



The Book Planter



Ag in the Classroom

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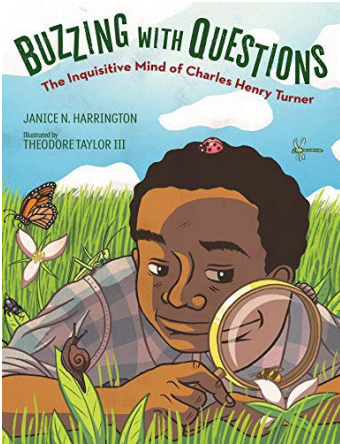
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Buzzing with Questions:

The Inquisitive Mind of Charles Henry Turner

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Illustrated by: Theodore Taylor III



Can spiders learn? How do ants find their way home? Can bugs see color? All of these questions buzzed endlessly in Charles Henry Turner's mind. He was fascinated by plants and animals and bugs. And even when he faced racial prejudice, Turner did not stop wondering. He constantly read, researched, and experimented. This activity sheet will explore the book, and insects and their connection to farmers and agriculture.

Facts about Charles Henry Turner

- Charles Henry Turner (1867-1923) was an American entomologist.
- Turner was the first African American to receive a PhD in zoology from the University of Chicago.
- Turner was the first person to discover that insects can hear and alter behavior based on previous experience (such as proving that bees could see color, insects could illustrate, and were capable of learning).
- He published more than 70 research papers.

Vocabulary from the Book

- **Acrobat:** an entertainer who performs gymnastic feats
- **Biologist:** a person who studies humans, plants, animals and the environments in which they live
- **Crustacean(s):** large, mainly aquatic group of arthropods (animals with an exoskeleton and segmented body), including crabs, lobsters, shrimp, and barnacles
- **Curiosity:** the desire to learn or know
- **Entomologist:** a scientist who studies insects
- **Indefatigable:** persisting tirelessly
- **Inquisitive:** asking and inquiring; eager to learn
- **Insects:** very small animals with hard coverings over their bodies

- **Laboratory:** a room or building equipped for scientific experiments, research, teaching or manufacturing
- **Odorous:** giving off smell
- **Scientist:** a person who studies or has expert knowledge of one or more of the natural or physical sciences
- **Translucent:** clear enough to let light to pass through

While Reading¹

1. Ask students to listen for vocabulary of the day. When students hear any of the vocabulary during the reading, ask them to clap twice.
2. Ask students to keep track of the number of insects introduced in the book.

After Reading Questions¹

1. How many insects were introduced in the book?
2. How would you describe Charles?
3. What were some challenges that Charles faced?
4. What was Charles famous for?
5. How did Charles help other scientists?

Engage – Student Motivator

1. Ask students, “What is a scientist?”
2. Create an anchor chart on the board, and allow students to individually or in groups complete the sentence, “A scientist is a person who...”
3. Next, ask if students know what an entomologist is.
4. Show students the cover of the book, *Buzzing with Questions: The Inquisitive Mind of Charles Henry Turner*. Tell them they may notice clues on the cover of the book that answers the question, “What is an entomologist?”
5. Tell students, “An entomologist is a scientist who studies insects.”
6. Ask students how they think entomologists (a scientist who studies insects) might be important to a farmer or agriculture. (*Entomologists can provide important information about beneficial and harmful insects to farmers. Harmful insects can damage a farmer’s crop or livestock. Beneficial insects can help a farmer’s crop or livestock.*)

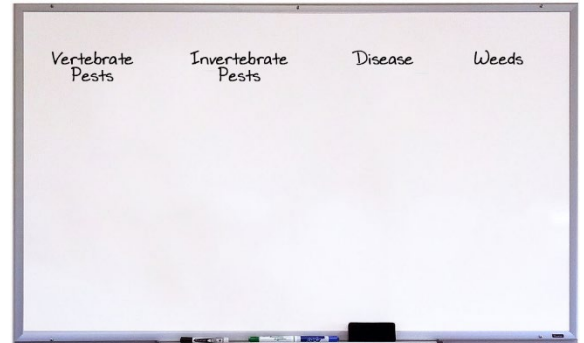
Activity 1: Pests and Pesticides in Agriculture²

