



## Bravo, Bats!

*Why Bats Deserve Our Thanks*

**Materials:** Beneficial Bat Fact Sheets ● Giving Thanks for Bats Recipe Worksheet ● Common food items/spices that are dependent on bats such as chocolate, orange juice, ketchup, French fries, peanut butter, apple, banana, black pepper, coffee beans, jelly/jam, corn, oatmeal, hamburger buns with sesame seeds, allspice, basil, cloves, ginger, whole coconut ● bananas, strawberries, and dipping chocolate and/or ● assorted fruit, flaked coconut, and pecans for fruit salad

### Teacher Instructions

Hand out copies of Beneficial Bats Fact Sheet, and use it to discuss ways many food items and agricultural products are dependent on bats for insect control, seed dispersal, pollination, fertilizer, and ecosystem maintenance. Help students define words in word bank. Display common food items (see above) that students are familiar with; let students investigate, smell, taste, etc. items they might not be familiar with such as whole bean coffee, spices, figs, and peppercorns.

Bring in or make in class: fruit salad with coconut and nuts and/or chocolate-dipped bananas and strawberries as samples of snacks that we can enjoy thanks to bats.

Have students complete the Giving Thanks for Bats Recipe Worksheet.

**Answer key:** flour (wheat), margarine (see coconut), white and brown sugar (see dates and coconut), ginger, cloves, and pumpkin should be highlighted.

### Extension Ideas:

For homework, each student should find a recipe at home, write it on the blank recipe cards on page 9-6, and highlight the bat-dependant ingredients.

Create a recipe book of bat-dependent dishes. Have each student bring from home or find on the internet one or more recipes that contain at least two bat-dependent ingredients. Have students organize the recipes into a book illustrated with bats and interspersed with interesting bat facts (such as how many insects bats can eat in an hour, etc)







## Beneficial Bats

### Word Bank

pollinate  
pollen

disperse  
nectar

beneficial  
fertilizer

insectivore  
ecosystem

carnivore  
dependent

Did you know that without bats, we might not be able to enjoy some of our favorite foods such as peanut butter, chocolate, bananas, bread, French fries, ketchup or orange juice? There are over 1,100 species of bats, and they live on every continent except Antarctica. Only 3 species of bats suck blood. Most (70%) eat insects. The other 30% of bats eat fruit, pollen, or nectar, or are carnivores. Most of what we eat comes from plants. Bats help provide us with these foods, and many other products, by eating insects that destroy certain plants, by pollinating plants and dispersing seeds, and even by providing fertilizer.

Bats also help keep humans healthy. We obtain 80 different medicines from plants that rely on bats for their survival. Bats keep us from getting sick by eating disease-carrying insects, such as mosquitoes which carry malaria and West Nile virus. Bats also protect the environment; if bats were not around to eat so many insects, we would have to use many more harmful pesticides, which can harm animals, including us!

**Bats eat insects** that would damage or destroy a wide variety of agricultural products. Small bats can easily eat up to 2,000 insects every night. Here are just a few foods that bats save from insects.

- Vegetables: asparagus, beans, carrots, celery, corn, cucumbers, eggplant, spinach, lettuce, broccoli, cauliflower, cabbage, olives, peas, potatoes, tomatoes and peppers.
- Fruit: apples, avocados, cherries, citrus fruit, grapes, peaches, pears, pumpkin, squash, and all sorts of berries such as blackberries, blueberries, strawberries and cranberries.
- Seasonings: garlic, basil, ginger, honey (Bats eat insects whose larvae destroy beehives.)
- Seeds & Grains: oats, rice, wheat, and sesame seeds.
- Nuts: almonds, pecans, peanuts, and pistachios.
- Other: coffee and mushrooms.





We usually think of bees and butterflies as pollinators of flowers, but **bats are major pollinators** as well. The following items depend on bats for pollination.

- Bananas
- Dates (Date palm trees are also tapped for the sweet sap, which is turned into sugar and molasses.)
- Coconut (The coconut palm tree also give us coconut palm oil, which is used to make many products such as candy bars, soap, sugar, soap, ink, margarine and cosmetics.)
- Cloves (In addition to being used as a spice, cloves are used in perfumes and medicines.)
- Vanilla
- Brazil nuts
- Avocadoes

**Bats help spread seeds** of many plants over a wide area, making sure that more plants grow and produce food. Bats may carry off a piece of fruit, eat the fruit and drop the seeds some distance from the original plant, or they might eat the seeds, which then pass through their bodies and are discarded in their feces. Without bats to spread seeds, we might not have these tasty treats.

- Almonds and cashews
- Figs
- Allspice
- Chocolate (Chocolate is made from the cacao tree. Fruit bats eat the cacao fruit pulp and discard the cocoa bean, which will grow into a new tree. This is especially important because cacao fruit won't fall from the tree by itself, so we depend on bats to provide us with more cacao trees.)

**Bat guano**, or feces, **makes a very rich fertilizer**. One particular seasoning is very dependent on bat guano: peppercorns, from which we make black pepper.

**The rainforests of the world depend on bats** to spread seeds, pollinate plants, and control insects. Bats are responsible for 90% of rainforest reforestation. We rely on many rainforest products every day such as rubber, medicines, coffee, chocolate, and bananas. About 80% of what we eat and one quarter of our medicines come from the rainforest.





Name \_\_\_\_\_

## Giving Thanks for Bats Recipe Worksheet

### Instructions

What would Thanksgiving be like without pumpkin pie? Without the help of bats, we might not have this popular Thanksgiving dessert. Here is a basic recipe for pumpkin pie. Highlight the ingredients that are dependent on bats in some way (you may use your Fact Sheet).

### Pumpkin Pie

#### Ingredients

##### Crust:

- 1 cup flour
- Dash salt
- 1/2 cup (1 stick) margarine
- 2 1/2 Tablespoons cold water

##### Filling:

- 3 eggs
- 1 egg yolk

#### Directions

Preheat oven to 425 degrees. For crust, mix flour and salt in a bowl; cut in margarine with a fork until crumbly. Add water and mix until a ball is formed. Roll out on a floured surface into a circle slightly larger than your pie pan. Place the crust in the pan; fold and crimp the edges. For the filling, in a large bowl, combine eggs, egg yolk, white sugar and brown sugar. Add salt, cinnamon, nutmeg, ginger and cloves. Gradually stir in milk and cream. Stir in pumpkin. Pour filling into pie crust. Bake for 10 minutes. Reduce heat to 350 degrees and bake for an additional 40 to 45 minutes, or until filling is set.

- 1/2 cup white sugar
- 1/2 cup packed brown sugar
- 1 teaspoon salt
- 1/2 teaspoon cinnamon
- 1/2 teaspoon nutmeg
- 1/2 teaspoon ginger
- 1/4 teaspoon ground cloves
- 1 1/2 cups milk
- 1/2 cup heavy whipping cream
- 2 cups pumpkin (canned or fresh)





Name \_\_\_\_\_

## Bravo Bats! Recipe

Recipe Title: \_\_\_\_\_

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Ingredients:

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Directions:

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