

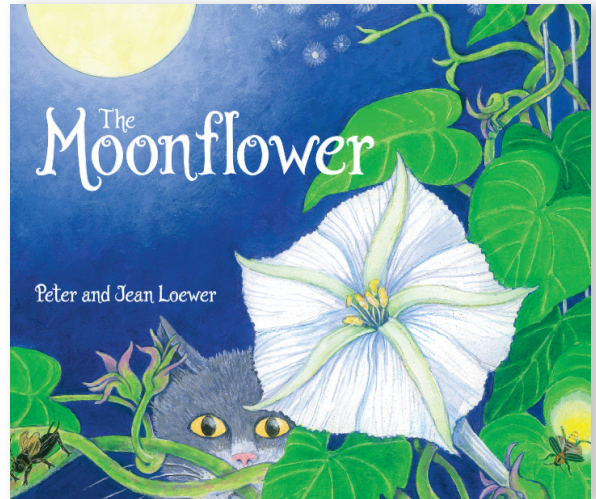
Ω
PEACHTREE
TEACHER'S GUIDE

The Moonflower

Written by Peter Loewer
Illustrated by Jean Loewer

PB: 978-1-68263-101-0

Ages 6–10 | Nonfiction
Lexile • F&P • GRL V; Gr 5



ABOUT THE BOOK

A relative of morning glories and sweet potatoes, the moonflower opens its splendid white blooms on dark summer evenings, attracting the hawkmoths that will spread its pollen from flower to flower. The night sky shines as a variety of nocturnal animals float and skitter their way in and around the moonflowers. When the dawn light emerges, the pollinated moonflowers start to curl up, while new tightly closed buds await the next night. The nighttime creatures return home as the sun comes up, and the moonflowers, now wilted, begin to dry out. In the coming weeks they will spill seeds onto the ground so new plants can sprout and the cycle can begin again.

Informational sidebars accompany the lyrical text on each spread. The sidebar material discusses facts about the plant or animal mentioned on that page in more depth. The story closes with a discussion about the habits of nocturnal animals. The book also includes a simple glossary and directions for planting a moonflower.

THEMES

Flower life cycle | Pollination and fertilization
Nocturnal animals | Continuity of life

BEFORE YOU READ

- Order moonflower seeds (*Ipomoea alba*) before you begin the study of this book. Plant the seeds in individual milk cartons and potting soil following the directions at the back of the book. Morning glory seeds can be substituted if moonflower seeds are unavailable.
- Ask your students to fill out an anticipation guide (see Worksheet 1) or make a KWL chart (What I Know, What I Want to Learn, What I Have Learned).
- Show your listeners the front cover of the book and ask them what they think the book is about. Establish a purpose for reading the book.
- Show pictures without reading text and have children name all the animals.

AS YOU READ

- As the names of each living thing are introduced in the story, ask your listeners to write them in a journal.
- Instruct students to select a picture from the book that appeals to them and briefly write down what they see in that picture. They might want to select two or three pictures to describe. Later, the students can write about that picture or illustrate it from their memory and notes.

AFTER YOU READ

- Create a simple 24-hour timeline of the events in *The Moonflower* and break it down into sections. (For example: sunset to midnight, midnight to sunrise, sunrise to noon, etc.) Put the timeline on the board. Divide the students into groups and assign each one a section of the night or day to describe and illustrate. Ask them to fill in what they think would happen during that period. Compile the material from all the groups and make a large timeline poster for display in the classroom. Point out the continuity and renewal of the cycles.
- A variation on the previous activity: Have students draw individual pictures illustrating the cycle of a typical moonflower's life. Students will then cut out their pictures and paste them to a rectangular piece of paper. Tape both ends of the paper together to create a life cycle wheel. You may hang with string to display. (Each child will need three pieces of yarn and a paperclip at the end of the project to hang.) Punch three holes in the top three areas of the wheel and pull yarn through the holes and tie. Meet all three pieces of yarn in the center and tie to a paperclip. Hang in classroom.
- Together, list sensory words or visual images depicted in the book. Write them on the board. Have students suggest more words that express the feelings that the story evokes in them and add them to the list.
- Use the follow-up thought questions and activities provided below as a class discussion guide or have small groups of students discuss and write answers to them.

