AP Human Geography
Mr. Grenz
11.1-11.4 Review Questions

Name _____

Date _____ Period _____ Score ____/22
(1/2 pt. each)

Chapter 11 Industry and Manufacturing

KEY ISSUE 1

Where Is Industry Distributed?

This chapter outlines the regions where industry is located and why. The two most important considerations regarding location are where the markets for the products are located and where the necessary resources are located. Increasingly industry has diffused from MDCs to LDCs, especially through the operation of transnational corporations.

Learning Outcome 11.1.1: Describe the locations of the principal industrial regions.

Most of the world's industry is clustered in the three regions: Europe, North America, and East Asia.

The **Industrial Revolution** originated in Britain during the late eighteenth century because of the combination of entrepreneurs, capital, raw materials, and available labor. It also included social and political changes but it generally refers to the economic changes that began in Britain in the late 1700s. Prior to the Industrial Revolution small-scale manufacturing was home-based and known as **the cottage industry.** The Industrial Revolution resulted in major changes for the iron and steel industry, coal mining, transportation, textiles, chemicals, and food processing.

Each of the following three regions accounts for roughly one-fourth of the world's total industrial output: Europe, North America, and East Asia. The other leading industrial producers are Brazil and India.

Western Europe has major industrialization regions in Britain, the Rhine-Ruhr Valley, the mid-Rhine, and northern Italy. Britain's is the oldest of these industrial regions, and with the decline of tradi-

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tional industry it was able to attract high-tech industries in the late twentieth century, especially Japanese companies. The Rhine-Ruhr has been important largely because of coal and iron deposits, and steel making. The mid-Rhine includes parts of Germany and France, and has been important because of its proximity to large consumer markets. The Po valley of northern Italy began with **textile** manufacturing and has benefited from low labor costs. Northeastern Spain was Western Europe's fastest growing industrial area in the late twentieth century, especially in the motor-vehicle industry.

The oldest industrial areas in Eastern Europe are the central industrial district, which is centered on Moscow, and the St. Petersburg industrial district which was one of Russia's early nodes of industrial development. Other industrial areas in Eastern Europe include the Volga industrial district, particularly important for petroleum and natural gas, and the Ural industrial district, which has become a main source of raw materials but lacks energy sources. The Kuznetsk is Russia's most important industrial region east of the Ural Mountains. Outside the former Soviet Union there are important industrial regions in Donetsk, Eastern Ukraine, and Silesia which includes parts of Poland and the Czech Republic.

North America became a major industrial region later than Europe. Textiles were important in the United States by 1860. Manufacturing has been traditionally located in the northeastern United States with its numerous raw materials. These areas include New England, the Middle Atlantic, the Mohawk Valley, and the Pittsburgh-Lake Erie region. The western Great Lakes have also become important, especially because of the dominance of Chicago as a market center. Southern California is the leading U.S. industrial area outside of the Northeast. Canada's most important industrial area is in southeastern Ontario, benefiting from its location and the availability of cheap hydroelectric power.

East Asia has become a major industrial region since the second half of the twentieth century by taking advantage of its large labor force. Japan emerged first, followed by South Korea, Taiwan, and China. The latter is now the world's largest manufacturer of textiles and apparel, steel, and many household products. It also has the world's largest supply of low-cost labor and the world's largest market for many consumer products.

KEY ISSUE 2

Why Are Situation and Site Factors Important?

Learning Outcome 11.2.1: Explain the two types of situation factors and why some industries locate near inputs.

Situation factors involve minimizing the cost of shipping from sources of inputs or to markets. A location near sources of inputs is optimal for bulk-reducing industries. Industries that extract a large amount of minerals tend to be bulk-reducing industries.

Learning Outcome 11.2.1: Explain why some industries locate near markets.

Bulk-gaining industries, single-market manufacturers, and perishable products companies tend to locate near markets.

Learning Outcome 11.2.3: Explain why industries use different types of transportation.

Trucks are most often used for short-distance delivery, trains for longer trips within a region, ships for ocean crossings, and planes for very high-value packages. Some firms locate near break-of-bulk points, where goods are transferred between modes of transportation.

Learning Outcome 11.2.4: Explain how the optimal location for steel production has changed.

Steel production has traditionally been located near inputs, but the relative importance of the two main inputs—coal and iron ore—has changed. Some steel production, especially mini-mills, is now located near the markets. Industries that extract a large amount of minerals tend to be bulk-reducing industries.

Learning Outcome 11.2.5: Explain the distribution of motor vehicle production.

Because they are bulk-gaining products, most motor vehicles are assembled near their markets. The distribution of motor vehicle production has changed because the distribution of buyers has changed.

Learning Outcome 11.2.6: Explain the three types of site factors.

The three site factors are labor, capital, and land. A labor-intensive industry has a high percentage of labor in the production process.

