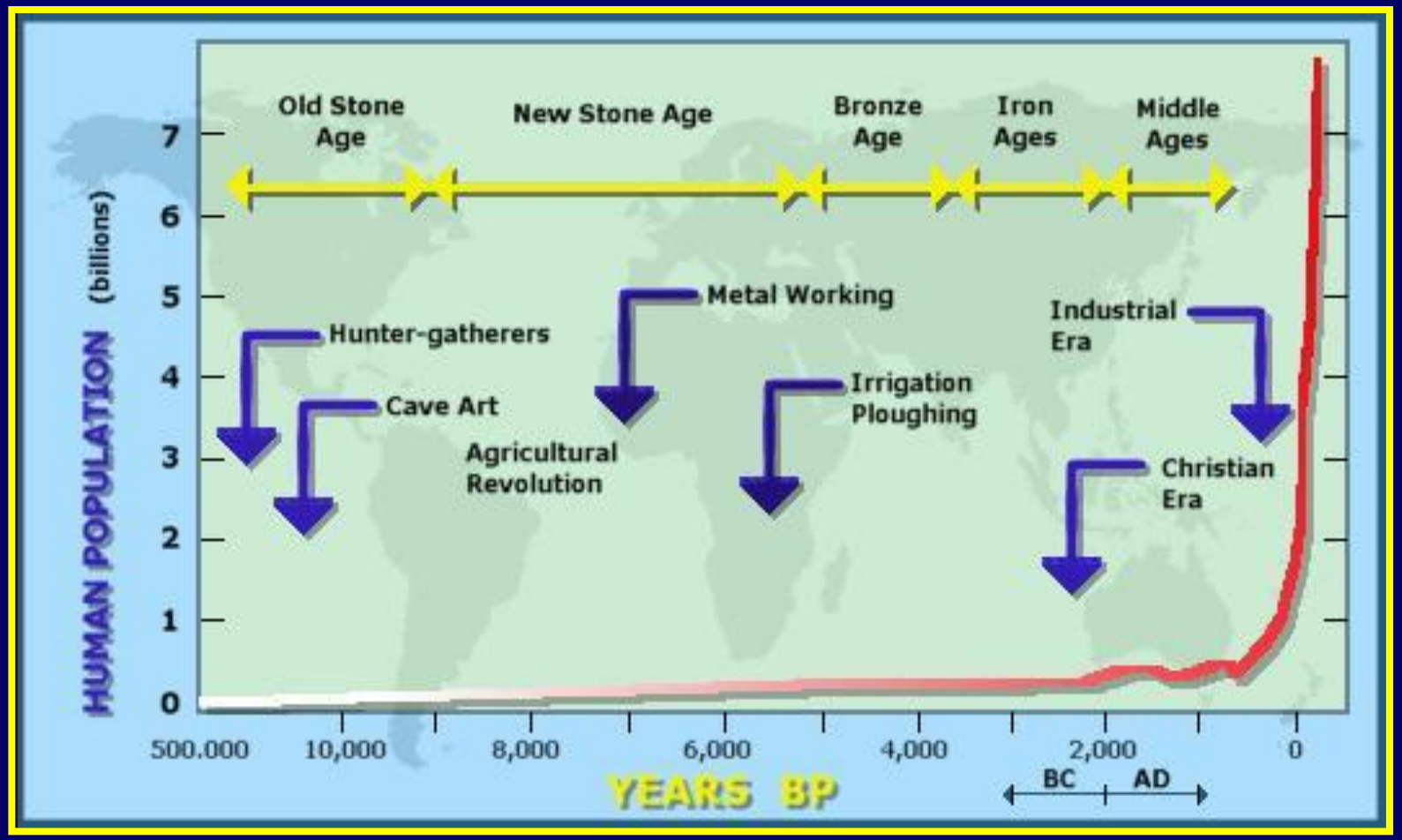
Human Population Growth

Clarifying Objective 2.1.4

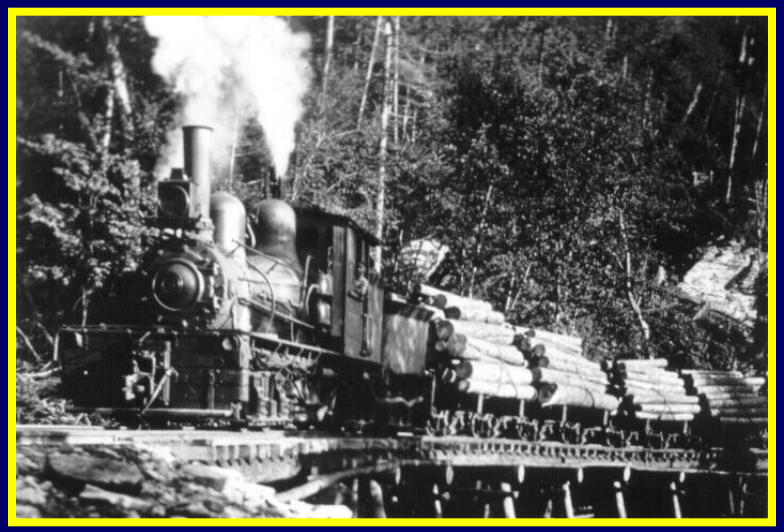
Explain how ecosystems can be relatively stable over hundreds or thousands of years, even though populations may fluctuate due to availability of food and shelter, as well as the number of predators or disease.

