

GOODSPEED MUSICALS

Student's

GUIDE TO THE THEATRE

Roald Dahl's
*James
and the
Giant Peach*

A new musical



Featuring Pilobolus



GOODSPEED
MUSICALS[®]

The Max Showalter Center for
Education in the Musical Theater

Goodspeed's Student Guide to the Theatre
is made possible through the generosity of

UK
& S

UPDIKE, KELLY
& SPELLACY, P.C.

Connecticut's law firm with a worldwide reach

JAMES AND THE GIANT PEACH

The Norma Terris Theatre
October 21 - November 21, 2010

MUSIC & LYRICS BY
BENJ PASEK AND JUSTIN PAUL

BOOK BY
TIMOTHY ALLEN McDONALD

BASED ON THE BOOK BY
ROALD DAHL

SCENIC DESIGN BY
CHRIS BARRECA

LIGHTING DESIGN BY
STEPHEN STRAWBRIDGE

CHOREOGRAPHED BY
MICHAEL TRACY/PILOBOLUS

DIRECTED BY
GRACIELA DANIELE

PRODUCED FOR GOODSPEED
MUSICALS BY
MICHAEL P. PRICE

Roald Dahl's
**James
and the
Giant Peach**

Student Guide to the Theatre
TABLE OF CONTENTS

ABOUT THE SHOW: The Story.....	3
ABOUT THE SHOW: The Characters.....	5
BEHIND THE SCENES: Scenic Design.....	6
BEHIND THE SCENES: Pilobolus.....	7
PAGE TO STAGE: Roald Dahl.....	8
PAGE TO STAGE: Orphan Stories.....	9
SCIENCE FOCUS: Insects.....	11
SCIENCE FOCUS: What Floats Your Peach?.....	13
SCIENCE FOCUS: Peaches.....	14
FUN AND GAMES: Word Search.....	15
FUN AND GAMES: Crossword Puzzle.....	16
How To Be An Awesome Audience Member.....	17

The Student Guide to the Theatre is intended for use with the corresponding
Teacher's Instructional Guide.

ABOUT THE SHOW

The Story

Setting: Early Summer 1961 near Dover, England

It's a perfectly perfect morning when James Henry Trotter and his parents attend the circus where they see many performers including Marvo the Magician. During the show, a large **shrouded** cage containing the famous white rhino of Boreo-boo is wheeled into the center ring and an angry roar erupts from inside. James dashes into the crowd to take a picture, but the cage is not strong enough to hold the rhino and it pounces forward breaking through its four walls. Trying to protect James from the charging rhino, both Mr. and Mrs. Trotter are **devoured** by the beast.

James is left **orphaned** and alone until he is sent to the home of his two aunts, Spiker and Sponge. James' aunts are angry that they must take care of him, but brighten up when they realized they can put James to work.

On his first day at his new home, James is left behind as Spiker and Sponge go to the beach. James falls asleep under a peach tree, but is startled awake upon his aunts' return. On his way back to the house he hears a rustling from behind the garden. Marvo the Magician from the circus steps out looking a bit worse for the wear. Marvo explains that he has a **debt** to pay James and pulls out a book of spells. He and James concoct the "Magic Green Worms" potion, and after it is complete, James mistakenly drops it onto the ground, spilling the worms at the base of the peach tree. The grass, ground, and tree glow neon green as the worms dive into the dirt.

Meanwhile, Spiker and Sponge notice a giant peach growing from the tree and they **devise** a plan to charge admission for people to come see the giant peach. It's not long before word gets out and Spiker and Sponge earn money by signing contracts with reporters, **botanists**, scientists, and a Hollywood producer.

Forced to guard the giant peach overnight, James climbs the tree and the peach begins glowing, revealing a tunnel leading to the pit of the peach. James jumps in and meets Spider, Green Grasshopper, Centipede, Ladybug and Earthworm, who have transformed and grown after eating James' magic green worms. The insects manage to release the peach from the tree and it falls to the ground and rolls into the sea forming a sort of ship.

A while after starting their voyage on the ocean, the group encounters several sharks who try to attack the peach. James comes up with the idea to attract some seagulls using Earthworm for bait, and then ties them to the peach's stem. With the help of the seagulls, the peach is able to fly away and escape the sharks.

Back at Spiker and Sponge's house the two realize that both the peach and James have vanished. Fearing they'll lose all the money they made from their peach contracts, Spiker and Sponge take their cash and board a cruise ship to New York City where they encounter Marvo the Magician. They are just about to confront him when they notice the peach flying by the ship. The aunts hatch a scheme and manage to get Marvo to **divulge** that he forgot to lock the rhino cage at the circus and is actually responsible for the death of James' parents as well as the giant peach.

Spiker and Sponge **coerce** Marvo into casting an evil spell, but Marvo adds a sentence at the end of the spell stating that James must give the peach to his aunts willingly and at that moment the spell will end.

On the peach, James notices horrific figures in the clouds and notifies the insects. Centipede reaches out to the clouds and a hand reaches back, pulling him into the water. James jumps in and rescues him with the help of Spider's web. Suddenly, Sponge and Spiker emerge from the clouds to claim their precious peach and reveal to James that they have taken Grasshopper and Ladybug and will kill them unless he hands over the peach. James agrees to the terms and his friends are released. Each of the insects is tied to a bunch of seagulls and floats safely away off the peach. James then gives his aunts the peach, but they fall from the sky as the spell is instantly broken.

