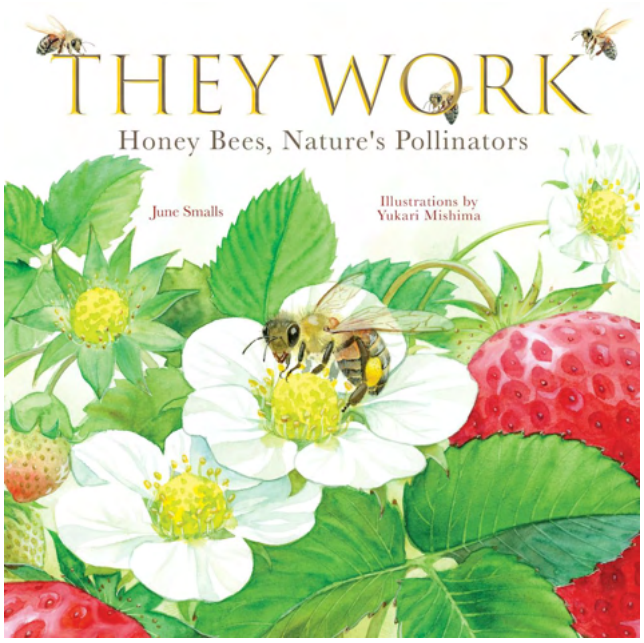
They Work

Teacher's Guide

About the Book:



She is the queen. She fought for that position from the moment she broke out of her cell.
Her job is important, but she is not the leader.
A hive is only successful if many, many bees are working.

Experience the life cycle of the honey bee up close and personal with this striking picture book from June Smalls (author of She Leads, He Leads, and They Lead) and illustrator Yukari Mishima. Told in a poetic style along with fun facts on each page for older readers wanting a deeper dive, They Work is a beautiful exploration of life inside a beehive, as well as the dangers and predators bees face out in the world—including humans.

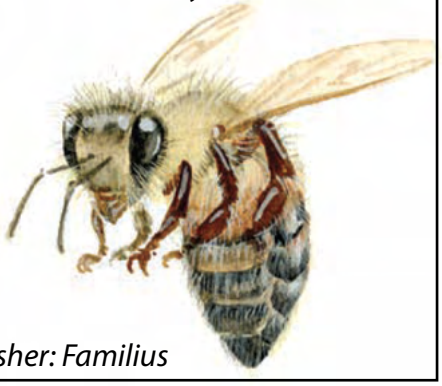
About the Author: June Smalls

June Smalls has been making up stories since she only had pets and stuffed animals to share them with. She is the author of fiction and nonfiction books that are funny, educational, odd, and entertaining.
June loves going on adventures, for research of course, from falconry to digging up fossils; tracking wildlife to working with scientists and wildlife conservationists. Writing is always an adventure.
Visit her at: www.junesmalls.com

About the Illustrator: Yukari Mishima

Yukari Mishima was born and raised in Hiroshima, Japan. She has always loved to draw and paint pictures. She majored in foreign language courses at university and worked an office job for 10 years after graduation. At the age of 35, she quit the corporate world and decided to pursue her passion and become a freelance illustrator.
Visit her at www.in-my-sketchbook.com

Art by Yukari Mishima



Author: June Smalls *Illustrator: Yukari Mishima* *Publisher: Familius*

Content Standards:

Anchor Standards	**CCSS: ELA-LITERACY: CCRA.R.1, CCRA.R.4, CCRA.R.7**
1st Grade	**CCSS: ELA-LITERACY: RI.1.1, RI.1.4, W.1.7, SL.1.1, SL.1.2, SL.1.5, L.1.4** **MATH: CONTENT.1.G.A.1, 1.G.A.2** **NGSS: 1-LS1-1, 1-LS1-2, K-2-ETS1-2, K-2-ETS1-3**
2nd Grade	**CCSS: ELA-LITERACY: RI.2.3, RI.2.4, W.2.7, SL.2.1, SL.2.2, L.2.4** **MATH: CONTENT.2.G.A.1** **NGSS: 2-LS2-2, K-2-ETS1-2, K-2-ETS1-3**
3rd Grade	**CCSS: ELA-LITERACY: RI.3.1, RI.3.4, W.3.2, W.3.4, W.3.7, SL.3.1, SL.3.4, L.3.4** **MATH: CONTENT.3.G.A.2** **NGSS: 3-LS2-1, 3-LS4-2, 3-5-ETS1-1, 3-5-ETS-2, 3-5-ETS-3**
4th Grade	**CCSS: ELA-LITERACY: RI.4.1, RI.4.4, W.4.2, W.4.4, W.4.7, W.4.9, SL.4.1, SL.4.2, SL.4.4, L.4.4** **MATH: CONTENT.4.MD.C.5** **NGSS: 4-LS1-1, 3-5-ETS1-1, 3-5-ETS-2, 3-5-ETS-3**
5th Grade	**CCSS: ELA-LITERACY: RI.5.4, RI.5.7, W.5.2, W.5.4, W.5.7, W.5.9, SL.5.1, SL.5.4, L.5.4** **NGSS: 5-LS2-1, 3-5-ETS1-1, 3-5-ETS-2, 3-5-ETS-3**

About This Guide:

This teacher's guide for *They Work,* written by June Smalls and illustrated by Yukari Mishima, is aligned with Common Core State Standards and Next Generation Science Standards. Its activities and assignments are geared toward students in 1st-5th grade. It is assumed the teacher will adapt and scaffold the assignments based on their students' needs and level.

This guide can be printed but was created for easy viewing as a digital PDF (pages 1-10). All printables for students are located on pages 11-18. It is available for educational use only, free of charge. It is not to be resold or distributed for profit.

This guide was created by DK Ryland - credentialed K-12 teacher and picture book author/illustrator. Visit her at www.DKRyland.com

Table of Contents

Art by Yukari Mishima

English Language Arts

Pre-Reading Questions:

- Who is the author and who is the illustrator?
- What do you think this book will be about?
- Do you think this is a fiction or non-fiction book? Why?
- What do you already know about bees?
- How do you personally feel about bees? Can you think of any way bees might be helpful to humans?
- Think about the title *They Work*. What do you think it means?

Post Reading Discussion:

- What is the queen's role in the hive? Why might this role be important?
- What is unique about a queen's diet? Where does royal jelly come from?
- What are some of the jobs of the worker bees?
- Can you explain the lifecycle of a bee? Does this lifecycle: egg - larvae - pupa - adult remind you of any other lifecycles? (butterflies, moths, beetles, flies, etc.)
- Why do worker bees need to clean the cells of the nursery after they hatch?
- What do the queen's attendants do? Why is this an important job?
- How are the worker and drone's diets different from the queen's?
- What do bees build their comb out of? Why do they build hexagonal cells?
- How is honey created? Do you eat honey? Do you know how honey is harvested from a hive to your plate?
- What are some of the threats to bees? Can you think of any ways you could help protect bees?
- Can you explain the process of pollination? Why is pollination important? Do you know any other pollinators?
- What is the purpose of a bee's waggle dance?

Writing Prompts:

- If you could be any kind of bee (queen, worker, drone) which would you be? Why?
- Think about the idiom "busy as a bee." Do you think the word busy accurately describes a bee? Make up your own idiom using an adjective and a different animal. (examples: Fierce as a... Calm as a.... Loud as a...) Explain why you chose the adjective and animal that you chose.
- What do you think would happen if bees stopped doing their jobs? How is this similar to if humans stopped doing their jobs? How is it different?

English Language Arts

Find the Definition:

Students will complete the printable on page 11 by using a dictionary to look up new-to-them vocabulary words from *They Work*.
Answers will vary but new vocabulary may include words such as: larvae, metamorphosis, nectar, pollinate, forage, etc.