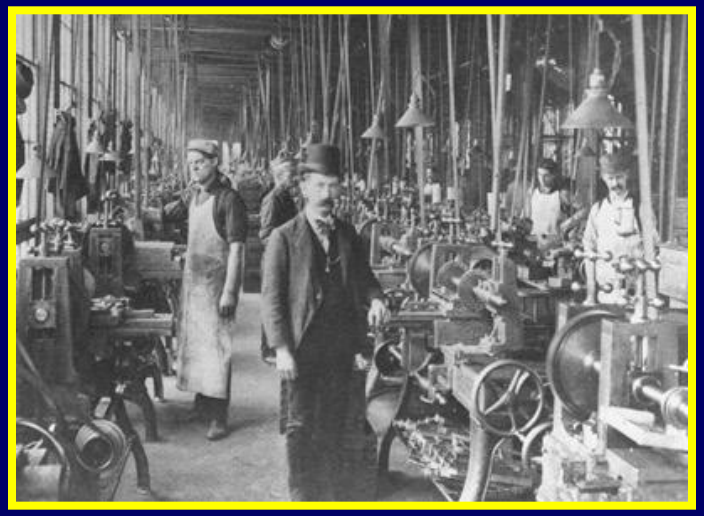
The human population is growing exponentially the rate of growth increasing dramatically over the past 200 years.

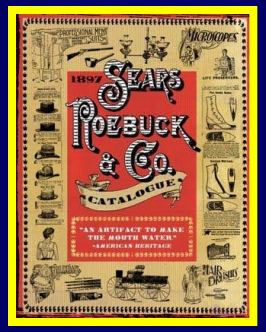


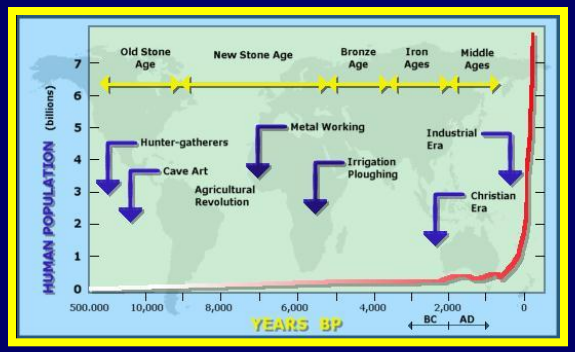
Industrial Revolution

In the early 1800's, the industrial revolution began producing affordable products to meet the needs of the masses.