Having traveled all the way to New York City, the peach lands on top of the Empire State Building after its fall from the clouds. James and the insects are reunited and find that Spiker and Sponge have been crushed to death by the peach. James is free of his evil aunts and lives in Central Park inside the peach pit which has been enchanted by Marvo. The insects go on to lead successful lives and Grasshopper and Ladybug fall in love, get married, adopt many children, and care for James as if he were their first born son.



ABOUT THE SHOW

The Story

ACTIVITY 1: Unscramble the Events

Number these events in order from 1 to 10. Number 1 should be the first thing that happens in the story and number 10 is the last thing that happens.

- ___ Marvo the Magician casts a spell on Spiker and Sponge
- ___ The white rhino devours James' parents
- ___ The peach rolls into the Ocean
- ___ The peach lands on top of the Empire State Building in New York
- ___ James goes to the circus parade with his mother and father
- ___ James is sent to live with his aunts Spiker and Sponge
- ___ The peach magically grows
- ___ The peach is attacked by a shark
- ___ James gives the peach to Spiker and Sponge
- ___ James crawls inside the peach and meets the insects

ACTIVITY 2: Draw It!

Choose one of the events from the list in Activity 1 and draw a picture of what you imagine it to look like in the box below.



Illustration © Quentin Blake

WHAT IS THAT???

shrouded: hidden or covered

devoured: destroyed by eating

orphaned: to be left without parents.

debt: something owed to someone.

devise: to invent, plot, or scheme.

botanist: a person who specializes in the study of plant life.

divulge: to reveal, tell or make public.

coerce: to cause someone to do something by force or threat.

ABOUT THE SHOW

The Characters

WHAT IS THAT???

wretched: miserable or unhappy

triumph: to gain victory

third-rate: inferior or poor quality

paternal: fatherly

nurturing: comforting

maternal: motherly

surrogate: substitute or alternate

pessimist: someone who expects the worst possible outcome.

JAMES TROTTER: An eleven-year-old boy who experiences a great deal during the course of this adventure. He witnesses the horrible death of his parents, is abused by his **wretched** aunts, is lost at sea on a giant peach with a group of talking insects, and eventually overcomes all of this to **triumph** over evil.

MR. & MRS. TROTTER: James' perfectly perfect parents. On a family trip to the circus, Mr. and Mrs. Trotter are killed while protecting James from the white rhino of Boreo-boo.

SPIKER & SPONGE: James' wretched aunts. They must care for James after his parents are killed, but refuse to accept him as part of the family. Instead they constantly mistreat him as though he was their servant.

MARVO THE MAGICIAN: A **third-rate** circus magician who forgets to lock the cage of the rhino that ends up killing James' parents. Although not very good at parlor tricks, Marvo is well studied in practical magic and casts the spell that causes the peach to grow.

GREEN GRASSHOPPER: The leader of the insect troupe. He is wise, smart, **paternal** and becomes a father-figure to James.

LADYBUG: She represents all things **nurturing** and **maternal**. Ladybug is comforting, kind, gentle, patient and sweet. She eventually earns the honor of becoming James' **surrogate** mother.

CENTIPEDE: A pest and a **pessimist**. Centipede is full of rage and hatred towards all things human. He is originally from the Bronx and becomes a crazy uncle to James.

EARTHWORM: By nature, he/she is both male and female and has very poor vision. He/She is quite vain, refined in taste, and enjoys high culture and fashion.

SPIDER: A French garden spider. She is young, beautiful, hip, fun, daring, brave and serves as an older sister to James.



Did You Know...
Ladybug and Green Grasshopper are played by the same two actors who play Mrs. and Mr. Trotter.

WHAT IS THAT???

scenic designer: the person who is responsible for the scenery on stage. He or she designs the background and atmosphere for the entire production.

rendering: a scenic designer's two-dimensional drawing of how he or she wants the set to look.

technical director: the person in charge of all technical aspects of a show including set, lighting and sound. He or she makes sure everything is safe and that the designers' visions are met.

carpenters: the people who build the set structures.

charge scenic artist: the person who leads and oversees the painting of the scenery for a theatrical production.

set model: A miniature, three-dimensional version of what will become the full set of a show. Set models help the designer visualize how the set will actually look on stage.

BEHIND THE SCENES

Scenic Design

When people think of going to the theatre they often do not realize the amount of time and hard work that goes into creating how a show looks. The audience only sees the actors but there are actually a group of people that work together behind the scenes as well. They are in charge of designing, building, and painting the sets for the theatre.

Everything starts with the **Scenic Designer** reading a play and imagining how it will look on stage. He or she then takes their ideas and creates draftings and **renderings** which are drawings of how he want each part of the set to look throughout the play. These drawings are first given to the **Technical Director**, the person who is responsible for how the scenery is built. He makes sure the scenery is safe for the actors to walk or dance on, while still maintaining the designer's original vision.

The Technical Director then has a team of **carpenters** that build the different parts of the set. The **Charge Scenic Artist** is the person responsible for how the scenery is painted after it is built. She has a team of scenic artists that work together to paint the entire set. Both the carpenters and the scenic artists work with the designer to translate their idea from small, two-dimensional drawings into the life size, three-dimensional sets that you see on stage.

-Written by Katie Zeranski, Goodspeed Staff Scenic Artist



*Set Models by
Chris Barreca*



Did You Know...

All the sets are created, built, and painted in Goodspeed's very own production shops.