Art by Yukari Mishima

Figurative Language - Idioms:

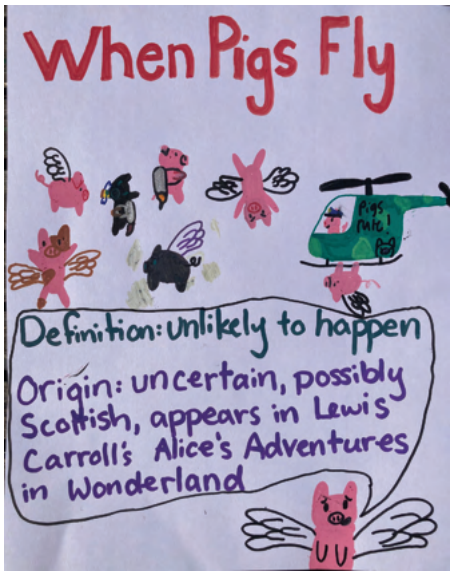
Introduce and give examples of idioms to the class.

Idioms are figurative language in the form of phrases that are not meant to be taken literally but their meaning is widely understood amonst a certain culture.

Examples of idioms include:

- Busy as a bee.
- A piece of cake.
- Raining cats and dogs.
- When pigs fly.
- Once in a blue moon.
- Break a leg.

Example (answers will vary):



Lead a discussion asking what idioms the class knows and what they think the examples you share mean.

Break the class up into groups of 3-4 and either assign each group an idiom or have them research and choose their own. Have students use the worksheet on page 12 to record more information about their idiom and to plan out their poster and presentation.

After they finish the worksheet, have each group create a poster with their idiom clearly stated, a picture that represents their idiom's meaning, the idiom's definition, and an explanation of its origin. Each group will then present their research to the class.

Social Studies

Civics - My Role in the Classroom:

Lead a class discussion comparing and contrasting a bee's role in a hive to a person's role in society.

Questions may include, but are not limited to:

- Why is every role in a hive important?
- What would happen if some bees decided not to do their jobs?
- Are peoples' roles in society important in the same way?
- Are some peoples' jobs more important than others? Why or why not?
- Do you, as a student, have a role in this classroom?
- Why is your role important to the health of this classroom?
- What would happen if you decided not to perform your role?

Students will use the printable on page 13 to draw and describe their role and its importance for the health of your classroom culture. Have students cut out their hexagon so that you can piece together a classroom honeycomb that is a visual representation of how all your students work together to create an effective and successful learning environment.

The History of Honey:

Discuss as a class:

- How long do you think people have been eating honey? Do you eat honey?
- What is beekeeping and why do people do it?
- Beekeepers keep hives that are considered domesticated. How do you think domesticated bees are different than other domesticated animals like cats and dogs?

After your class discussion, watch this video about the history of beekeeping:
https://www.youtube.com/watch?v=T4SWh3UYxJQ
then have students answer the questions on page 14 in the printables section.

Science

Pollination Experiment:

Supplies Needed

- Popsicle Stick
- Yellow and Black Pom Poms
- Glue
- Cupcake Holders
- Sugar
- Coffee Grounds

In this hands-on activity, students will create a model to demonstrate how bees and other insects pollinate flowers.

Split the class into partners.
The partners will make their own bee by gluing pom poms onto a popsicle stick.
Have each student color and cut out the flower on page 15 in the printables section.
Have students place a cupcake holder on top of each flower.
Pour enough sugar to cover the bottom of one cupcake holder, and pour coffee grounds to cover the bottom of the other.
These represent a flower's pollen.

Have students take turns dipping the pom pom bee into the sugar and then into the coffee grounds. This represents the bee traveling from one flower to another and leaving pollen on each flower as they go.

Discuss as a class:

- What happened to the cupcake holders of sugar and coffee grounds the more the bee traveled to each one?
- How does this demonstrate how flowers are pollinated by bees in nature?

Extention: Pair this lesson with a lesson about flowers.

Scientific Facts:

Discuss as a class:

A scientific fact is an observation about the natural world that has been tested and repeatedly confirmed to be true. Students will use the printable on page 16 to find and record scientific facts from *They Work*.

Have students cut out all of the hexagons on page 16, including the 4 hexagons that are stuck together.

Trace the 4 hexagons that are stuck together onto yellow construction paper.

