

The Bee Series

Revised Summer 2014

Grade/Course: 7th grade ELA	Topic: Bees from Panama to the USA and around the world	Lesson (number/title) & duration Two Plays: The Exploration of bees species, the habitat, and their role in the world's ecosystem: *BeeBC: about a group of filmmakers creating a movie about bees from around the world *Beetween Bees: about life without the various bee species *7-8 week units for two separate 7 th grade classes
Brief Lesson Description: Students will be instructed through mini lessons and their own investigation questions about bees. Students will use information researched to create stations to teach others about their bee and what life would be like without them. This will then assist students in writing scenes for a play about bees and their interactions with humans, each other, and their habitat.		
CONTENT		
Performance Expectation(s): NGSS <p>MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.*</p> <p>MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.</p> <p>MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.</p> <p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.</p> <p>MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.</p> <p>CCSS</p> <p>ELA</p> <p>Literacy.W.7.1.a Introduce claim(s), acknowledge alternate or opposing claims, and organize the reasons and evidence logically.</p> <p>Literacy.W.7.3 Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.</p> <p>Literacy.W.7.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>Literacy.W.7.5 With some guidance and support from peers and adults, develop and strengthen writing as needed by</p>		

planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.

Literacy.W.7.6

Use technology, including the Internet, to produce and publish writing and link to and cite sources as well as to interact and collaborate with others, including linking to and citing sources.

Literacy.W.7.7

Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions for further research and investigation.

Wisconsin

Theatre

B.8.1

Create a character through physical movement, adapting movement and making physical choices to fit the requirements of the scene

B.8.2

Create a character verbally, adapting language choices and dialogue to fit requirements of the scene

B.8.7

Create a character (physically, verbally, and facially) from an original idea

D.8.1

Accept and use criticism constructively to revise and refine their own work

D.8.2

Share their comments constructively and supportively within the group

E.4.5

Make decisions regarding the scene's visual elements (such as where doors are located or where the audience will sit)

E.4.6

Rehearse and perform a scene or play for peers and invited guests

Essential Question (Phenomena):

How does the wide variety of bee species impact our ecosystems? What are the consequences of a possible bee extinction? What are the solutions?

Learning Intention(s):

- Research basic information about a specific bee following a graphic organizer
- Develop investigation questions to continue a more in depth study
- Design a learning station to teach others about your bee specie
- Collaborate with peers to create scene based on interest in a bee specie
- Understand the format and writing style for writing a scene
- Draft, edit, and revise a scene written in a small group setting
- Discuss purpose and direction of the playwriting process
- design costumes, props, and scenery as needed
- create costumes, props, and scenery
- rehearse scenes in small and whole group settings
- collaborate in a full scale production and participate in a performance

Success Criteria:

- A station is created to show understanding about a bee specie
- worksheet, quiz, and/or product is created at each station by all students
- students successfully work in small groups based on interest of bees
- research is included in scenes written in a collaborative group
- Rehearse scenes and develop and strengthen writing, acting, and production components for the play.
- Develop your individual character and group characters.
- participate in design and construction of costumes, props, and scenery
- perform in the production for our school and visiting schools

Academic Vocabulary:

eusocial
 asocial
 colony
 queen bee
 brood
 worker bees
 stage directions

Prior Student Knowledge (Learning Progression):
 basic information about Panama from unit completed in 6th grade

