

# Populations

- 1) Obtain the article title **ECOLOGY, ECOSYSTEMS AND POPULATIONS**. You will use this article as reference for the next **5** pages of your flip book.
- 2) Read *Section 1* of the article.
- 3) Obtain a blank sheet of paper and title it "Environmental Factors."
  - a. On top of the worksheet, neatly define **biotic factors** and **abiotic factors**. In addition, obtain the marine or lake ecosystem picture. Cut out the picture of the marine or lake ecosystem and glue it below the definitions.
  - b. In BLUE, circle 3 biotic factors and in RED, circle 3 abiotic factors. Be sure to label exactly what you are circling (i.e. water, rock, tree, fish, etc). *Include a key for each color used.*
  - c. Next to your ecosystem picture, create a pyramid indicating the levels within an ecosystem (similar idea to your energy pyramid), starting from **population** through **community** and up to **ecosystem**. Give a specific example from your ecosystem picture for each level.
  - d. Below the ecosystem picture, answer the following:
    - i) How does altering (changing) one of the *biotic factors* you identified compromise the rest of the ecosystem? Be specific.
    - ii) How does altering (changing) one of the *abiotic factors* you identified compromise the rest of the ecosystem? Be specific.
- 4) Show your teacher your page (for grading) in order to get materials for the next step.
- 5) Read *Section 2* of the **ECOLOGY, ECOSYSTEMS AND POPULATIONS** article.
- 6) Obtain a blank sheet of paper and title it "Complex Relationships in an Ecosystem".
  - a. Define **symbiotic relationship (or symbiosis)** and **biotic relationship** under your title
  - b. Obtain a table of symbiotic relationships. Complete the definitions for each type of relationship. Be sure to write in your own words.
  - c. Obtain an envelope with 20 pictures of biotic and abiotic factors. Pair up the pictures based upon the definitions of each relationship. There will be 2 pairs (i.e. 2 examples) of each type of relationship. *HINT:* There may be more than one possible way to pair but each picture has a match that is *best* suited to each other.

- d. When completed, have the teacher check to make sure you paired up the picture correctly.
  - e. For each of the example boxes in your table, draw a detailed colored picture representing an example of each of the types of relationships.
  - f. When done, fill in the last box, using your example to explain who benefits and why.
  - g. Cut out the table and glue it onto your page titled "Complex Relationships in an Ecosystem".
- 7) Show your teacher your page (for grading) in order to get materials for the next step.
  - 8) Obtain the Predator-Prey Relationships work packet. Read and follow the directions in order to complete the packet.
  - 9) Show the completed packet to your teacher in order to get materials for the next step.
  - 10) Read *Section 3* of the **ECOLOGY, ECOSYSTEMS AND POPULATIONS** article.
  - 11) Obtain a blank sheet of paper and title it "Predator-Prey Relationship".
    - a. Under the title, define the **limiting factor** and **carrying capacity**.
    - b. Return article and obtain the Predator-Prey Data Table and a piece of graph paper.
    - c. Using the jackrabbit and coyote data, follow the given steps and graph the predator-prey relationship (on the graph paper).
    - d. On the graph, identify the following parts:
      - i. Carrying-capacity
      - ii. Exponential growth
      - iii. Limiting factor
    - e. Once done graphing and identifying, cut out your graph and glue it onto your page titled "Predator-Prey Relationship".
    - f. Below your graph, briefly describe what would happen to the prey population if the predator population was removed. Be sure to discuss it in terms of a short term AND long term effect.
  - 12) Show your teacher your page (for grading) in order to get materials for the next step.
  - 13) Obtain the Human Population Webquest worksheet. Follow the directions in order to complete the worksheet.
  - 14) Obtain a blank sheet of paper and title it "Human Populations".

- a. Go online and look for a world's population clock. Below your title, write the date and time and give the world's population for that exact moment.
- b. Pick up a Human Population graph and follow the directions below:
  - i. Analyze the data in the graph.
  - ii. Copy and complete the data table on your "Human Populations" page. *HINT:* When completing the table, think about the economical, environmental, political states of each country.
- c. Below your graph, briefly write a prediction about the effect of change in a biotic/abiotic factor would have on the population in one of the countries. Be specific when writing your prediction.

15) Show your teacher your page (for grading) in order to get materials for the next step.

16) Read the short article *Invasive Species in Arizona*.

17) Obtain a blank sheet of paper and title it "Invasive Species".

- a. Under the title, define **invasive species**.
- b. Return article and pick up materials for next step.
- c. Read *Arizona's 10 Most Unwanted Invasive Species* to get some examples of invasive species.
- d. On a separate sheet of paper, create an "UNWANTED" or "WANTED" poster for a particular invasive species to Arizona. You may need to do some additional online research. Be sure to include the following on your poster:
  - i. NAME/ ALSO KNOWN AS (latin name/common name/"criminal" name)
  - ii. PICTURE - a drawing or photograph (color would be nice)
  - iii. IDENTIFYING CHARACTERISTICS - key features to look for when identifying the criminal
  - iv. LAST SEEN - where did the species originally come from? Include a map - you may obtain one from your teacher
  - v. SUSPECTED HIDEOUTS - include a map of AZ with its current distribution shaded; description of preferred habitat
  - vi. CRIMES COMMITTED by your species (crimes must be specific to your species and not general to all invasive species)

vii. REWARD for elimination of your species (think ecologically, economically, socially, politically - again, be specific for your species)

viii. Color, neatness, and creativity

e. Once done making your poster, glue it onto your page titled "Invasive Species"

18) Return *Arizona's 10 Most Unwanted Invasive Species* article and show your teacher your page (for grading) in order to get materials for the next step.