DIRECTIONS: Read the information on the next page. It will help you to underline all the climates described (they have Capital Letters). When you are done reading, choose one of the 3 creative assignments below to synthesize what you know about the different climates of Hawai‘i & the importance of climate to plants or animals found in the islands. You may work alone or in groups of 2 or 3.

AFTER READING: Choose 1 of the topics below and base your assignment on 1 flora or fauna (plant or animal) species found in Hawai‘i.

A) Write a JOURNAL (like a diary) or TRAVEL BROCHURE as if you were the 1st plant or animal species to survive on these islands. Think of where you would stay & how you might adapt (change) over geological time to feel at home here.

B) Create a 5-10 frame/page COMIC STRIP or CHILDREN’S STORY with pictures to show a day in the life of 1 plant or animal species – include info about the climate and weather, plus how & if you survive it (do you adapt or die or ??).

C) Present or write a 3 minute VISUAL or RADIO PLAY to show how 1 species would re-act to the many climate zones of Hawai‘i. Include info about which climates it would like, why & how will it react to reach the perfect climate for its survival?

SELF-EVALUATION: After completing your assignment, grade your efforts below.

1. I worked with (give partners’ names): _______________________

2. I think my grade should be (circle 1): A    B    C    D    F

   because: ________________________________________________

3. I think our group grade should be:    A    B    C    D    F

   because: ________________________________________________
TYPES OF CLIMATES

Hawai‘i is a place of extreme climates. The Big Island of Hawai‘i contains the world's greatest concentration of climate types in its 4038 square miles. From dry, coastal, deserts to some of the wettest spots on earth, to hot moist tropical jungles, to stark, barren, snow-capped mountains, the Big Island has an astonishing array of climates.

You have probably heard a similar oft-quoted line, "Hawai‘i has 11 of the world's 13 climate zones." How many world climate zones are there, and which ones does Hawai‘i have?

Long ago the Greeks came up with a climate system that had three types: torrid, temperate, and frigid. In other words: hot, cool and cold. Hawai‘i easily has all three of these, but nobody uses that simple system anymore.

Nowadays, people use a Climate Classification system created by a scientist named Koppen. According to the Koppen system, Hawai‘i has 4 of all 5 of the climate zones in the world, and 10 of the 13 sub-zones. The five major climate zones are defined by temperature and precipitation (rain or snow) measurements. They are:
1. Arid and Semi-Arid
2. Tropical Rainy
3. Warm Temperate Rainy
4. Cool Snow Forest
5. Polar.

Of the different global sub-categories, Hawai‘i has 10 of the Koppen sub-zones. All of these are found on Hawai‘i Island. To explore these ten climates, let's start from the mountaintops with their Polar climate and work our way down in elevation to the coast where both Arid and Rainy Tropical are found.
Hawai‘i has the two tallest mountains on earth. When measured from their base off the ocean floor, both Mauna Kea and Mauna Loa rise over 31,000 feet high. The summits have a Polar Tundra climate. Here soil is permanently frozen. It is cold up there and the area receives an average of 15 inches or less of rain annually.

Directly below the summit Polar Tundra zone are narrow bands of a Temperate climate called the Summer-Dry Cool zone. This zone covers the upper montane and sub-alpine areas circling around the peaks down to about 8500 feet above sea level. The upper summit area of Hualalai is also in this zone. Warmer than the Polar yet still cool enough to leave frost on the ground at times, this zone gets around 15 to 20 inches of rain a year.

Further down is another Temperate zone, the Summer Dry-Warm climate. This zone dominates the volcanic saddles between Kohala and Mauna Kea, or the Waimea Plains, and the Pohakuloa saddle area between Mauna Loa and Mauna Kea. As its name implies it is characterized by summer dryness and, though warmer than the cool zone, it has about the same yearly precipitation.

The next climate down makes up the largest climate zone on the island – the Continuously Wet Warm Temperate climate. It stretches from the mid-elevations (height above sea level) of windward Kohala, along the Hamakua, Hilo, and Puna rainforests, wrapping around the island through Kau, and North and South Kona. In these mauka lands some of the largest remaining native Hawaiian rainforest still exists. The rainfall in this zone varies between 60 to 150 inches a year. Much of the precipitation falls as fog-drip creating a cloud-mist type of rainforest.
Below this Temperate zone lies the Wet Tropical climate. Along the entire windward coast from sea level up to 2000 to 3000 feet in elevation lies the Continuously Wet sub-zone. Here temperatures stay warm to hot and rainfall exceeds 300 inches a year in some areas. This is the climate where the majority of the island's residents live.

The south and southeastern Ka‘u coastal area, including Ka Lae, encompasses the Wet Tropical Summer Dry zone. Another tropical zone found is a small patch of Tropical Monsoon. On the coast near Paauilo in Hamakua is an area that receives a great majority of its heavy rainfall in the hottest months of the year.

The fourth tropical sub-zone, the Tropical Wet and Dry, lies along mauka Kona. It is characterized by wet summers and dry winters. Kona is the only place in the whole state which receives its high rainfall in the kau (summer) and not hooilo (winter).

Finally, we arrive at the Arid to Semi-Arid Climate. From Upolu point to Keahole at the coast, moving inland above Kawaihae to Puako, through the barren lava fields of Mauna Loa and Hualalai, exists a Hot Semi-Desert. Along the North Kona, South Kohala coast, from Kiholo to Kawaihae, right along the coastal strand exists a Hot Desert climate. With less than 10 inches of rain a year and hot, hot days, this zone benefits well from the calm, clear, and invigorating ocean waters. If not for the cooling ocean breezes that come ashore, these lands of resorts and beach houses would be a miserable place to be.

On one island in the tropics we have 10 different climate zones, and it is impressive and unequaled anywhere else on earth for an area of equal size. From Arid to Wet Tropical to Cool Temperate to Polar Tundra, our island is a land of all seasons.