Students will fill out each of the individual hexagons with scientific facts about bees. They will then glue them onto the yellow paper.

Have students fold their facts like an accordion and glue the title page to the top.

Math

Shapes in Nature:

Students will use the worksheet on page 17 to go on a scavenger hunt for shapes. They will record their findings in the provided graph.

This is a geometry lesson for lower elementary students.

Art by Yukari Mishima

Engineering with Hexagons:

Supplies Needed

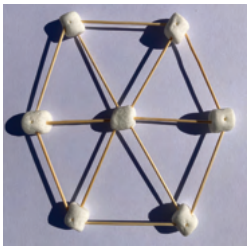
- Mini Marshmallows
- Toothpicks

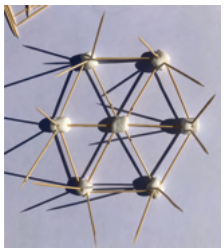
In this hands-on activity, students will create a hexagonal tower using toothpicks and mini-marshmallows in order to test the strength of hexagons for building.

Split the class into groups of 3 or 4. Give half of the class the assignment to build with hexagons, and half of the class the assignment to build with squares.

Discuss as a class:

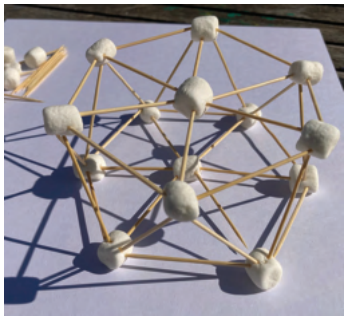
- Explain that engineers frequently look to nature to come up with building solutions.
- Ask: Why do you think honey bees use hexagons to create their hives?
- Ask: Which towers do you think will be taller and stronger, the ones built with hexagons or squares?

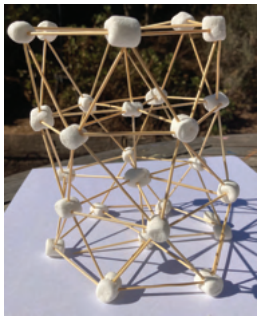


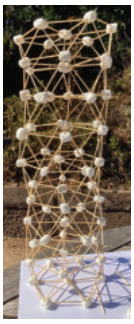


For the hexagonal tower, have students make the base of the tower, with one marshmallow in the middle and 6 on the outside. Once you have the base, create an identical hexagon (this will be the next floor of your tower).

Once you have two hexagons built, build upward by placing two toothpicks in each marshmallow on the outside of the base to connect to a marshmallow in the next floor. Connect one toothpick from the middle marshmallow to the middle marshmallow on the floor above.

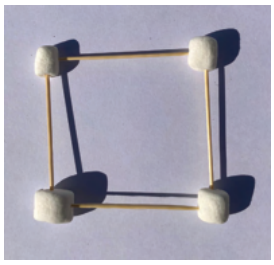


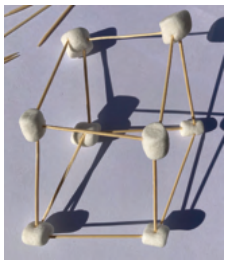




Keep building and see how tall you can make your tower.

For the square tower, have students make the base of their tower by connecting 4 marshmallows.





Students will create a cube by connecting another square to the base square. At this point, it will already be very difficult for the cube to stand on its own.

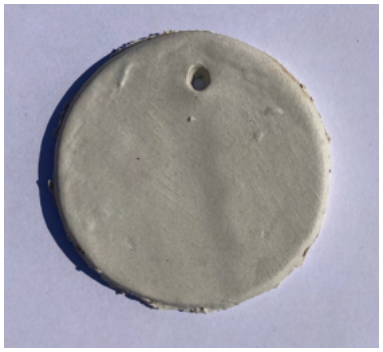
Have students try to find ways to make the cube stronger and see if they can build higher than 1 floor. They will likely be able to reinforce their cube with triangles but will not be able to build as high as the hexagonal tower.

Discuss: Engineers use triangles in building because they are considered the strongest shape. Ask your students to describe how triangles were used to reinforce the hexagonal tower.