THOUGHT QUESTIONS & ACTIVITIES

- Why do you think the moonflower developed to bloom at night?
- Choose three of the animals from the list you made as you read. Decide which one of the three is the most important to the moonflower and write it at the top of a piece of paper. Choose another one of the three animals that is least important to the moonflower. Skip one line and write that animal as the third on the list. Then put the other animal in the middle. Explain why you ranked them this way.
- List reasons for why flowers need insects.
- Rewrite this story using the morning glory, a close relation of the moonflower. The morning glory opens during the day instead of at night. Use the same pattern as the book for your story, except set it

in the daytime and substitute animals that are active during the day.

- Make a list of things of things you do each night as it begins to get dark. Discuss the idea that the moonflower is beginning its activities as students are ending theirs.
- Make up a firefly "code" of your own and write a key corresponding to the letters of the alphabet. You can use numbers or simple symbols for your code. Write your name or a sentence in your code.
- What are some things that take place in the country or in a big city during the night? Write a paragraph describing a typical night in one of these places.
- Explain why a seedpod must dry out and why this is important to the flower.
- Make up another name for the moonflower. What would you call it? Why would you name it that particular new name?

CURRICULUM CONNECTIONS

SOCIAL STUDIES

- Provide a simple outline map of the United States. Help students find and label your city and state on their maps. (Save the maps for other activities on this list.)
- The book states that the sun sets in the west. In what direction would you look to see the rising sun? Discuss compasses and directions, using an accurate compass, if possible. Talk about the orientation of your classroom or your school. In what direction does it face? Do the windows face the rising or the setting sun? Draw and label a simple compass rose on the board and discuss how maps are oriented. Have students draw a compass rose (with north pointing up) on the maps you saved. Ask more advanced students to make a simple map of the school grounds or their neighborhood. Younger students could draw a picture of the rising or the setting sun.
- Using students' current knowledge, discuss the climate in your area and list familiar words that describe your local weather and temperature.
- Look up in an almanac or on the Internet your state's average temperatures throughout the year. Discuss the way temperatures vary from place to place and from season to season. Relate the different temperatures to things the students are familiar with, like a snowy day (or the lack of snowy days), a trip

to the beach, etc. Ask them what they would do or what they would be wearing in the various situations. Have students illustrate with pictures or write descriptions of the clothing and activities.

- Look up the standard state abbreviations. Write the abbreviation for your state and the surrounding states or any combination you choose. If the blank US map you provided in the first activity has the outlines of the states, students can fill in the abbreviations for each state.
- Use the Internet to look up the plant hardiness zones for the US and identify your state and zone. Use the key to help understand what zone your city and state are in. Discuss the meaning and significance of the temperatures. www.usna.usda.gov/science/plant-hardiness-zone-map
- Draw lines indicating the hardiness zones for your state or the US on your map from the first activity. Label and color the different zones. www.usna.usda.gov/science/plant-hardiness-zone-map

VOCABULARY

After you have read the book, say the words on the following list aloud. Give the list to the students and discuss the meaning of each word. Divide the class into pairs. Tell the students to try to remember how to say the words on the list. Encourage them to figure out the pronunciation using what they know about letter sounds. Have the students practice reading the words to each other. Write the words out of order and have students list them in alphabetical order. (These words are from the main text and not the sidebars.)

bicycles	fragrance	sparklers
blossoms	glide	swoops
buzzes	glow	trumpets
curls	golden	twining
delight	perfume	underground
flashing	shrubbery	unfurl
flicker	silvery	whir