UNDERSTANDING

<p>Science & Engineering Practices: (Understanding)</p> <p>Engaging in Argument from Evidence Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).</p> <ul style="list-style-type: none"> Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-ESS3-4) 	<p>Disciplinary Core Ideas: (Content)</p> <p>ESS3.C: Human Impacts on Earth Systems</p> <ul style="list-style-type: none"> Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3) <p>LS4.D: Biodiversity and Humans Gr. 7</p> <ul style="list-style-type: none"> Changes in biodiversity can influence humans’ resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2-5) <p>LS2.C: Ecosystem Dynamics, Functioning, and Resilience Gr. 7</p> <ul style="list-style-type: none"> Biodiversity describes the variety of species found in Earth’s terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem’s biodiversity is often used as a measure of its health. (MS-LS2-5) <p>LS4.B: Natural Selection</p> <ul style="list-style-type: none"> Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4) <p>LS4.C: Adaptation</p> <ul style="list-style-type: none"> Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes. (MS-LS4-6) 	<p>Crosscutting Concepts: (Understanding)</p> <p>Connections to Nature of Science</p> <p>Science Addresses Questions About the Natural and Material World</p> <ul style="list-style-type: none"> Scientific knowledge can describe the consequences of actions but does not necessarily prescribe the decisions that society takes. (MS-ESS3-4)
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Possible Preconceptions/Misconceptions

- Bees do not impact all life on earth - including human food
- Bees all live in a eusocial environment
- All bees make honey

LESSON PLAN – 5-E Model

ENGAGE: Initiates the learning task - Activates prior knowledge and make connections between past and present learning experiences, and anticipate activities and focus students' thinking on the learning outcomes of current activities. The learner should become mentally engaged in the concepts, practices, abilities, and skills of the curriculum unit.

Why are bees important? Students will compose an investigation question in small groups to learn some basics about bees. Investigations will be shared out in a whole group setting. From this, we will compose follow up questions for groups to research further.

Questions that may be asked or answered:

What would happen if there were no longer bees?

What types of bee species are there in the world?

During this time, I will also re-show the power point I created when I was learning about the Megalopta bee.

Various videos will be shown throughout the engage and explore phase:

<https://www.youtube.com/watch?v=IE-8QuBDkkw>

<https://www.youtube.com/watch?v=mdfMkr1pXrM>

<https://www.youtube.com/watch?v=6CxCTyxRFh0>

<https://www.youtube.com/watch?v=YaaQUGPXtnU>

ted talks - why are bees disappearing?

<https://www.youtube.com/watch?v=dY7iATJVCso>

What happens if the bee dies?

<https://www.youtube.com/watch?v=JiYBVrFiLA>

Winnie the Pooh and the great honey pot robbery - full episode

https://www.youtube.com/watch?v=XO_V5uEumW0

EXPLORE: Lesson Description – Provides students with a common base of experiences within which they identify and begin developing concepts, practices, abilities and skills. Students actively explore the contextual situation through investigations, reading, web searches, and discourse with peers.

Students will break into groups to research a chosen bee species, making sure there are no doubles. The teacher will help decide groups as these will become the performance groups.

Bee species options and informational websites:

<http://www.pestworldforkids.org/pest-guide/bees/>

<http://www.buzzaboutbees.net/types-of-bees.html>

The Honey Bee -(Family: Apidae)

The Bumblebee (Family: Apidae)

Leafcutter and Mason bees (Family: Megachilidae)

Digger Bees and Carpenter Bees (Family: Apidae)

Mining Bees (Family: Andrenidae)

<http://www.fao.org/docrep/006/y5110e/y5110e00.htm#Contents>

Students will create stations for their specie of bees: the purpose is to teach others in the class about your research. An assessment piece should also be designed by the student group for the rest of the class. These will be graded by the station group. An example will be provided by the teacher about the Megalopta bee.

Students will explore each other's stations about the bee species chosen. They will create a tri-fold board display with any additional information needed. A worksheet will also be created for students to use for discovery of information.

Display boards can be:

- ecosystem web using string and tacks or arrows with accompanying information
- missing/wanted "person" display
- collage/mural with accompanying information
- scientific news article
- children's book display

EXPLAIN: Concepts Explained and Academic Vocabulary Defined– Development of an explanation for the situation students have been exploring. The learner verbalizes their contextual understanding and demonstrates their skills or abilities. Teachers introduce formal labels, definitions, and explanations for concepts, processes, skills, or abilities.