Art

Bean Mosaic:

Provide each student with a ball of air dry clay that they will then roll out to about 1/2 of an inch think.
Use a cookie cutter or a carving tool to cut a circle or desired shape.
Poke a hole through the top of the circle with a pencil or pen.
Use various dried beans to create a bee mosaic in the clay.
Once dry, seal the clay by painting with modge podge and string with twine.



Supplies Needed

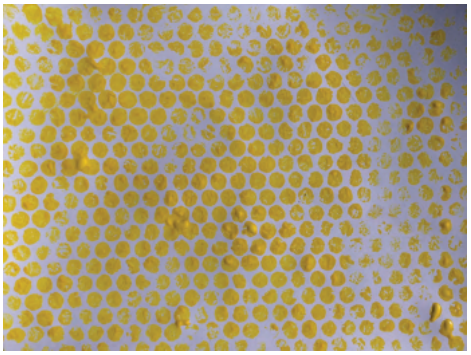
- Air Dry Clay
- Cookie Cutters, Clay Cutting Tools, or a Plastic Butter Knife
- Various Colored Beans
- Twine
- Modge Podge & Paintbrush

Honeycomb Painting:

Cut sheets of bubble wrap to the size of a piece of paper.
Paint over the bubble wrap with orange or yellow paint and use as a stamp to create a honeycomb pattern on your cardstock. Let dry.
With a pencil, sketch out honey drips from the top of the cardstock and paint with orange, yellow, or gold paint.
Use white paint to create highlights on one side of your honey drips and a darker tone than your honey to create shadows on the other side of your honey drips.
Finally, draw a bee flying in front of the honeycomb.

Supplies Needed

- Bubble Wrap
- Acrylic Paint & Paintbrush
- Cardstock



They Work: Find the Definition

Use a physical or online dictionary to find definitions for words you are not familiar with from *They Work*.

1. _____

_____

2. _____

_____

3. _____

_____

4. _____

_____

Choose one (or more) of your chosen vocabulary words and use it in your own sentence:

_____

_____

_____

They Work: Idioms

Use this worksheet to plan your idiom group poster.

Our idiom: _____

A picture that represents our idiom:

Idiom definition:_____

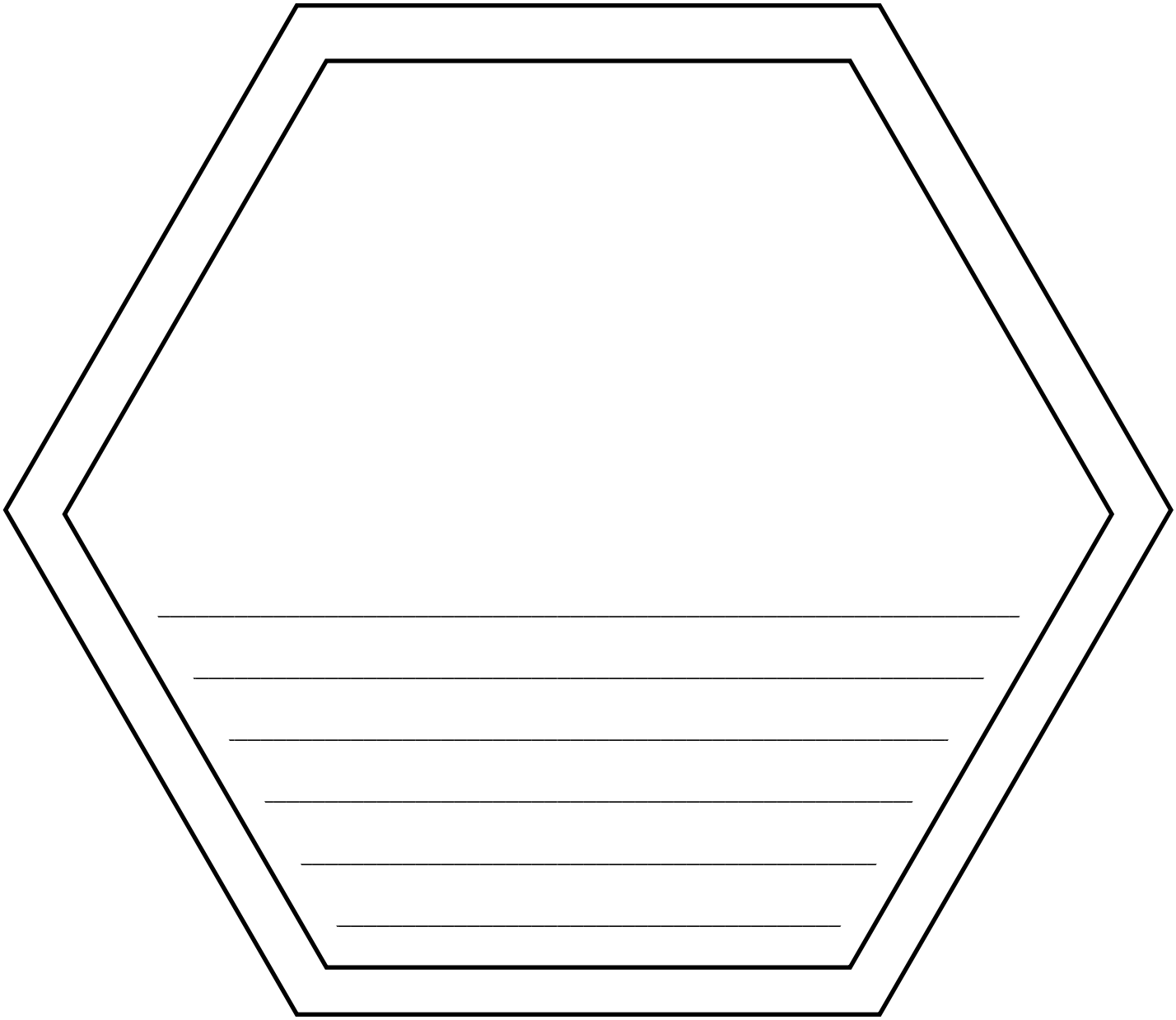
_____

Idiom origin: _____

_____

They Work: My Role in the Classroom

Just like every bee in the hive has an important role for the sucess of the hive, every person in a classroom has a role to do in order to ensure a successful learning environment.
Use the hexagon below to describe what you do, or can do, in the classroom to help make it an effective place for learning and growth. Draw a picture of yourself doing that action above your description, color the border, and cut out your hexagon.



They Work: History of Bees and Beekeeping

Answer the following questions as you watch the youtube video, History of Bees and Beekeeping: https://www.youtube.com/watch?v=T4SWh3UYxJQ

What evidence is there that humans have been eating honey for thousands of years?

_____

_____

What are hunter-gatherers?

_____

_____

What were some of the uses of beeswax and honey in ancient times?

_____

_____

Why did humans eventually domesticate honey bees?