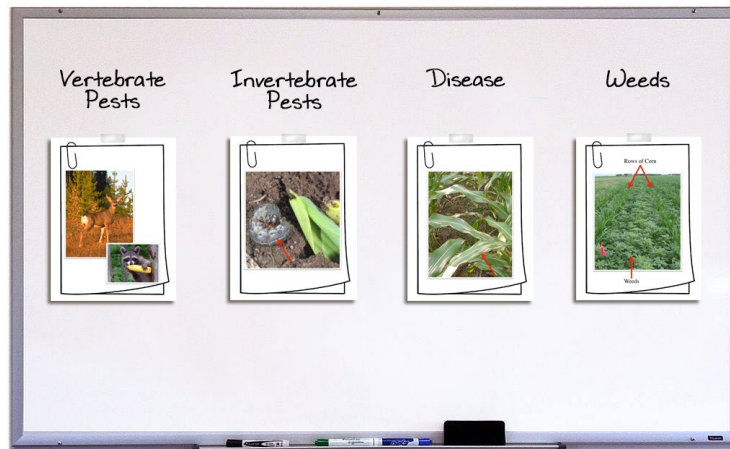
Materials:

- [Corn Pest Images](#), printed or projected on board
- Images or examples of materials that are used by pesticide applicators, such as a pesticide manual, pesticide labels, personal protective equipment, calibration cups, record keeping forms, or pesticide storage sign (optional)

Procedures:

1. Ask students if they can define the word, “pest.” Ask if they can give you examples.
2. Explain that pests are organisms living and growing where they are not wanted. They can cause damage to plants, humans, structures, and other creatures.
3. Inform students that they will be learning about different kinds of pests and the ways they can be controlled to prevent damage to plants that provide our food.
4. Write the following words horizontally across the board: **Vertebrate Pests**, **Invertebrate Pests**, **Disease**, and **Weeds**.
5. Teach students that there are four main categories of agricultural pests:
 - **Vertebrate Pests:** Have a backbone.
Examples: Rodents, birds, reptiles, and other mammals
 - **Invertebrate Pests:** No backbone. Examples: Insects, spiders, ticks, slugs
 - **Weeds:** Any plant growing out of place
 - **Disease:** Fungi, bacteria, viruses, and other microorganisms
6. Discussion: Have students share an example of a pest, why the organism is a pest, and whether the pest is a vertebrate, invertebrate, weed or disease.
7. Teach students that pests can pose a serious threat to a food supply. A major food crop is corn, which supplies humans with food that we eat, food for animals, and corn ethanol used for fuel. There are many pests to corn, including vertebrates, invertebrates, weeds and diseases.
8. Print the [Corn Pest Images](#) and place them on the board underneath the appropriate pest category. Use the images and the information below to teach students about the following pests that could damage corn crops.
9.
 - **Vertebrate Pests** – Deer, raccoons, rabbits, birds, and other creatures can eat the corn crop at various stages of the growth of the corn.
 - **Invertebrate Pests** – Cutworms are the larvae of what will eventually become a moth. In the larvae stage, the cutworms live near or below the soil surface. The cutworms feed on corn that has recently emerged from the ground, chewing off the small corn sprouts causing damage that often appears as if the corn has been “cut.” Other invertebrate pests can attack corn at various stages of growth.
 - **Weeds** – Besides the corn plants, any other plant in the corn field could be considered weeds, as these other plants are competing for water, sunlight, and nutrients with the corn.
 - **Diseases** – Blights, rusts, and leaf spots are just a few diseases that can affect corn. Corn blight is caused by fungal pathogens, with lesions developing on the lower leaves and possibly spreading to the whole plant. The corn experiences decreased photosynthesis, with the corn leaves eventually turning brown.





Activity 2: Integrated Pest Management²

Background information for teacher:

To control pests both in our homes and on crops, integrated pest management is a strategy that we can use. Integrated pest management is a process that uses different ways to control pests. The steps include:

1. Identify the Pest
2. Monitor Pest Activity
3. Choose Control Methods
4. Evaluate Results

The control methods in integrated pest management include cultural, biological, mechanical, and chemical. As homeowners use a combination of ways to control pests, farmers also use these methods but in different ways. Depending on the audience, explain control methods from the example of a mouse in the house and/or the example of control pests in agriculture.

- **Cultural control** means changing the environment. In the home, that can be cleaning up food and keeping the area clean. In agriculture, that means crop rotation in fields, managing the soil for optimum soil health, and choosing resistant varieties, such as corn hybrids that are resistant to a pest.
- **Mechanical control** means physical objects such as traps, machines, and devices. In the home, a mouse trap may be used. In agriculture, plowing and tillage of the soil might be used to control weeds and traps are also used for monitoring insects and catching pests.
- **Biological controls** are natural enemies of the pests, such as animals and other creatures. In the home, that could be a cat that eats the mouse. In agriculture, that can be predators like lady beetles and lacewings, or parasites like wasps and flies.

- **Chemical controls** are poisonous to the pests, such as sprays, dusts, and baits. In the home, mouse bait (a rodenticide) might be used. In agriculture, pesticides are sometimes used to control various pests to crops.

