Preview Preview Preview Preview Preview

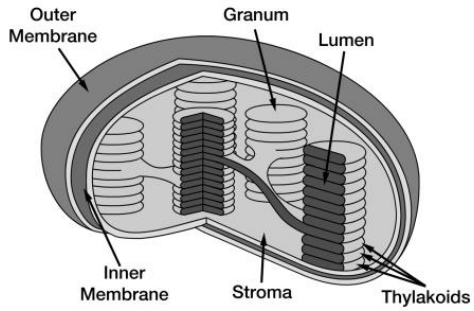
The following material will appear on the upcoming exam. Use this preview to familiarize yourself with the material, and guide you in studying. Be sure to look up the definitions of any words you do not know. You are free to discuss this material or ask questions about it.

Use a #2 pencil to fill in the information on your NCS answer sheet. Put your **O-Key Account Username** in the boxes indicated **for LAST NAME** and darken the appropriate circles. **Write <u>your</u> Name (Last, First)** and "**Star**" or "**NoStar" in the space above the boxes containing your O-Key Account Username**. Darken the **(S) or (N)** in the **last column of the name circles**. Enter the number **1532** and **darken the corresponding circles** in the **first 4 columns** of the **"Student ID."** Failure to perform this correctly will incur a **-10pt handling fee**. Read all questions and answers ***carefully*** before choosing the **single BEST response** for each question. Feel free to ask the instructor for clarification.

One of the most venomous spiders in Oklahoma is the black widow, the female of which is famous for its red hourglass marking on a black abdomen. When injected by fangs into a victim, black widow venom, or **latrotoxin**, accelerates the rate of acetylcholine secretions into the synapse. Although fatal to many birds and mice, black widow bites rarely are fatal to humans because of the larger doses necessary to kill.

In their natural laboratory, the 100-acre island called Daphne Major, Peter and Rosemary Grant and their assistants watched the struggle for survival among individuals in two types of small birds called Darwin's finches. One type of finch has big, strong beaks; the other has small, weak beaks. The struggle is mainly about food -- different types of seeds -- and the availability of that food is dramatically influenced by year-to-year weather changes. Natural selection, at its most powerful, greatly reduced the population size of certain finches during a severe drought in 1977. That year, the vegetation died off and seeds of all kinds were scarce. The finches quickly ate up all the small, soft seeds, leaving mainly large, tough seeds that the finches normally ignore. However, unusually rainy weather in 1984-85 resulted in more small, soft seeds and fewer of the large, tough ones.

Chloroplast



Preview **Preview** **Preview** **Preview** **Preview**

Orange-power frogs are black and have a bright orange pattern on their back which looks remarkably like Pistol Pete. They produce ***OUtoxin***, which causes muscle contractions in animals that contact them. ***OUtoxin*** is a protein secreted by the frog's skin. A similar species, the red-raider frog produces a paralytic skin-secretion, ***TTtoxin***. The frogs feed on small leaf-eating caterpillars.

Ecuador is called the "Land of the hummingbirds" and has more species than any other country. It is a very geographically diverse area and has nearly every type of habitat, from sea level to snow-capped Andes mountains. There are over 132 species of hummingbird that arose from a common ancestor. They have distinctive morphological adaptations to their habitat and food and are diverse in color, size and bill shape.

Unfortunately, some of the *paraquat*, a weed-killer, that farmers are spraying nearby strikes a "bird of paradise" plant. *Paraquat* grabs the electrons that leave Photosystem I and effectively carries them away.

In 2010, California began experiencing a reduced amount of annual precipitation. Drought conditions have worsened and scientists are now concerned about the survival of the giant Sequoia trees.

Bluebirds (genus *Sialia*) are a group of medium-sized birds that prefer open grasslands with scattered trees. The Western Bluebird is found in Oklahoma while the Eastern bluebird can be found east of the Mississippi River.

Dr. Henley has done fieldwork in some extreme places. On a windless sunny day in the Arctic, he went for a slow 20 minute walk on the sea ice wearing only jeans and a dark flannel shirt, and despite an air temperature of about 20 ˚F (-7 ˚C), he never felt cold.

On the Great Salt Plains (GSP) of Oklahoma on a day with an afternoon high temperature of 102 ˚F (39 ˚C), Dr. Henley only had to urinate slightly once in 8 hours despite drinking 1½ gallons of water over the course of the day, and burned his buttocks by sitting on the scorching hot sand, which caused him to jump up in pain. Although he felt uncomfortable, his body temperature remained normal (37 ˚C).

Climate change researchers predict that the greatest average temperature increases are likely to occur (1) at night, (2) at higher latitudes (near the poles, such as where Dr. Henley worked), and (3) at high altitudes (mountains). Some temperature data from weather and oceanographic stations around the world and satellite imagery of the extent of mountain glaciers and polar sea ice now support these predictions. Many species of plants and animals also have responded in the ways scientists predicted. For example, over the last 10-20 years, many alpine trees in the western U.S. have died due to infestation with various beetle species that are active in the warmer months. These beetles were always present, especially at lower altitudes, but the recent extent of forest destruction is unprecedented.