BEHIND THE SCENES

Pilobolus

James and the Giant Peach features a special collaboration with a dance company called Pilobolus. Pilobolus is not just a regular dance company that performs ballet or tap – it is made up of talented people who not only dance, but can also tumble and do daring acrobatics. In many of Pilobolus' performances, the dancers will link together in various ways to form shapes that look like animals and plants as you can see in the pictures on this page.

Pilobolus uses its unique ability to transform into incredible shapes for *James and the Giant Peach*. The Pilobolus performers are responsible for forming the shadow figures you'll see on stage including the rhinoceros and insects.



Photo by John Kane



Photo by Robert Whitman

TRY IT!

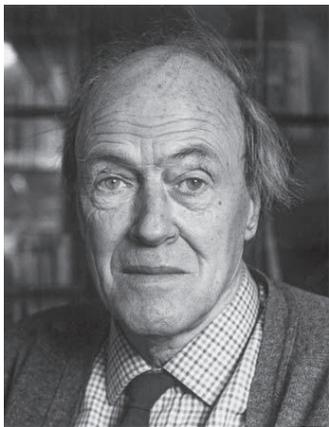
Make shadow figures like Pilobolus does. You'll need a bright flashlight and a wall. Turn off the lights, point the flashlight on the wall, and place your hand in front of the flashlight so you can see a shadow. Make different shapes with your hands to form animals on the wall. If you want to learn how to make specific animals visit this website:

<http://pbskids.org/zoom/activities/do/shadowanimals.html>

Did You Know...
Pilobolus is actually the name of a type of fungus found on cow dung.

PAGE TO STAGE

Roald Dahl



ROALD DAHL, author of *James and the Giant Peach*, was born in England on September 13, 1916. As a child, Dahl loved stories and books. His mother told him and his sisters tales about trolls and other mythical creatures. He also kept a diary starting at the age of 8. Dahl said of his diary, "To make sure that none of my sisters got hold of it and read it, I used to put it in a waterproof tin box tied to

a branch at the very top of an enormous conker tree in our garden. I knew they couldn't climb up there. Then every day I would go up myself and get it out and sit in the tree and make the entries for the day."

Dahl had an unhappy time at school, as do many of the characters in his books. His favorite memories of this time were trips to the sweet shop where he and his friends would stand outside the shop window wondering how Gobstoppers change color and whether rats might be turned into liquorice.

At the age of nine, Dahl was shipped off to boarding school where he suffered from terrible homesickness. He would write to his mother once a week and continued this habit through his adulthood. When he was thirteen, Roald attended private school where he excelled at sports, but not at class work. In fact, his English teacher thought he was a horrible writer. Roald was consistently beaten by the older boys and abused by his teachers. Luckily, the school was close to Cadbury's, one of England's most famous chocolate factories, where he would escape after a terrible school day to test new varieties of chocolate bars. Dahl dreamed of working in the inventing room of a chocolate factory, and it was these fantasies that inspired *Charlie and the Chocolate Factory*.

When Dahl was 23 and World War II was just beginning, he signed up with the Royal Air Force where he was accepted as a pilot officer in Iraq. Not long after joining, Dahl had a horrible crash. Requiring a hip replacement and two spinal operations, he was sent back home to England in 1941.

In 1942, Dahl was sent to the US and began his career as a writer. For the first fifteen years of his writing career, Dahl concentrated on short stories for adults that were published in several American magazines. Although Dahl was a successful short story writer, most of his fame and success came from his children's books. Dahl first became interested in writing children's books by making up bedtime stories for his two daughters. This was how *James and the Giant Peach* came to be. After that book was published in 1961, a string of bestsellers followed including *Charlie and the Chocolate Factory*, *The BFG*, *Danny the Champion of the World*, *The Twits*, *The Witches*, and *Matilda*. Dahl's books have been translated into 34 languages from around the world.



Illustration from *Charlie and the Chocolate Factory*

Roald Dahl was a great believer in the importance of reading. "I have a passion for teaching kids to become readers," he said, "to become comfortable with a book, not daunted. Books shouldn't be daunting, they should be funny, exciting and wonderful; and learning to be a reader gives a terrific advantage." Roald Dahl died in 1990 at the age of 74, but he continues to be one of the most beloved children's writers in the world.

HOW MANY ROALD DAHL BOOKS HAVE YOU READ?

- | | |
|--|--|
| <i>The Gremlins</i> (1943) | <i>The BFG</i> (1982) |
| <i>James and the Giant Peach</i> (1961) | <i>Revolt Rhymes</i> (1982) |
| <i>Charlie and the Chocolate Factory</i> (1964) | <i>The Witches</i> (1983) |
| <i>The Magic Finger</i> (1966) | <i>Dirty Beasts</i> (1984) |
| <i>Fantastic Mr. Fox</i> (1970) | <i>Boy - Tales of Childhood</i> (1984) |
| <i>Charlie and the Great Glass Elevator</i> (1972) | <i>The Giraffe and the Pelly and Me</i> (1985) |
| <i>Danny the Champion of the World</i> (1975) | <i>Matilda</i> (1988) |
| <i>The Enormous Crocodile</i> (1978) | <i>Rhyme Stew</i> (1989) |
| <i>The Twits</i> (1980) | <i>Esio Trot</i> (1990) |
| <i>George's Marvellous Medicine</i> (1981) | <i>Vicar of Nibbleswicke</i> (1991) |
| | <i>The Minpins</i> (1991) |

