Environmental Quiz

Most recent update November 1, 2016

The population of the world in 1950 was 2.6 billion. The world population is currently about:

- 3.4 billion
- 7.4 billion
- 9.3 billion
- 11.5 billion

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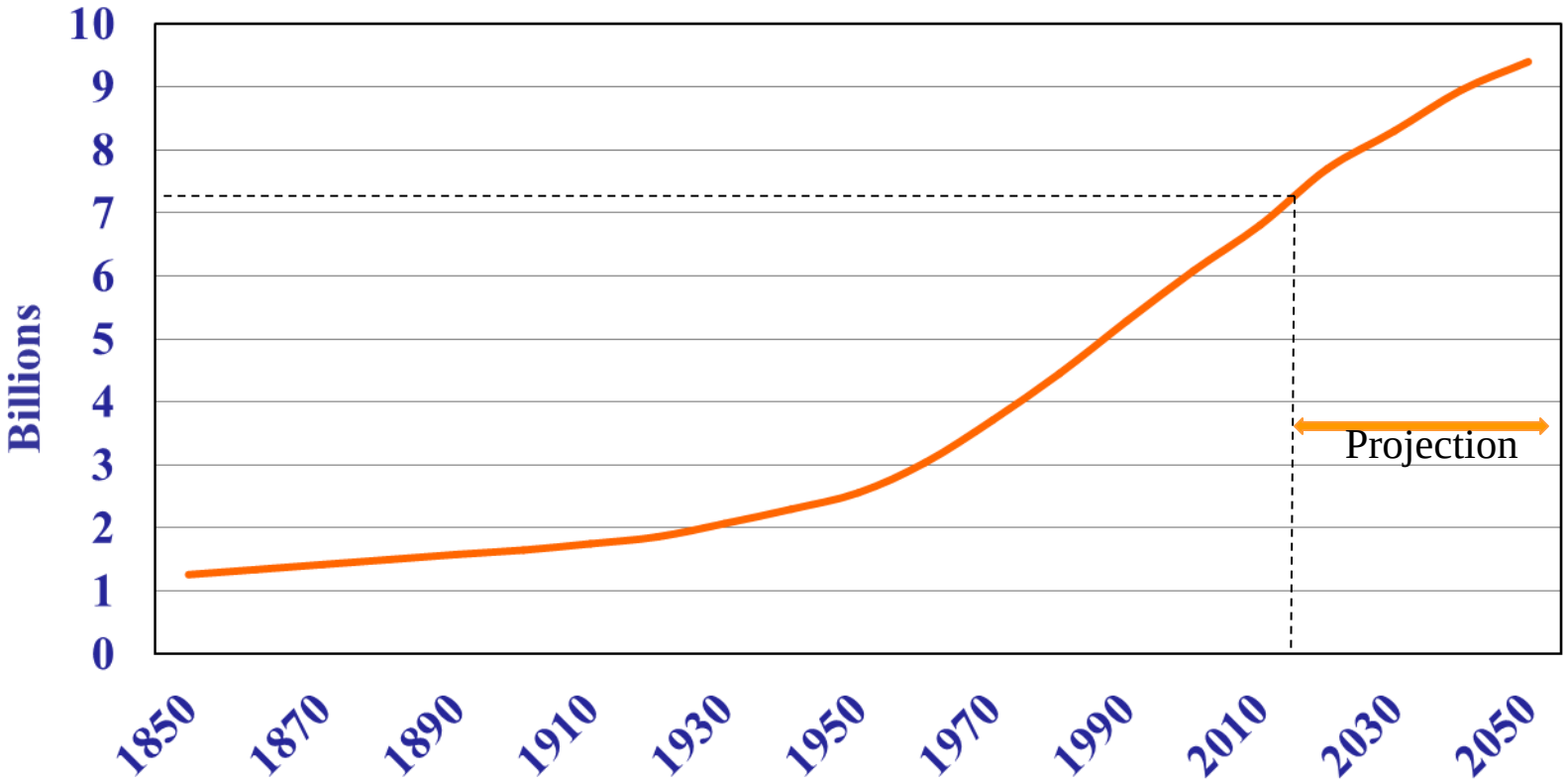
World Population 1850-2050



Source: U.S. Census Bureau, International Programs Center, 2016.

The population of the world is currently increasing at a rate of about 9,000 people per:

- month
- week
- day
- hour

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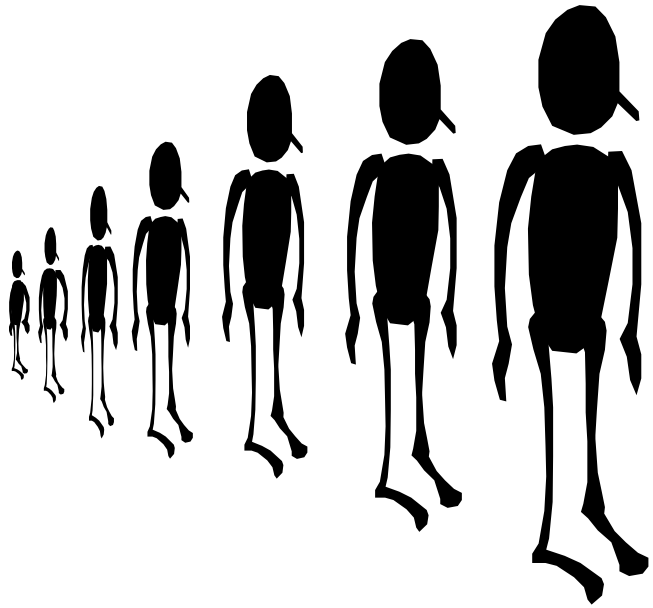
Rate of Population Increase - 2016

Time Unit	Population Increase
Year	78,165,166
Month	6,513,764
Week	1,503,176
Day	213,566
Hour	8,899
Minute	148
Second	2.5

Source: U.S. Census Bureau, International Division, 2016.

The estimated world population in the year 2050 is about:

- 3.4 billion
- 6.8 billion
- 9.7 billion
- 11.5 billion



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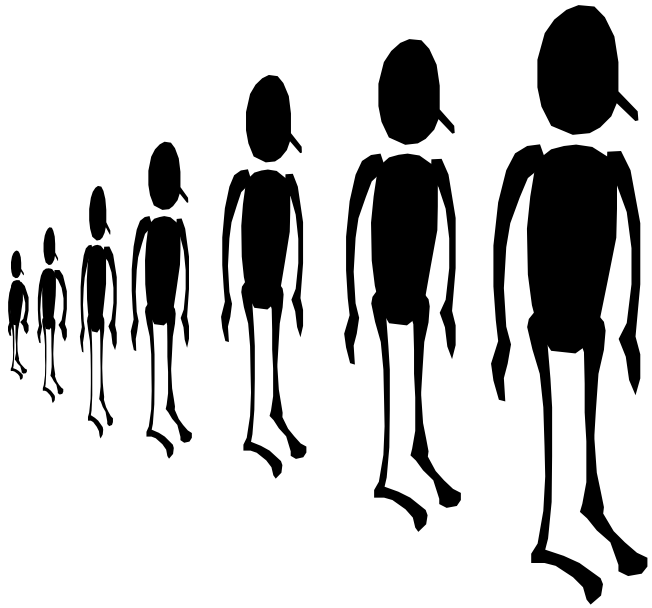
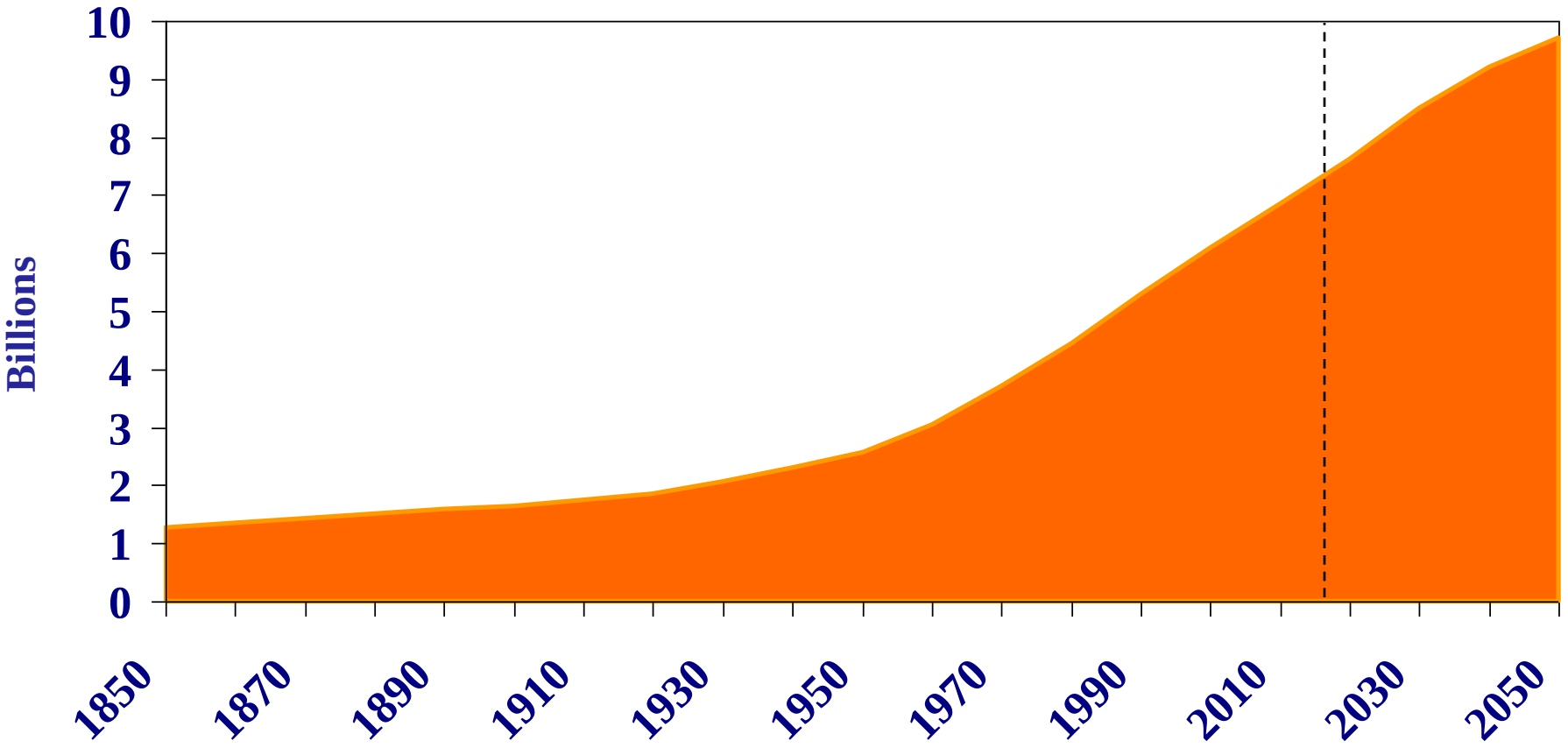


World Population 1850-2050

(Medium projection of growth assumed after 2000)



Source: U.S. Census Bureau, International Programs Center, 2016.

The population of the United States in 1960 was 181 million. The U.S. population is currently about:

- 220 million
- 325 million
- 420 million
- 511 million

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The medium (most likely) estimate of the U.S. population in the year 2060 is:

a. 220 million
b. 319 million
c. 417 million
d. 511 million

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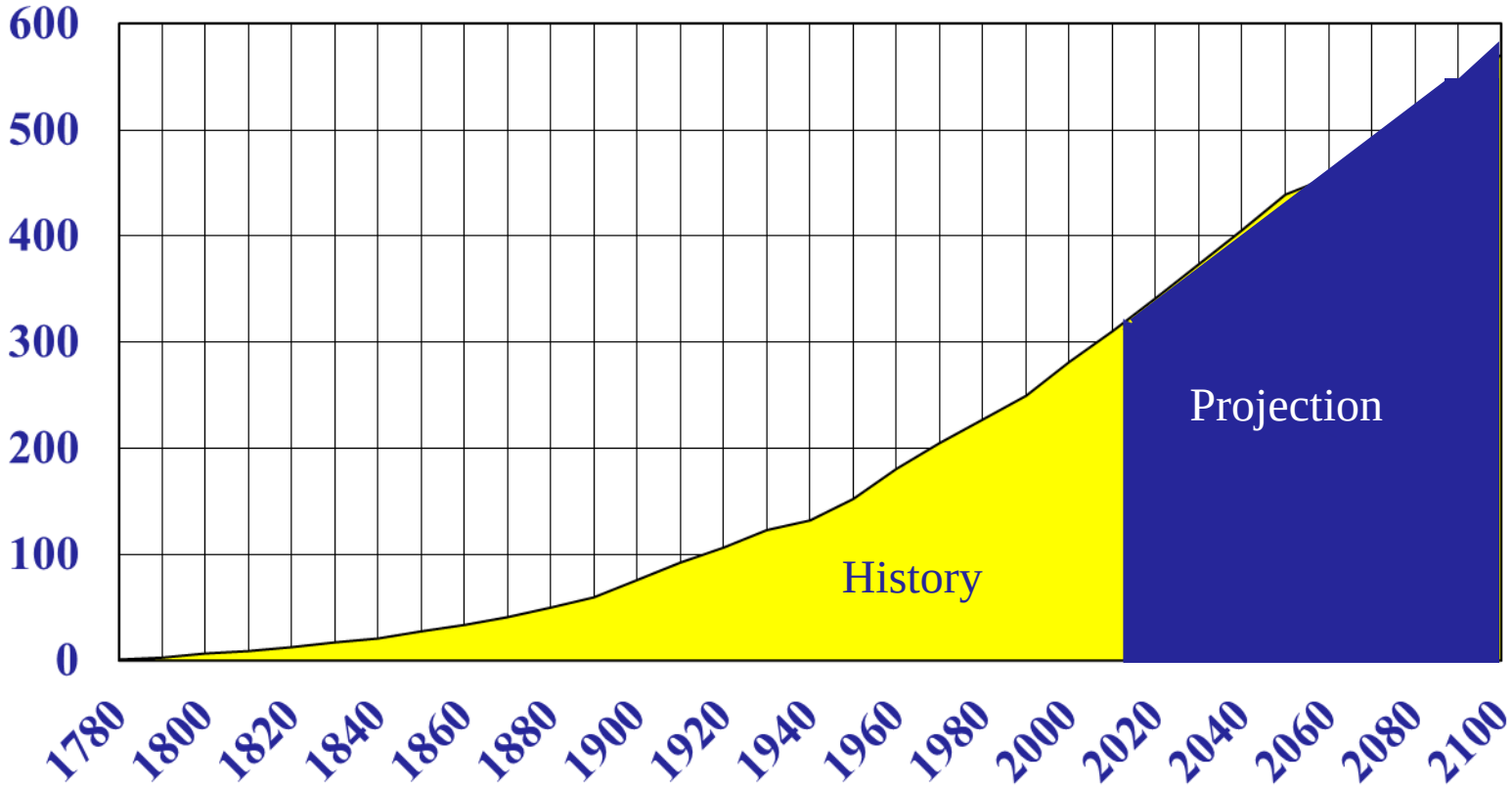
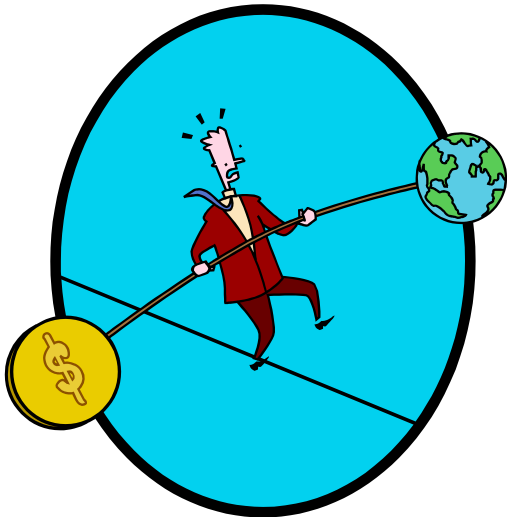
Growth of U.S. Population, 1776- 2100



