Bats in the Belfry

Supplemental Activities Packet

This packet contains classroom activity suggestions and worksheets to reinforce concepts from the Playbook® story and to go beyond the story into the content areas of Language Arts, Math, Science, Social Studies, Art, Health, etc., as well as Character Development.
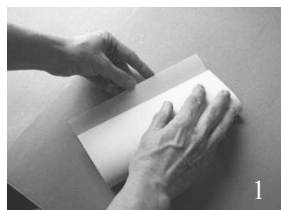
Activities range in age appropriateness and skill level so that teachers can choose activities that best suit their particular students. An Answer Key is provided on the last page.
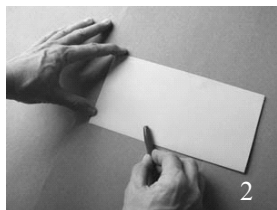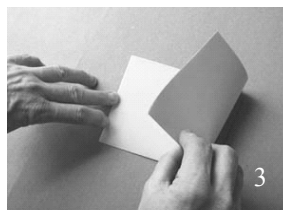
Origami Bats

Directions: At home, follow the steps below to make a fun paper bat! Look at the pictures labeled step by step to help you. You may use any square, lightweight piece of paper.
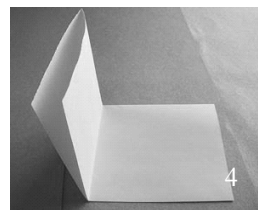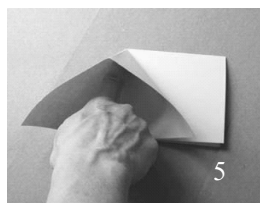
1 — Fold your square in half.

2 — Crease the fold with a smooth and hard object.
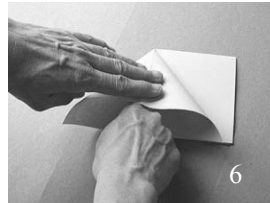
3 — Fold the paper in half again to make a smaller square, and crease fold as in step 2.
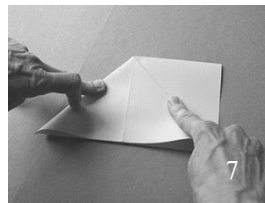
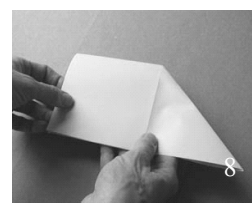**4** — Stand up one side so it is pointing straight up to the ceiling.

5 — Push your finger into the back bottom corner. This will open up a roof shape.
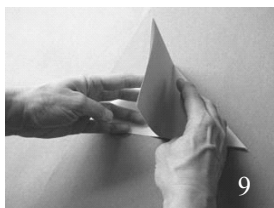
6 — Hold down the roof while you remove your finger.

7 — Make sure the triangle is symmetrical, and press it down flat, creasing all edges carefully.

8 — Turn over your shape. It will look like this.

9 — Stand up the square flap. You may have to push it around and rub the fold to make it willing to stand up.

10 — Collapse the roof into a flat triangle.
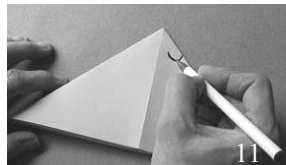
11 — Draw a "smile" shape that **does not touch** the center crease. If your line touches the crease or gets too close, the bat's head will fall off!
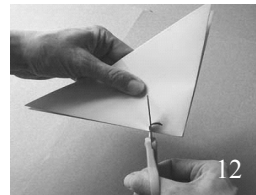
12 — Cut along the line you just drew.
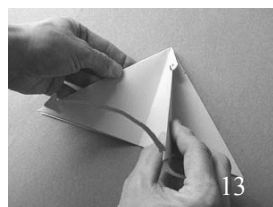
13 — Flip the top cut layer over to the left side.
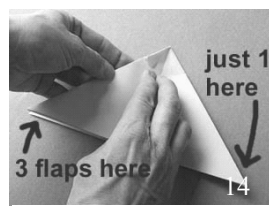
14 — just 1 here / 3 flaps here / Now your paper will look like this.
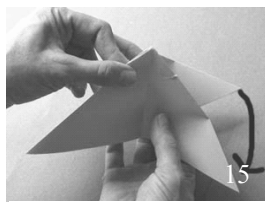
15 — Flip one of the back un-cut layers to the right.
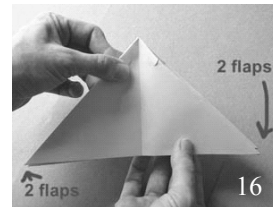
16 — 2 flaps / 2 flaps / Ta-Da! Now turn it over.
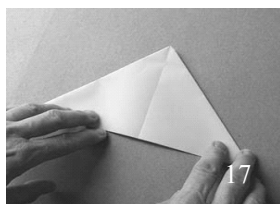
17 — This is the plain side you see after flipping the paper over.
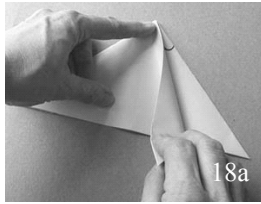
18a — Fold in both edges to sit along the center crease.

