up the weaving process. This loom was run by water. It allowed for more production of better fabric in less time.

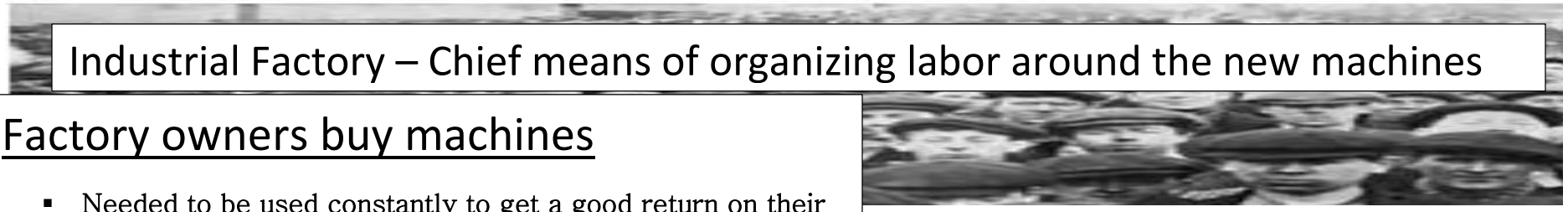
HOW DID THIS

HELP

TEXTILE PRODUCTION ?

ENTER THE FACTORY

Alright. *Enough dancing around the issue.* The real crux of the Industrial Revolution was when **production was centralized into one building**: THE FACTORY. Below is a brief overview of life in a factory…



Industrial Factory – Chief means of organizing labor around the new machines

Factory owners buy machines

- Needed to be used constantly to get a good return on their investment
- Workers needed regular hours & shifts to keep machines producing for MAXIMUM output
- Before (Cottage) people had worked irregular hours

FACTORY OWNERS HAVE A PROBLEM!

- Need to create a system in which:
  - Employees become accustomed to working regular hours
  - Perform simple task over and over
  - In an efficient manner
  - "Turn Man to Machine"
  - **REPETITIVE AND BORING WORK**

IT WORKED!

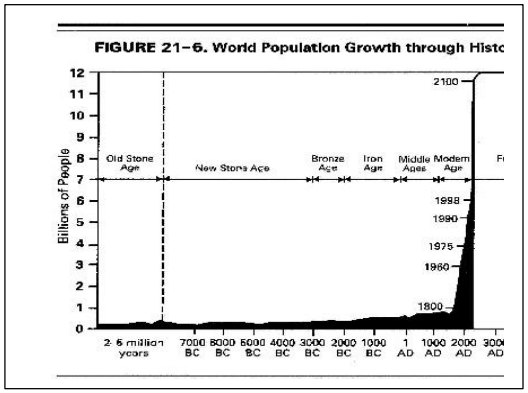
- **2ND and 3rd generation began to see the work week and the work day as normal**
- **Mid 19th Century ->Britain was the richest industrial Nation**
- **EXAMPLES**
- **½ the world's coal and manufactured goods**
- **Cotton Industry= Rest of the World Combined**

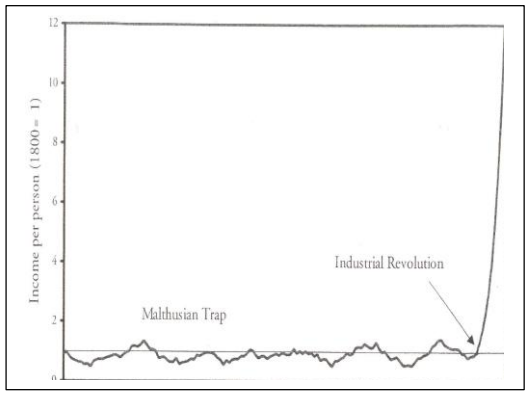
THEREFORE Owners MUST have strict rules

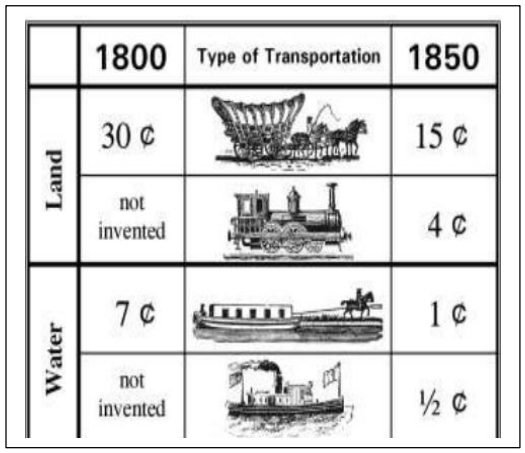
- **ADULTS**
  - Find for infraction
  - Fired for serious mistakes
  - Bad example for young workers
- **CHILDREN**
  - LESS LIKELY TO UNDERSTAND THE IMPLICATION OF DISMISSAL SO…