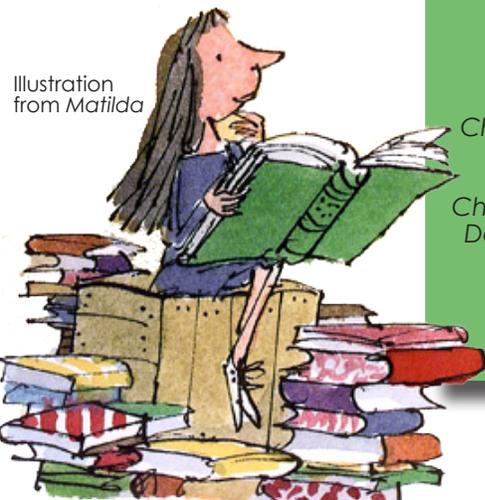


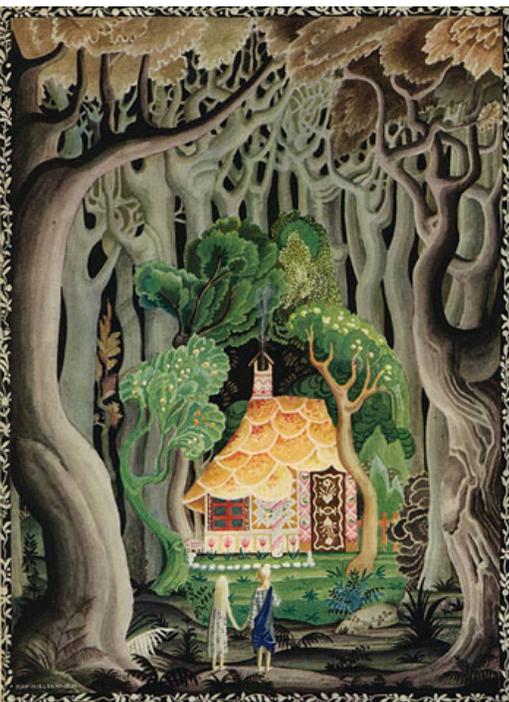
Illustration from *Matilda*

PAGE TO STAGE

Orphan Stories

"They were dead and gone in thirty-five seconds flat. Poor James, on the other hand, was still very much alive, and all at once he found himself alone and frightened in a vast unfriendly world. The lovely house by the seaside had to be sold immediately, and the little boy, carrying nothing but a small suitcase containing a pair of pajamas and a toothbrush, was sent away to live with his two aunts." – *JAMES AND THE GIANT PEACH* (Dahl, 1)

FROM FAIRYTALE TO FICTION



"Hansel and Gretel" painting by Kay Nielsen

What do *James and the Giant Peach*, *Annie*, *The Wizard of Oz*, and *Harry Potter* have in common? The main characters in all of these stories are orphans. Orphans are children whose parents have died. For hundreds of years, orphans have been used as the heroes and heroines in folktales and fairytales. Stories like *Cinderella*, *Hansel and Gretel*, *Snow White*, *Tarzan* and *Rapunzel* include not only those characters who are orphaned by the death of their parents, but also children who are lost, abandoned, cast out, mistreated by evil step-parents, or raised by wild animals.

Orphan tales made their way from the spoken to the written tradition and by the 1800s, the orphan heroine became a popular character in American and European literature. Classic novels such as *Heidi*, *The Little Princess*, *The Secret Garden* and *Anne of Green Gables* are all examples of this type of character. These heroines were usually left with relatives, like a mean aunt, who didn't want them. By the end of the story the orphan heroines transformed the lives of those around them by the force of their spunky, sweet natures.

Orphans have continued to appear as characters in modern children's fiction such as J.K. Rowling's *Harry Potter*, Joan Lowery Nixon's *Orphan Train* series, Gertrude Chandler Warner's *The Boxcar Children*, and Roald Dahl's *James and the Giant Peach*.

COMMON PATTERNS IN ORPHAN STORIES

Mistreatment: Most orphans in literature are treated badly. The characters may be spoken to harshly, beaten, or threatened. The other characters around the orphan are usually jealous because they want something owned by the orphan. Spiker and Sponge are mean to James and jealous that he has the peach and they don't.

Quests: The performance of difficult tasks, or a quest, frequently exists in orphan tales. The orphan must leave an unhappy home in order to find a place where he or she belongs. When James leaves Spiker and Sponge's home he finds that he belongs with the insects and makes the peach his new home.

Obstacles: The orphan's quest is not an easy one. He or she is faced with many obstacles and in most cases, other characters get in the way. Often, it is a step-mother, step-sister or Aunt who acts as the obstacle for the orphan. This obstacle is usually in the form of hard work, beatings or a lack of food. Because orphans have no parents to protect them, they must stand on their own to overcome their problems. Assistance is always provided at an important moment and often comes in the form of magical people, talking animals or enchantment of objects. James' aunts are his obstacle and keep him from being happy, but with the help of magic, the peach is enchanted and he climbs aboard to escape.

Rewards: After defeating the obstacles, orphans are often rewarded with something that brings happiness such as friendship, love, power or money. Other orphans are rewarded by being saved from monsters or finding a home. In James' case, he is rewarded by being saved from his monster-like aunts as well as finding a family in the insects and a home on the peach.

Punishment: Evil people that fight against orphans are usually punished in some way. The evil-doer might go to jail or even die in the end. The aunts are punished when the giant peach rolls over and flattens them.