Students will begin to understand the purpose of our play: to explain to others what different species of bees do and why they need to keep doing them. This phase will be students working in groups to develop a scene about their chosen bee. The script outline will be read aloud and students will be given scene writing guidelines. Throughout this process, students will edit a shared document and add in their written scene. Students will also audition for parts that were written by the teacher. These students may or may not be part of a bee scene depending on the scale of the role.

ELABORATE: Applications and Extensions – Extends students' conceptual understanding through opportunities for students to apply knowledge, skills, and abilities. Through new experiences, the learners transfer what they have learned and develop broader and deeper understanding of concepts about the contextual situation and refine their skills and abilities.

The days will become split with working on dialogue and character development, and actually editing the play in the classroom. When ready, students will begin to design their costumes, props, and scenery while continuing to rehearse their scenes. This process will take approximately four weeks before we perform for the school and visiting schools (if possible).

Upon the conclusion of our performances, students will reflect on their learning and experience by responding to a video of their performance and written short answer questions.

EVALUATE: - Students assess their understanding and abilities and opportunities are provided for the teacher to evaluate students' understanding of concepts and development of goals identified in learning outcomes.

The final step is to put the play together, rehearse, and prepare for the performances. Various techniques will be taught to develop writing, acting, props, costumes, and scenery. As this process comes together, focus will be put on understanding and relating how bees directly affect all existence of life. Students will need to understand how scenes need to build on each other just the way stories do in general.

A final test and reflection will be given following the performances.

Formative Monitoring (Questioning / Discussion):

- stations created for others to learn
- scene writing
- costume, props, scenery construction
- rehearsals

Summative Assessment (Quiz / Project / Report):

- Station research worksheets

- Performance
- Final short answer quiz
- Reflection

Elaborate Further / Reflect:

Materials Required for This Lesson/Activity

- Computer lab/Chrome Book cart for research
- Smart Board to watch videos
- Library books for in class research and reference
- Tri-fold station teacher example
- Tri-fold for each station group
- Tri-fold station expectations/rubric
- Scientific Method form for investigation questions
- investigation question worksheet for extended research
- Notebooks for gathering research and journaling about their findings
- Fabrics and crafts as needed to create scenery, costumes and props
- Images or video compiled to project during the performance ??
- Final evaluation and reflection
- Scene Writing guidelines and rubric
- Play outline

Name: _____

Ms. Glo's Amazing Scientific Method Form

Investigation Topic: _____

Investigation Question #1:

Hypothesis (what I think the answer is?):

Cite my Sources: (you must fill out the **complete web address!**)

1. _____
2. _____
3. _____

Conclusion: What is the answer to my question based on research?

What is one piece of information or new question you want to explore further? (This should reflect what you are most interested in.)

Draw an image to help express your findings.

A large, empty rectangular box with a thin blue border, intended for drawing. It occupies the majority of the page below the instruction text.

Station Questions and Expectations

BeeBC World News and Beetween Bees

Directions: You are to create a learning station with your group about what life would be like without your chosen bee species. 1. You will design a tri-fold display board with your group. Below are the tri-fold design options and the questions designed to help you get started with required information. However, you are expected to provide more information than just the researched answers based on what you learn and discover about your bee in your group. 2. You must create your own worksheet / graphic organizer / or quiz for other students to complete at your station. You will be required to grade their work at the conclusion of our station activity. 3. You must provide all websites, books, articles, etc as a bibliography posted on your display board.

Tri-fold Design Options:

- **Ecosystem Web:** using drawings and index cards, draw arrows or use string to show the connections between plants and animals in relation to your bee, making sure to include all required information about your bee.
- **Missing/Wanted Bee Poster:** Just like FBI's most wanted, design the tri-fold like a flyer with drawings and text to provide all of the required information about your bee.
- **Collage/Mural:** using pictures and index cards, show and write all of the required information about your bee.
- **Scientific News Article:** compose several news articles that are based in fact, describing the required information about your bee. Use a variety of writing formats including informational (fact) and an editorial (opinion).