Learning Outcome 11.2.7: Explain the distribution of textile and apparel production.

The clothing industry is a labor-intensive industry. Three steps in production are spinning, weaving, and sewing. Most spinning and weaving occur in low-wage countries, but some sewing occurs in developed countries near consumers.

Situation factors involve decisions about industrial location that attempt to minimize transportation costs by considering raw material source(s) as well as the market(s). If the cost of transporting the

inputs is greater than the cost of transporting the finished product, the best plant location is nearer to the inputs. Otherwise the best location for the factory will be closer to the consumers.

The North American copper industry is a good example of locating near the raw material source. Copper concentration is a **bulk-reducing industry**; the final product weighs less than the inputs. Two-thirds of U.S. copper is mined in Arizona so most of the concentration mills and smelters are also in Arizona. Steelmaking is another bulk-reducing industry. Steel was made by the Bessemer process, invented in 1855, which combined iron ore and carbon at very high temperatures using coal to produce steel. By the beginning of the twentieth century most large U.S. steel mills were located near the East and West coasts because iron ore was coming from other countries.

Today the U.S steel industry is located near major markets in minimills. It has become a **footloose industry**, which can locate virtually anywhere because the main input is scrap metal and is available almost everywhere. Today the U.S. steel industry takes advantage of **agglomeration economies**, or sharing of services with other companies that are available at major markets. The agglomeration of companies can lead to the development of **ancillary activities** that surround and support large-scale industry. This will result in continued growth which is called **cumulative causation. Deglomeration** occurs when a firm leaves an agglomerated region to start in a distant, new place. However, according to Alfred Weber's theory of industrial location or **least-cost theory**, firms will locate where they can minimize transportation and labor costs as well as take advantage of agglomeration economies.

The location of **bulk-gaining industries** is determined largely by the markets because they gain volume or weight during production. Most drink bottling industries are examples of bulk-gaining industries; empty cans or bottles are brought to the bottler, filled and shipped to consumers.

Single-market manufacturers are specialized, with only one or two customers, such as manufacturers of motor vehicle parts. Obviously they will tend to cluster around their customers. Perishable-product industries such as fresh food and newspapers will usually locate near their markets.

Transportation costs will decline with distance because loading and unloading costs are the greatest. The major modes of transportation are ship, rail, truck, and air. A **break-of-bulk point** is a place transfer from one mode of transportation to another is possible.

Site factors include labor, land, and capital. **Labor-intensive industries** are those where the highest percentage of expenses are the cost of employees, such as textile and apparel production. Land, which includes natural resources, is a major site factor. City sites offer proximity to a large supply of labor as well as to sources of capital. More recently factories are locating in suburban and rural locations because land is cheaper and proximity to highways is more important now. There are also important environmental factors. For example, aluminum producers locate near dams to take advantage of hydroelectric power. The availability of capital is critical to the location of high-tech industries such as those in California's Silicon Valley. The distribution of industries in LDCs is largely dependent on the ability to borrow money.

KEY ISSUE 3

Where Does Industry Cause Pollution?

Learning Outcome 11.3.1: Explain reasons for global warming and damage to the ozone layer.

Air pollution occurs at global, regional, and local scales. At the global scale, the principal pollution is global warming, caused primarily by burning of fossil fuels in factories and vehicles.

Learning Outcome 11.3.2: Explain regional and local-scale air pollution and solid waste pollution.

Acid deposition is a major form of regional-scale air pollution. Sulfuric acid and nitric acid generated by burning of fossil fuels fall into bodies of water. Carbon monoxide, hydrocarbons, and particulates are the major forms of local-scale air pollution. Solid waste is typically placed in landfills or incinerated.

Learning Outcome 11.3.3: Explain differences between point and nonpoint sources of water pollution.

Point-source pollution originates from a specific place, such as a pipe, generated principally by factories and sewage disposal. Nonpoint sources are generated primarily by agricultural runoff.

Air, water, and land remove and disperse waste, but **pollution** will occur when more waste is added than a resource can accommodate. **Air pollution** is a concentration of trace substances at a great level than occurs in average air. The burning of fossil fuels generates most air pollution. Air pollution may contribute to global warming because of the **greenhouse effect**, which is when carbon dioxide traps some of the radiation emitted by Earth's surface. The **ozone** layer of Earth's atmosphere absorbs dangerous ultra violet (UV) rays from the Sun but is threatened by pollutants called **chlorofluorocarbons (CFCs)**.

Pollution in the form of tiny droplets of sulfuric acid and nitric acid, formed as a result of the emission of burning fossil fuels, return to Earth's surface as **acid deposition**. When dissolved in water, the acids may fall as **acid precipitation, which** damages lakes and agricultural land in regions of heavy industrial development. Urban air pollution consists of carbon monoxide, hydrocarbons, and particulates. In the presence of sunlight this forms **photochemical smog, which** is a serious problem in many urban areas.