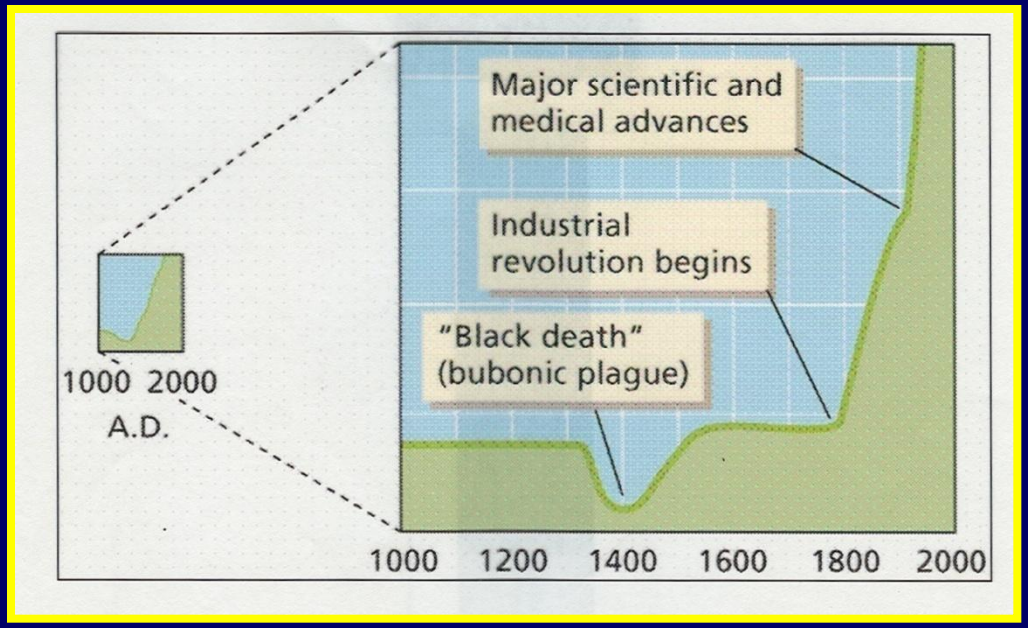






Medical Revolution

Prior to the 1830's, infant mortality was high and widespread epidemics were common.



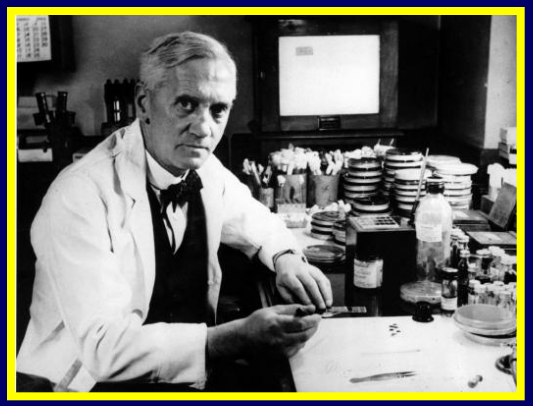
In 1348, the bacteria caused bubonic plague spread across Europe, killing between 25% to 50% of the population.

Medical Revolution

In the early 1800's, a country doctor, named Edward Jenner, discovered the first vaccine.

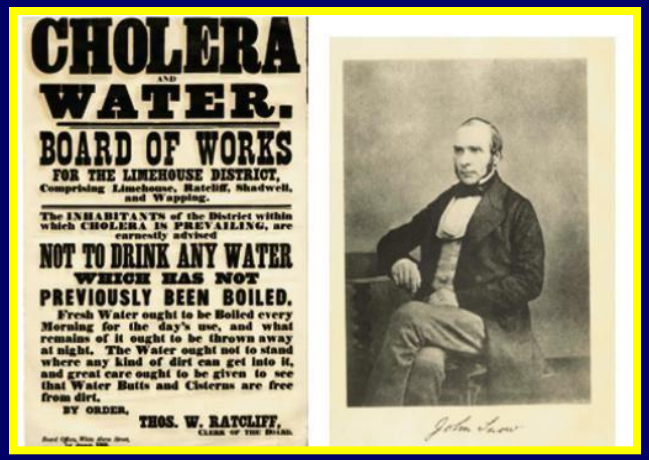
In the early 1900's, Joseph Lister proved that operating in sterile environments and cleaning wounds helped prevent infections.

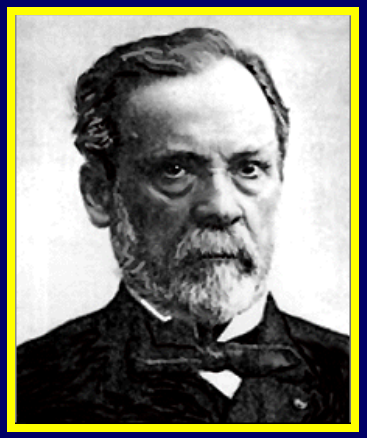
In the 1930's, Alexander Fleming discovered that penicillin could stop bacterial infections.



Better Sanitation

In 1854, John Snow proved that cholera was transmitted through contaminated water.



