**(AP) ENVIRONMENTAL SCIENCE 2022-23 March 10, 2023**

**Today’s Agenda (Day 122)**

1. Housekeeping Items

🡪 BRING:

1. Homework Check:

🡪 Activity: Blades of Grass

🡪 Activity: Caribbean Field Identification Guide

1. Class Activity:

🡪

🡪DAY: Chapter 14 PPT Review

1. **Section 14.1 - The Development of Agriculture**
2. **Section 14.2 - Fertilizer and Agriculture**
3. Section 14.3 - Agricultural Chemical Use
4. Section 14.4 - Problems with Pesticide Use
5. Section 14.5 - Why Are Pesticides So Widely Used?
6. Section 14.6 - Alternatives to Conventional Agriculture

HOMEWORK:

* READ: Chapter 14 – Agricultural Methods and Pest Management
* COMPLETE: Chapter 14 Vocabulary and Reading Guide
* **STUDY**: Chapter 14 Vocabulary Quiz and Chapter 14 Test

REMINDER**~~:~~**

* QUIZ: Ch 14 Vocabulary 🡪Mar. 14
* **TEST: Ch 14 🡪 March 16**
* **TEST: Ch 15 🡪 March 23**
* QUIZ: Ch 15 & 16 Vocabulary 🡪Mar. 30
* **TEST: Ch 16 & 17 🡪 April 4**
* **TEST: Ch 18 🡪 April 11**
* QUIZ: Ch 17 - 19 Vocabulary 🡪April 13
* **TEST: Ch 19 🡪 April 18**

Chapter 14 Vocabulary

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Alternative agriculture | Auxins | Bioaccumulation | Biocides | Biomagnification | Carbamates |
| Chlorinated hydrocarbons | Fungicides | Genetic engineering (biotechnology) | Genetically modified organism | Herbicides | Insecticides |
| Macronutrients | Micronutrients | Monoculture | Nonpersistent pesticides | Nontarget organisms | Organic agriculture |
| Organophosphates | Persistent pesticides | Pesticide | Pests | Pheromone | Polyculture |
| Rodenticides | Sustainable agricultures | Target organism | weeds |  |  |

**(AP) ENVIRONMENTAL SCIENCE 2022-23 READING GUIDECHAPTER 14**

REVIEW QUESTIONS

1. How does the practice of shifting agriculture provide nutrients for the growth of agricultural products?

2. Why is abandonment of fields important in a shifting agriculture system?

3. List conditions that make labor-intensive farming necessary.

4. How were the invention of machines and the development of monoculture linked?

5. Why are fertilizers used? What problems are caused by fertilizer use?

6. List three advantages and three disadvantages of large-scale mechanized monoculture.

7. What are micronutrients? How do they differ from macronutrients?

8. List two functions of soil organic matter.

9. Describe why pesticides are commonly used in mechanized agriculture.

10. How do persistent and nonpersistent pesticides differ?

11. What is biomagnification? What problems does it cause?

12. Describe how some populations of pests become resistant to pesticides.

13. How do sustainable farming practices differ from conventional mechanized monoculture?

14. Explain why a complete knowledge of the biology of a pest is important in using integrated pest management.

15. Describe three techniques used to control pests that do not involve the use of pesticides.

16. How is a genetically modified organism different from other organisms?

17. What characteristics have been introduced into insect-resistant and herbicide-resistant genetically modified crops?

18. List three reasons many sustainable farms are small family enterprises.

CRITICAL THINKING QUESTIONS [for APES students only]

1. If you were a public health official in a developing country, would you authorize the spraying of DDT to control mosquitoes that spread malaria? What would be your reasons?

2. Look at table 14.1. What caused the changes in the effectiveness of the insecticide? If you were an agricultural extension agent, what alternatives to pesticides might you recommend?

3. Imagine that you are a scientist examining fish in Lake Superior and you find toxaphene in the fish you are studying. Toxaphene was used primarily in cotton farming and has been banned since 1982. How can you explain its presence in these fish?

4. Are the risks of pesticide use worth the benefits? What values, beliefs, and perspectives lead you to this conclusion?

5. Do you think that current agricultural practices are sustainable? Why or why not? What changes in agriculture do you think will need to happen in the next 50 years?

6. Imagine you are an EPA official who is going to make a recommendation about whether an agricultural pesticide can remain on the market or should be banned. What are some of the facts you would need to make your recommendation? Who are some of the interest groups interested in the outcome of your decision? What arguments might they present regarding their positions? What political pressures might they be able to bring to bear on you?