Required Informational Questions

Bee very descriptive!

1. What is your bee species? (scientific name and common name if applicable)

2. Where is your bee found? Countries / specific regions / climate / season / etc

3. Describe the bee's living conditions: hive / burrowed stick / ground / etc

4. How many bees typically live together? What are the different names of the bees in the group?
eusocial / asocial / family / brood / etc

5. What surrounding environment does the bee live in? How does their environment help them survive? tropical / desert / deciduous / etc

6. What does your bee pollinate? How does it pollinate it? What does it do with the pollen / nectar?

7. What specific purpose does the bee serve in its habitat? How does it impact its surrounding environment? ex: it pollinates wheat for human food by...

8. What threatens this bee species? ex: crop chemicals / fertilizer/ ants / fungus / disease / humans / etc

9. What does the bee do to protect itself? move locations / sting / warning signals / etc

10. What additional questions do you need to ask and answer to help with understanding your bee?

Question:

Answer:

Question:

Answer:

Station Rubric:

	Expectations	Self-Grade	Teacher Grade
Tri-fold Design:	A station design was clearly chosen and very purposefully designed for style, information, and interest		
Information:	All basic required information was included. Additional information was also researched and included.		
Assessment:	A worksheet / quiz / or graphic organizer was created for other students to use for gathering information from your station		
Final Grade:			

Station Rubric:

	Expectations	Self-Grade	Teacher Grade
Tri-fold Design:	A station design was clearly chosen and very purposefully designed for style, information, and interest		
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Final Grade:			

Scene Writing Guidelines

Character - all character names are center aligned and the only word(s) on that line.

Stage Directions - an instruction in the text of a play, especially one indicating the movement, position, or tone of an actor, or the sound effects and lighting. Stage directions do not need to be written in complete sentences, but must make sense. *(All stage directions are in parenthesis, italics, and left aligned.)*

Dialogue - Correct punctuation must be used! Correct grammar must be used unless it is the dialect of a character to speak incorrectly. Dialogue must be written left aligned.

Scene Designation - When a scene starts or ends, use uppercase letters, italics, and center aligned.

SCENE 2

Anna

(spoken with excitement, Anna crosses stage left to Andrea.) Wow! I can't believe it's you! Where have you been?

Andrea

(looking scared and shy, does not move towards Anna) I don't really want to talk about it. *(Andrea looks down and shuffles her feet.)* I'll tell you, but it has to be later. I need your help right now.

Anna

I'm taking you straight home. Your mom is going to freak out when she sees you after all this time.

Andrea

My mom can't know I'm back home. *(grabs Anna's shoulder)* You can't tell her - promise me you won't say a thing to anyone? The only reason I'm here is because I need your help.

Anna

My help? What's going on?

Andrea

I'll tell you on the way. Come with me.

(Anna and Andrea exit stage right. Lights fade to black.)

END SCENE

The Bee Series

Final Evaluation and Reflection

1. How have humans impacted the life of bees? Bee specific and give examples.

2. How can **you** cause change to bees and their continued survival?

3. Describe the most **important** piece of information you learned?

4. Describe the most **interesting** piece of information you learned?

5. What is the difference between "house left" and "stage left?"

6. What is the difference between "upstage" and "downstage?"

7. What is being asked of you if you are told to "strike the stage?"

8. If we did this play again for the upcoming 7th graders, what advice would you give?

9. What would you change about this experience or what would you want to make sure stayed the same?

10. Grade yourself: (circle one and add a comment about why you deserve that grade for your overall success.) 4 3 2 1



The Bee Series

BeeBC World News

Setting: The play starts with a voiceover of a narrator. Upstage of the curtain are three main settings for scenes. Upstage Center is tropical foliage with brightly colored flowers. Downstage Right is a dry and desert like setting with a sand hill and a cactus. Downstage Left is a field of wheat/corn/or some vegetable.

