

Busy as a Bee 😊

Name _____ Date _____

In this activity, we are going to look at the production of just one food crop—almonds. California produces 82 percent of total almonds in the world. Almond producers depend upon bees to pollinate their almond trees. What would happen if bees were not available and we had to depend on humans to pollinate the trees?

Calculate Some Almond Pollination Numbers from California's Central Valley:

1. There are approximately 810,000 acres of trees with 112 trees on each acre (810,000 acres of trees X 112 trees = 90,720,000 total trees to pollinate in California's Central Valley). To make the numbers a little easier to calculate, we are going to just focus on just one farm. The average farm size in California is 64 acres. How many total almond trees are found in the average farm size? Show your work.

2. Without bees to pollinate these trees, your class has been hired to pollinate the almond trees for one farm. Each tree has 28,000 flowers to pollinate, but only about 25 percent (7,000) of the flowers actually produce almonds. We are only going to pollinate 7,000 flowers per tree. How long would it take your class to pollinate all the trees? In order to solve this problem, you will be placed into groups of 4-5 "bees" to get some average pollination times. First we will determine how long it takes each of you to pollinate 50 flowers on a "tree". Within your group, each "bee" (that's you) will touch the flowers on the almond tree outline, in order by number (from 1-50). The other members in your group will time how long it takes you to do this. You will do four separate trials pollinating your tree and then determine your average time to pollinate fifty flowers.

	Trial 1 (secs)	Trial 2 (secs)	Trial 3 (secs)	Trial 4 (secs)	Average Time
"Bee" #1					
"Bee" #2					
"Bee" #3					
"Bee" #4					

3. What is the average of the times of all four of the practice "bees" in your group? Show your work.

4. What is the average time for all the "bee" groups in your class? Show your work.

5. We currently know that you need to pollinate 7,000 flowers on a tree and we have the average time it takes one person to pollinate only fifty of those flowers. How long would it take one person to pollinate one tree? For your answer, figure the number of seconds and convert to minutes.

6. If you work an eight-hour day, how many trees can one person pollinate? Show your work. Let's assume that your class has thirty students. That means your class can pollinate _____ trees per day. Show your work.

7. Your class can pollinate (answer from #8) _____ trees per day. There are 7,168 (answer from #2) trees total per farm to pollinate. Divide that number to determine how long it would take your class to pollinate one farm.

8. We need to pay your class for their work. Minimum wage is about \$9.00 per hour in California. How much will you paid per day? Show your work. How much for _____ days? How much for your whole class?

9. Compare that cost to that of renting bees to do the work. Usually two hives are placed on each acre at the cost of \$150.00 per hive. A rental colony usually has eight frames with 1,500-2,000 bees per frame. Populations might triple in size depending upon how nutritious the crop is being pollinated. The average farm size is 640 acres. How much would the bees cost?

10. What kinds of things would impact the cost of hiring your class to do the work? Think of the conditions—pollinating 50 flowers every _____ seconds for 8 hours a day.