Source: U.S. Census Bureau, Population Division (2013)

China's mid-year 2016 population was 1.37 billion – 4x the U.S. Assuming a continuation of the 2016 U.S. population growth rate of 0.82% annually, how many years would it take for the U.S. population to become equal to the current population of China?



a. 50
b. 90
c. 175
d. 400
e. 900

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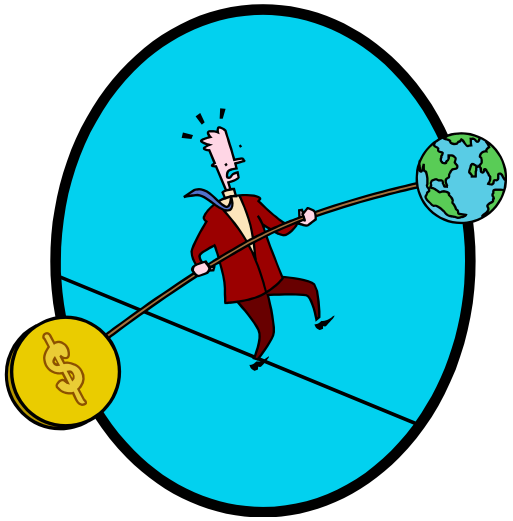

a. 50
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If the U.S. population were to continue its current rate of growth (0.82% annually) for the next 400 years, the population would increase to over 8.5 billion. (The current world population is 7.4 billion).

If the current rate of growth (0.82%) were to continue for the next 900 years, this seemingly negligible growth rate would result in a U.S. population of over 506 billion (68x the current *world* population).

True (T) or False (F):

Consumption of mineral resources globally has increased sharply over the past 30 years.

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True (T) or False (F):

The world's most economically developed countries consume a far larger share of the world's industrial raw materials than their collective share of world population.

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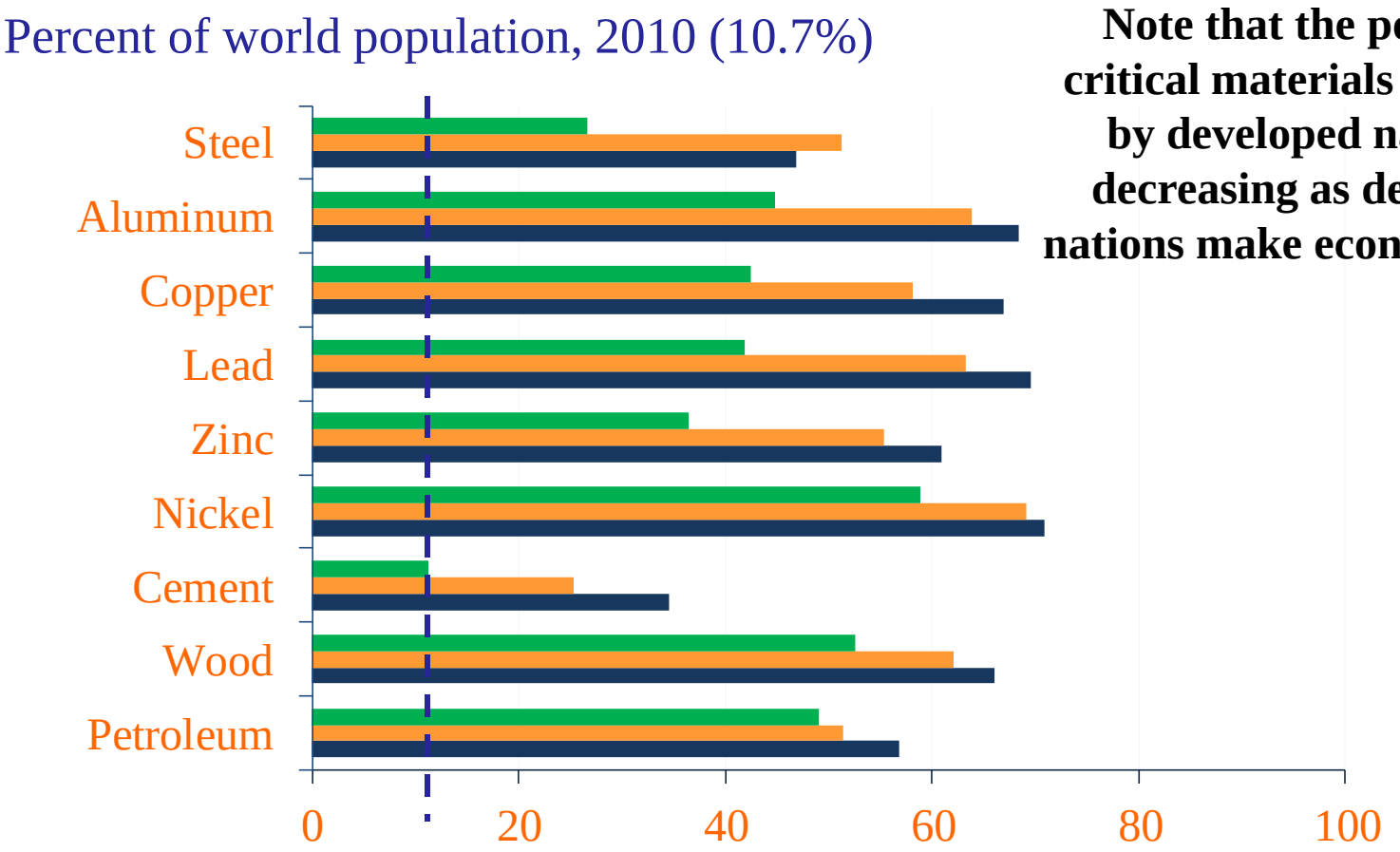
Percent of Global Consumption of Selected Materials by Developed Nations*



Note that the portion of critical materials consumed by developed nations is decreasing as developing nations make economic gains.

* Developed nations included in consumption statistics are the United States, Canada, the 15 western European nations that first formed the EU, Japan, Australia, New Zealand, and S. Korea.

True (T) or False (F):

The United States is a net exporter of most raw materials used by industry today.

True (T) or False (F):

The United States is a net exporter of most raw materials used by industry today.

Due in part to domestic environmental concerns, the U.S. is a net importer of most categories of raw materials used to support our economy and lifestyle.

