

# BAT'S MATH QUIZ

Adapted from: Carlsbad Caverns National Park's Teacher Guide: *About Bats, Caves, & Deserts*.

## **GRADE LEVEL:**

Elementary/Intermediate

**SUBJECTS:** Life science, Mathematics (unifying concepts and statistics)

## **Related Colorado Content**

**Standards:** SC3.1, SC3.3, SC4.1, MA1, MA2, MA5, MA6

**TIME:** 30 Minutes

**OBJECTIVE:** The students will be able to solve bat-related math problems. Students will be able to draw and write conclusions based upon their answers.

**MATERIALS:** Bat's Math Quiz worksheet, pencil.

**BACKGROUND:** After solving math problems, students should be able to draw the following conclusions:

An active bat's heart beats much faster than an active human heart.

A bat's heart beats dramatically slower when it hibernates.

Some species of bats eat a lot of harmful insects. (Most species of bats are insect-eaters).

## **PROCEDURE:**

1. Distribute the Bat's Math Quiz worksheets.

2. Have the students complete the sheet individually or as a team.

## **ANSWER SHEET**

**Fact #1:** An active human's heart beats 150 times per minute. An active bat's heart beats 900 times a minute.

**Question 1.** When compared to a human, how many more beats does the bat make per minute?

**Answer:** 750

**Question 2.** How many times does a bat's heart beat per second?

**Answer:** 15

**Fact #2:** When the average bat hibernates, its heart rate drops to about 20 beats per minute.

**Question 1.** How many times will a hibernating bat's heart beat in one day (24 hours)?

**Answer:** 28,800

**Question 2.** What do you think would happen to hibernating bats, if human activity woke them frequently? Explain your answer.

Answers will vary. Most importantly, a bat's metabolism slows down while hibernating. When woken up, they expend energy that cannot be replaced due to lack

of food sources during the winter.  
This could cause them to die.

## BAT'S MATH QUIZ (continued)

**Fact #3:** Insectivorous (bats which eat insects) bats can eat half their weight in insects each night.

**Question 1.** If a bat weighs 16 grams and a moth weighs 0.4 grams, how many moths will the bat eat before it is full?

**Answer:** 20

**Question 2.** If the same bat ate only moths, how many moths could it eat from May to September (150 days)?

**Answer:** 3,000

**Question 3.** Why do farmers like bats?

### **EXTENSIONS/ADAPTATIONS:**

1. Students can work in pairs or groups to solve each problem.
2. Have students create their own word problems using the facts provided.
3. Student can research new and interesting facts and create new word problems.

**BAT'S MATH QUIZ**  
**Student Worksheet**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**DIRECTIONS:** Use the information provided to answer each question. Show all work in the space provided below each question.

---

**Fact #1: An active human's heartbeats 150 times per minute. An active bat's heart beats 900 times a minute.**

**Question 1.** When compared to a human heart, how many more beats does the bat make per minute?

**Question 2.** How many times does a bat's heart beat a second?

**Fact #2: when the average bat hibernates, its heart rate drops to about 20 beats per minute.**

**Question 1.** How many times will a hibernating bat's heart beat in one day (24 hours)?

**Question 2.** What do you think would happen to hibernating bats if human activity woke them frequently? Explain your answer.

**BAT'S MATH QUIZ**  
**Student Worksheet (continued)**

**Fact #3. Insectivorous (bats which eat insects) bats can eat half their weight in insects each night.**

**Question 1.** If a bat weighs 16 grams and a moth weighs 0.4 grams, how many moths will the bat eat before it is full?

**Question 2.** If the same bat ate only moths, how many moths could it eat from May to September (150 days)?

**Questions 3.** Why do farmers like bats?