DATA ANALYSIS

IMPACT OF THE INDUSTRIAL REVOLUTION IN INDUSTRIALIZED COUNTRIES







	1800	Type of Transportation	1850
Land	30 ¢		15 ¢
	not invented		4 ¢
Water	7 ¢		1 ¢
	not invented		½ ¢

POPULATION

(YEARS BP= BEFORE PRESENT)

1. How many years did it take before earth's population eclipsed 1 Billion people??
2. From that point, how many years did it take to eclipse 7 billion people?
3. What event led to the rapid increase in the number of people on this planet?

STANDARDS OF LIVING

4. What event led to standards of living for people on earth?

5. What does the line going downward to the left imply about the Standard of Living for some people?

TRANSPORTATION

6. How much did it cost to ship a tone of cotton via train in 1800?

7. What is the cheapest way to ship something?

8. What invention allowed for shipping to become cost effective?

9. Would you say that transportation improved or deteriorated due to the

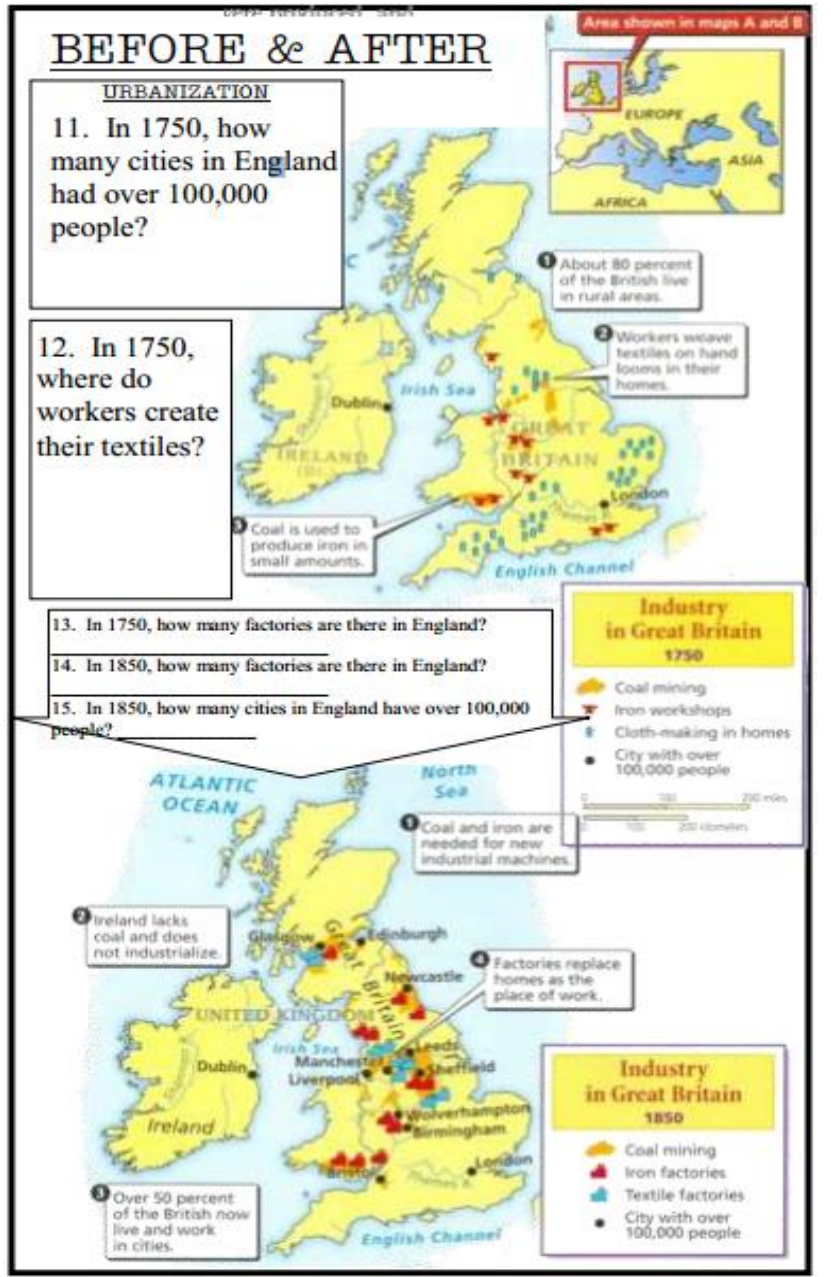


Table I Population of some cities in England in the Industrial Revolution

Cities	1801	1841
Manchester	35,000	353,000
Leeds	53,000	153,000
Birmingham	23,000	183,000
Sheffield	46,000	111,000

Source: Korn (1953, p. 67)

URBANIZATION

16. Where are all of these cities located?

17. Where did the Industrial Revolution begin?

18. How did the Industrial Revolution affect cities?

Top 10 Cities, 1800			Top 10 Cities, 1900		
Rank	City (Modern Country)	Population	Rank	City (Modern Country)	Population
1	Beijing (China)	1,100,000	1	London (United Kingdom)	6,480,000
2	London (United Kingdom)	861,000	2	New York (United States)	4,242,000
3	Canton (China)	800,000	3	Paris (France)	3,330,000
4	Edo (Japan)	685,000	4	Berlin (Germany)	2,707,000
5	Constantinople (Turkey)	570,000	5	Chicago (United States)	1,717,000
6	Paris (France)	547,000	6	Vienna (Austria)	1,698,000
7	Naples (Italy)	430,000	7	Tokyo (Japan)	1,497,000
8	Hangzhou (China)	387,000	8	St. Petersburg (Russia)	1,439,000
9	Osaka (Japan)	383,000	9	Manchester (United Kingdom)	1,435,000
10	Kyoto (Japan)	377,000	10	Philadelphia (United States)	1,418,000