18b
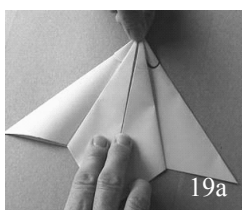
19a — Grab the bat's nose and fold the head down over the tummy.

19b — Draw your bat's face and decorate it however you want! **Be a little batty with your creativity!**

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Art
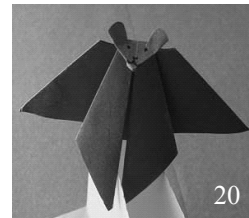
Bat Math!

Directions: Help the characters in the story solve these word problems.

Use the following information for questions 1-3: The average weight for a bat is approximately one and a half ounces (approximately 11 bats per pound). The average weight for a bell ringer is approximately 200 pounds.

1. If the total weight of the bats is 190 pounds how much must Cousin Barnabus' collection box weigh in order to ring the bell?

_____

2. How many bats would be needed to pull the rope and ring the same bell as the average bell ringer? You only need to work in approximate numbers.

_____

3. A bat has the dimensions Length=14", Height=6", and Width=2". Using the same number of bats from problem 2, find the total volume of bats in the belfry in cubic inches? (Hint: V=L x W x H)

_____

4. Cousin Barnabus flew from Transylvania in order to visit his cousins in London. The distance is approximately 1,300 miles (as the bat flies). If Barnabus wants to reach London in 10 days, how many miles does he need to cover each night?

_____

5. If Barnabus picks up some good tail winds, and covers 260 miles each night, how many days would it take him to get to London?

_____

6. Barnabus can fly only between the hours of 8 P.M. and 6 A.M. If Barnabus flies 260 miles every night and wants to reach London in 5 days, how fast will he have to fly?

_____

7. If the Town Crier is on the job every day except Sunday from 4 p.m. to midnight, how many hours a week does he work?

_____

8. Beulah goes to see an indoor play every other Saturday. She goes to see an outdoor play once a month. How many plays total will she see in one year?

_____

9. Tickets to see an indoor play cost $20. Tickets to see an outdoor play cost $10. If the Town Crier decides to accompany Beulah to the plays she attends, according to her schedule in question 8, how much money will he spend on plays in the next year?

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Name: _____

Cousin Barnabus Sees the Sights

Directions: In the story, ***Bats in the Belfry***, Cousin Barnabus was interested in seeing all the famous parts of the city. Could he have seen the following sights during his trip to London? Investigating the timeline below, mark "P" for "Possible" or "I" for "Impossible" on the lines provided.