PAGE TO STAGE

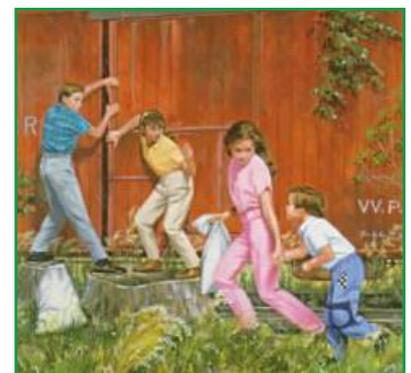
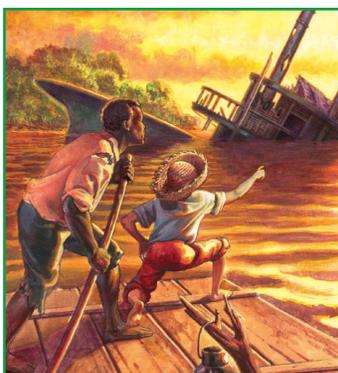
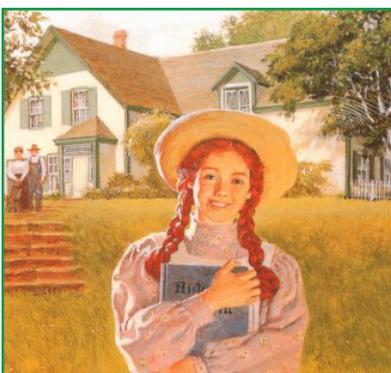
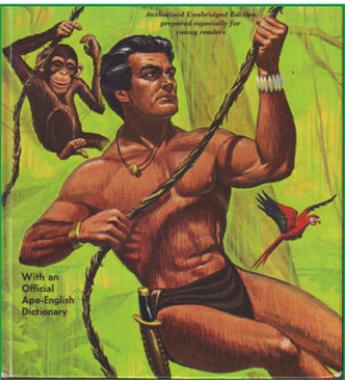
Orphan Stories

WHY DO WE LOVE ORPHAN CHARACTERS?

Orphans are some of the most famous characters in fiction, but why do we love them? It's not Harry Potter's lightning bolt or Dorothy's ruby slippers, but it is our ability to relate to these characters that makes them so popular. Orphans show us that the impossible is possible. They are truly alone in the world and have no family to help them through difficult times, but orphans always succeed in the end. Orphan tales allow us to root for the underdog and teach us that children are powerful and don't always need adults to become strong and independent people.

Activity 3: Name the Orphan Story

Can you name the famous orphan characters in the pictures below? See how many you know and fill in the name of the story on the line below the picture.



WHAT IS THAT???

Arthropod: any animal without a backbone that has a segmented body, jointed limbs, and a hard shell that is shed periodically.

Insect: any type of arthropods with the body clearly divided into a head, thorax, and abdomen, with three pairs of jointed legs, and usually with one or two pairs of wings.

Arachnid: any type of arthropods, including spiders, that have a segmented body divided into two regions, four pairs of legs and no antennae.

Bug: an insect or other creeping or crawling invertebrate animal.

Pest: an organism that may cause illness or damage or consume food crops and other materials important to humans.



SCIENCE FOCUS

Insects

James and the Giant Peach is infested with insects and other creepy crawly critters. Below are descriptions of the real insects represented in the musical.

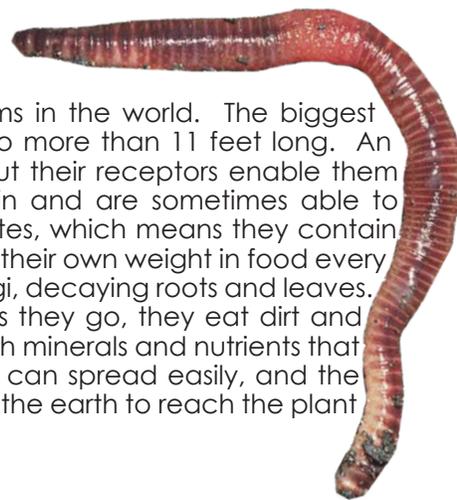
SPIDERS



Spiders are arachnids, not insects. There are more than 38,000 types of spiders and they live almost everywhere. Spiders were one of the first predators to walk on land, starting more than 350 million years ago. Most spiders have 8 eyes so they can look in several directions at once. Their eyes are usually small and often cannot see shapes very well. Although a spider doesn't have a nose or ears, hairs covering the spider's legs are able to sense touch, vibrations and sound. A spider's silk can be used for making egg sacs, wrapping prey, or building webs. A large web may contain more than 100 feet of silk thread and can take about an hour to build. Once finished, the spider sits in the middle or at the edge and holds the web so it can feel the vibration of a trapped insect. It then wraps the prey in silk and bites. Spiders do not chew and swallow food; they drink it. First the spider stabs its prey with its fangs and injects poisonous venom to stop it from moving. Then it drips digestive juices on its meal, turning the animal's insides into liquid so the spider can slurp them out.

EARTHWORMS

There are about 2,700 different species of earthworms in the world. The biggest worms in the world live in Australia and can stretch to more than 11 feet long. An earthworm does not have any eyes, arms, or legs, but their receptors enable them to sense light. Earthworms breathe through their skin and are sometimes able to replicate lost segments. Earthworms are hermaphrodites, which means they contain both female and male organs. Worms are able to eat their own weight in food every day. They get most of their nutrients from bacteria, fungi, decaying roots and leaves. Earthworms are constantly burrowing in the earth. As they go, they eat dirt and debris from which they cast out new soil that is filled with minerals and nutrients that plants need. They also loosen dirt so that plant roots can spread easily, and the narrow tunnels they make allow water and air to enter the earth to reach the plant roots.