Narrator

Welcome to the Bee Series. *(Long pause to wait for the audience to quiet down)* In a world filled with bees, children run screaming, in fear of getting stung!

Josie

(Josie, Yahna, and Jimmy walk on from stage left). Ahhh! Shoo, shoo bee! *(runs across stage trying to get away.)*

Yahna

I absolutely hate bees! *(swatting at it as it flies by)*

Jimmy

I've got it. *(Jimmy grabs a notebook while watching and waiting for the bee to land. When it does, he slams his notebook on it, killing it.)* See, no big deal *(puffing up his chest trying to seem manly and strong while walking past and off stage.)*

Narrator

Brave fathers sprayed pesticides under the porch at night.

Father

(cackles loudly while shaking a can of wasp/hornet spray and spraying the air around him)

Narrator

And an oblivious child takes a drink from her open can of soda.

Madi

(takes a big gulp and pretends to be choking and sprays/spits out the soda and shouts) AHHHH!
Something stung my tongue!

Narrator

Yet around the globe, people actually rejoice and celebrate bees. They live off their hard work, use their image to show strength, and most of all, we humans love honey. *(pause)* In order to teach people how to

rejoice in the existence of bees, the BeeBC decided to create a documentary about bees from around the world. Here, is their story.

(Downstage Left a group of people enter stage from the stairs. They include a cameraman, a sound engineer, an equipment carrier, a scientist, and a reporter.)

Equipment Carrier

Hey guys, wait up.

Cameraman

(turns around and rolls his eyes.) Keep up or we'll hire someone else. It's your job to carry the extra equipment. Don't worry though, things will get easier after we eat the lunches you have in your bag. *(equipment carrier shakes his head and continues to walk behind everyone else.)*

Reporter

I like this location. Let's stop and take a look around. I'm betting if we set up near this area of cacti, we'll see a bee in no time.

Scientist

This region is best known for the *Perdita Minima* bee. ***(add information and dialogue as needed based on research)***

Sound Engineer

Shhhh! I think I hear something!

Cameraman

The sun is in a perfect position. Let's film this scene.

(insert scene about a bee that lives in the desert)

Equipment Carrier

This sun is blazing down. I can't take it anymore! I need to set this stuff down. I need water! *(carrier throws everything down and scavenges through the bags looking for a bottle of water. When he/she does, he/she drinks the whole bottle.)*

Reporter

I love this climate. *(pulling out a pocket mirror)* I'm hot, but my sweat dries immediately. I don't have to reapply make-up. That is a nice side effect.

Cameraman

That's a wrap people. Let's pack up and head out. We have a big day tomorrow. I've never been to Panama. I can't wait to see what their bees are like.

Narrator

The BeeBC were on their way to Panama where a group of scientists are studying the Megalopta. These bees are known for being eusocial and asocial. This means that sometimes they live in groups, but sometimes they choose to live alone. Megalopta means big eyes, and they are best known for foraging for food during dusk and dawn. The scientific question under study is: Do the Megalopta have an anatomical structure or layer in their eyes that help them see during dusk and dawn?

Sound Engineer

Did you guys hear that too? What did that person mean, anatomical structure?

Scientist: Karen

I'm so glad you asked. The Megalopta have very large eyes, but they are not shaped the same way as other insects that fly at night. What we are trying to figure out is how their eyes are different and why.

Sound Engineer

Oh good. You heard that voice too. I've been told that I hear a lot more than others. I guess that is a good thing when you're the sound guy.

Scientist: Karen

(giving the sound engineer a weird look) But what do you think about the question under study?

Sound Engineer

I think eyes are cool. It sure is nice to have them.