_____

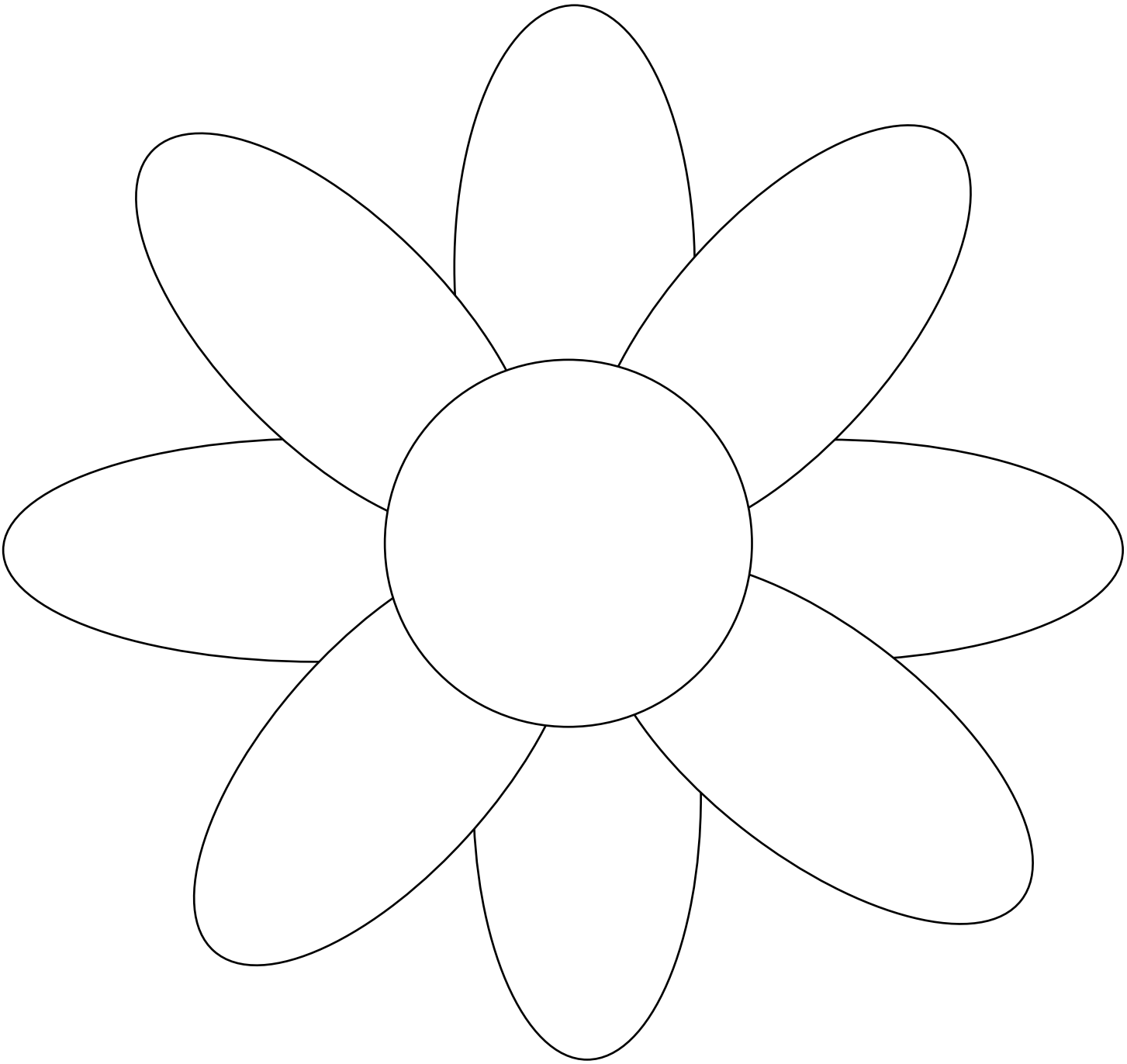
_____

Why are bees important for the food crops that humans eat?

