CHAPTER 6 NOTES Environmental Science: Biomes

Directions: Fill in the information from the classroom or online notes.

Environmental Science Standard and element:

SEV2. Students will demonstrate an understanding that the Earth is one interconnected system.

c.) Characterize the components that define a Biome. Abiotic Factors – to include precipitation, temperature and soils. Biotic Factors – plant and animal adaptations that create success in that biome.

SEV5. Students will recognize that human beings are part of the global ecosystem and will evaluate the effects of human activities and technology on ecosystems.

e.) Describe the effects and potential implications of pollution and resource depletion on the environment at the local and global levels (e.g. air and water pollution, solid waste disposal, depletion of the stratospheric ozone, global warming, and land uses).

Figure 3: Temperature and precipitation help determine the type of vegetation in an ecosystem. As temperature and precipitation decrease, the climate of an area becomes drier and vegetation becomes sparser.

BIOME PYRAMID
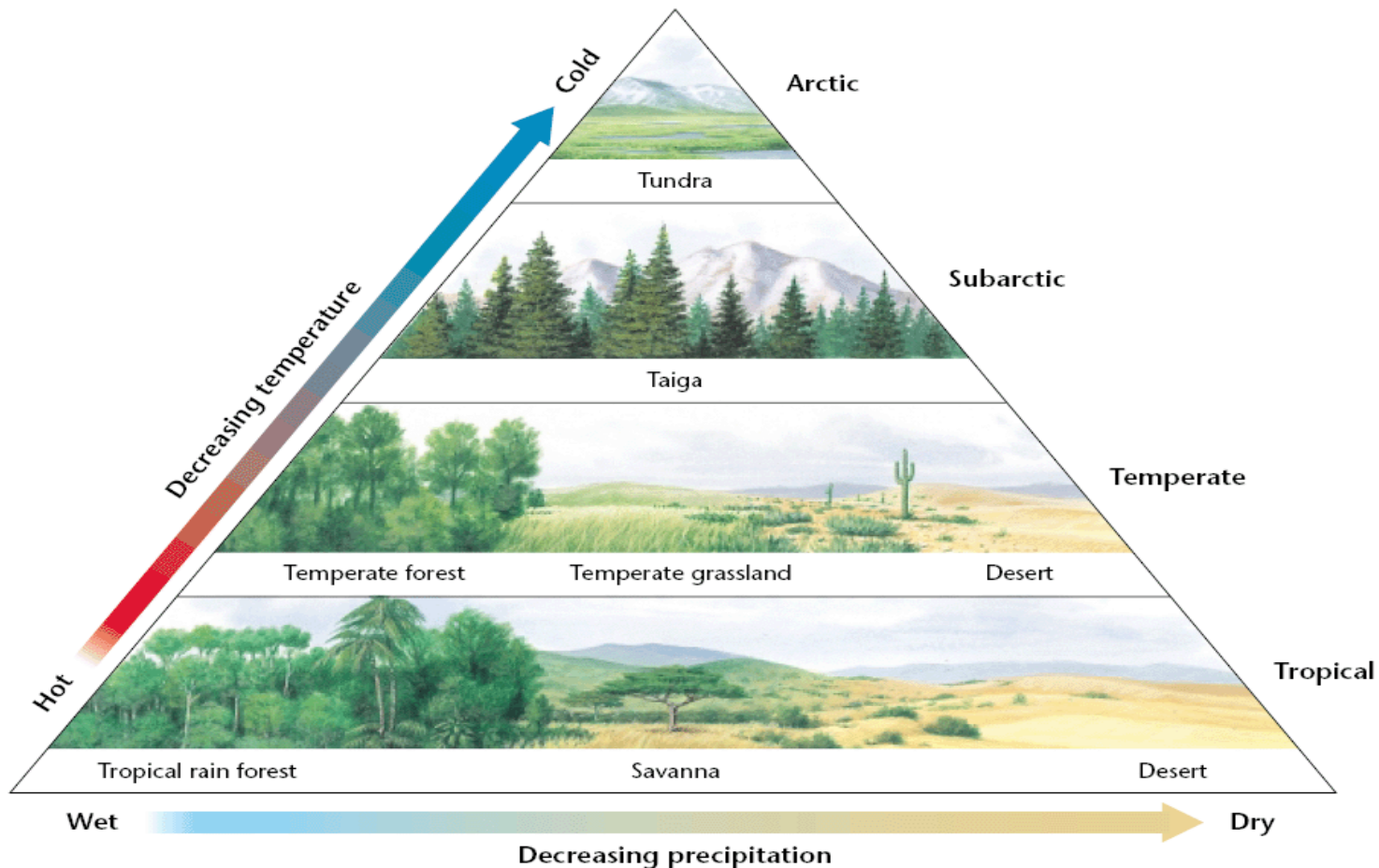
IMPORTANCE OF BIOMES

All of the *diverse biomes* in the world are very important for life to exist on Earth. The animals and plants that live in them have a delicate balance. The *activities* of humans often upset that balance. As a result, there are serious problems in all biomes. Now that we are fully aware of what our actions do, it is time to correct them. By doing all we can in the way of *conservation* and *preservation* of the biomes, we can help to ensure that the plants and animals out there have a chance to thrive. New laws *forcing* both *companies* and *individuals* to recycle and cut down on waste are necessary to *slow* down the *negative* effects of human actions. More money needs to be given for cleanup and to research reversal of humans' activities.

All *biomes* are important to the overall structure of the Earth. Even though these biomes have undergone a variety of changes in the past, what the future holds for them is *uncertain*. It all depends on what we are willing to do to reverse the catastrophic destruction of our world.