1. _____ The Tower of London

2. _____ The British Museum

3. _____ Big Ben

4. _____ Westminster Abbey

5. _____ Buckingham Palace

6. _____ The Houses of Parliament

7. _____ Windsor Castle

8. _____ Picadilly Circus

9. _____ St. Paul's Cathedral

10. _____ Madame Tussaud's

B.C. 3,000– Evidence of scattered settlement of present-day London	**A.D. 43 –** Londinium founded by Romans	**190-225 –** Protective wall built around city	**410 –** Roman legions leave Britain	**604 –** St. Paul's Cathedral founded	**9th century –** Viking invasions	**878 -** King Alfred defeats Vikings	**10th century –** London made capital under Ethelred the Unready	**c. 1000 –** Original St. Botolph's built	**1045 --** Westminster Abbey built by St. Edward the Confessor	**1066 --** Norman Conquest	**1078 –** William the Conqueror builds the Tower of London

Name: _____

Rounding Up by the Century

Directions: When we talk about historical events, we often refer to the century in which it happened. Centuries are always one year ahead of the actual date. For example, the Declaration of Independence was signed in 1776, so we say that it happened in the 18th century. Using the time line below, place each historical event in its correct century.

1. The Great Fire of London: _____ century
2. The Roman army leaves England: _____ century
3. Buckingham Palace begun: _____ century
4. Your birth date: _____ century
5. New Houses of Parliament begun: _____ century
6. The Norman Conquest: _____ century
7. St. Paul's Cathedral founded: _____ century
8. First London Bridge began: _____ century
9. King Alfred defeats the Vikings: _____ century
10. The year 2007: _____ century

1087 – Windsor Castle begun	**1176 -** First London Bridge began	**14**[th] **century –** Black Death kills half the population of the city	**1660 --** Charles II becomes king	**1666 –** Great Fire of London (setting of *Bats in the Belfry*)	**1703 –** Buckingham Palace begun	**1759 –** British Museum opens	**1819 –** Picadilly Circus begun	**1835 –** First exhibition, Madame Tussaud's	**1840 –** New Houses of Parliament begun	**1845 --** Trafalgar Square completed	**1859 –** Big Ben operational

Social Studies

History/ Life Skills

Understanding the Bats' World

Directions: Use the lines provided to answer the questions about **Bats in the Belfry**. Consider clues found in the story to support your answers.

1. **Foreshadowing** is a literary technique in which events that happen later are hinted at earlier in the story. For example, in *Romeo and Juliet,* the characters state early in the play that they would rather die than live apart, and they both end up dying in the end instead of finding happiness together. Find an example of foreshadowing on page 13 or elsewhere in the Playbook® text, and explain how it hints at events that occur later in the story.

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2. How do you imagine the bats conversing with the Town Crier? Are the characters in the belfry or down on the streets? Why might the author have made the decision to allow only the Town Crier to be able to communicate with the bats? How does this affect the story?

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Name: _____

Cockney Rhyming Slang

A **Cockney** is a person who was born within the sound of Bow's bells—that is, within the sound of the church bells of St. Mary le Bow in London. Our honest, hard-working town crier would be shocked to find out that the Cockney rhyming slang he uses in the story probably originated as a kind of thieves' code—a secret language developed by shady characters who wanted to talk to their friends without other people understanding what they were saying.

There are many examples in the play:

"trouble and strife" = wife

"meat pies"   = eyes

"plates of meat"   = feet

"loaf of bread"   = head

Here are some other examples:

"hickory, dickory, dock   = clock   Sometimes shortened to just "dickory," as in, "the dickory struck one."

"apples and pears"   = stairs   Sometimes shortened to just "apples," as in, "he went up the apples to bed."

"butcher's hook"   = look   Sometimes shortened to just "butcher's," as in, "take a butcher's at this."

"Auntie Ella"   = umbrella

Directions: Now it's your turn to **think of some similar expressions**. You, too, can develop a secret language that will enable you to hold a conversation with your friends that no one else can understand. Imitate Cockney slang shown above, or make up your own pattern for a secret language. One fun "made-up" language is called Pig Latin, in which you move the first consonant sound of a word to the end of the word, followed by "ay." The word, "banana," for example, would become "anana-bay."