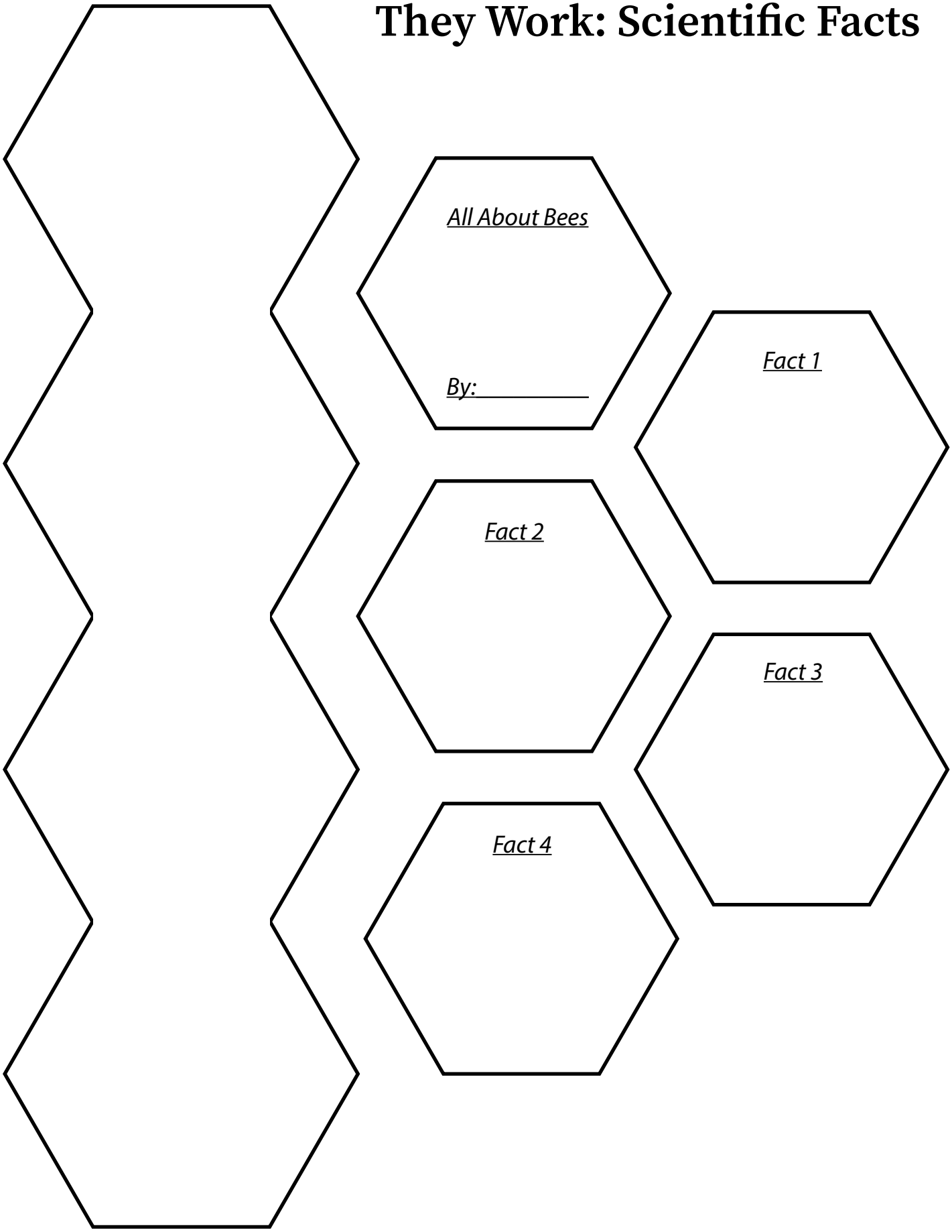
_____

_____

They Work: Pollination

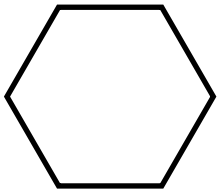
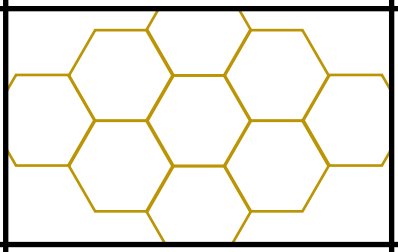
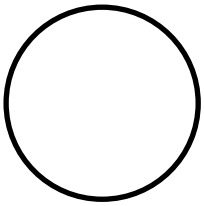
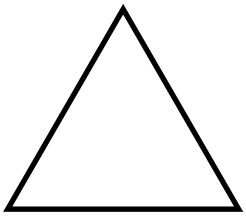
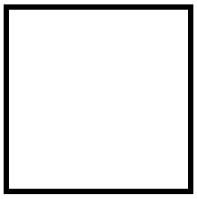


They Work: Scientific Facts



They Work: Shapes in Nature Scavenger Hunt

Hexagons are 6 sided shapes that can be found in bee hives. Go on a scavenger hunt around campus to find what other shapes you can find in nature. Record what you find in the table below.

SHAPE	DRAWING	DESCRIPTION
		*Hexagons can be found in bee hives.*
		
		
		
		

They Work: Building with Hexagons

Make a prediction. How many floors tall will you be able to build your tower?

Draw a picture of your final tower below:

Which group was able to build the tallest tower? Squares or hexagons? Why?: