

Worksheet – Bee Lesson Plan – Middle School

Name _____ Date _____

Total apple production in the United States in 2005 was 234.9 million cartons valued at \$1.9 billion. While every state in the US produces apples, Missouri has a climate suitable for apples and is home to several local orchards. If we no longer had bees to pollinate apple trees, what would happen if we were to rely on pollination done by humans?

Calculate and show your work:

1. There are approximately 159,000 acres of trees, housing 110 trees per acre (159,000 acres X 110 trees = 17,490,000 total apple trees that need to be pollinated in Missouri). However, we are going to focus on one small Missouri orchard. The average apple tree orchard size is 60 acres. How many apple trees are found on an average size orchard?

2. Scenario: We no longer have bees to pollinate our apple trees, and a Missouri orchard has hired you and your classmates to pollinate their trees. Each tree has 28,000 flowers to pollinate, but only a quarter (25% or 7,000) of flowers will produce apples. The class will pollinate 7,000 flowers on each tree. How long will it take you and your classmates to pollinate all the apple trees in the orchard?

Break into groups of “bees”, four or five in number. You will find your average pollination times. First, calculate how long it takes each of you to pollinate 50 flowers per apple tree. Each bee in your group will touch flowers on the tree in order from one to 50. The rest of the bees in the group will time how long it takes for each groupmate to do this. Each student will do four separate trials pollinating the apple tree and then determine your average pollination time.

	Attempt 1	Attempt 2	Attempt 3	Attempt 4	Average Time
Bee #1					
Bee #2					
Bee #3					
Bee #4					
Bee #5					

3. Calculate all four of each of the bee’s pollination attempts into an average number.

4. Average the time for all the groups of bees in your classroom.

5. Each tree will need 7,000 flowers to be pollinated. We now know the average time it takes one human to pollinate 50 of those flowers. How long would it take for a human to pollinate one entire tree? (Figure the number of average seconds and convert into average minutes.)

6. How many apple trees could one human pollinate in an 8-hour workday? Calculate how many trees your entire group of bees can pollinate in a day, using the total number of students in your class.

7. Using how many trees per day could your entire class of bees pollinate (your answer on #8), determine how many apple trees per orchard can be pollinated. Divide that by the total number of trees per orchard needing pollinated (answer to question #2), to determine how long it would take to pollinate the entire orchard.

8. Your class will need to be paid to pollinate. The orchard will pay each person \$9.00 per hour. How much will each pollinator be paid per day? How much would the entire class make per day?

9. Compare the cost of paying people to pollinate against renting bees to pollinate. Two hives per acre cost \$150.00 per hive. On an orchard of 640 acres, how much would the rental bees cost?