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Social Studies/ Language Arts   Vocabulary/ Speech

Name: _____

The Only Flying Mammals
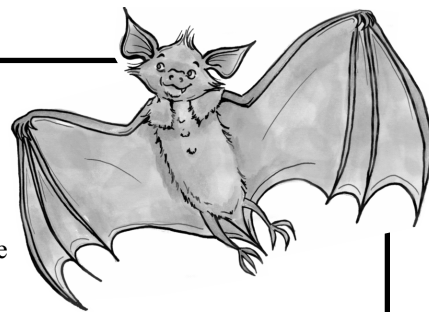
All plant and animal life is divided into groups. This special study is called taxonomy. All life is classified according to **Kingdom**, **Phylum**, **Class**, **Order**, **Family**, **Genus** and **Species**. Kingdom is the broadest group, and species is the most specific. An easy way to remember this is by using the first letters of each word and replacing the words with, "King Philip Came Over From Germany Saturday." This aid to memory is called a **mnemonic**.

Bats belong to the order Chiroptera, which means "hand-wings." This comes from two Greek words: "cheiro," meaning hand, and "pteron," meaning wing, because they have what look like small hands at the ends of their wings. This means that, contrary to common belief, they are actually **not** closely related to rodents.

Bats belong to the kingdom Animalia, their phylum is **Vertebrata** (animals with back bones), and their class is **Mammalia** (mammals). Their order, **Chiroptera**, is divided into large bats and small bats, and it is only the small bats that use **echolocation**.

While most bats are not actually blind, they have poor eyesight. Since they spend most of their flying time in the dark, they use a system in which the sound of their little squeaks or cries bounces off solid obstacles (such as walls or trees) and they can fly without hitting them. This system is used by other animals like whales and dolphins, and is the basis for radar systems.

While the majority of bats eat insects and fruit, some types are indeed "vampires." These small bats are the size of a package of M&Ms, and they usually drink the blood of animals such as cattle or other livestock. Vampire bats live mostly in Latin America. Many bats help humans by eating the insects which would destroy our crops.

Bats are mammals. This means that they are warm-blooded (or have a constant body temperature), have hair or fur, produce live young rather than eggs, and produce milk to feed their young. Bats reproduce slowly, raising only one offspring per year. They typically live 25 to 40 years. Bats are the only mammals that truly fly; animals such as flying squirrels and flying lemurs can actually only glide for short distances.

Bats are the subject of many false myths in Western societies. While people have often thought of them as dirty, disease-carrying, and blood-sucking, they are actually shy, and carry rabies much less often than many other species of wild animals. In China, one of the few places where bats have been viewed positively, they have been portrayed in art as a symbol of happiness and good luck.

Some interesting sources of information on bats are:

http://batworld.org

http://www.si.edu/Encyclopedia_SI/nmnh/batfacts.htm

Internet Quest: Did you know that the world's smallest mammal is the bumblebee bat, found in Thailand, which weighs less than a penny? In contrast, giant flying fox bats can have wingspans of up to six feet! At home or at your school's library, use the Internet to find one or two obscure and fascinating facts about bats! Share what you discover with your class.

Amazing Bat Trivia
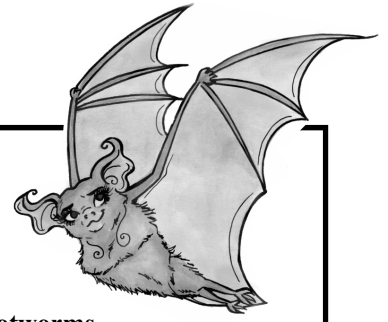
1) **Nearly 1,000 kinds of bats** account for almost a quarter of all mammal species and most are highly beneficial.

2) A single little brown bat can catch 600 mosquitoes in just one hour.

3) A colony of 150 big brown bats can **protect local farmers from up to 18 million rootworms** each summer.

4) The 20 million Mexican free-tails from Bracken Cave, Texas, eat 250 tons of insects nightly.

5) Tropical bats are key elements in rain forest ecosystems, which rely on them to pollinate flowers and disperse seeds for count- less trees and shrubs.

6) In the wild, important agricultural plants as variant as bananas, mangoes, cashews, dates and figs **rely on bats for pollination and seed dispersal.**

7) Desert ecosystems rely on nectar-feeding bats as primary pollinators of giant cacti, including the famous organ pipe and saguaro of Arizona.

8) Bat droppings in caves support whole ecosystems of unique organisms, including bacteria useful in detoxifying wastes, improving detergents, and producing gasohol and antibiotics.