- Most metals
- Portland and masonry cement
- Petroleum (the basis for plastics)
- Wood and wood products

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2015, and by Major Foreign Sources a/ b/ c/ d/

Material	% Imported	Principal Foreign Sources (2011-14)
Niobium	100	Brazil, Canada
Manganese	100	S. Africa, Gabon, Australia, Georgia
Graphite	100	China, Mexico, Canada, Brazil
Strontium	100	Mexico, Germany, China
Arsenic (trioxide)	100	Morocco, China, Belgium
Bauxite/Alumina	100	Jamaica, Guinea, Brazil, Guyana
Fluorspar	100	Mexico, China, S. Africa, Mongolia
Indium	100	China, Canada, Belgium, S. Korea
Thallium	100	Germany, Russia
Thorium	100	India, France
Asbestos	100	Brazil, Canada
Quartz crystal	100	China, Japan, Romania, UK

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2015, and by Major Foreign Sources a/ b/ c/ d/

Material	% Imported	Principal Foreign Sources (2011-14)
Rubidium	100	Canada
Cesium	100	Canada
Tantalum	100	China, Germany, Indonesia, Kazakhstan
Mica (natural)	100	India, Brazil, China, Belgium
Scandium	100	China
Vanadium	100	Czech Rep., Canada, S. Korea, Austria
Gallium	100	Germany, China, UK, Ukraine
Iodine	100	Chile, Japan
Gemstones	99	Israel, India, Belgium, S. Africa
Bismuth	95	China, Belgium, Peru, UK
Titanium	91	S. Africa, Australia, Canada, Mozambique
Platinum	90	S. Africa, Germany, UK, Canada
Garnet (industrial)	88	Australia, India, China

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2015, and by Major Foreign Sources a/ b/ c/ d/

Material	% Imported	Principal Foreign Sources (2011-14)
Germanium	85	China, Belgium, Russia, Canada
Antimony	84	China, Bolivia, Belgium, Thailand
Diamond (dust, grit)	84	China, Ireland, Romania, S. Korea
Potash	84	Canada, Russia, Israel, Chile
Stone (dimension)	83	China, Brazil, Italy, Turkey
Zinc	82	Canada, Mexico, Peru, Australia
Lithium	80+	Argentina, Chile, China
Rhenium	79	Chile, Poland, Germany
Silicon carbide	77	China, S. Africa, Netherlands, Romania
Rare earth metals	76	China, Estonia, France, Japan
Cobalt	75	China, Norway, Finland, Russia
Tin	75	Peru, Indonesia, Bolivia, Malaysia
Silver	72	Mexico, Canada, Poland, Peru

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2015, and by Major Foreign Sources a/ b/ c/ d/

Material	% Imported	Principal Foreign Sources (2011-14)
Barium (Barite)	70	China, India, Morocco, Mexico
Peat	69	Canada
Titanium (sponge)	68	Japan, Kazakhstan, China
Chromium	66	S. Africa, Kazakhstan, Russia, Mexico
Palladium	58	Russia, S. Africa, UK, Switzerland
Tungsten	49	China, Bolivia, Canada, Germany
Magnesium Cpds	43	China, Brazil, Canada, Australia
Aluminum	40	Canada, Russia, United Arab Emirates
Mica (scrap/flake)	39	Canada, China, Finland, Mexico
Silicon	38	Russia, Brazil, China, Canada
Nickel	37	Canada, Australia, Russia, Norway
Copper	36	Chile, Canada, Mexico
Salt	32	Chile, Canada, Mexico, The Bahamas

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2015, and by Major Foreign Sources a/ b/ c/ d/

Material	% Imported	Principal Foreign Sources (2011-14)
Lead	31	Canada, Mexico, Peru, Australia, Kazakhstan
Nitrogen (fixed)	29	Trinidad/Tobago, Russia, Canada, Ukraine
Petroleum	27	Canada, Saudi Arabia, Mexico, Venezuela, Iraq,
Magnesium Metal	26	Israel, Canada, China, Mexico
Iron and steel	25	Canada, S. Korea, Brazil, Russia
Lumber (softwood)	25	Canada
Perlite	21	Greece, Turkey
Pumice	21	Greece, Iceland, Mexico
Vermiculite	20	S. Africa, Brazil, China
Sulfur	16	Canada, Mexico, Venezuela
Gypsum	14	Mexico, Canada, Spain
Talc	13	Pakistan, Canada, China, Japan

Net U.S. Imports of Selected Materials as a Percent of Apparent Consumption - 2015, and by Major Foreign Sources [a/] [b/] [c/] [d/]

Material	% Imported	Principal Foreign Sources (2011-14)
Feldspar	12	Turkey, Mexico, Germany, India
Beryllium	11	Kazakhstan, China, Nigeria, UK
Iron and steel slag	11	Canada, Japan, Spain, Italy
Cement (Portland/masonry)	10	Canada, S. Korea, China, Greece

a/ U.S. Geological Survey. 2016. Mineral Commodity Summaries - 2016.

b/ Principal foreign sources arranged by most important supplier to the left, next most important to the right of that, and so on.

c/ Petroleum data from U.S. Department of Energy, Energy Information Administration 2016 (October).

d/ Data for construction lumber from RISI, Random Lengths, 2015, 2016.

Considering U.S. consumption of the following materials, which is consumed in the greatest quantity? (Cement is a binder, and makes up 8-15% of concrete)

a. steel
b. aluminum
c. wood
d. plastic
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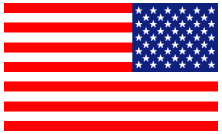

Annual U.S. Consumption of Various Raw Materials, 2015

	Million Metric tons	Million m^3
Roundwood*	184	411
Cement	93	30
Steel	110	15
Plastics	54.2	60
Aluminum	5.3	1.9

* Roundwood includes all forms of wood, including construction materials, finished products such as furniture, cabinets, and moldings, wood that goes into paper manufacturing, and wood used to generate energy.

More wood is consumed every year in the United States than all metals and all plastics combined.

Source: Data for wood from Wood Resources International (2016); for cement, steel, and aluminum from the U.S. Geological Survey (2016); and for plastics from the American Plastics Council (2016).

True (T) or False (F):

Energy consumption per capita (per person) in the United States is twice that of the European Union.

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Per Capita Energy Consumption in the U.S. and the E.U. Countries, 2008

	Energy Consumption (kilograms of oil equivalent per person)
United States	7885.9
Finland (EU highest)	6555.0
France	4396.8
Germany	4187.0
UK	3894.6
E.U. Average	3773.4

China's emissions of carbon dioxide in 2014 were greater than those of any other nation, and twice those of the United States. In that same year China's per capita emissions of carbon dioxide were:

a. 35% greater than the U.S.
b. 15% greater than the U.S.
c. About the same as in the U.S.
d. Less than one-half those of the U.S.
e. Less than one-third those of the U.S.

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Water covers approximately 70% of the Earth's surface. About ____ of this is available for human use.

- 1 percent
- 5 percent
- 10 percent
- 15 percent

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True (T) or False (F):

Globally, the area of forests is declining, mostly due to human activity.

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Conversion of forest to non-forest uses totals about 8 million acres annually, primarily in the tropical regions.

The number one cause of tropical deforestation worldwide is:

- commercial logging.
- wildfire.
- clearing of lands for agricultural use.
- gathering of firewood.
- building of roads and cities.

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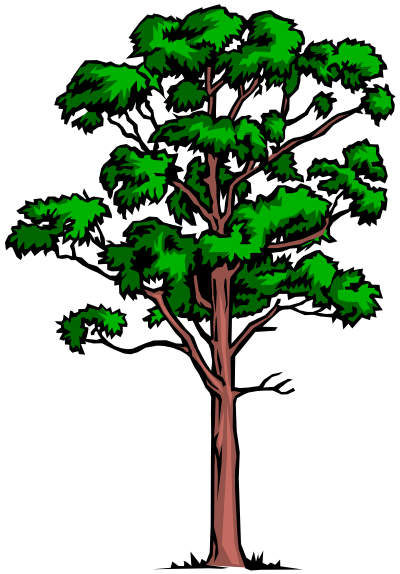
Various estimates indicate that 60 to 85% of tropical deforestation today is due to permanent and shifting agriculture.

The area covered by forests in the U.S. in 2012 was approximately ____ of the forested area that existed in 1600.