Most water pollution is generated by water-using industries, municipal sewage, and agriculture Polluted water can harm aquatic plants and animals. It also causes waterborne diseases such as cholera, typhoid, and dysentery, especially in LDCs that suffer from poor sanitation and untreated water. It also harms aquatic plants and animals as the water becomes oxygen starved and fish die (**biochemical oxygen demand**).

Paper products constitute the largest percentage of solid waste in the United States. Most of this waste is disposed in **sanitary landfills**. The number of landfills in the United States has declined by three-fourths since 1990; there are now a smaller number of larger regional landfills. Incineration reduces the bulk of trash by about three-fourths, but burning releases toxins into the air. The disposal of hazardous waste is especially difficult. Hazardous waste sites, such as Love Canal, near Niagara Falls, New York, have leaked and caused health problems.

KEY ISSUE 4

Why are Situation and Site Factors Changing?

Learning Outcome 11.4.1: Explain reasons for changing distribution of industry within the United States.

Industry is moving from the North to the South within the United States. Lower labor costs and absence of unions are major factors in the migration.

Learning Outcome 11.4.2: Explain reasons for the emergence of new industrial regions.

Some jobs have been transferred to low-wage countries as part of the new international division of labor. The BRIC countries (Brazil, Russia, India, and China) are expected to be the top industrial powers by the middle of the twenty-first century.

Learning Outcome 11.4.3: Explain reasons for renewed attraction of traditional industrial regions.

Traditional industrial regions attract and retain industries that need skilled labor. Just-in-time delivery has increased the attraction of locating near consumers.

Within regions in MDCs industry has relocated to urban peripheries and rural areas from central city locations. At the interregional level manufacturing has moved towards the south and west in the United States. Historically industrial growth has been encouraged in the South by government policies to reduce regional disparities. Southern states have enacted **right-to-work laws** that require factories to maintain an "open shop" and prohibit a "closed shop." In a closed shop everyone who works in the factory has to join the union. Thus Southern right-to-work laws have made it much more difficult for unions to organize, collect dues, and bargain. States that have passed these laws are called **right-to-work states.**

In Western Europe government policies and those of the European Union have also encouraged industry to move from traditional industrial centers in northwestern Europe toward southern and Eastern Europe. For example Spain's textile and motor-vehicle manufacturing industries have grown substantially since its admission to the European Union in 1986.

Some central European countries such as Poland, the Czech Republic, and Hungary have received industrial investment since the fall of communism in the early 1990s. They offer less skilled but cheaper labor than Western Europe and have locations that are close to major markets.

In 1970 nearly one-half of world industry was in Europe and nearly one-third was in North America; now these two regions account for only one-fourth each. The share of world industry in other regions has increased from one-sixth in 1970 to one-half in 2010. These regions include East Asia, South Asia, and Latin America.

As industry has declined in MDCs, it has increased in LDCs. In 1980 80% of the world's steel was produced in MDCs. Between 1980 and 2008, MDC's share of steel production declined to 40%, and that of LDCs increased to 60%.

China is the leading new industrial center in the world because of its low labor costs and vast consumer market. Mexico and Brazil are the leading industrial centers in Latin America, with manufacturing clustered near large cities such as Mexico City and Sao Paulo. Since the 1980s manufacturing in Mexico has moved north to take advantage of the U.S. market, and **maquiladora** plants have been established close to the U.S. border. Maquiladoras, which assemble U.S. parts and ship the finished product back to the United States, have benefited from the **North American Free Trade Agreement (NAFTA).** NAFTA has eliminated restrictions on the flow of materials and products between the United States and Mexico.

The cost of labor is changing the spatial organization of industry around the world. This is particularly true of the textile and apparel industry. In the twentieth century production in the United States moved from the Northeast to the Southeast to take advantage of cheaper wages. More recently the apparel industry is located in Latin America, China, and other Asian countries. Now the United States imports more than 75% of its clothing needs. This is one part of the **new international division of labor**. Industrial jobs are transferring to LDCs largely as a result of transnational corporations' search for low-cost labor. **Transnational corporations** are **outsourcing**, turning over much of the responsibility for production to independent suppliers. There is concern that some of these clothes are made in factories called

sweatshops, not unlike those in the early Industrial Revolution, where the working conditions are terrible.

In some MDCs industry is remaining in traditional regions because of skilled labor and rapid delivery to market. The **Fordist** approach, named for Henry Ford, traditionally assigned each worker a specific task in mass production industry. **Post-Fordist** production has recently become the norm in MDCs. It is flexible production with skilled workers characterized by teams working together, problem solving through consensus, and factory workers being treated alike regardless of their level.