GRASSHOPPERS

Grasshoppers are insects. There are thought to be as many as 18,000 types of grasshoppers thriving in all types of habitats all over the world with the exception of the North and South Poles. Grasshoppers have five eyes, but no ears. They are herbivores, which means they eat only plants. A grasshopper can make a chirping noise by rubbing its back leg along a stiff vein in the front wing. The leg has small teeth on it, like a comb, which buzz and vibrate. Male grasshoppers chirp to attract females for mating and to ward off rivals.

CENTIPEDES

Centipedes are arthropods, but not insects. There are estimated to be 8,000 types of centipedes found worldwide in many geographic locations including tropical rainforests, deserts and even the Arctic Circles. Centipedes are elongated animals with one pair of legs per body segment. Although the name is Latin for hundred (centi) foot (pedis), centipedes can have a varying number of legs from under 20 to over 300. Despite how many legs they actually have, centipedes always have an odd number of pairs of legs. They can have 15 or 39 pairs of legs, but never 20 pairs.



LADYBUGS

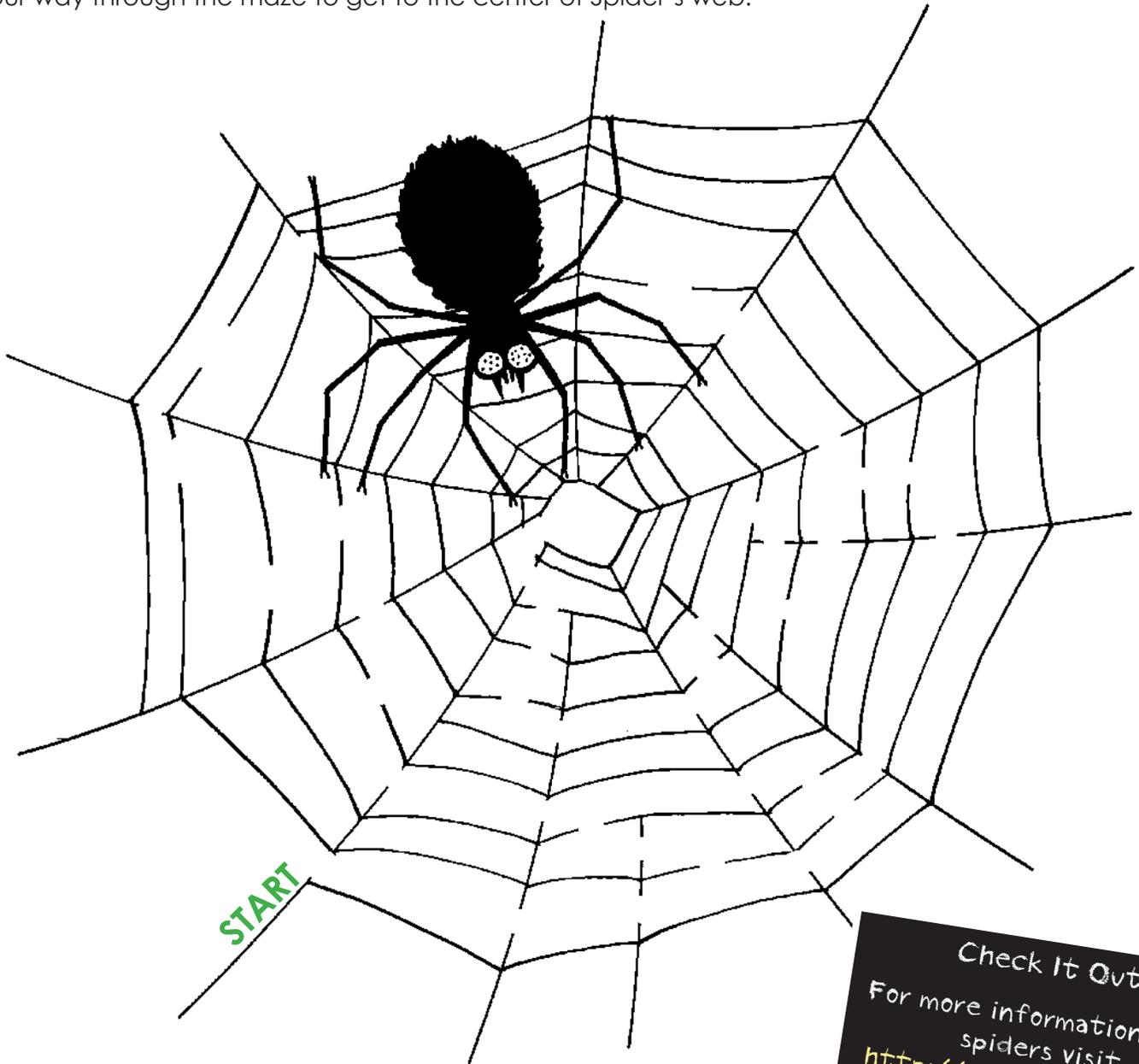
A ladybug is a type of beetle. The 5,000 known species are found worldwide with over 350 species living in North America alone. Ladybugs eat aphids and scale insect, which are small bugs that are pests in fields and gardens. Because of this, farmers in Europe have welcomed ladybugs on their vines to eat insect pests for more than 1,500 years. Even today farmers and gardeners use ladybugs to protect their plants from pests. People once thought that ladybugs had magical powers and in early America, it was said that a ladybug would bring good luck if it was found in the house in winter.