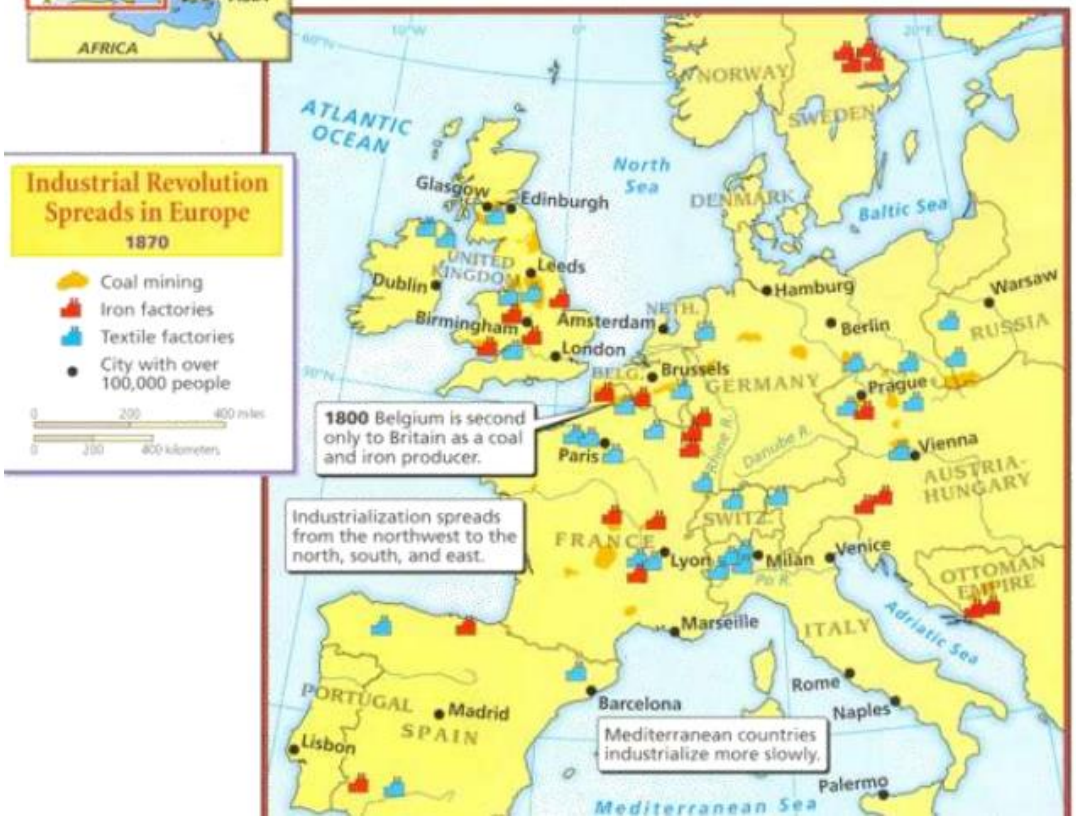
URBANIZATION

19. What cities are on both lists?

20. In 1900, which Asian country has experienced the IR?

21. Where are most of the largest cities in the world in 1900?

D The Industrial Revolution spread more quickly in some countries than in others. Industrial development depended on having enough natural resources, government support, and money for new factories and technologies.



URBANIZATION & SPREAD OF THE INDUSTRIAL REVOLUTION

22. How many cities over 100,000 are in Europe by 1870?

23. Which directions did the Industrial Revolution spread from England?

24. What three industries dominated the Industrial Revolution?

SO, NOW THAT YOU HAVE RESEARCHED THE HARD DATA, COMPLETE THE FOLLOWING STATEMENT ABOUT THE INDUSTRIAL REVOLUTION

AFTER MY INTENSE ANALYSIS OF THE DATA PRESENTED TO ME, I CAN UNEQUIVOCALLY STATE THAT THE INDUSTRIAL REVOLUTION CAUSED POPULATIONS TO _____. I ALSO DECLARE THAT THE INDUSTRIAL REVOLUTION CAUSED MOST PEOPLE's STANDARD OF LIVING TO _____. GREATER TECHNOLOGIES ALLOWED FOR TRANSPORTATION TO _____. MANY PEOPLE MOVED TO THE CITIES DURING THIS ERA BECAUSE THE NUMBER AND SIZE OF LARGE CITIES _____. THE INDUSTRIAL REVOLUTION SEEMED TO MAINLY AFFECT _____ AND _____ DURING THIS ERA WITH THE EXCEPTION OF _____ IN ASIA.

Effect of the INDUSTRIAL REVOLUTION on the SLAVE TRADE

Cause	Effect
Eli Whitney invents the Cotton Gin in 1793	Makes Cotton easier/quicker to produce
Huge increase in the amount of cotton being produced	1830- 750,000 bales in US 1850- 2.8 million bales
American south became more dependent on Cotton	American South became more dependent on Slaves
Northern Abolition groups pushed to end slavery	Southern Groups refused to give up their slaves
American Civil War	Slavery is outlawed

CHILD LABOR

So… Why would you hire a child?

Who fought to change laws to outlaw child labor?

Timeline of Child Laws in the USA

1832
New England Unions condemn Child labor saying it, "endangers their well-being"

1836
