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HoneybeeZZZ [1st grade]

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UNDERSTANDING BY DESIGN

Unit Cover Page

Unit Title: HoneybeeZZZZZZZ

Grade Level: First Grade

Subject/Topic Area(s): Science/Insects

Designed By: Jordan Taylor

Time Frame: 1 month (20 class days)

School District: Houston ISD

School: Walnut Bend Elementary School

School Address and Phone:

Walnut Bend Elementary

10620 Briar Forest Dr.

Houston, TX 77042

713-917-3540

<http://www.houstonisd.org/walnutbendes>

Brief Summary of Unit (Including curricular context and unit goals):

First grade students will engage in a research unit about honey bees, learning about colony demographics, habitats, pollination patterns and preferences, and their importance within the agriculture world. The goal is for students to understand the importance of honeybees and their impact on our global and local ecological systems.

UbD Template 2.0

Stage 1 – Desired Results		
<p>Established Goals (e.g. standards)</p> <p>TEKS SCI1.9.B Analyze and record examples of interdependence found in various situations such as terrariums and aquariums or pet and caregiver</p> <p>TEKS SCI1.9.C Gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter</p> <p>TEKS SCI10 The student knows that organisms resemble their parents and have structures and processes that help them survive within their environments.</p> <p>TEKS SCI1.10.A</p>	Transfer	
	<p><i>Students will independently use their learning to...</i></p> <p>*identify examples of interdependence in nature</p> <p>*make environmentally conscious choices about gardening and food purchase</p> <p>*resist killing bees</p>	
	Meaning	
	<p>Understandings <i>Students will understand that...</i></p> <p>*Humans, plants, and animals all depend on each other to live and grow in our world.</p> <p>*Honeybees and flowering plants depend on each other for survival</p> <p>*Humans depend on honeybees for food</p>	<p>Essential Questions</p> <p>*Why should I like honeybees?/ How is a honeybee like ME?</p> <p>*Why are honeybees important?</p> <p>*How would our world be different without honeybees?</p> <p>*What do honeybees do?</p>
	Acquisition	
	<p>Knowledge <i>Students will know...</i></p> <p>*Honeybees live in colonies comprised of one queen bee, male drones, and female worker bees</p> <p>*Honeybees collect nectar to make honey while simultaneously spread pollen among plants to enable plant reproduction</p> <p>*Honeybees are attracted to certain types of plants and flowers ~~~~~ EXTENSIONS: *Honeybees have three body parts: head, thorax, abdomen</p> <p>*Honeybees hatch from eggs</p> <p>*Honeybees have stingers that protect them from predators, but stinging something will kill them</p>	<p>Skills <i>Students will be able to...</i></p> <p>*use scientific tools to observe bee behavior</p> <p>*record observations and organize data</p> <p>*make a list of food that is made possible by bees</p> <p>*identify different plants from which bees gather nectar ~~~~~ EXTENSIONS *label parts of a bee</p>

Investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats		
Stage 2 – Evidence		
CODE (M or T)	Evaluative Criteria (for rubric)	
		<p>Performance Task(s) <i>Students will demonstrate meaning-making and transfer by...</i> *Planning a garden to plant that is bee-friendly</p> <p>I am a beekeeper and I need your help! I love bees, and have worked with solitary bees and bumblebees before, but I just ordered a colony of honeybees and I do NOT know what they need. Can you help me plan a spot for my honeybees on my farm that would be perfect for them and for me? I think they might not like the same types of flowers and plants as solitary bees and bumblebees, so I need to know what kind of flowers and plants honeybees like! I also need to know what types of fruits and vegetables I can sell at the market if I have honeybees to pollinate them. I would like for you to please draw a map of my farm, including where my house is, where the honeybee hive will be, and what plants I should plant around there. I look forward to seeing your ideas about how I should make a welcoming home for my new honeybees!</p> <p>Attach a list of requirements for the map, see appendix. Optional: show students the rubric for project.</p> <p>-----</p> <p>--</p> <p>Other Evidence (e.g., formative) *Group discussion *Science Journal entries *note cards and data organization *K-W-L chart *class activities (“Which Bee Could be Me?” “Energy Chain” etc.)</p>