SCIENCE FOCUS

Insects

Activity 4: Spider Web Maze

Find your way through the maze to get to the center of Spider's web.



START

Check It Out!
For more information about
spiders visit
[http://www.kidzone.ws/lw/
spiders/facts.htm](http://www.kidzone.ws/lw/spiders/facts.htm)

DID YOU KNOW...

- Three out of four creatures on the planet are insects. They outnumber all other creatures.
- If all insects vs. all other animals were placed on a scale, the insects would weigh more.
- There are more species of insects than any other kind of creature.
- Fossil records prove that insects began to inhabit the earth 150 million years before dinosaurs.
- Insects have adapted to live and survive among all groups of organisms and in all types of habitats except for the ocean.
- An ant can lift over 50 times their weight.
- Fleas can jump the equivalent length of a football field.
- The mayfly has one of the shortest life spans. Adults only live for a few hours after emerging from the water.
- The queen termite has the longest life span and lives for 10-15 years.

SCIENCE FOCUS

What Floats Your Peach?

"A strong current and a high wind had carried the peach so quickly away from the shore that already the land was out of sight. All around them lay the vast black ocean, deep and hungry. Little waves were bibbling against the sides of the peach."

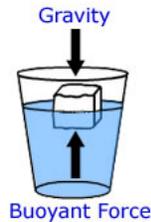
— JAMES AND THE GIANT PEACH (Dahl, 58)

How is James' giant peach able to float across the Atlantic Ocean, making its way from England to New York City? Something called buoyancy allows the peach as well as ships and all other floating objects to stay above the surface of the water.



Buoyancy is the tendency of something to float or to rise when in a fluid. Buoyant force was first applied scientifically in 200 BC when a Greek mathematician and inventor named **Archimedes** noticed that the water spilled out of his bathtub when he sat in it. Because of this observation, he figured out that the weight of the water he displaced or moved was equal to the buoyant force in the water. This is called the Archimedes Principle and it applies to all fluids.

Think of buoyant force as the opposite of gravity. While **gravity** pulls everything downwards and allows us not to fly away through outer space, **buoyant force** is the upward pull of a fluid that allows us to swim or sail in the water without sinking.



When you place an ice cube in a glass of water, the ice displaces some of the water, causing the level in the glass to rise and the ice cube to float in the water. Like a game of tug-of-war, gravity is pulling the ice cube down while buoyant force is pushing it up.

It is easy to see why a light-weight ice cube might float on water, but how is a heavy ship able to float? Although ships are made of steel, their density or solidness is less than the water's density. Density can be found by dividing an object's weight by its volume or size. To better understand density, think of a stone and a beach ball. Although the stone is smaller, it sinks because it is solid and has a higher density than the water. The larger beach ball is able to float because it is filled with air and has a lower density than the water. Ships are similar to beach balls in that they also have large areas filled with air, which helps lower the density. If all those spaces were filled with cargo, the ship would probably sink just like the stone.



Gravity, buoyancy and density all contribute to an object's ability to float in the water.

FIGURE IT OUT

We've now discovered that large ships don't sink because their density is lower than the water's density, but do you think a peach would be able to float in real life? To find out, fill a large bowl halfway with water. Place a ruler in the center of the bowl to measure the original depth of the water. Next, place a peach in the bowl. If the peach floats, notice how much of the peach is covered with water and note how much the water level in the bowl has risen by measuring again with your ruler. If the peach sinks, think about why this has happened. What could be done to the peach to make it float?

WHAT IS THAT???

buoyancy: the tendency of something to float or to rise when in a liquid

gravity: the attraction of two objects such as earth and something on its surface.

Archimedes: a Greek mathematician, physicist and inventor who is best known for his work on hydrostatics, mechanics and geometry

WHAT IS THAT???

pit: the hard stone that holds a seed inside some kinds of fruits.

orchards: farms where fruit trees are grown.

roots: the parts of plants that grow underground and absorb water and minerals, store food, and hold the plant in place.

pollen: a fine yellow dust in the center of a flower produced by certain plants when they reproduce.

harvest: to gather crops.

cultivate: to raise or grow by labor and care.

FOCUS

Peaches

"The two women and the small boy stood absolutely still on the grass underneath the tree, gazing up at this extraordinary fruit. James's little face was glowing with excitement, his eyes were as big and bright as two stars. He could see the peach swelling larger and larger as clearly as if it were a balloon being blown up." – JAMES AND THE GIANT PEACH (Dahl, 20)

HOW DO PEACHES GROW?

Unlike in *James and the Giant Peach*, peaches do not magically appear on trees and grow to enormous sizes. If you've ever eaten a peach you know that it has something called a **pit** inside. In the middle of the pit you can find a seed and it is this seed that grows into a new peach tree. In order for the tree to start growing, the pit has to crack open so the seed can be planted in the ground. Sometimes animals like squirrels will eat peaches and if the animal chews on the pit, they may crack it open to reveal the seed.

Most peaches are grown on farms called **orchards**. Farmers use machines to crack the pits open and then they plant the seeds. A seed sends **roots** down into the soil, and soon a stem and leaves appear above the soil. Over time, the stem grows taller and hardens into a tree trunk. After a few years, the peach tree will be large enough to grow flowers and then the tree is ready to grow peaches.