Scientist: Karen

Oh, brother. I hope the audience that watches BeeBC will be more interested in what I have to say. Nevertheless, let's go crew. We've might have a long walk ahead of us through the forest to find some nests in sticks. What we are looking for are fallen tree branches. *(pointing off the trail)* You see that one over there? That is what we want, a tree branch that has broken off from the tree, but isn't touching the ground.

Sound Engineer

It has to be floating?!

Scientist: Karen

You're ridiculous! No, it has to be supported by another plant that it has fallen into. If it touches the ground then it will be susceptible to ants. Ants are the main predator of bees around here. They eat anything!

Sound Engineer

That sounds like a game, like when I was a kid I used to play with my brother that the ground was made up of lava. We'd jump on all the furniture in the house and even line up the dining room chairs to extend into other rooms. Those were some good times. It drove my mom nuts.

Scientist: Karen

Yeah, I'm sure she loved it. (*rolling eyes and saying sarcastically*) It's just like you jumping over lava in your living room. Except this is a bee living in a branch. Great comparison. (*to the cameraman*) Are all sound engineers this weird?

Cameraman

Only the good ones.

Scientist: Karen

That's what I suspected. (*They continue walking and looking around for fallen branches, checking the ends of them.*) Oh, hold up, I think I found one.

insert megalopta scene

Cameraman

Annnddd, CUT!

Reporter

Thank you Karen. I know how busy you are running your studies. That was a great shot and wonderful information. I'm sure we'll use a lot of that in our documentary.

Scientist: Karen

I really enjoyed this experience. Thank you for being interested in what I do. You know, it's funny when you think about how important bees are, yet people don't realize how much our entire existence relies on them. We swat at them, we run away from them, but we rarely sit back and appreciate what they do on a daily basis.

Cameraman

I couldn't agree more. I might have the best job in the world.

Equipment Carrier

It sure beats my job.

Scientist: Karen

You might have to carry things, but look at all you get to experience! You're in a beautiful place, with smart, interesting people, and everything is paid for.

Equipment Carrier

Yeah, I guess you're right. I forget sometimes to appreciate things.

Scientist: Karen

We all do sometimes. Don't stress about it. Alright, I've got to head back to my lab. Bye everyone! Good luck on your next adventure! (*waves and exits stage leaving opposite the film crew*)

Equipment Carrier

(to himself) I think I'm in love! *(exit stage with crew)*

continued dialogue of BeeBC crew in between bee scenes decided in class

Reporter

From Ancient Greece to modern times, bees have continued to be celebrated. From being drawn on pottery to being on the town flag of Manchester, England, bees have been a symbol of hard workers. They are the most highly organized species that works for the whole community. They represent strength, hard work, and unity. The world would be a better place if we all lived a little bit more like the bees. Next time you see a bee and roll up that newspaper to smash it, remember, that **bees** are actually man's best friend.

Cameraman

Annnndddd...CUT!

Reporter

Did we get it?

Cameraman

Sure did! Wow everyone, what a great last shot. This will be amazing. I'll send everything off to the editors tomorrow and we'll be relaxing back at home in no time.

Reporter

I'm sad to see this project come to a close. I found this Bee series to be one of the best I've gotten the pleasure to work on.

Cameraman

I'm looking forward to seeing the reels.

Sound Engineer

I think this calls for a celebration!

Equipment Carrier

Can I put these bags down now?! (said with exhaustion)

Sound Engineer

No, my good man, you have yet to carry everything back to the hotel. Your job isn't over yet.

Equipment Carrier

Well, can you all help a bit then. Someone got an extra hand? *(trying to hand off a bag to everyone)* Really? Anyone? *(Everyone laughs and exits stage. The Equipment Carrier heads offstage trying to catch up to the crew.)*
Wait up guys!

Curtain Closed

The Bee Series

Beetween Bees

Setting: The play starts with a voiceover of a narrator. Upstage of the curtain are three main settings for scenes. Upstage Center is tropical foliage with brightly colored flowers. Downstage Right is a dry and desert like setting with a sand hill and a cactus. Downstage Left is a field of wheat/corn/or some vegetable. Downstage Center is a science lab / classroom.