LANGUAGE ARTS

- Enlarge and reproduce the glossary words from the back of the book and distribute to students. Have them cut out the words and definitions separately. Instruct them to match up the words with their definitions and paste them on sheets of paper to create their own picture dictionary. Ask them to illustrate each word.
- Using a dictionary, define fiction and nonfiction. Talk about what makes *The Moonflower* a nonfiction book. Ask students to write a simple fictional story based on the information in *The Moonflower*.
- Discuss compound words. Go back through the text and identify the compound words. Define each part of the word and then discuss how the two parts give meaning to the larger word.
- Look up the word “nocturnal” in a dictionary. Compare the definition to the one in the glossary. Ask students to make a list of the nocturnal animals they know. Add the animals from the book. Practice writing sentences using sensory words about the nocturnal animals listed in the book.
- Have each student choose an animal to research. Use the following steps to prepare for the report: Have students read about the animal. Ask them to find interesting facts about their animal and write them down on cards or paper. The following suggestions will help them in their research.
 - Name: Does the name of the animal mean something? What are the babies called? Do the parents have special names? Older students may find the scientific name. (For example, a deer male is a buck, a female deer is a doe, and a young deer is a fawn. The scientific name for the deer family is in Latin: *Cervidae*.)
 - Appearance: What does the animal look like? How big or small is it? How much does it weigh? Does it have any interesting body parts? Tell about them. What other animals is it related to?
 - Habitat: Where does your animal live? What biome/habitat does it live in? Is it found only in the United States? Can you find it somewhere else in the world?
 - Locomotion: How does your animal move around? Does it have to escape enemies or use its motion to get food?
 - Offspring: How many babies does your animal usually have? When and where are the babies born? How long are they with the mother before they are born? Do they come from eggs? How long does it take for them to hatch? What can the babies do after they are born? Can they move around or do they need the parents to help them?
 - Diet: What does your animal eat? Is it a carnivore, herbivore, or omnivore? Where is your animal in the food chain?
 - Habits: Tell about interesting things your animal does. Does it live alone or in groups? Does it

have a special way of getting food or getting away from enemies? What is its usual behavior?

- Any interesting facts: Is there something about your animal that makes it special? Does it do something most animals do not do? Does it have special adaptations that make it different from most other animals? Does it do anything that seems strange to you?
- Have students use the ideas generated from the above and their notes to write a report on an animal or insect from the story. They should begin with an introduction telling about their animal in general. Then write a paragraph for each main circle on their prewriting graphic. Ask them to list the names of the books and Internet sites they used. Have them draw a picture of their animal.
- Read the story and direct the students to listen carefully because they will be rewriting the story after you finish reading it. (You will want to read only the narrative text and skip the information included in the sidebars for this activity.) Then have the students retell it in writing on their own paper. Ask them to put this version aside for later. After students have completed the vocabulary activity (Worksheet 2), reread the story and have students rewrite it again in their own words. Compare the two versions. Discuss the differences. Ask why the second version might be better.
- Write a poem about a moonflower or another flower. Make a flower card and include their original poem inside it.
- Divide students into ten groups. Assign each group a sidebar of information from the book. Ask each group to write a riddle about the organism described in the sidebar. Make a game of having one group read their riddle and allowing the other groups to guess the answer. (You may want to omit the nocturnal sidebar at the end unless you have exceptionally creative students.) Example:
I use radar to move.
I have large ears.
I make high-pitched squeaks.
What am I? (Answer: bat)
- Ask students to find a poem about flowers or the moon at the library. Have a recital day. Ask each student why he/she chose that particular poem to learn.
- Help the class write similes using the living things from the book. Have the students make up their own comparisons. Example:

Her face was as white as a moonflower.

The boy jumped as quick as a cricket.

- Have students look up information about bats. What do they eat? Why are so many people afraid of bats? Create a book in the shape of a bat and include information and several pictures.

SCIENCE AND MATH

- Discuss the following vocabulary words. Label a diagram of a flower using a simple picture depicting flower parts. Draw a moonflower next to the diagram.
 1. **stamen:** the thin male part inside the flower
 2. **pistil:** the thin female part inside the flower
 3. **anther:** the end tip of the flower's stamen (the male part) that has the pollen
 4. **filament:** the thin part that holds the anther
 5. **ovary:** the bottom of the pistil (female part) where the ovules (first seeds) are grown
 6. **petal:** the brightly colored flower part that is around the stamen and pistil
 7. **sepal:** little leaves right under the colored flower; they are really part of the flower and not true leaves
 8. **stem:** the stalk that holds up the flower
 9. **peduncle:** the thick, rounded top of the stem
 10. **stigma:** the top part of the pistil where the pollen grains must land to make a seed
 11. **style:** the tube-like middle part of the pistil; this is where the pollen moves down to the ovule
- Ask students to look up the life cycle of the moth. Draw and label the different stages. Compare and contrast the moth life cycle with the seed formation of a flower. Write the differences on a T-chart.
- Ask students to bring in different kinds of seeds. Have them make labels for each seed with the plant name. Create a display of the seeds.
- Discuss the term Fahrenheit. Plot the Fahrenheit scale from 0 to 250 on a graph. Demonstrate how to use even increments when making a graph. Identify freezing (32 degrees) and boiling (212 degrees). Then plot a centigrade thermometer and compare the two. (Boiling = 100° C, and freezing = 0° C.)
- Ask students to look up information about the nighthawk. Try to find other birds that are closely related to it. Write their names and report back to the class.
- Soak thirty bean seeds in water overnight. Lima beans are best because of their size. Split apart the beans and locate the baby plant inside. Identify the

leaves, the stems (cotyledons), and the food source for the baby plant (the seed). Ask students to draw the dissected seed and label their observations.

- Research the phases of the Moon. Have students make a poster or chart showing each phase and label the names of the phases.
- Look up how tall moonflowers grow (average is around 15 feet but they can get up to 70 feet in height.) Measure a length of string and cut it off at 15 feet. Stretch out the string and brainstorm ideas about what is taller or wider than 15 feet. Use the string to compare this length with common objects and lengths around the room and school and write simple equations showing this comparison.
Example: *15 feet = 18 lockers*
15 feet = 24 students in line
- Report on an insect's proboscis, antennae, or compound eyes and how they help the insect. Look for ways each is adapted to its job.
- Collect examples of non-poisonous wildflowers. Press them in old books. Consult a wildflower identification guide and label as many as possible.
- Set up an experiment called "*What Kind of Soil Do Seeds Need?*" Use dirt from the schoolyard, sand, a container of water, and gravel in each of four pots. Give equal amounts of water as needed and plant three seeds in each pot. Have students predict what will happen to the seeds in each pot and record it in a science journal or on a piece of paper. Have students consider the following points when organizing information for experiment:

Title of Experiment: (You name it.)
Question you are asking: (What are you trying to find out?)
Prediction: (Tell what you think will happen.)
Materials: (List what you need to do the experiment.)
Observations:
• Qualitative (What you can tell using your senses.)
• Quantitative (What you can measure using numbers.)
Results: (What actually happened?)
Conclusion: (What did you find out or learn?)
Watch and record results daily

- Ask students to research the moonflower. Where does it live most commonly? What disease problems does it have? What other plants is it related to? Will the juvenile plants look the same as the parent plant?
- Have students look up the word "pollination." Try to find at least three ways pollen gets from flower to flower.

ART

- Show students how to make a construction-paper card to go with their moonflower poems. To create the vines and tendrils, twist green crepe paper. Use white tissue paper for the blossoms.
- Have students make a pop-up vase card filled with flowers. You can see an example from this website: <http://www.enchantedlearning.com/crafts/popupcards/flowervase/>

ABOUT THE AUTHOR

Peter Loewer earned a Max Beckmann fellowship to attend Brooklyn Art School, where he received a BFA in graphics. He has written numerous books on gardening and authored dozens of magazine and newspaper articles on the subject. He is also a botanical artist and conducts exploratory nature walks where he lives in North Carolina.

ABOUT THE ILLUSTRATOR

Jean Loewer received a BFA in painting and a certificate in art education from Hunter College. She has illustrated ten children's books, taught art in public schools as well as adult education classes, and has worked as a children's librarian. She lives in North Carolina.

