

This chapter will be a little different because it contains quite a bit of math and a history lesson as well as the usual environmental information. This is an interesting chapter.

**You are not permitted to use a calculator on the AP Environmental Science exam. So you will not be permitted to use a calculator on our exams. You will find the actual calculations fairly simple, so don't panic. Instead, practice, practice & practice some more.**

### **I. KEEP IN MIND:**

- Know inside and out, forwards and backwards, the population vocabulary list. Start early. Do you realize how important it is to keep up with reading the chapter and the workbook? By now, you should have a routine of reading and studying every night for at least 30 minutes. You can decide now what grade you want for the semester. That grade is based on your schedule of study. It's called self-discipline and if you can master this skill, then you have a real chance of being successful.

### **II. KEY POPULATION VOCABULARY**

age structure	birth rate	death rate
demographic transition	growth rate	human carrying capacity
life expectancy	logistic carrying capacity	logistic growth curve
maximum lifetime	population	population dynamics
species	zero population growth	histogram

### **III. KEY CONCEPTS**

1. Read the case study of the disasters in China & Myanmar: *Earthquakes & Cyclones*. The loss of so many people is horrendous in terms of human suffering. But you can't see the loss of 100,000 people on a graph of each country's population growth. 100,000 people are replaced in how many days? Environmental Science is all about saving the planet Earth by saving species and preserving the quality of air and water. Keep in mind that to do this, we must do something about the size of the human population. What do Botkin & Keller say about population? See "Re-examining *themes & issues*" (p 74). What plan of action should environmentalists use in Bangladesh?
2. A couple of people (Paul Ehrlich and Thomas Malthus) are notable for their work in human population. Why is each famous?

3. Botkin & Keller did a nice job organizing this chapter. Section 4.1 describes the basic concepts: rates of growth, population & technology, quality of life versus carrying capacity, and definitions. What's the important point or points of each of these concepts? Think about using flash cards. See, the good thing about flash cards is that you'll have all of them for review for the big exam in May.
4. Another study strategy is to condense all the important information from the chapter onto one or two pieces of paper. Just the process of making the study sheet will improve your comprehension and again, give you a tool to use for studying for the AP exam in May.
5. This chapter has a lot of important graphs and pictograms. Know them. How do you learn a graph? Read the caption and understand its color code system. Then hide the caption with your hand and explain the graphs to yourself OUT LOUD.  
Study these graphs over a period of several days. Impossible to learn all in one night, unless you have a photographic memory.
  - a. Figure 4.2: explain why Kenya's growth is rapid while Italy's is negative
  - b. Figure 4.3: both the line & bar graphs tell a story. You should be able to tell the same story.
  - c. Figure 4.4: why do the blue bars go negative?
  - d. Figure 4.6: wow. Pretty scary.
  - e. Figure 4.8: This is a REALLY BIG CONCEPT! Know & describe the Demographic Transition Stages I – V – post 2nd transition.
  - f. Figure 4.10b: why do females mortality rates exceed that of men after 20 years age?
6. Know the *four major periods of the history of the human population*. And know the *stages of the "demographic transition."* ("Know" means list & describe until it's in your head so much you are dreaming about it.) Keep these two analyses separate in your mind. It's easy to get them mixed up.
  - a. The 4 major periods: **hunter/gatherers, early pre-industrial agrarian, machine (industrialized), modern**. The stages of the demographic transition (include birth & death rates in this one): **undeveloped** or pre-industrial ((I), **transitional** (II), 1st **stable** (III).
  - b. Also, describe how populations may change in the *post-industrial* world: 2nd transitional (IV), 2nd stable at higher population level (V)

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<sup>1</sup> After C. Schneider. revised August 2010, October 2012

7. Recognize the shapes of an **exponential** graph and a **logistic** graph. Explain why a logistic graph for humans will be difficult to achieve.
8. How can we stop population growth? Why does population growth need to stop?
9. Be able to calculate *without using a calculator*:
  - a. population density,
  - b. crude birth rate & birth rate *as a percent and per 1000*,
  - c. crude death rate & death rate as a percent and per 1000, d. population growth rate,
  - e. population doubling time (i.e. Rule of 70)
10. Other things you need to know about the human population (Hint: make flash cards)
  - a. Why are Thomas Malthus's ideas relevant? (more about this when we study food production)
  - b. What is the current size of world population?
  - c. What is the current size of USA population?
  - d. Name the 3 most populous countries on Earth:
  - e. Which regions of Earth have the highest fertility rates?
  - f. Which regions of Earth have the lowest fertility rates?
  - g. What percent of the world's population lives in a developed country?
  - h. What percent of the world's population lives in a developing country?
  - i. What is the TFR for ZPG? IKYN\*