Stage 3 – Learning Plan		
CODE (A, M, T)	Pre-Assessment <i>How will you check students' prior knowledge, skill levels, and potential misconceptions?</i> *Students will be given a quiz to pre-assess knowledge of honeybees. See Appendix	
	Learning Activities	Progress Monitoring (e.g., formative data)
M	Day 1 HOOK Set up an interest station that has books, toys, and maybe music playing. When students come in, gather on the carpet. Tell students that we will be learning about honeybees and – BAD NEWS – but the honeybees are vanishing! Begin by reading <i>The Case of the Vanishing Honeybees: A Scientific Mystery</i> . Create a <i>Know-Want to Know-Learn</i> chart about honeybees.	K-W-L
A, M	Day 2 Pre-assessment Give the pre-assessment quiz. Bring students to carpet and tell them that in order for our class to work on solving the vanishing honeybee mystery, we need to learn all about honeybees. Spend some time examining questions that arose the previous day on the K-W-L chart and organize questions into categories for learning (i.e.: <i>What do honeybees do? Where do honeybees live? What do honeybees eat? How do honeybees help us?</i>)	Pre-assessment quiz
M	Day 3 What do honeybees do? Start with teaching about the colony and the queen. Split up the class into a queen, worker bees, and drones. Students can stay in these groups for the remainder of the unit (suggestion: address the students as bees for classroom management). A colony can house around 50,000 bees. There is one queen bee, some male drones, and some female workers. They have slight differences in size and	Science Journals

A, M	some other physical characteristics, but address the common physical characteristics that they all share: 3 body parts (song; appendix), black and yellow, wings, etc. Ask students which type of bee they would want to be and why.	Science Journals "Which Bee Could be Me?" (see appendix)
M	<p>Day 4 <i>What do honeybees do?</i> Use <u>The Bee Book</u> for kids to learn about what each bee does within a colony, and make an anchor chart. Children will then complete the "Which Bee am I?" activity, then ask students again which bee they would want to be- have them write in science journals about which bee and why.</p>	Science journal POWER POINT
M, T	<p>Day 5 <i>What do honeybees do? POLLEN DAY</i> Achoo! What is all that yellow stuff that get collected on cars, roofs, and sidewalks? Access students' prior knowledge of pollen. They should be familiar with the substance, but might not know what it is or where it comes from. Look at a power point show of flowers that have evident pollen, and point out to students that pollen comes from flowers! (add to vocab) Explain that plants cannot make fruit unless they have pollen from other plants- how do they get the other plant's pollen?? Write a hypothesis in science journals.</p>	Science journal review (reexamining previous day's hypothesis)
T	<p>Day 6 <i>What do honeybees do?</i> So, students know that plants need pollen from other plants in order to produce fruit (without other pollen, most plants would have flowers but no fruit). Ask students to share hypotheses about how pollen is spread from previous day. Then use <u>The Bee Book</u> for kids to learn about how worker bees fly around to different flowers to collect nectar. Watch a video (appendix) of a worker honeybee flying from flower to flower and ask students if notice anything (honey bees are messy, they get pollen all over their legs when they are gathering nectar)- Honeybees and other flying insects are responsible for spreading pollen from flower to flower ("pollination" on vocabulary chart)!</p>	Pollination Play game
M	<p>Day 7 <i>What do honeybees do?</i> Play the "Pollination Play" game (directions in appendix)</p>	Science Journals
M		Science Journals

	<p>Day 8 <i>Where do honeybees live?</i> Revisit what a hypothesis is: students made a hypothesis about how flowers get pollen from other flowers to make fruit. Add hypothesis to the vocabulary chart. Tell students that in order to keep gathering facts about the honey bee mystery, we need to figure out where bees live. Write a hypothesis in science journals about where students think bees live. We know they live in beehives- where are the beehives?</p>	
T	<p>Day 9 <i>Where do honeybees live? FIELD TRIP</i> Before the field trip, tell students that we are going to gather evidence about where honeybees live. Scientists gather evidence to prove or disprove their hypotheses. Take a field trip to a nearby farm that houses beehives, or have a local beekeeper come to school for an “in-school” field trip. Also consider a virtual field trip to a honeybee farm or beekeeper farm/apiary (see Appendix). After field trip, have students write notes in science journals about where honeybees live, while teacher records notes on class chart.</p>	Photo activity
M, T	<p>Day 10 <i>Where do honeybees live?</i> Look at a world map and access prior knowledge about animal habitats. Review notes from field trip, and connect to the fact that honeybees can live in lots of different habitats. Compare notes from the field trip to students’ hypotheses, and ask students how else we can gather evidence about honeybees. Read <i>The Honey Makers</i> and write down more notes about where honeybees live on the class note chart. Look at a picture of a forest scene on the SMART board or projector (see appendix) and point to the different spots that would be good for a beehive, considering that honeybees like to build their hives in old trees, logs, caves, and rock crevices.</p>	Energy Chain in Science Journals
M	<p>Day 11 <i>Where do honeybees live?</i> Using either pictures online or order a honeycomb for your classroom (see appendix) for students to observe the inside of a beehive. Students can use hand lenses to look closely at the size and shape of the hexagons that make up a hive. Read <i>The Magic School Bus: Inside a Beehive</i> and discuss how bees</p>	Ticket IN the door Science Journals
M, T		Class list compare/contrast