Massachusetts passes the first child labor law. Children under 15 working in factories must attend school for 3 months a year

1842
Massachusetts limits children's work days to 10 hours a day

1886
One of the largest unions in the world, AFL (American Federation of Labor) proposes a ban on all labor for children under 14

1904
National Child Labor Committee forms to aggressively seek reform to national child labor laws

1924
Congress passes Constitutional Amendment banning child labor; Did not gain enough votes by the states… Fails.

1938
Congress passes Fair Labor Standards Act regulating the minimum ages and hours of children in the workforce

Imagine that our factory owner not only employed you, but also owned everything around you. Our factory owner has decided to move to the outskirts of town and build his own town, a *Company Town*. Here, he owns the real estate, buildings, utilities, hospitals, grocery stores, gas stations, etc...

Pullman, Illinois

- Built in the 1880s by George Pullman
- George Pullman owned a railcar company
- Pullman ruled the town like a king
  - Banned alcohol, set rent, costs, etc.
- Pullman wanted to build the "perfect town"
- Provided housing for workers that was far superior to what they would have had elsewhere
- Economic Panic in 1893 led to cuts in wages...
  - Pullman did not decrease rent, prices, etc.

Social Effects

WOMEN

Industrial Revolution was a mixed blessing for Women

GOOD	BAD
▪ Factory work provided higher wages than work done at home	▪ Women earned roughly 1/3 of the wages earned by men

- Women worked hard for the Abolition of slavery
- Women began to push for more rights for themselves

ABOLITION OF SLAVERY

- Slavery had increased with the Invention of the COTTON GIN
- Great Britain was the first to ban slavery (1833)
  - Different parties were pushing for an end to slavery in the British Empire
    - 1. Opposed it Morally
    - 2. Opposed it Economically
    - 3. Preferred Cheap labor
- The United States ended slavery after the Union defeated the Confederacy in 1865 The rest of the world soon followed.