Procedures:

1. Print or write “Identify the Pest” on a sign or sheet of paper, “Monitor Pest Activity” on a second sheet, “Choose Control Methods” on a third sheet, and “Evaluate Results” on a fourth sheet. Prior to sharing the correct order of the steps, have four volunteers hold the signs (not in the correct order) and have the group hypothesize what is the correct order for the steps of Integrated Pest Management.
2. Use the information found in the *Background Agricultural Connections* section of this lesson to explain the correct order and the steps.
3. Explain that there are four control methods in integrated pest management. They include cultural, biological, mechanical, and chemical. Just as homeowners use a combination of ways to control pests, farmers also use these methods but in different ways. Explain control methods from the example of a mouse in the house and/or the example of controlling pests in agriculture.
 - **Cultural control** means changing the environment. In the home, that can be cleaning up food and keeping the area clean. In agriculture, that means crop rotation in fields, managing the soil for optimum soil health, and choosing resistant varieties, such as corn hybrids that are resistant to a pest.
 - **Mechanical control** means physical objects such as traps, machines, and devices. In the home, a mouse trap may be used. In agriculture, plowing and tillage of the soil might be used to control weeds and traps are also used for monitoring insects and catching pests.
 - **Biological controls** are natural enemies of the pests, such as animals and other creatures. In the home, that could be a cat that eats the mouse. In agriculture, that can be predators like lady beetles and lacewings, or parasites like wasps and flies.
 - **Chemical controls** are poisonous to the pests, such as sprays, dusts, and baits. In the home, mouse bait (a rodenticide) might be used. In agriculture, pesticides are sometimes used to control various pests to crops.
4. Place students into groups of two, three, or four.
5. Discuss with the students that all living things require air, food, water, and shelter to survival. Explain to the students that they are going to invent, design, and build a pest.
6. Show the students the supplies that are available.
7. Have the students do the following:
 - Decide what the pest will do.
 - Build an imaginary pest out of the supplies that are available, keeping in mind that the pest requires air, water, food, and shelter.
 - Materials:

- ❖ to make pests- pipe cleaners, felt, beads, toilet paper rolls, glue, markers, toothpicks, yarn, aluminum foil, construction paper, etc.
 - ❖ Index cards
 - ❖ Shoe boxes (optional)
- Name the pest.
 - Determine the quantities of the pest needed to cause significant damage.
 - Decide how the pest is controlled.
8. Have the students prepare cue cards for an oral presentation.
 9. Have the students present their pests to the class for discussion.
 10. As a culminating activity, have the students write about what they have learned about pest management. Use the attached, [What I Learned About Pests and Pest Management](#) worksheet.

Activity 3: Pest Poetry⁴

1. Display the poem [Spider Mites](#) and another of the [Poem for Two Voices activity sheet](#). Distribute copies of the poem to each student.
2. Divide the students into two groups. Group A will read column A of the *Spider Mites* poem and Group B will read column B of the poem. Discuss how the poems are written and read. Read *Spider Mites* as a class.
 - Note: Line 1 should be read, then line 2, and so on. If words appear in both columns of the same line, they should be read simultaneously.
3. On the overhead projector, create a collaborative poem for two voices that is about a pest. It is important to elicit characteristics of the organism, such as colors, sounds, and actions. Divide the class into groups and read the poem together. Note: Repetition of a phrase makes the poem sound more exciting.
4. Pair the students and have them write their own pest poem for two voices. A possible procedure is described below:
 - Decide on the pest about which the poem will be written.
 - Brainstorm a list of characteristics about the pest-special colors, sounds, habitats, movements, etc.
 - Determine one or two words or phrases that will be repeated in the poem.
 - Write the poem on the [Poem for Two Voices](#) student activity sheet, keeping in mind that words written on the same line should be identical words, which will be read at the same time.
 - Read the poem as a team.
 - Make necessary changes.
 - Rewrite the revised poem neatly on a clean activity sheet.
5. Have the students rehearse and perform their poems for classmates or duplicate the poems and have the entire class read each poem.

Activity 4: Virtual Insect Collection Lab³

This virtual insect collection lab allows students to participate in a virtual science experience as they learn more about insects and what they can tell us about our world.

<https://insectcollectionlab.nmsu.edu/interactive/>

Activity 5: Butterfly Treats¹

Materials:

- Celery
- Cream cheese or peanut butter
- Small pretzels
- Raisins

Directions:

1. Cut a small piece of celery for the body of the butterfly.
2. Spread the cream cheese or peanut butter on the inside of the stalk of celery.
3. Break pretzel in half and add the two pieces to the middle of the stalk for the wings.
4. Add two raisins for eyes.



