

Norwood Discovery Graphics: STEM Fairy Tales

Written by Jason M. Burns

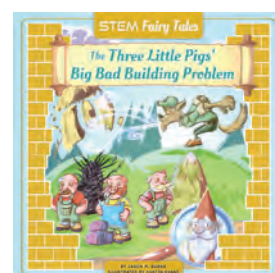
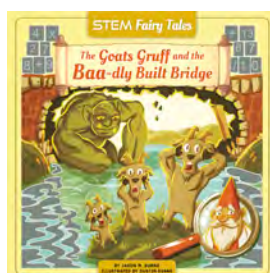
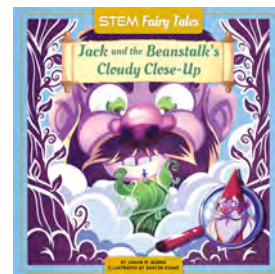
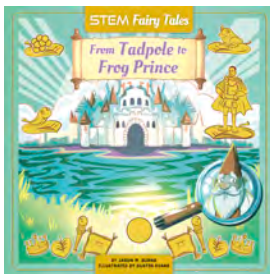
Illustrated by Dustin Evans

STEM Consultant: Stacia Williams, M. Ed

Series Description

Re-visit your favorite fairy tales through the eyes of Dr. Gnome-It-All, a STEM scientist and internet influencer. Find out how each fable has a basis in scientific reality while also entertaining as a magical story. How does *The Frog Prince* help us understand the amphibian life cycle or *The Billy Goats Gruff* teach us about building bridges? Pick up one of these engaging graphic novels and expand your STEM brain! Each text includes colorful, engaging illustrations, a glossary, and a bibliography for further reading.

Series Titles



Teacher's Notes:

In these teacher's notes, you will find resources to support students as they engage with each text. Each title in the *STEM Fairy Tales* series is rich with magical story-telling and detailed information that helps students learn about the real world around them. Students will learn about important STEM subjects like plant and animal life cycles, nutrition, meteorology, bridge building, code building, precious metals, and more. These teacher's notes will help you provide students with opportunities to organize their thinking as they read each text so that they are able to absorb and discuss what they've learned. Resources include:

- 1. Graphic Organizer/Notetaking page:** Helps students identify and absorb key information as they read and reflect on what they learned.
- 2. Fiction or Non-fiction Tracking Sheet:** Helps identify which elements of the story are fiction and which are non-fiction.
- 3. Comprehension Check/Quiz (for each title):** Helps students and teachers assess what has been learned. Questions can be used as discussion questions, a mini-quiz, or to further guide reading/re-reading of the text.

GRAPHIC ORGANIZER & Reading Response

Name: _____

Date: _____

Title	
Author	

	During Reading: Keep track of what you are reading.
Story Structure	Beginning (introduction, characters, setting): Middle (events and conflict): End (solution and character change):
Facts to Remember	

After Reading: What was the most interesting thing you learned?

	What vocabulary words did you learn?
Word	Meaning

Visualize: Draw a panel showing your favorite part of the book. Give it a caption, thought bubble, or dialogue balloon.

Name: _____

Date: _____

Fiction Vs. Non-Fiction

Title	
Author	

Fiction	Non-Fiction

Name: _____

Date: _____



From Tadpole to Frog Prince

Answer the following questions about **From Tadpole to Frog Prince** by Jason M. Burns.

- 1 What was the princess's ball made from?
 - a. Plastic
 - b. Gum
 - c. Bronze
 - d. Gold

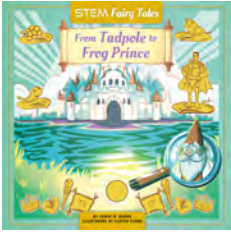
- 2 What does it mean to be **ectothermic**?
 - a. Body temperature changes based on the environment.
 - b. Body temperature always stays the same.
 - c. Body temperature is freezing.
 - d. Body temperature is hot.

