Pollination is Big Business!

Content Connections:
Math - Basic algebra, word problems
Earth & Space Science - How humans interact with and affect their environment and vice versa

Grades: 5th-8th

Time: 30-45 minutes

Objective: Students will be able to describe the economic importance of pollinators after solving word problems containing actual chocolate making statistics.

Materials:
- Chocolate Math worksheets
- Pencils
- Calculators
- Drawing and writing paper

Background:
The Cacao tree grows in the tropics and produces cacao pods, the source of chocolate. Each tree produces approximately 30 pods a year. Each pod contains roughly 40 cocoa beans. It takes approximately 500 beans to make 1 pound of chocolate, so therefore each tree produces about 2 pounds of chocolate a year.

To put that in context, Americans alone consume 2.8 billion pounds of chocolate each year, or over 11 pounds per person, so that means the average American needs the pods from 5 and a half cacao trees. 1.4 billion trees are needed to produce enough chocolate to satisfy Americans alone. Cacao pod production wouldn't be possible without pollinators!

Procedure:

1. Tell students that we're about to find out just how much pollinators matter! Ask them who likes chocolate? Everyone likes chocolate! Explain that chocolate comes from a tree that is pollinated by a little insect, the midge.
2. Have students work individually to complete the Chocolate Math worksheet to find out how many pods it takes to make a bar of chocolate! After they complete the worksheet, work with them to extrapolate how many cacao pods it would take to feed the class.
3. Ask students to react to the Chocolate Math worksheet. Is this statistic surprising? How important are midges?
4. Now let them make a list of some of the other foods they eat pretty regularly. If foods are processed, include what they are made from (i.e., corn chips don't grow, but they are made out of corn, which is grown).
5. Explain that 84% of commercially grown crops are insect pollinated. What does that mean for the food on our lists we just created? Discuss in partners and then share back with the whole group.
6. Ask students to cross off ⅓ of the items on the list. Explain that pollinators are responsible for ⅓ of every bite of food we take and without pollinators, our list of favorite foods would be a lot shorter! Additionally, they are responsible for half the world's oils, fibers, and raw materials.
7. To summarize, ask students to draw a model or visual representation of the importance of pollinators in the world.

Name:_____

Chocolate Math

HELP! The Hershey Chocolate Factory is going berserk! They have lost part of the recipe for making chocolate! They have some of the information, but they need YOUR help to figure out the rest! See if you can solve the following problems to help the chocolate factory get back on track. GOOD LUCK!

1. A Cacao tree grows approximately 30 pods a year. Each cacao pod contains about 40 cocoa beans. How many cocoa beans does each tree produce every year?

_____ beans

2. Round your answer from number 1 to the nearest thousand. _____

3. If it takes approximately 500 cocoa beans to produce 1 pound of chocolate, how many pounds of chocolate can each Cacao tree produce in 1 year?

_____ pounds

4. How many Cacao trees would you need to make 40 pounds of chocolate?

_____ trees

5. An average milk chocolate bar weighs about 1.5 ounces. There are 16 ounces in a pound. How many chocolate bars can be made with one pound of chocolate?

_____ bars

6. How many chocolate bars can be made from 35 pounds of chocolate?

_____ bars

Chocolate Math Answer Sheet

1. 30 pods x 40 beans = 1,200 beans
2. 1000
3. 2 pounds
4. 40 pounds divided by 2 pounds per cacao tree = 20 trees
5. 1 1⁄2 (1.5) x 10 = 15 Therefore you can make 10 bars per pound 6. 35 pounds x 10 bars per pound = 350 bars