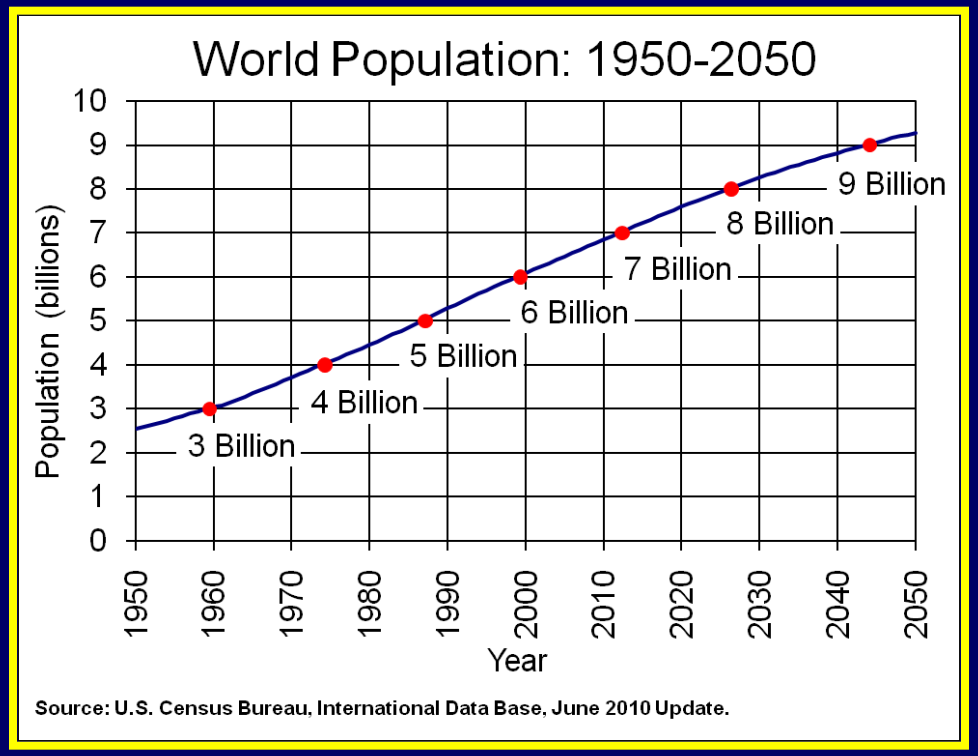


In the mid-1800's, Louis Pasteur, discovered that many diseases were caused by bacteria that could be killed with heat.

In the 1920's, cities began treating water to reduce disease.

Higher Exponential Growth

With people living longer, the human population began increasing even faster, reaching 7 billion people in the year 2012.



1830 – 1 Billion
1930 – 2 Billion
1960 – 3 Billion
1975 – 4 Billion
1987 – 5 Billon
1998 – 6 Billion
2012 – 7 Billion
2016 - 7.3 Billion

Population Clock

The question then becomes, how many people can Earth support?

What is Earth's Carrying Capacity?

Who will be most affected as competition for resources increases?

Three Categories of Nations

Highly Developed – High Income

USA, Canada, Australia, New Zealand, Japan, Western Europe, and Scandinavia

Moderately Developed – Middle Income

Latin America, former USSR, China, Eastern Europe, South Africa

Developing – Low Income

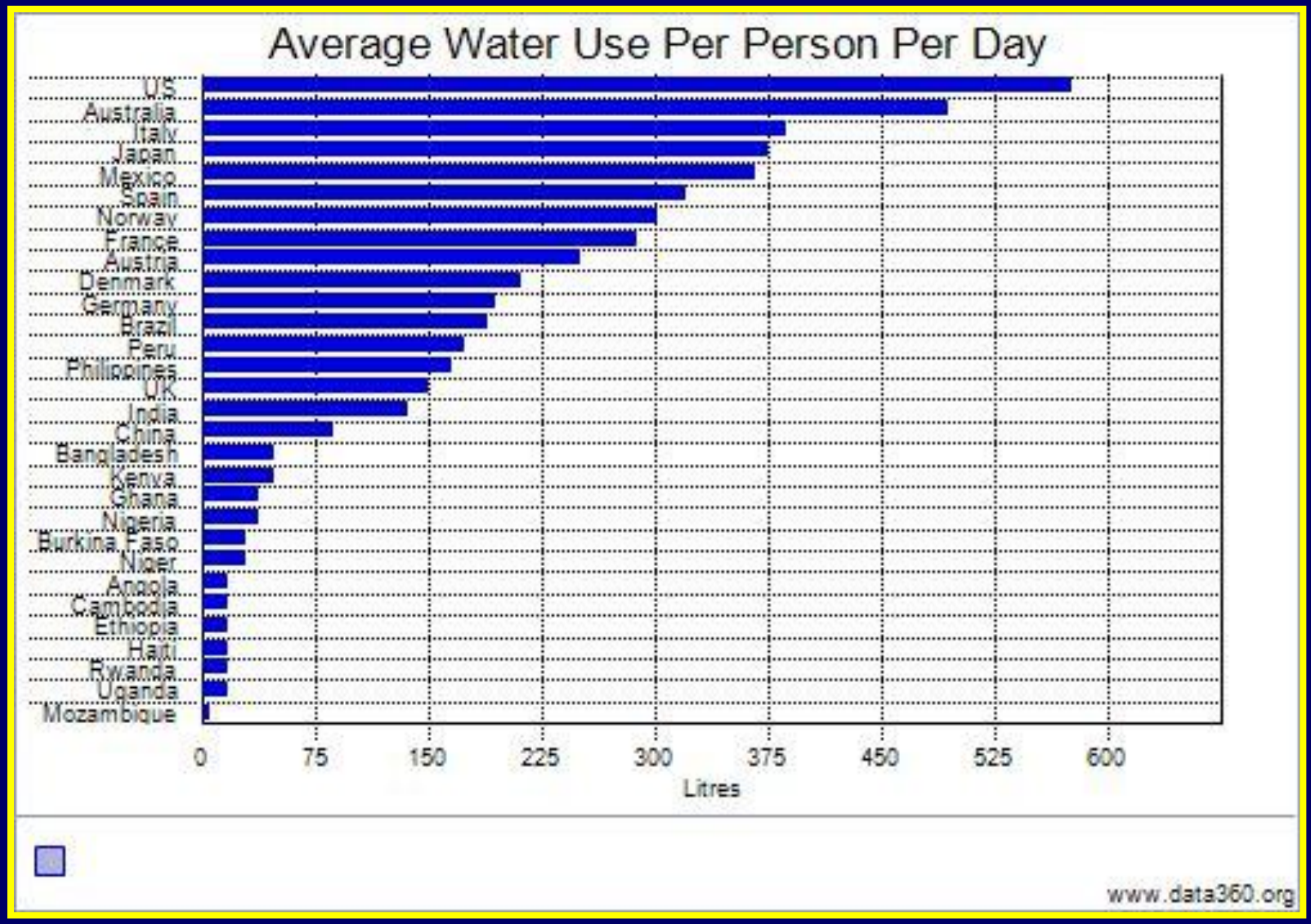
Eastern and Central Africa, India, and Central Asia.

Distribution of Resources

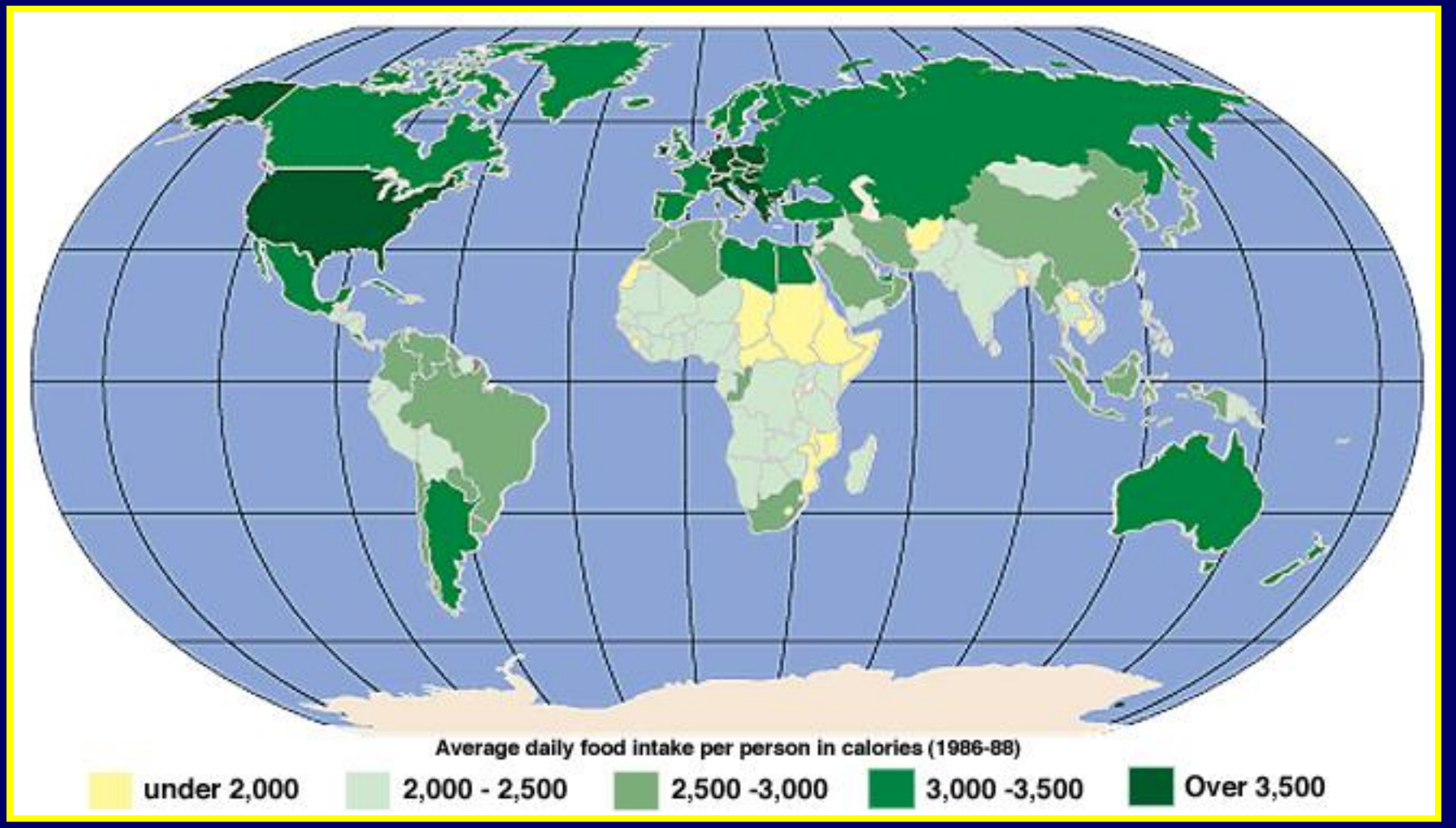
Highly developed nations contain 16% of the world's population but control 81% of the world's wealth.

Population Density

Distribution of Resources

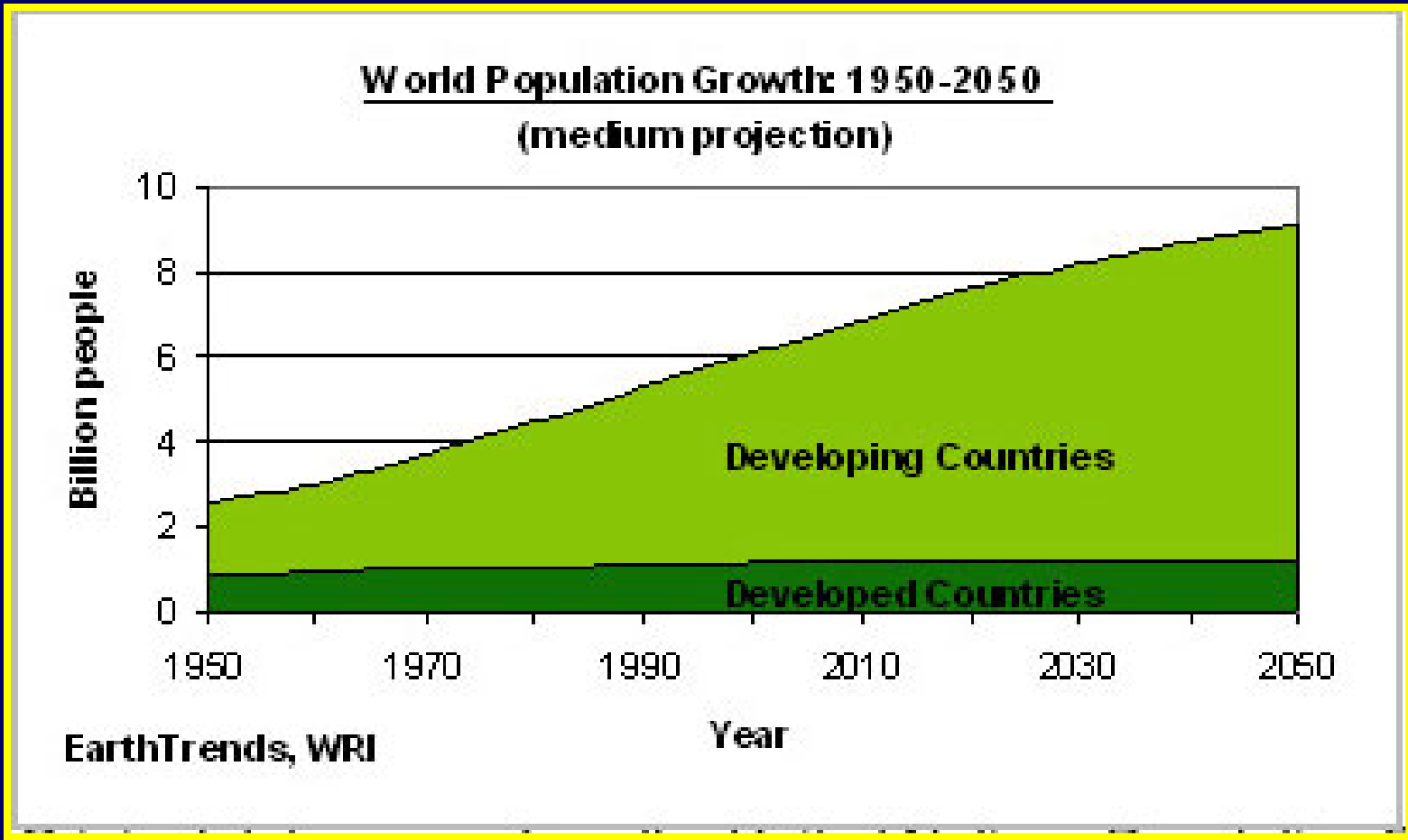


Distribution of Resources



Distribution of Resources

Populations in developing nations are increasing much faster than developed nations.



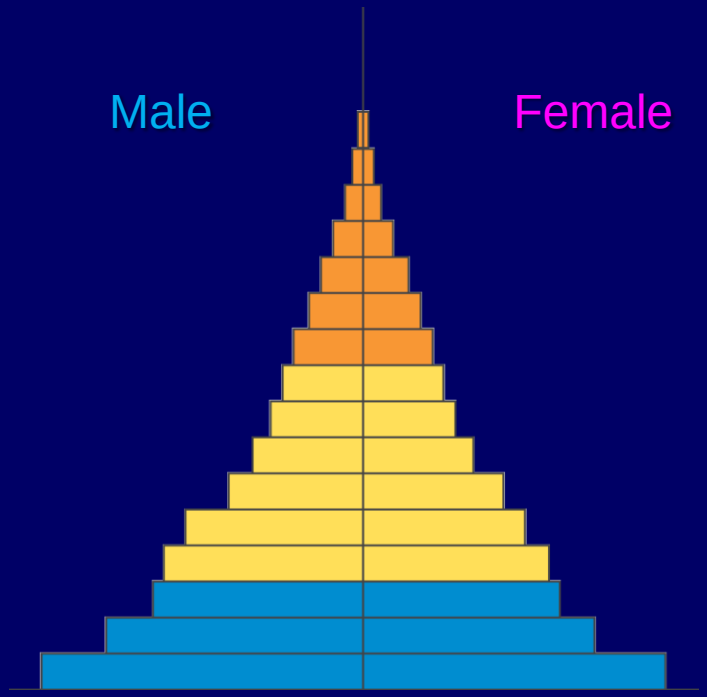
Population Age Structure Graphs

How fast a population will grow can be estimated through age structure diagrams.