- 73 percent
- 50 percent
- 33 percent
- 17 percent

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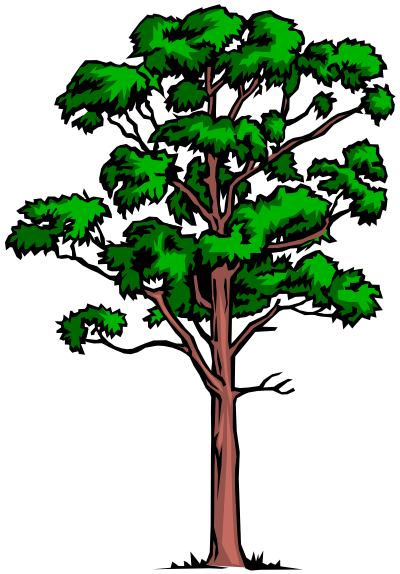

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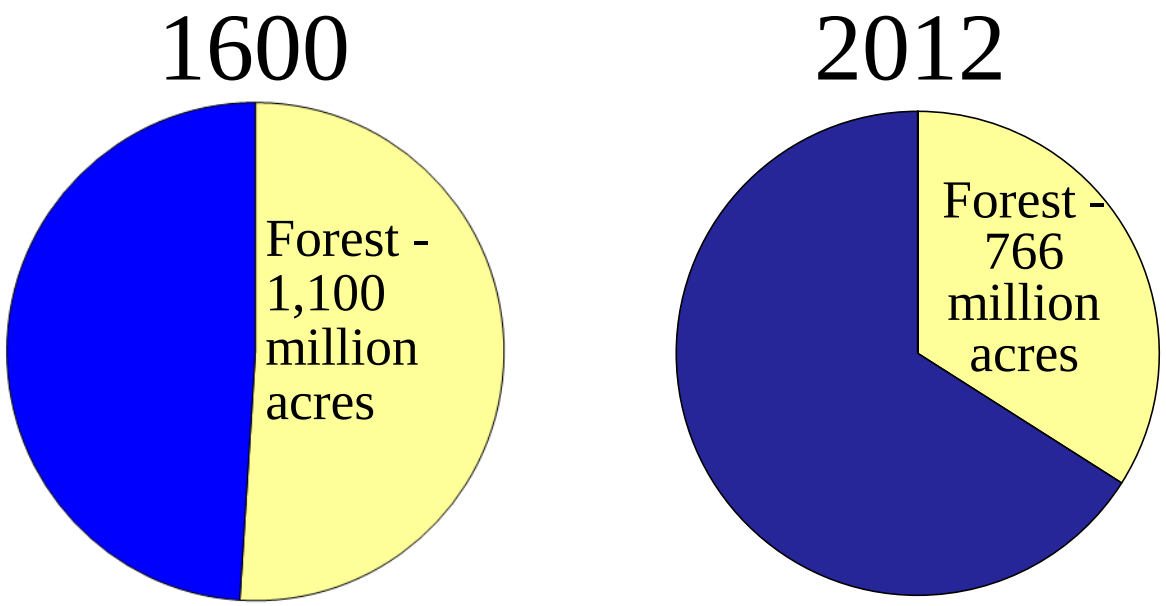
In the U.S. in 2012, forests covered 73% of the land area that was forested at the time of European settlement



Source: USDA - Forest Service

True (T) or False (F). The geographic area that encompasses the United States today has greater forest coverage than the same geographic area did in 1920.

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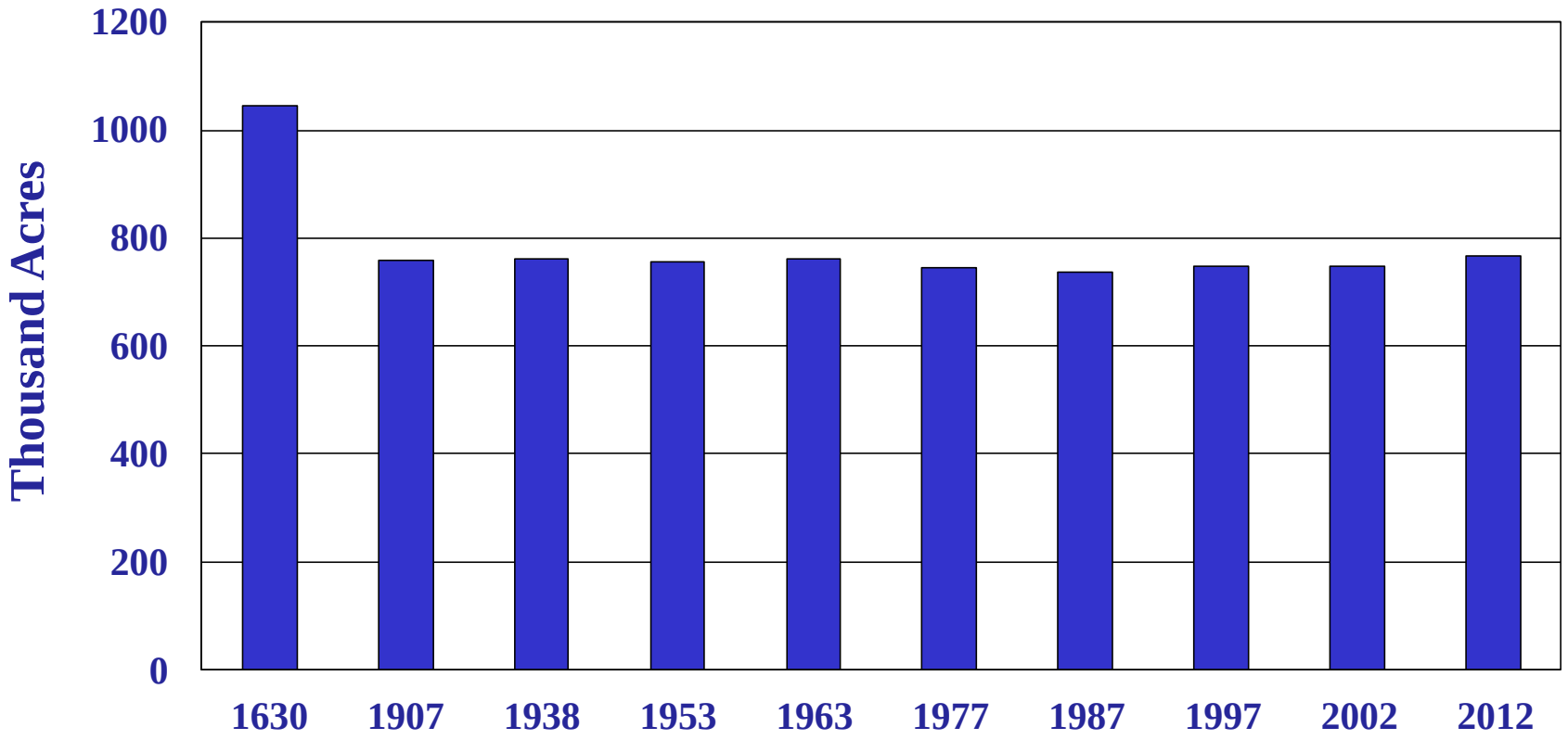
Forest Area in the United States 1630-2012



Source: USDA-Forest Service, RPA Update. (2013).

Which of the following statements most accurately describes U.S. forests:

- Forest harvest exceeds growth by 20 percent.
- Forest harvest exceeds growth by 5 percent.
- Forest harvest roughly equals growth.
- Forest growth exceeds harvest by 29 percent.
- Forest growth exceeds harvest by more than 100 percent.