REVIEWS

"The lyrical text describes the nighttime activity surrounding the plant with magical overtones that remain true to nature's nocturnal cycles. Brief information given in the text is supported by facts in vertical sections on one side of the double-page spreads." —*School Library Journal*

Teacher's Guide for
THE MOONFLOWER
prepared by Shirley Smith Duke

Copyright ©2019 by Peachtree Publishing Company Inc. All rights reserved. For instructional uses only and not for resale. Except for the printing of complete pages, with the copyright notice—no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means—electronic, mechanical, photocopy, recording, or any other without written permission. Requests for permission to use any section of the work should be mailed to: Permissions Department, Peachtree Publishing Company Inc., 1700 Chattahoochee Avenue, Atlanta, GA 30318-2112.

updated 12/19/18

THE MOONFLOWER

WORKSHEET 1: ANTICIPATION GUIDE

Name: _____ Date: _____

Write **Yes** or **No** in the blanks.

_____ 1. Moonflowers bloom at night.

_____ 2. A hawk moth's tongue is as long as its body.

_____ 3. Bumblebees cannot see at night by the light of the moon.

_____ 4. Bats see in the dark with their eyes.

_____ 5. Moths have noses.

_____ 6. Insects always know they are carrying pollen.

_____ 7. Fireflies communicate with their flashes.

_____ 8. You can tell the temperature using cricket chirps.

_____ 9. A moth can still fly if it loses its antennae.

_____ 10. Seeds don't grow if the flower part falls off.

THE MOONFLOWER WORKSHEET 2: VOCABULARY

Name: _____ Date: _____

WORD BANK

abdomen	Fahrenheit	nighthawk	robin
antennae	germinate	nocturnal	stamen
bat	hawk moth	owl	tendrils
bumblebee	mockingbird	pistil	wing-cover
compound eye	moonflower	pollen	
cricket	mourning dove	proboscis	

1. To develop and grow _____
2. A climbing vine in the morning glory family with heart-shaped leaves _____
3. A large, black insect with yellow markings that makes a pleasant buzzing sound as it flies

4. A slim-winged gray-brown bird that is active at night _____
5. A threadlike part of a climbing plant that is used for support _____
6. A common insect that is often found outside on summer nights with a soft, high-pitched song

7. A gray-brown bird with a small head and a long, pointed tail _____
8. Active at night _____
9. The hindmost section of an insects body _____
10. The common measure of temperature in the United States _____

THE MOONFLOWER

WORKSHEET 2: VOCABULARY (continued)

WORD BANK

abdomen	Fahrenheit	nighthawk	robin
antennae	germinate	nocturnal	stamen
bat	hawk moth	owl	tendrill
bumblebee	mockingbird	pistil	wing-cover
compound eye	moonflower	pollen	
cricket	mourning dove	proboscis	

11. Flexible feeler-like projections on the head of an insect, such as a hawk moth _____
12. A medium-sized gray and white bird with a slender, down-curved beak _____
13. A nocturnal winged animal with a mouse-like, fur-covered body. At rest it hangs upside down _____
14. The male part of the flower, which is made of a sac at the end of a stalk _____
15. Fine, powdery, usually yellow grains produced by the male part of the flower _____
16. The female part of a flower that contains the ovules, or future seeds _____
17. A nocturnal bird with large eyes and with plumage so soft it can fly without a sound _____
18. The front pair of wings in many insects that have developed into covers, usually very colored

19. A common red-breasted thrush who is often seen walking about looking for worms on lawns

20. A sight organ made up of many single eyes crowded close together _____
21. A hairy, medium-to-large moth with long proboscis _____
22. The long, slender mouthpart of an insect, used like a straw to move food into the insect _____

THE MOONFLOWER

WORKSHEET 2: VOCABULARY ANSWER KEY

1. germinate
2. moonflower
3. bumblebee
4. nighthawk
5. tendril
6. cricket
7. mourning dove
8. nocturnal
9. abdomen
10. Fahrenheit
11. antennae
12. mockingbird
13. bat
14. stamen
15. pollen
16. pistil
17. owl
18. wing-cover
19. robin
20. compound eye
21. hawk moth
22. proboscis