7. Why are few consumers demanding alternative methods of crop production, and why are farmers not using those methods?

**(AP) ENVIRONMENTAL SCIENCE 2022-23 ACTIVITY**

**ACTIVITY: Making and using a quadrat**

**Setting up a quadrat**

1. A picture containing tree, outdoor, swing, garden

   Description automatically generatedChoose the location and the type of monitoring you wish to do. Consider any safety concerns associated with monitoring the site – especially when working within marine habitats.
2. Make a 1 m2 quadrat by measuring 4 m of string. Cut the string. Tie knots at 1 m intervals. The knots and string ends form the quadrat corners. Alternatively, use any objects that can form four straight 1 m sides.
3. Place the quadrat(s) randomly in the area you wish to monitor.
4. You can also mark out smaller sections to form four quarters within the 1 m2 – this can make it easier to carry out a count in groups.
5. Take a photo of the quadrat.

# ACTIVITY: Blades of Grass/Weeds/Flora

**(Lab Activity Worksheet)**

**Group Members:**

**Data Collection: Quadrat Location: \_\_\_\_\_\_**

|  |  |  |
| --- | --- | --- |
| **Square Number** | **Number of blades of grass**  (or other prevalent flora) | **Number of weeds** |
| **1** |  |  |
| **2** |  |  |
| **3** |  |  |
| **Average** |  |  |

**Data Analysis:**

**Total number of blades of grass (estimated): \_\_\_\_\_\_\_\_\_\_\_\_ x 100 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_** **avg # of blades of grass**

**Total number of weeds (estimated):** **\_\_\_\_\_\_\_\_\_\_\_\_ x 100 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_** **avg # of weeds**

**Total number of plants in 1 square meter (estimated):**

**\_\_\_\_\_\_\_\_\_\_\_\_ + \_\_\_\_\_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_**

**total blades of grass total # of weeds**

**Percent weeds in 1 square meter (estimated):**

**( \_\_\_\_\_\_\_\_\_\_\_\_ „ \_\_\_\_\_\_\_\_\_\_ ) x 100 = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**total # of weeds total # of plants**

**Questions:**

1. Why do we take three representative samples in estimating the population of something?
2. What is a representative sample?
3. Instead of using a representative sample to determine the size of a population, why not just count the individuals to determine the total number?
4. How do you think the Florida Game and Fresh Water Commission determined that there are over one million alligators in the state?
5. You have been asked to determine the number of pencils in the school. How might you estimate the total number of pencils? List the steps that you will take to calculate the number or pencils. Include a description of how you will obtain an accurate sample.
6. Estimate the number of blades of grass that might exist in a football field. (Assume the field has the same kind of grass as in the school yard and is roughly 2,000 square meters.)
7. Spotted Seatrout spawn over seagrass beds. The seagrasses provide protection for young Spotted Seatrout and many other kinds of fish. How might knowledge of the number and density of seagrass beds help fish biologists estimate the future number of Spotted Seatrout?

**(AP) ENVIRONMENTAL SCIENCE 2022-23 ACTIVITY**

**ACTIVITY: Create a Field Identification Guide of**

**Common Caribbean Weeds, Shrubs and Trees**

How to Make a Field Guide

A field guide is an important tool to help a person identify a specific species. It usually has a picture and description of the species. You are going to make a field guide.

Here is what your field guide must have:

* A cover with a title
* A table of contents
* A page explaining the purpose of your field guide (how is it going to help someone identify the **six** **species** you have selected).
* One page that discusses the characteristics of the family to which your species belong.
* A brief explanation stating why carefully observation is important.
* A page dedicated to each species. This must include:
* Scientific name (binomial nomenclature) Hierarchy from Domain to species.
* A **hand drawn/digital** picture of your species.
* A thorough description of your species. As you write it, ask yourself, “Could someone use this description and identify the species?”
* Interesting information and facts about the species.
* To raise your level to 4, add two additional species and include the following information: where it lives, what it eats, what eats it, and what other species live in the same area.

As you do this assignment, remember what you will be using this in the gardens. So, make a DIGITAL FIELD GUIDE…perhaps in SLIDES format

# Species One - TEMPLATE

|  |  |
| --- | --- |
| Common Name: | Scientific Name: |
| Description of species: |  |
| Identifying characteristics/markings/etc. |  |
| Interesting facts: |  |