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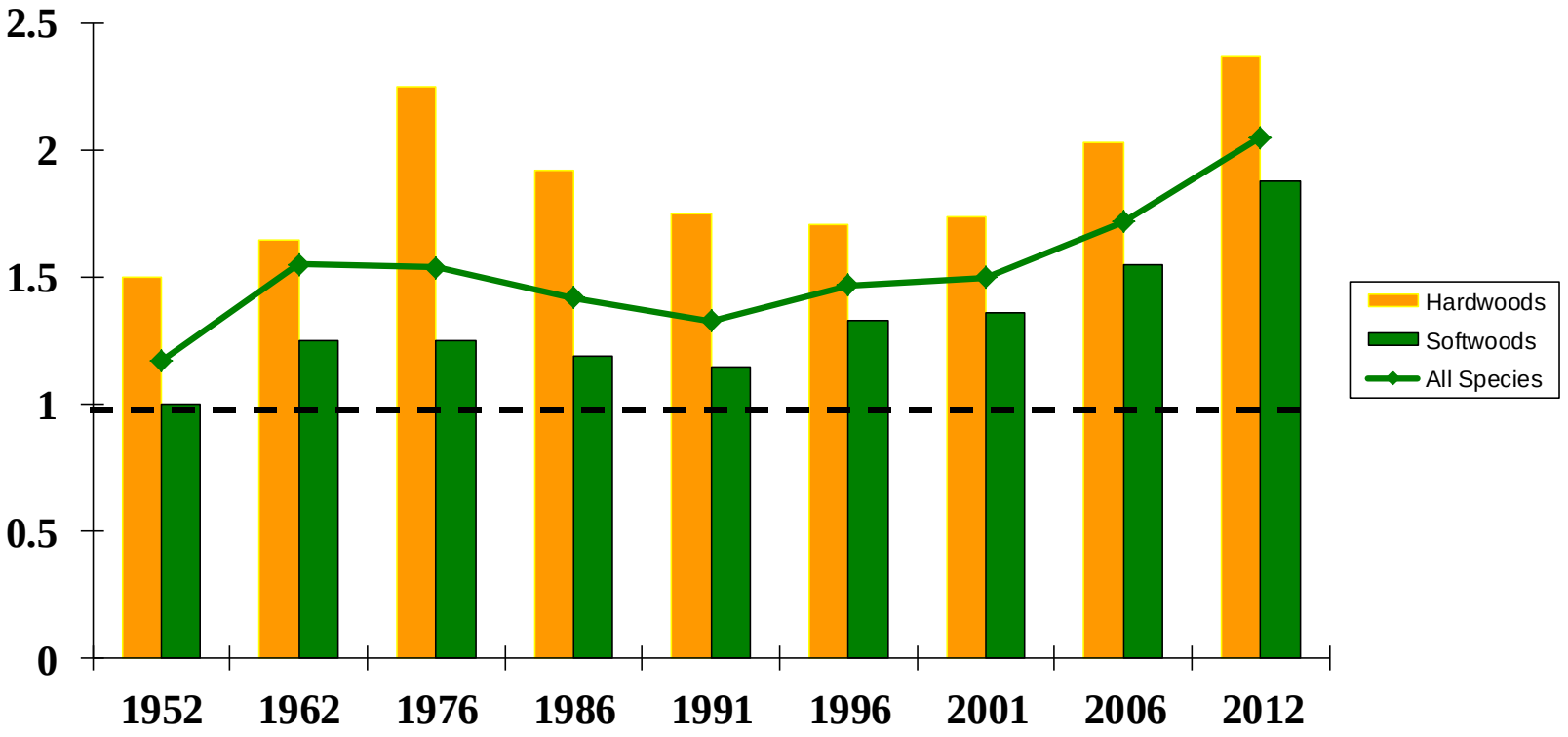
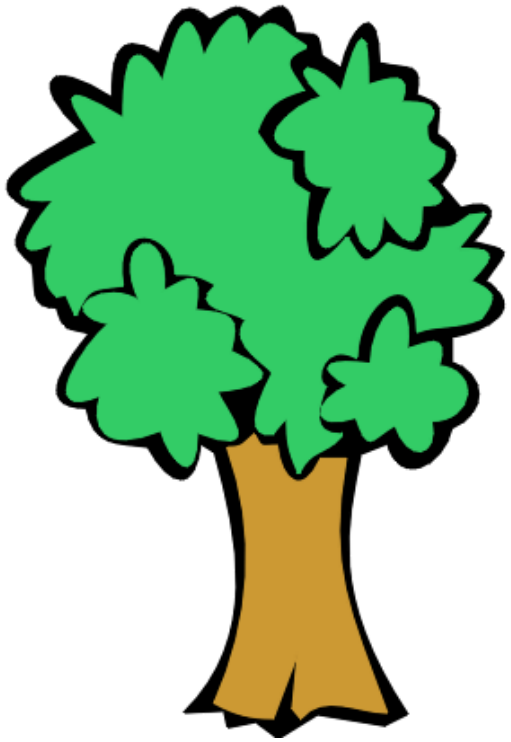
Net Growth/Removals Ratios – U.S., 1952-2012

When net forest growth divided by removals = 1.0, timber inventories are neither expanding or declining.



Source: Smith, et al., 2004; USDA-Forest Service, General Technical Report WO-78. (2009); Forest Resources of the United States, 2012 (USDA-Forest Service (2013).

True (T) or False (F). Growing trees capture carbon dioxide from the air and release oxygen.



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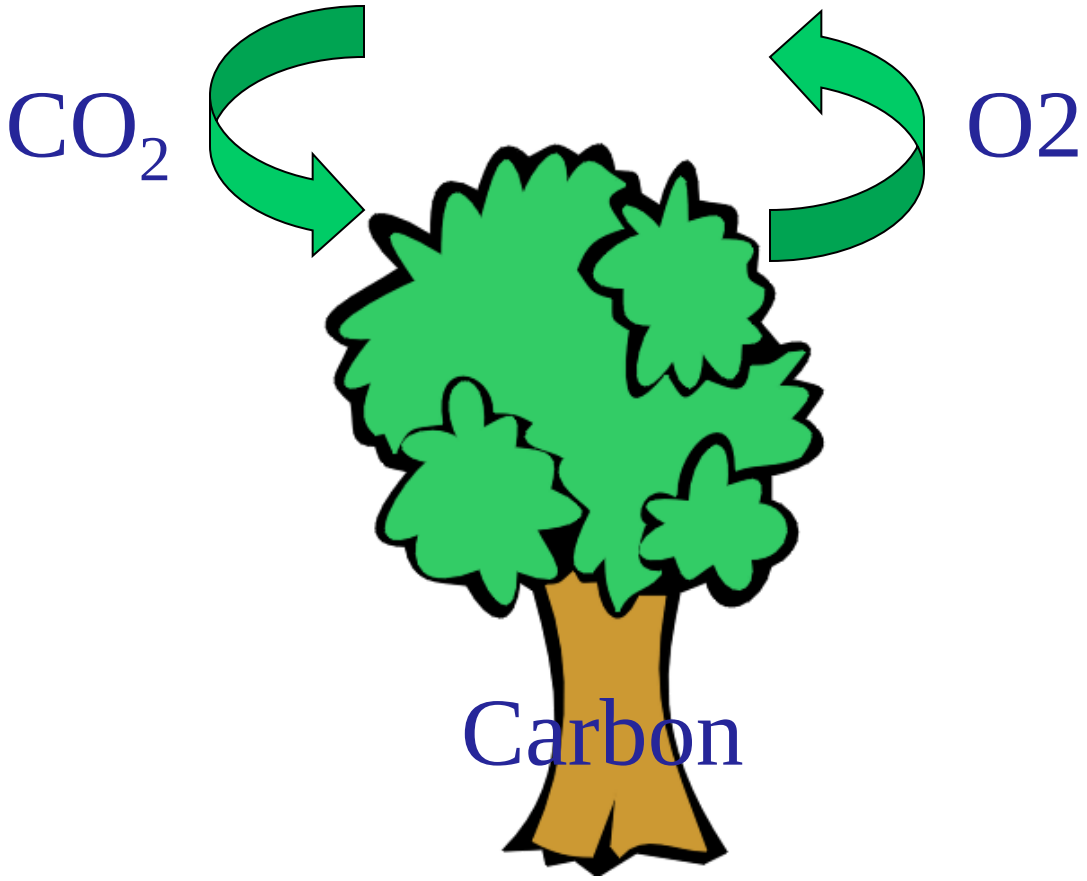
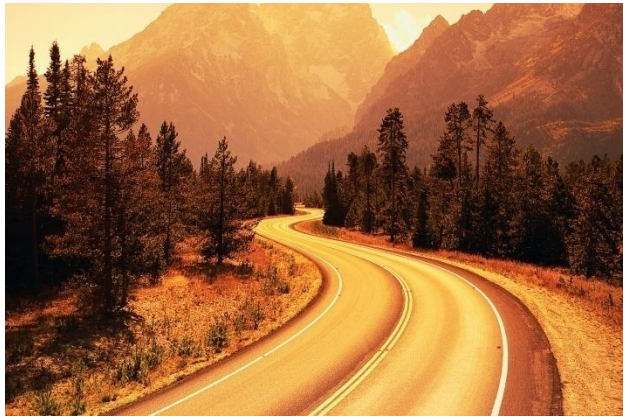


True (T) or False (F):

As originally established, it was never intended that the National Forests of the U.S. would be periodically harvested to obtain timber that would be used in meeting the nation's need for wood.