Narrator: Welcome to the Bee Series. In a world without bees, children played barefoot in the grass, families poured as much syrup as they could on their pancakes at an outdoor restaurant without any fear, and schools didn't have to keep their classroom windows closed in the spring. It was a world seemingly without fear. But oh...once you look closer, the world was now without many things. The world had no flowers, no longer could a child enjoy peanut butter and honey sandwiches, and the farmer's crops stopped growing. It was a world without BEES! Many wondered how this happened. At first the bee population declined. There were many theories: was it the pesticides and chemicals farmers sprayed onto their crops? Was it global warming? Or was it Winnie the Pooh, who finally ate all of the honey, leaving the bees without any homes? Theories abound. But we can be sure of only one thing: people need bees to survive. And now welcome to our play, Beetween Bees...

(curtain open to reveal children seated listening to a teacher)

Jason: the "teacher"

This is why we need you children. You will be the great change we seek. With your hard work, and small hands, you can bring back the crops we are missing.

Amanda

(raising hand) Excuse me? Umm, well. I thought this was summer school. My mom signed me up for summer school. Do we get math books and English books? What kind of science will we do? Why do I need small hands??!!

Jason

All fantastic questions. So let me ask you one question! When was the last time you ate corn on the cob? Or how about Doritos?

Amanda

It's been almost two years. Again, what does that have to do with having small hands?

Jason

Our corn supply has long been depleted. There is no more corn. So everything we used to eat, has now changed. The only fruits and vegetables we have are created in labs. You have to have a lot of money in order to eat real food, am I right?

Amanda

I guess. I don't usually pay the grocery bill.

Jason

Well, it is time you did pay, pay attention! Why don't we have corn? Why aren't vegetables able to grow in your backyard? Tell me, why is our food supply based on plants that don't flower?

Billy

(shooting up hand while answering at the same time) I got this one. Because we don't have bees. There isn't anything to pollinate our farmlands. So the plants grow, but they don't produce the fruit and vegetables we like.

Shelly

But that doesn't explain why I can't get a good cheeseburger anymore! Is this our science class? Are you the science teacher?

Jason

Alright, alright. I'm not exactly the science "teacher" mind you. I'm more of a "project manager." This means that I have been given the job of a boss, and you, my smart little children, are going to be my workers! Doesn't that sound exciting?

Shelly

Do we get a cheeseburger when we're done?

Jason

Funny you ask that. In a way, yes. You see, once the bees died off, the crops stopped fruiting. When that happened, all the grains that cows eat, stopped producing seeds, so we weren't able to plant another crop in the spring. Without enough food for cows, we can't maintain the huge amount of cows for our food supply. If we are successful, we might be able to lead the country into a new era of food! You might not get a cheeseburger this week, but maybe in a few years!

Shelly

I'm in. What do we have to do?

Amanda

What do I have to do to get an A in the class?

Jason

As you know it is proficient or advanced. All you have to do is be a good sport, and do your best. How does that sound everybody?

Everybody

Yeah / Sure / I guess

Jason

I'm passing out Q-tips. These are going to represent the bee's proboscis. Does everyone know what that is?

Amanda

I remember hearing about that when I saw the play at school last year. But they were talking about the Blue Morpho Butterflies in Panama.

Jason

Great memory! Yes, that is correct. Well, bees also have a proboscis. It is a long skinny snout that helps them pollinate flowers. You are going to become my little worker bees. All you need are small, steady hands, and Q-tips! Let's practice. Can I have someone pass out the flowers?

Narrator

Summer school students around the country practiced this new technique, not realizing they were part of a larger experiment of how to continue life as we know it without bees. Meanwhile, over in _____, there was another science experiment going on.

insert several scenes from around the world of inventions/experiments of how to recreate what bees do.