Unions

1. What is a UNION?

2. <u>COLLECTIVE BARGAINING</u>=

3. What is a STRIKE?

4. What is the AFL?

5. How old did you have to be to work in 1833?

1. Name one benefit the Union wants:

2. What benefit does Mr. Burns vow to get back?

3. When did the Union earn the Dental Plan?

4. To what job does Homer get elected?

5. When "collectively bargaining", how does Homer get the Dental Plan back?

INDUSTRIAL REVOLUTION

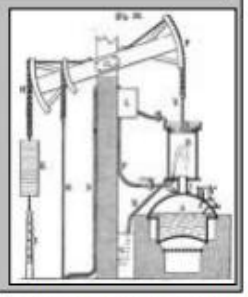
INDUSTRIAL REVIEW

We've just experienced one of the most influential movements in all of human history. Life after the Industrial Revolution was drastically different than before. Use this to guide your review of the global movement that came to be known as the Industrial Revolution.

BEGINNINGS

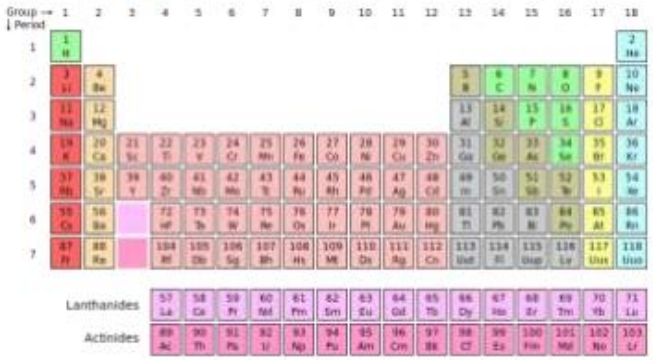
Circle the nation where it began.

How would this invention (*the Steam Engine*) have helped the circled area during the Industrial Revolution?



Also, during the Industrial Revolution, the people in the nation you circled started *Scientific Farming*, rather than the random farming they had done before... What movement led to higher crop yields?

Circle the **two** elements that the area above had that made it the ideal spot for the Industrial Rev.



INNOVATORS

Sure, Coal and Iron are great, but without human ingenuity, England is just a coal-y, iron-y little island. Let's focus on the people behind the Industrial Revolution...

NAME	INNOVATION	SIGNIFICANCE/WHO CARES?
 James Hargreaves		
 James Watt		
 Eli Whitney		
 Edward Jenner		
 Henry Bessemer		
 Louis Pasteur		

These guys added to production of textiles, steel, energy, and raw cotton. They also helped increase the length of life with vaccinations.

PRODUCTION

Why is the one on the right more productive than the one on the left?

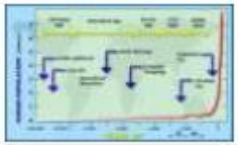
_____

_____

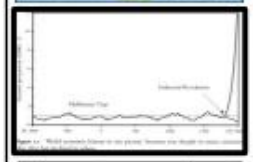
_____

COMPLETE THIS SENTENCE

"Because of the Industrial Revolution,



Population _____."



Standard of Living _____."

	1800	Type of Transportation	1850
Land	30 ¢		15 ¢
	not invented		4 ¢
Water	7 ¢		1 ¢
	not invented		½ ¢

Transportation _____."

City size _____."

How did the Industrial Revolution make life better for...

Women

Slaves

Kids

HOW DID THE INDUSTRIAL REVOLUTION AFFECT THE ENVIRONMENT?

What is this group called?

What are they fighting for?

How does Collective Bargaining help them?

ANSWER THE FOLLOWING QUESTIONS ABOUT OUR LEMONADE STAND IN A CAPITALIST SYSTEM AND A COMMUNIST SYSTEM

CAPITALI$M

Name of the Stand: _____
Owner of the Stand: _____
Who keeps the Profits: _____
Who controls the Means of Production: _____

COMMUNISM

Name of the Stand: _____
Owner of the Stand: _____
Who keeps the Profits: _____
Who controls the Means of Production: _____