- 3 True or False: Frogs have little arms and legs when they are first born.
True False

- 4 What does the frog want in return for saving the princess's ball?
 - a. Royalty
 - b. A jewel
 - c. Her love
 - d. A fly

- 5 Some frogs are slimy because...
 - a. the mucus helps them breathe through their skin.
 - b. their skin gets coated in slime from the body of water they live in.
 - c. it helps them slip away from predators.
 - d. they drool through their skin to stay moist.

- 6 Short answer: Why does the frog turn into a prince?



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- 6 Short answer: Why does the frog turn into a prince?

Possible responses may include: "The princess finally welcomed him into her home and was kind to him."

Name: _____

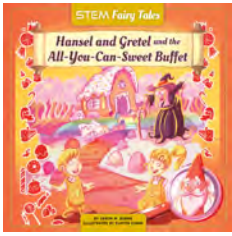
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Hansel and Gretel and the All-You-Can-Sweet Buffet

Answer the following questions about **Hansel and Gretel and the All-You-Can-Sweet Buffet** by Jason M. Burns.

- 1 What does a **botanist** study?
 - a. Robots
 - b. Farming
 - c. Plant life
 - d. Candy
- 2 How do Hansel and Gretel end up alone in the woods?
 - a. They get lost
 - b. Their step-mother leaves them there
 - c. They're chased by a wolf
 - d. They run away
- 3 **Cellular respiration** is the process of breaking down food into...
 - a. Energy
 - b. Liquid
 - c. Smaller snacks
 - d. Sugar
- 4 Why are apples a better sweet treat than cake?
 - a. Apples contain processed sugar
 - b. Apples are less expensive than cake
 - c. Apples don't require a fork
 - d. Apples contain natural sugar
- 5 Why did the witch feed Hansel and Gretel so many treats?
 - a. She was a good witch and loved seeing children happy
 - b. She didn't know about proper nutrition
 - c. She wanted them to lose their teeth
 - d. She wanted to fatten them up and eat them
- 6 Short answer: Describe how Hansel and Gretel escaped the witch's gingerbread house.



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- 6 Short answer: Describe how Hansel and Gretel escaped the witch's gingerbread house.
Possible responses may include: "Gretel pretended not to know how to do laundry and shoved the witch inside the washing machine. Then they gathered fruits and vegetables from the garden to have enough energy for their trip home."

Name: _____

Date: _____



Jack and the Beanstalk's Cloudy Close-Up

Answer the following questions about **Jack and the Beanstalk's Cloudy Close-Up** by Jason M. Burns.

- 1** List the 4 forms water can take when it falls from the clouds:
 1. _____
 2. _____
 3. _____
 4. _____
- 2** What does Jack trade his cow for?
 - a. Money
 - b. Apples
 - c. Jewels
 - d. Magic beans
- 3** Fill-in-the-blank: As vapor rises and meets cooler air, water particles stick to _____ to form clouds.
 - a. Ice
 - b. Dust
 - c. Salt
 - d. All of the above
- 4** What valuable items did Jack steal from the giant?
 - a. Gold coins, a cat, a guitar
 - b. Gold coins, a hen, a harp
 - c. Gold earrings, a hen, a harp
 - d. Gold earrings, a cat, and a guitar
- 5** True or False: Lightning is created when bits of ice crash into each other.

True False
- 6** Short answer: Explain why Jack stole from the giant and what the items were used for.



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- 5 True or False: Lightning is created when bits of ice crash into each other.
True **False**
- 6 Short answer: Explain why Jack stole from the giant and what the items were used for.
Possible responses may include: "Jack stole from the giant because he and his mother did not have money and needed food to get through the seasons. They used the coins to buy food and ate the hen's golden eggs."

Answer Key



Rapunzel and Her UnbeLEAFable Hair

Answer the following questions about **Rapunzel and Her UnbeLEAFable Hair** by Jason M. Burns.