Just-in-time delivery is the shipment of parts and materials to a factory immediately before they are needs. It avoids the stocking of unnecessary and expensive inventory. Two kinds of disruption can result from reliance on just-in-time delivery: labor unrest and "Acts of God" (such as a blizzard or flood).

Key Issues Revisited

11.4. Why are situation and site factors changing?

- New industrial regions are able to attract some industries, especially because of low wage rates
- Traditional industrial regions have been able to offer manufacturers skilled workers and proximity to customers demanding just-in-time delivery

Review Questions

11.4.1. One of the main reasons that industry in the United States has shifted its production is

A. that they have moved to states with "closed shops."

B. that they have moved to be closer to illegal laborers.

C. that they have moved to "right to work states."

D. that they have moved for better climate.

E. that they have moved to be closer to iron ore deposits.

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(Use of the textbook may be necessary to answer some questions)

Name _____

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1. Define: **Industrial Revolution** –

2. What was the "cottage industry?"

3. The Industrial Revolution resulted in major changes for what **seven** industries?

4. List the **FOUR** major industrialized areas in Europe and list the primary industries/importance of each area.

Area Name	Primary industries and/or importance

5. **Where** has manufacturing been traditionally located in the United States and **why**?

6. Currently, where is the leading US industrial area outside of the area mentioned in question #5?

7. Why has East Asia become a major industrial region since the second half of the 20th century? Which **FOUR** countries are leading the way industrially?

8. What industry-based categories does China lead the world in? (list them all)

9. Review Question 11.1.1 One of the major catalysts for the Industrial Revolution in England was
   A. Adam Smith's *Wealth of Nations*
   B. James Watt's steam engine
   C. Henry Ford's assembly line
   D. Horace Greeley's "Manifest Destiny"
   E. Steve Jobs' microprocessor

10. Review Question 11.1.2 Canada's most important industrial area is
   A. Southeastern Ontario
   B. The Mohawk Valley
   C. The St. Lawrence Seaway
   D. the western Great Lakes
   E. the Prairie Provinces

11. Thoroughly explain **situation factors**. Include cost and transportation.

12. What is a **bulk-reducing industry**? What is a good example of this in the United States?

13. Define: **Footloose Industry**-

14. What is the difference between **agglomeration** and **deglomeration**?

15. Explain Alfred Weber's **least-cost theory**:

16. **What** is the location of bulk-gaining industries determined by and **why**? What is an example of a bulk-gaining industry?

17. Define: **Break-of-bulk point**-

18. What **THREE** things do **site factors** include?

19. What are **labor-intensive industries?** List an example of this.

20. Why are factories recently locating in suburban and rural locations?

21. Review Question 11.2.1 Few important minerals would be found in
    A. Europe
    B. Central Asia
    C. SW Asia
    D. Northern Africa
    E. All of these regions lack important minerals

22. Review Question 11.2.2 The world's largest steel-producing nation in 2010 was
    A. Russia
    B. The United States
    C. Japan
    D. England
    E. China

23. What will occur when more waste is added than a resource can accommodate?

24. Define: **Air pollution** –

25. What causes most air pollution?

26. What is the **greenhouse effect**?

27. What purpose does the **ozone** layer serve?

28. What is the difference between **acid deposition** and **acid precipitation**?

29. What **three** sources generate most water pollution?

30. What constitute the largest percentage of solid waste in the US? Where is most of this waste disposed of?

31. Review Question 11.3.1 The worst air pollution in the US would be found in
    A. New York
    B. Denver
    C. Los Angeles
    D. Detroit
    E. Houston

32. Review Question 11.3.2 The largest polluters of toxic waste are
    A. nuclear power plants
    B. coal burning plants
    C. wind farms
    D. mines
    E. research labs

33. How has the US south encouraged industrial growth? (be sure to define this term)

34. Since 1970, what **THREE** regions have seen a large increase in their share of world industry?

35. Why is China the leading new industrial center in the world? (2 reasons)

36. What is a **maquiladora** and how have they benefitted from NAFTA?

37. What is changing the spatial organization of industry around the world? In which industry is this particularly true?

38. Define: **international division of labor** -

39. Why are industrial jobs transferring to LDC's?

40. What is **outsourcing**?

41. What is the difference between the **Fordist** and **Post-Fordist** approaches?

42. What is **just-in-time delivery** and what does it help with?

43. Review Question 11.4.1 One of the main reasons that industry in the US has shifted its production is
    A. that they have moved to states with "closed shops"
    B. that they have moved to be closer to illegal laborers
    C. that they have moved to "right to work states"
    D. that they have moved for better climate
    E. that they have moved to be closer to iron ore deposits

44. Review Question 11.4.2 According to Goldman Sachs, all of these countries are expected to dominate global manufacturing in the 21st century EXCEPT
    A. the United States
    B. Brazil
    C. China
    D. India
    E. Russia