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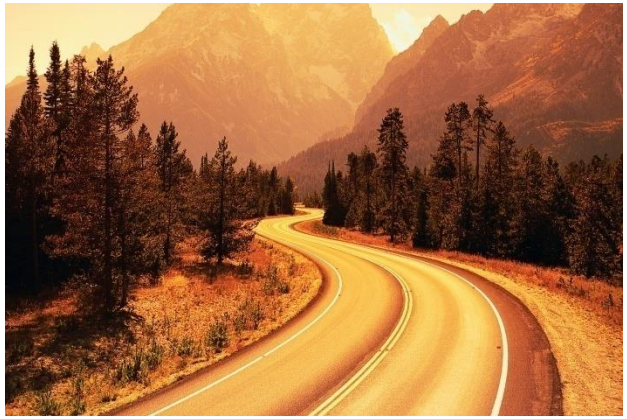
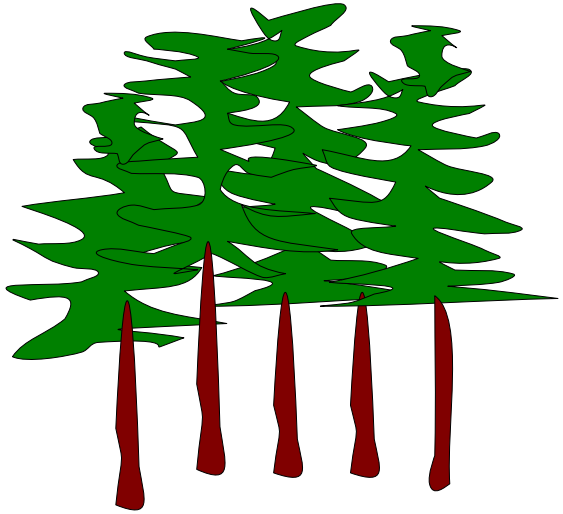


True (T) or False (F). At current rates of deforestation, forty (40) percent of current forests in the U.S. will be lost by the middle of this century.



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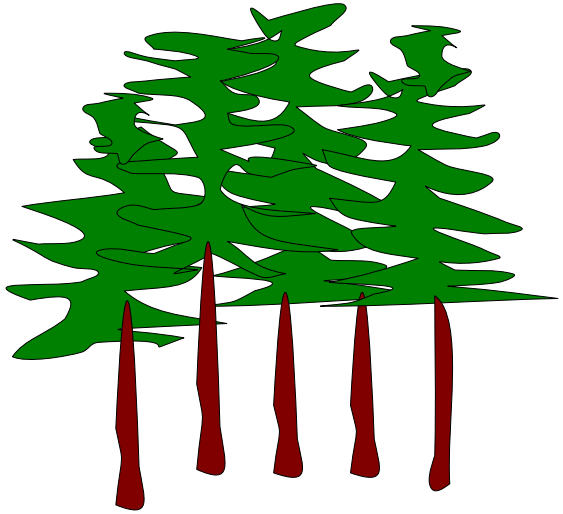

In fact, the area covered by forests in the U.S. is increasing.

True (T) or False (F). When properly managed, forests can provide products and services indefinitely.

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Forests are renewable. When managed with care, forests can provide watershed services, wildlife habitat, recreation, and a flow of wood and wood fiber forever.

True (T) or False (F):

In the U.S. more species of plants and animals have been driven to extinction by logging activity than any other activity of mankind.

True (T) or False (F):

In the U.S. more species of plants and animals have been driven to extinction by logging activity than any other activity of mankind.

There is no evidence that even one plant or animal species has been driven to extinction as a result of logging activity in the United States.

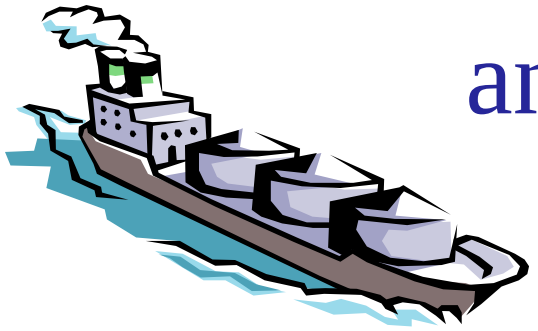
True (T) or False (F). Under United States law, forest harvesting is allowed in federally designated wilderness areas.

True (T) or False (F). Under United States law, forest harvesting is allowed in federally designated wilderness areas.

No harvesting is allowed in wilderness areas

True (T) or False (F):

Considering the total annual harvest of forests in the United States and the total consumption of wood and fiber products within our country, the U.S. is a net importer of wood and wood products.



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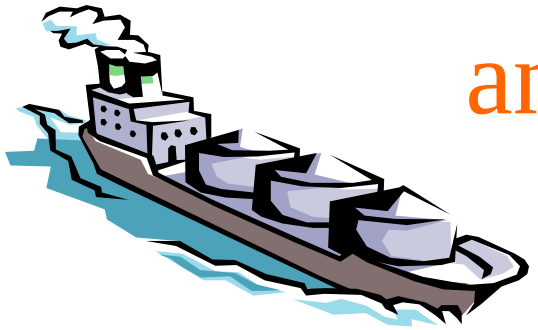

The United States is a Net Importer of Wood and Wood Products

Net U.S. imports of wood and wood products amounted to 9 percent of total U.S. wood consumption, and 25 percent of construction lumber consumed in the U.S. in 2015.

As a percentage of all the paper used in the United States in 2015 _____ was recovered for reuse.

- 15 percent
- 38 percent
- 67 percent
- 81 percent

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Recovered paper provided _____ of the fiber used in manufacturing paper in the United States in 2015.

- 15 percent
- 40 percent
- 60 percent
- 80 percent

Recovered paper provided _____ of the fiber used in manufacturing paper in the United States in 2011.

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True (T) or False (F). Paper can be recycled indefinitely so that no more trees need to be cut.

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Wood fiber deteriorates with each reuse, and can be reused no more than 4-9 times before disintegrating. Consequently, a continued supply of virgin fiber is needed in papermaking.

True (T) or False (F). Reduced paper consumption is likely to result in a greater extent of forest cover in the United States.

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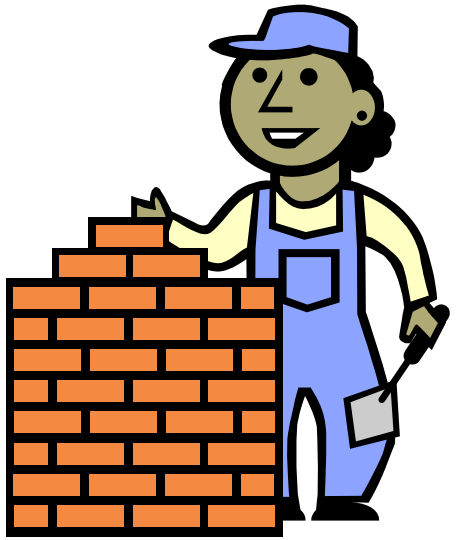
The vast majority of wood used for papermaking in the U.S. comes from privately-owned forest land. Should consumption of paper (and pulpwood) decline markedly, many owners are likely to convert their forested land to agriculture or some other non-forest use that will provide income.