In the spring, a peach tree is covered with pink blossoms containing **pollen**. Wind and insects carry the pollen from one blossom to another, allowing the peaches to grow. Over the summer, the peaches grow and ripen. In orchards, people pick peaches to sell and eat. Sometimes, ripe peaches will fall off the tree by themselves, which may be the start of a brand new peach tree.

WHERE DO PEACHES COME FROM?

The peach is originally from China and has been **cultivated** there for more than 3,000 years. In the Chinese culture, the peach tree is considered to be the tree of life and peaches are symbols of immortality and unity.

From China, peaches traveled west to Persia where they were discovered by Alexander the Great who introduced them to the Greeks by the year 322 B.C. Later, peaches made their way throughout Europe and were brought into North and South America by way of the explorers and colonists.



DID YOU KNOW...

- The Romans called the peach a Persian apple, and the name for peach in many languages is actually the name for Persia.
- China is the largest world producer of peaches, with Italy second.
- California is the largest producer of peaches in the United States.
- Georgia is known as the Peach State because it grows so many peaches.
- Some believe that peaches are fuzzy to protect them from insects and disease.
- Nectarines are a type of peach that has no fuzz.
- The peach is a member of the rose family.

Try It!
Make **JAMES AND THE GIANT PEACH** Juice!
With an adult's help, puree together 6 peaches (skinned and pitted), half a mango, and the juice of one lemon.

WHAT IS THAT???

composer: the person who writes the melodies and music of the songs.

lyricist: the person who writes the words that go with the composer's music.

playwright or librettist: the person who writes the story and the dialogue of a play, as well as many of the stage directions that the actors and director follow, to tell a story for the stage.

director: the person in charge of everything that happens onstage. The director provides the vision of how a show should be presented, works with the actors on their roles, develops the blocking, and is in charge of the rehearsals.

choreographer: the person who creates dances and arranges movements for a musical.

FUN AND GAMES

Word Search

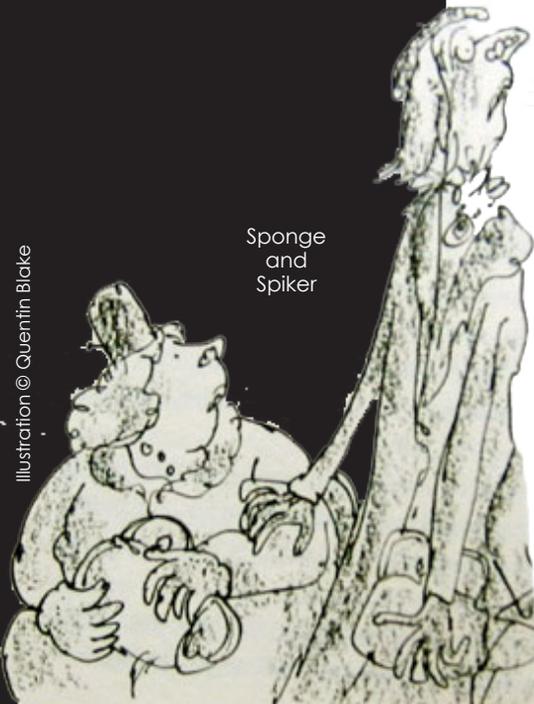
Activity 5: JAMES AND THE GIANT PEACH Word Search

Find and circle the words from the word bank within the puzzle below.



WORD BANK

- | | | |
|-------------|------------|---------|
| CENTIPEDE | JAMES | SHARK |
| CIRCUS | LADYBUG | SPIDER |
| EARTHWORM | MAGICIAN | SPIKER |
| GIANT | PEACH | SPONGE |
| GRASSHOPPER | RHINOCEROS | TROTTER |
| | SEAGULLS | |



Sponge and Spiker

Check It Out!
 To play games and learn more about Roald Dahl visit
<http://www.roalddahl.com/>
 or
<http://roalddahlfans.com/>

How to Be an Awesome Audience Member

Seeing a musical at the Goodspeed Opera House is a unique and exciting experience. All the members of the production, both cast and crew, work hard to give you a great show. As an audience member, you also have an important job. You must help the performers give their best performance possible. You can do this by practicing these rules of theater etiquette:

- Do laugh when the performance is funny.
- Do applaud when the performance is over. Applause is how you say “Thank you” to the performer. The actors will bow as you applaud. That is how they say “Thank you for coming.”
- Do stand and applaud if you thought the show was outstanding.
- Don’t forget to turn off your cell phone. A ringing or buzzing phone can be very distracting. It can also be embarrassing for you if it is your phone that is disrupting the show!
- Don’t text during the performance.
- Make sure to visit the restroom before the production begins.
- Don’t speak or whisper during the performance...whispering is still speaking, so only in an emergency should whispering occur.
- Remember that the Overture (introductory music) in musical theatre is part of the performance, so remain silent when the show begins.
- Don’t take pictures during the performance. It can be very distracting to the actors and it can result in an accident.
- Don’t put your feet up on the seats or kick the seat in front of you.
- Do remain in your seat for the entire performance. If you must leave, exit during intermission. In an emergency, calmly walk toward the nearest exit.

The Student Guide to the Theatre for James and the Giant Peach was prepared by Joshua S. Ritter M.F.A, Education/Library Director and Katherine Griswold, Education Assistant