- ① How many years does it take a **biennial** plant to flower?
 - a. 1
 - b. 4
 - c. 2**
 - d. 5
- ② Why did the husband steal from the witch's garden?
 - a. To make his wife a salad**
 - b. To make his wife some soup
 - c. To make the witch want to leave town.
 - d. All of the above
- ③ What deal did the husband make with the witch?
 - a. They would name their child after her.
 - b. They would let her babysit Rapunzel.**
 - c. They would give Rapunzel to the witch once she was born.
 - d. They would work in her garden.
- ④ What did the **collagen** in Rapunzel's hair help the witch do?
 - a. Grow her plants faster
 - b. Fertilize the soil in her garden
 - c. Make her younger**
 - d. Grow longer hair
- ⑤ True or False: Human hair has roots that transport nutrients just like plants.

True False
- ⑥ Short answer: Describe the story's resolution.

Possible responses may include: "A prince rides by Rapunzel's tower and hears her singing. He climbs up Rapunzel's hair and realizes she's been trapped in the tower with her plants. The next day he waits for the witch to leave and sneaks Rapunzel and her plants out of the tower using a tall ladder. Rapunzel and the prince fall in love and start a farm together."

Name: _____

Date: _____



The Goats Gruff and the Baa-dly Built Bridge

Answer the following questions about **The Goats Gruff and the Baa-dly Built Bridge** by Jason M. Burns.

- 1 Why do the Gruff brothers want to get to the other side of the bridge?
 - a. To go home
 - b. To go to school
 - c. To eat the good grass
 - d. To eat bales of hay
- 2 How did weather affect the **structural integrity** of bridges in the early days?
 - a. A breeze could blow them over
 - b. The heat from the sun could melt them
 - c. Wind blew items onto the bridges that caused blockages
 - d. Rain and flowing water could cause erosion
- 3 How did the youngest and middle Gruff get the troll to let them cross the bridge?
 - a. They told him their brother was bigger and tastier.
 - b. They pushed the troll in the water when he was distracted.
 - c. They answered the troll's riddle correctly.
 - d. They promised to bring the troll food.
- 4 Which civilization helped advance bridge building architecture?
 - a. Egypt
 - b. Rome
 - c. Greece
 - d. Maya
- 5 True or False: The troll ate the eldest Gruff brother for lunch.
True False
- 6 Short answer: Explain how the Gruff brothers constructed a new bridge that was strong enough to hold all three brothers at the same time.



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- 5 True or False: The troll ate the eldest Gruff brother for lunch.

True **False**
- 6 Short answer: Explain how the Gruff brothers constructed a new bridge that was strong enough to hold all three brothers at the same time.

Possible responses may include: "The brothers used mortar to anchor the posts and designed the bridge using arches to absorb more force. That meant the bridge was stronger and could hold more weight."

Name: _____

Date: _____



The Three Little Pigs' Big Bad Building Problem

Answer the following questions about **The Three Little Pigs' Big Bad Building Problem** by Jason M. Burns.

- 1 What kind of materials do the pigs use to build their houses?
 - a. Dirt, grass, metal
 - b. Straw, sticks, bricks
 - c. Dirt, sticks, bricks
 - d. Straw, sticks, cement

- 2 What are **building codes** needed for?
 - a. To enter buildings that don't use keys
 - b. To teach construction workers how to make buildings
 - c. To make sure things are built safely
 - d. To deliver materials to construction sites

- 3 List: What kinds of extreme weather can create winds strong enough to damage buildings?
 1. _____
 2. _____

- 4 What natural material is used to make bricks?
 - a. Clay
 - b. Sand
 - c. Rocks
 - d. Stone

- 5 True or False: Straw is actually surprisingly strong.

True False

- 6 Short answer: Use what you've learned about materials and structures to describe why the third pig's house did not blow over.



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 - c. To make sure things are built safely**
 - d. To deliver materials to construction sites
- 3 List: What kinds of extreme weather can create winds strong enough to damage buildings?
 - 1. Hurricanes**
 - 2. Tornadoes**
- 4 What natural material is used to make bricks?
 - a. Clay**
 - b. Sand
 - c. Rocks
 - d. Stone
- 5 True or False: Straw is actually surprisingly strong.

True False
- 6 Short answer: Use what you've learned about materials and structures to describe why the third pig's house did not blow over.

Possible responses may include: "The third pig used bricks, which are a strong and sturdy material. He also used mortar to connect his bricks and staggered pattern to make them stronger and more secure."