9) An anticoagulant from vampire bat saliva may soon be used to **treat human heart patients.**

10) Contrary to popular misconceptions, bats are not blind, do not become entangled in human hair, and seldom transmit disease to other animals or humans.

11) All mammals can contract rabies, however, even the less than half of 1% of bats that do, normally bite only in self-defense and pose little threat to people who do not handle them.

12) Bats are exceptionally vulnerable to extinction, in part because they are **the slowest reproducing mammals on earth for their size**. Most produce only one young a year.

13) Nearly 40% of American bat species are in severe decline or al- ready listed as endangered. Losses are occurring at alarming rates worldwide.

14) The world's smallest mammal is the bumblebee bat of Thailand which **weighs less than a penny**.

15) Giant flying foxes that live in Indonesia have wingspans of nearly six feet.

16) The common little brown bat of North America is the world's longest-lived mammal for its size with life spans exceeding 32 years.

17) Mexican free-tailed bats sometimes fly up to two miles high to feed or to **catch tailwinds that carry them over long distances at speeds of more than 60 miles per hour.**

18) The pallid bat of western North America is immune to the stings of scorpions and even the seven-inch centipedes upon which it feeds.

19) Fishing bats have echolocation so sophisticated that they can detect a minnow's fin as fine as a human hair protruding only two millimeters above a pond's surface.

20) African heart-nosed bats can **hear the footsteps of a beetle walking on sand from a distance of more than six feet.**

21) Red bats, which live in tree foliage throughout most of North America, can withstand body temperatures as low as 23 degrees during winter hibernation.

22) Tiny woolly bats of West Africa live in the large webs of colonial spiders.

23) **Vampire bats adopt orphans** and have been known to risk their lives to share food with less fortunate roost- mates.

Science

Biology

Discussion Prompt
For Teacher Use Only

Direct your students in a class discussion about the situation of the characters in **Bats in the Belfry**. The bats are victims of prejudice, and they take action to defend themselves against the humans' false beliefs. By both holding the protest demonstration and helping to save London from the fire, the bats' strive to change the humans' opinions of them. Have your students discuss what could have made the bats' ideas more effective, and how the bats' actions finally help them achieve their goal. Ask your students how they have fought against prejudices they have encountered. Have them think of ideas for what both adults and kids can do to fight for what they believe in! Record their ideas on the board. Students will learn how to make a difference while relating to the fun Playbook® characters!

Answer Key
For Teacher Use Only

Cousin Barnabus Sees the Sights
Part A:
1. P
2. I
3. I
4. P
5. I
6. I
7. P
8. I
9. P
10. I

Rounding Up by the Century
Part B:
1. 17th century
2. 5th century
3. 18th century
4. 20th century
5. 19th century
6. 11th century
7. 7th century
8. 12th century
9. 9th century
10. 21st century

Bat Math
1. 10 lbs (200-190)
2. app. 18 bats (11x=200)
3. 3024 in. cubed ([14x6x2]18)
4. 130 miles (10x=1300)
5. 5 days (260x=1300)
6. 26 mph (260/10)
7. 112 hours (24-8=16, 16x7=112)
8. 36 plays (3x12)
9. $600 (24x20=480, 12x10=120, 480+120=600)

Understanding the Bat's World
(Sample Answers)

1. On page 14, when Bathsheba claims she would simply cling to the clapper of the bell in order to avoid moving out of the belfry, Beulah states, "It would take a lot of bats to make up the weight of one bell ringer." This foreshadows the fact that later in the story, many bats have to help in order to ring the bell and alert the city to the fire.

2. I imagine the Town Crier visiting the bats in the Belfry after overhearing the bats discussing their protest demonstration plans near the street. Having the Town Crier able to converse with the bats allows him to tell the other people about how the bats rang the bell to save London. This directly affects the bats' future, since the people decide to let them stay in the belfries. His character also provides an interesting and fun narrator for the story.

Amazing Bat Trivia
Hint: If assigning "The Only Flying Mammals" activity, do not distribute "Amazing Bat Trivia" until after your students have found their own obscure bat facts.