	<p>make the hexagons out of chewed up beeswax. In science journals, students will draw an “energy chain” that shows the transfer from pollen/nectar to beeswax to the hexagon cells that make up a beehive. Discuss/point out from book that some of the pollen and nectar gets turned into honey instead of beeswax.</p>	with student list in SJs
M, T	<p>Day 12 <i>What do honeybees eat?</i> Begin by asking students what honeybees eat (they should have some idea, since we have discussed that worker bees are responsible for gathering nectar for the hive). Students can raise hands or do this as a ticket IN the door. Affirm that honeybees eat nectar, pollen, and honey, but tell students that honeybees are like kids. They have favorite foods/flowers just like us! Take a “nature walk” outside (science garden) and look for flowers – take note of color, size, and abundance in science journals.</p>	Activity: Could These Come From Bees?
M	<p>Day 13 <i>What do honeybees eat?</i> Revisit notes from the field trip, take a virtual field trip (appendix) or invite a local beekeeper to be a guest speaker in class. A beekeeper (from field trip, virtual tour, or guest visit) can identify local flowering plants to which honeybees are attracted. After, make a class list of local flowering plants that honeybees prefer. Compare with the students’ lists in science journals- are there any flowers in our school garden that would attract honeybees?</p>	Could These Come From Bees? Cont.
T, A	<p>Day 14 <i>How do bees help us?</i> Bring in several sample items of fruits, vegetables, nuts, and honey-based items that are “made possible by” honeybees. (See appendix). Students will sort which items come from honeybees and which items do not. Make a t-chart in science journals of the hypothesis sorted groups (students can draw pictures of items or make a written list).</p>	Post-assessment quiz
T, A		Performance task
T, A	<p>Day 15 <i>How do honeybees help us?</i> Revisit the groups students’ sorted the previous day, then reveal that all the items students sorted yesterday belong in one group: the group of items that come from honeybees. Then, extend the activity by sorting all items into groups according to WHAT</p>	Performance task

	<p>the honeybee does to make that item possible. One group will have fruits and vegetables that are pollinated by honeybees, one group will have items that come from honeybee wax, and one group will have items that are honey-based.</p> <p>Day 16 <i>Review and Performance tasks</i> Students will re-take the pre assessment quiz, and review all acquired information by reading another book about honeybees and giving a thumbs up/thumbs down about facts they already know about honeybees (are we getting any new information from the book?). See more options for books in Appendix.</p> <p>Day 17 <i>Review and Performance tasks</i> Introduce the performance task by dressing up as a beekeeper and asking the students for their help in planning the garden. Write the criteria on the board for students to reference.</p> <p>Day 18-20 <i>Performance task</i> Students will continue to work on performance task.</p>	
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Rubric for Garden Map (Performance Assessment)

	Approaching Expectations	Meeting Expectations	Exceeding Expectations
Flowers	Includes one type of flowering plant in the map.	Includes 3 different types of flowers.	Includes 4 or more different types of flowers.
Vegetables	Does not include any vegetable plants in the map.	Includes one vegetable plant.	Includes 2 or more vegetable plants in the map of the garden.
Other Features	No other features for the garden map.	Includes a tree or log for the honeybees to make a beehive.	Includes a place for honeybees to make a beehive as well as a water source.

Labeling	Does not label anything in the map.	Labels each plant correctly.	Labels each plant correctly and provides a purpose.
Explanation	Does not provide an explanation of what plants are and why they were chosen.	Explanation is simple (i.e.: <i>I put yellow flowers in the garden because honeybees like yellow.</i>)	Explanation includes more than one reason for choosing plants (i.e.: <i>I put zucchini plants in my garden because honeybees like yellow flowers and I like zucchini</i>)

Requirements for students:

- You need at least three different types of flowers.
- You need at least one kind of vegetable.
- You need a spot for honeybees to build a hive
- You need to write about what plants you chose and why.

Pre-Assessment Quiz:

1. Where does honey come from?
 - a. The store
 - b. Flowers
 - c. Honeybees
2. How do plants make fruit and vegetables?
 - a. They just grow by themselves
 - b. The Veggie Fairy
 - c. Honeybees pollinate flowers, which produce fruit
3. If you saw a bee, what would you do?