Ignorance is no longer an excuse for allowing the *destruction* of nature to continue. All of us have the ability, the opportunity, and the responsibility to learn the *facts*. When we do so, we will have a clear picture of what these biomes offer. Too often their value is underestimated and taken for granted. Steps have to be put into motion now to make sure that they are able to continue to *survive*.

POLLUTION and GLOBAL WARMING

Pollution is one of the biggest problems that humans contribute to various biomes. That pollution comes from the *vehicles* we drive, the *factories* where we produce items, *chemicals* that we use, and even *human waste*. Both *land* and bodies of *water* are being negatively impacted by such pollution. Even the quality of the *air* has suffered. This has lead to serious issues causing both people and nature to suffer.

Global warming has had adverse effects on the climate in many biomes. For example in some locations the temperatures are rising but the rainfall has decreased. As a result it is very hard for the plants and animals to be able to survive. In the Arctic, the permafrost has started to melt in some areas. This has created an array of issues for the plants and animals that live in this harsh biome.

The forest biomes are home to many trees and plants. They help us to have *clean air* due to the exchange of oxygen and carbon dioxide. When the forests are cleared out for logging so that various products can be made from the wood, it creates a great deal of chaos within those biomes. There are many forms of *medication* that have been found in the plant life of the rainforests. Many of them we use often.

We also don't have a full understanding of everything that *nature* could *offer* us. There could be a plant as yet undiscovered that holds the cure for cancer, AIDS, or other serious *health* problems. Yet if humans continue their destructive practices of overconsumption, then we will never have the opportunity to find out what they could have offered us.

When biomes are _damaged_ or _destroyed_, the Animals that live there are displaced. This means they start looking for new places to live. _Humans_ then complain about these animals moving into the _same area_ where they live. Yet those animals are only looking for a means of survival. We end up poisoning or trapping them as a way to clear them out of such areas. When we do so we severely _alter_ the natural balance of any given biome.