Links

Activity 1:

- Corn Pest Images
https://cdn.agclassroom.org/media/uploads/2016/02/02/Corn_Pest_Images.pdf

Activity 2:

- What I Learned About Pests and Pest Management worksheet
https://cdn.agclassroom.org/media/uploads/2015/10/07/What_I_Learned_About_Pests_and_Pest_Management.pdf

Activity 3:

- Spider Mites https://cdn.agclassroom.org/media/uploads/2015/10/07/Spider_Mites.pdf
- Poem for Two Voices
https://cdn.agclassroom.org/media/uploads/2015/10/07/Poem_for_Two_Voices.pdf

Sources

1. <http://ost.phila.gov/wp-content/uploads/2020/10/Buzzing-with-Questions-Toolkit.pdf>
2. <https://agclassroom.org/matrix/lesson/403/>
3. <https://agclassroom.org/matrix/resource/1230/>
4. <https://agclassroom.org/matrix/lesson/355/>

K-5 Subject Areas: English Language Arts and Science

English Language Arts (Reading and Writing)

- RL.K.1 With guidance and support, identify details in familiar stories.
- RL.K.3 With guidance and support, identify characters and settings in a familiar story.
- RL.K.4 With guidance and support, identify feeling words within a familiar story.

- W.K.1 With guidance and support, select a familiar book and use drawing, dictating, or writing to state an opinion about it.
- W.K.2 With guidance and support, select a familiar topic and use drawing, dictating, or writing to share information about it.
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- RL.1.1 Identify details in familiar stories.
- RL.1.2 With guidance and support, recount key details in familiar stories.
- RL.1.3 Identify characters and settings in a familiar story.
- RL.1.4 With guidance and support, identify sensory or feeling words in a familiar story.
- W.1.1 With guidance and support, select a topic and use drawing, dictation, or writing to state an opinion about it.
- W.1.2 Select a familiar topic and use drawing, dictating, or writing to share information about it.
- RL.2.1 Answer who, what, and where questions to demonstrate understanding of details in a familiar text.
- RL.2.3 Identify the actions of the characters in a story.
- RL.2.4 Use rhyming or repetition to identify words that meaningfully complete a line in a familiar story, poem, or song.
- W.2.1 Select a topic and use drawing, dictating, or writing to state an opinion about it.
- W.2.2 Select a topic and use drawing, dictating, or writing to create a written product with one or more facts about the topic.
- RL.3.1 Answer who and what questions to demonstrate understanding of details in a familiar text.
- RL.3.3 Identify the feeling of characters in a story.
- RL.3.4 Determine words and phrases that complete sentences in a text.
- W.3.1 Write an opinion on topics or texts, supporting a point of view with reasons.
- W.3.2 Write to share information by selecting a topic and writing about it, including one or more facts or details.
- RL.4.1 Use details from the text to recount what the text says.
- RL.4.2 Identify the theme of a familiar story, drama or poem.
- RL.4.3 Use details from the text to describe characters in the story.
- RL.4.4 Determine the meaning of words in a text.
- W.4.1 Write an opinion about topics or texts, supporting a point of view with reasons.
- W.4.2 Write to share information supported by details.
- RL.5.1 Identify words in the text that answer a question about explicit information.
- RL.5.2 Identify the theme of a story, drama or poem.
- RL.5.4 Determine the meaning of words and phrases as they are used in a text.
- W.5.1 Write an opinion about topics or texts, supporting a point of view with reasons.
- W.5.2 Write to share information supported by details.

Science

- K.P.1 Understand the positions and motions of objects and organisms observed in the environment.
- **K.P.2** Understand how objects are described based on their physical properties and how they are used.
- **1.L.1** Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive.
- **1.L.2** Summarize the needs of living organisms for energy and growth.
- **3.L.2** Understand how plants survive in their environments.
- **4.L.1** Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.
- **5.L.2** Understand the interdependence of plants and animals with their ecosystem.







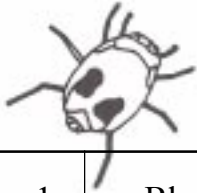
Rows of Corn



Weeds



Spider Mites



Column A

Column B

1	Blowing in the wind	Blowing in the wind
2		Drifting from field to field
3	Invaders	Invaders
4	Clinging, sucking, crawling	Clinging, sucking, crawling
5		Living off the leaves
6		Of strawberry plants
7	Large juicy berries	
8	No more	
9	Invaders	Invaders
10		Laying Eggs
11	Hatching	
12		Tiny in size
13	But growing quickly	
14	Blowing in the wind	Blowing in the wind
15	Spider mites	Spider mites

Poem for Two Voices

Name _____

Student Activity Sheet



Column A

Column B

1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

Author(s) _____