True (T) or False (F). The manufacture of wood construction materials generally results in far lower environmental impacts than when similar construction materials are manufactured from steel, aluminum, plastic, or concrete.



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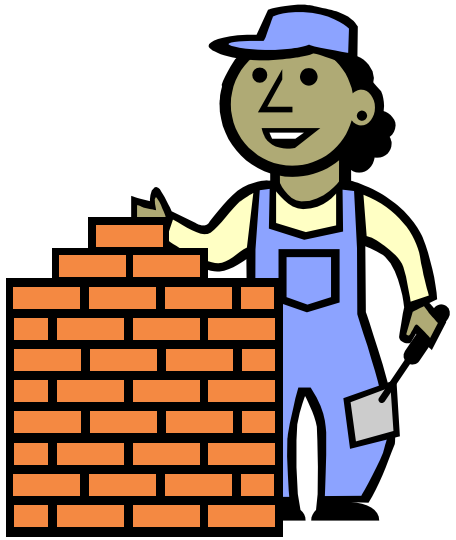
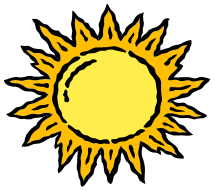
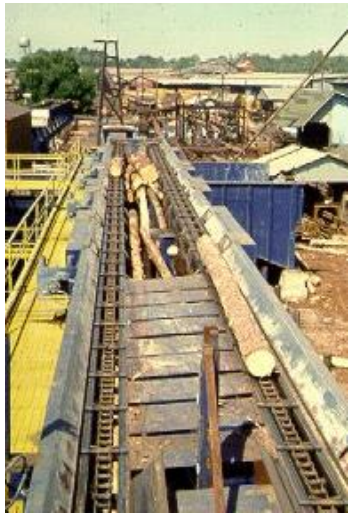


At a time when Society is seeking to more effectively harness solar energy, it turns out that one of our major raw materials – wood – is totally produced using solar energy.

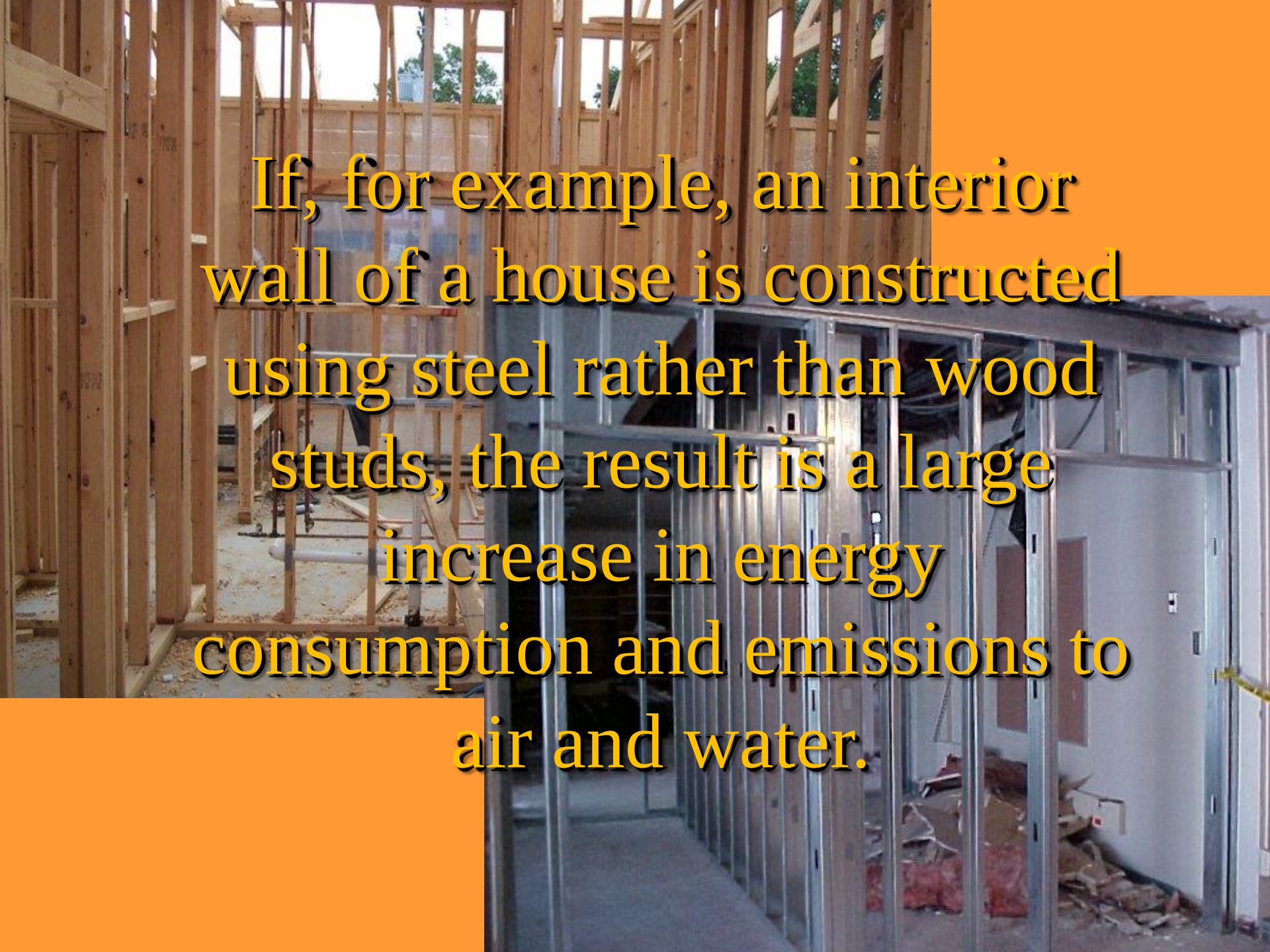


And, very little additional energy is required to convert wood into useful products.

The manufacture and use of all construction materials results in environmental impacts. The impacts, however, differ considerably.





If, for example, an interior wall of a house is constructed using steel rather than wood studs, the result is a large increase in energy consumption and emissions to air and water.

Interior Non-Load Bearing Wall, Wood vs. Steel

Comparative Energy Use (GJ)

Wood	Steel*	Difference
3.8	11.5	3.0X

* 30% recycled content, the average recycled content for steel studs.

Source: Athena Sustainable Materials Institute.

Comparative Emissions in Manufacturing Wood vs. Steel-Framed Interior Wall

Emission/Effluent	Wood Wall	Steel Wall	Difference
CO_2 (kg)	305	965	3.2X
CO (g)	2,450	11,800	4.8X
SO_X (g)	400	3,700	9.3X
NO_X (g)	1,150	1,800	1.6X
Particulates (g)	100	335	3.4X
VOCs (g)	390	1,800	4.6X
Methane (g)	4	45	11.1X

Source: Athena Sustainable Materials Institute.

Comparative Effluents in Manufacturing Wood vs. Steel-Framed Interior Wall

Emission/Effluent	Wood Wall	Steel Wall	Difference
Suspended solids (g)	12,180	495,640	41X
Non-ferrous metals (mg)	62	2,532	41X
Cyanide (mg)	99	4,051	41X
Phenols (mg)	17,715	725,994	41X
Ammonia (mg)	1,310	53,665	41X
Halogenated organics (mg)	507	20,758	41X
Oil and grease (mg)	1,421	58,222	41X
Sulphides (mg)	13	507	39X

Source: Athena Sustainable Materials Institute.

Question for Thought:

When someone says “In the United States, we have less than 4% of our original forests left,” what are they really saying?