BIOME COMPARISON CHART

BIOME	LOCATION	CLIMATE	FLORA (plants) 6 examples	FAUNA (animals) 6 examples
TUNDRA	Near the North Pole Alaska Canada Between 55° and 70° north latitude	It is cold through all months of the year. Average annual temperature is -18°F Precipitation: 6" - 10" (mostly snow)	Yellow Tundra Flower Mosses / Lichens / Grasses / Shrubs	Deer / Rodents / Bears / Hares / Foxes / Wolves
TAIGA (Coniferous Forest)	Canada Northern Europe Northern Asia South of the tundra	Winters: very cold with only snowfall. Summers: warm, rainy, humid Precipitation: 12" - 33" /year	Coniferous Trees (Evergreens) Douglas Fir / White Spruce / White Popler / Paper Birch / Jack Pine / Eastern Red Cedar	American Black Bear / Bald Eagle / Bobcat / Gray Wolf / Red Fox / River Otter
TROPICAL RAIN FOREST	Near the equator Central America in the Amazon river basin Madagascar / Zaire / New Guinea SE Asia: Cambodia	Temperatures range between 73°F & 87°F Precipitation: 50" - 260" of rain per year	Coffee Bean / Vanilla / Sugar Cane / Nutmeg / Allspice	Red-Eyed Tree Frog / Orangutan / Tucan / Tiger / Red Panda / Slothes
TEMPERATE DECIDUOUS FOREST	United States - Asia: Japan, China, SW Russia S. America: Chile, Paraguay New Zealand, Australia	Cold in the winter, Warm in the summer Avg annual temp: 50°F Precipitation: 30" - 60" /year	Oak Trees / Pine Martens / Broad Leaf Maple / Live Oak	Long-tailed Field-mouse / Earthworms / Sparrow / Bear / Hawk / Gray Squirrel
GRASSLAND	Africa - (savannah) United States - central plains Asia - Kazakhstan, Ukraine, Tibetan plains	Winter temps as low as -40°F. Summer temps up to 80°F Precipitation: 10" - 30" rainfall	Grasses / Sunflowers / Goldenrod / Clover / Stinging Nettle / Pampas Grass	Rhea / Coyote / Bobcat / Prairie Dog / Bumble Bee / Antelope / African Elephant / Wild dog / Zebra / Lion
DESERT	South America - Chile North America - SW USA Africa - Asia - Australia -	Hot in the day - over 100°F Cold at night - as low as 30°F	Giant Saguaro Cactus Mexican Gold Poppies Organ Pipe Cactus Prickly Pear Cactus Rosemary	Elf Owl / Javelina Kangaroo Rats / Collared Lizard / Kit Fox / Scorpions
CHAPARRAL	United States: west coast South America: west coast Africa: Cape Town Australia: western tip Mediterranean coast	Very hot and dry Mild winter: about 50°F Hot/dry summer: about 100°F Droughts are very common	Most have small, hard leaves to hold moisture Yucca / Sagebrush / Blue Oak Tree / Lebanon Cedar / Olive Tree / Mountain Mahogany	Cactus Wren / Gray Fox / Kit Fox / Spotted Skunk / Kangaroo / Roadrunner / Jackrabbit

BIOMES   **MAJOR THREATS TO EACH BIOME**

BIOMES	MAJOR THREATS TO EACH BIOME
Tundra	• **Permafrost melting due to global warming** • **Ozone depletion at North and South Poles means stronger UV (ultraviolet rays will harm the tundra** • **Drilling for oil harms the landscape and threatens wildlife**
Taiga (Coniferous Forests)	• **Deforestation through logging (the wood is used for pulp and making paper)** • **Drilling for oil and gas exploration which needs roads built to reach drill sites** • **Mining** • **Human triggered forest fires** • **Climate change**
Tropical Rain Forests	• **Deforestation through logging (tropical hardwoods are prized for making furniture and art pieces)** • **Cattle grazing in South America (Brazil is the largest exporter of beef)** • **Soya Plantations where soya, a high-protein plant used to feed cattle, is grown** • **Deforestation to grow palm plants to produce palm oil** • **Mining for minerals and gold deposits causing mercury poisoning** • **Damming the Amazon River which reduces water downstream**
Temperate Deciduous Forest	• **Acid rain caused by industrial and vehicular emissions** • **Clear-cutting of trees for logging, construction of buildings, and agriculture** • **Introduction of non-native species who compete with native species for food, resources, and land**
Grassland	• **Global warming which turns grasslands into deserts as rainfall patterns change** • **Land is being converted to row crops** • **Development of urban areas is increasingly cutting into grassland habitats** • **Drought and cold resistant crops are expanding into grasslands the delicate balance in grassland ecosystems** • **One type cash crops allow pests and diseases to spread easily, creating the need for deadlier toxic pesticides**
Desert	• **Global warming is increasing the incidence of drought, drying up more water holes** • **Higher temperatures produce more wildfires altering desert landscapes by eliminating slow-growing trees and shrubs and replacing them with fast-growing grasses** • **Domestic grazing animals, like cattle and sheep, destroy many desert plants and animals** • **Off-road vehicles kill desert plants and animals by running over tender roots and eggs of animals** • **Oil and gas production disrupt sensitive habitats** • **Nuclear waste are sometimes dumped in deserts, which have also been used as testing grounds**
Chaparral	• **Human development** • **Habitat destruction through air pollution, water pollution, climate change, and global warming**