Post Reproductive Age
(44 +)

Reproductive Age
(15 – 44)

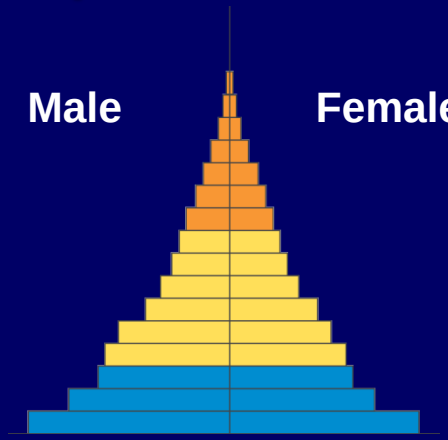
Pre-Reproductive Age
(0 – 14)



Populations with larger numbers of young people will grow the most rapidly

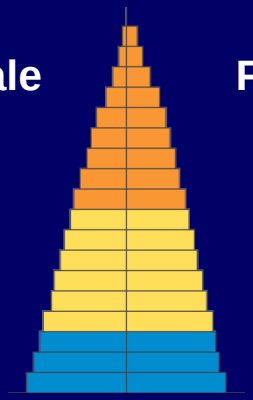
Population Age Structure Graphs

Nigeria



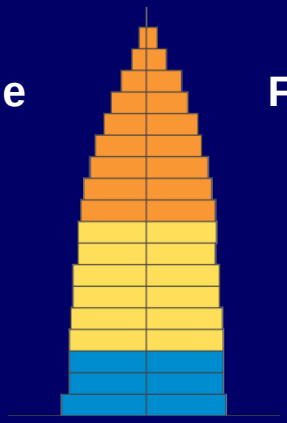
Rapid Growth

United States



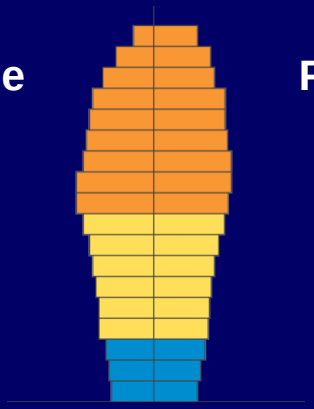
Slow Growth

Spain



Zero Growth

Germany



Negative Growth

Current USA

Ages 0-14

Ages 15-44

Ages 45-85+

Reducing Population Growth

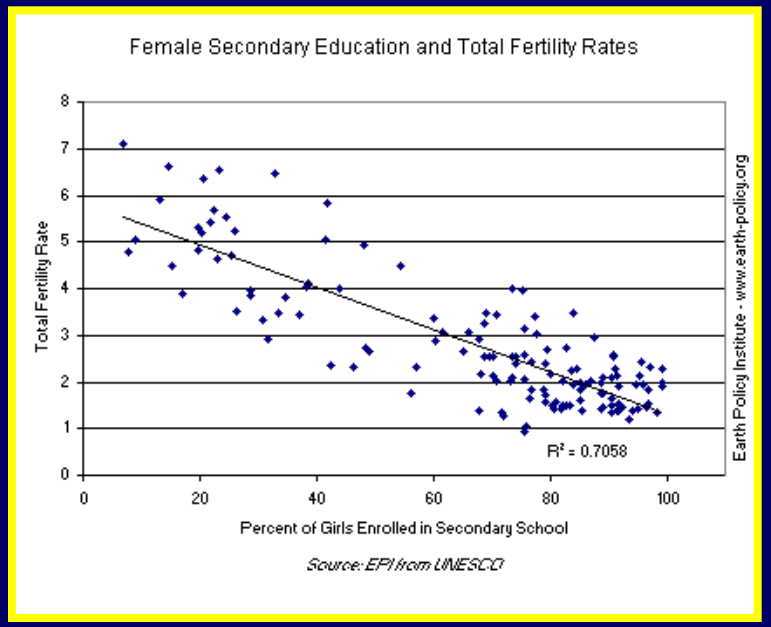
One of the most effective ways to lower population growth and reduce poverty is to provide adequate education to both girls and boys.

Primary School Enrollment and Total Fertility Rates			
Rank	**Country**	**Primary School Enrollment %**	**Fertility Rate (# Children per woman)**
1	Japan	100	1.3
2	Spain	99.8	1.5
3	Iran	99.7	1.8
4	United Kingdom	99.6	1.9
…			
183	Djibouti	40.1	3.9
184	Sudan	39.2	4.2
185	Eritrea	35.7	4.6

Reducing Population Growth

Female education is especially effective. Research shows that women who are empowered through education tend to have fewer children and have them later.

When women with educations do have children, they tend to be healthier and raise healthier children, who then stay in school longer.



Globally, 65 million girls are not in school

Human Population Growth

- Human population – exponentially (200 years)
- Industrial revolution, medical revolution, and more sanitary conditions
- Developing nations growing faster
- Age structure graphs predict rate of growth
- Large number of children = faster growth
- Educating girls is best way to slow down population growth