- a. Smash it
 - b. Walk away
 - c. Try to talk to it
4. True or False: A queen bee tells all the other bees what to do.
- a. True
 - b. False
5. True or False: Honeybees will sting you because they are mean.
- a. True
 - b. False
6. Do we need honeybees? If so, why?
7. What do honeybees do?
8. How do you feel about honeybees?

Body parts song:

(to the tune of "Head, Shoulders, Knees, and Toes")

Head, Thorax, abdomen, abdomen

Head, thorax, abdomen, abdomen

Watch out for my stinger; wings to fly on wind

Head, thorax, abdomen, abdomen!

Which Bee Could be Me?

Read aloud each scenario to students, then have them hold up their white board with “worker,” “queen,” or “drone” written to answer the question.

Scenario 1:

I am a small bee. Every day I fly around the hive looking for things to clean. I make sure the beehive is clean, then I get to go take care of the babies! I feed each larvae a little bit of honey and pollen, then go check on the other bees who need feeding. I have to guard the hive at night so no one hurts us! Which Bee Could be Me?

Scenario 2:

I am a bee. There are not many of my kind in the hive these days; it looks as though my work it cut out for me. I am going to visit Her Royal Highness later and will help her lay some more eggs. I wish I had a stinger but I don't. Which Bee could be Me?

Scenario 3:

I am the littlest bee. I get to do my favorite job – going to visit the flowers! I fly where my friends tell me and find beautiful flowers. I suck the nectar from one flower then fly to another, and another, until I am so full of nectar that I just have to fly home. When I get back to the hive, I will deposit the nectar into the honeycombs so I can start making honey! Which Bee Could Be Me?

Scenario 4:

I am the largest bee in my hive. I also have the most important job. If I could wear a crown I would. I am in charge of laying all the eggs for new little bees. Without me, there could be no swarm, no hive, and no purpose for the lives of the other bees. I am the most important bee. Which Bee Could Be Me?

Materials:

- yellow notecards for pollen, labeled for each different flower/child
- flower headbands
- wings?
- straws for nectar sipping
- fruit cards (can draw pieces of fruit on construction paper and cut out)
- crown

Students should be divided into groups of flowers, fruit, worker bees, butterflies, and other bees (that will stay in the hive, queen can wear a crown and other bees fly around her). Students who are flowers will have pretend “nectar” (straws) and pretend “pollen” (yellow cards). Flowers will stand in one spot while bees and butterflies fly around. Bees and butterflies will take a sip of pretend nectar from a straw and take one pollen card. When bees and butterflies sip from another flower’s straw, they will deposit a pollen card in exchange for another pollen card- therefore leaving that flower with new pollen. When a flower gets pollen cards from another flower, the fruit (sitting next to standing flower) can stand up and stay next to flower.

It’s the act of pollination!

Could *These* come from *Bees*?

Materials (or pictures of materials):

- Watermelon
- almonds
- mustard
- cereal
- strawberries
- Lemonade
- honey based hand lotion/cream
- a granola bar
- chapstick
- a beeswax candle
- guacamole
- raspberry sorbet

Students will, in groups of 4 or 5, sort these materials into two groups: one group of things that “come from” bees and one group of things that do not come from bees. Students will talk about why they think an item belongs in one group or the other, then present to the class their sorted groups. Once every group has presented, the teacher will reveal that *every* item belongs in the “comes from bees” group.

Vocabulary and Resources:

Books:

Markle, Sandra. *The Case of the Vanishing Honeybees: A Scientific Mystery*. Minneapolis: Millbrook Press, Lerner Publishing Group, 2014. Print.

The Bee Book. Haagen-Dazs loves Honey Bees. (online)
http://www.umpquasoilandwater.com/docs/BeeBook_Kids.pdf

Gibbons, Gail. *The Honey Makers*. New York: William Morrow and Company, Inc., 1997. Print.

Cole, Joanna. *The Magic School Bus Inside a Beehive*. New York: Scholastic, Inc., 1996. Print.

MORE BOOKS (not in lesson plan):

Wright, Virginia. *Buzzzzzzzz...: What Honeybees Do*. East Machais: CreateSpace Independent Publishing Platform, 2010. Print.

Milton, Joyce. *Honeybees*. New York: Penguin Young Readers: Reissue edition, 2003. Print.

Stevens, Janet. *Tops & Bottoms*. Orlando: Harcourt Brace, 1995. Print.

Online Resources:

The Green Belt in Austin (picture)
<https://www.flickr.com/photos/zug55/4028516990/in/photostream/>

Order a honeycomb from a local source: <http://www.rangehoney.com/HUGE-TEXAS-Honeycomb-Just-Cut-Comb-Honey.htm?jsessionid=90BC9EE0FDDFDF1E3135310A3D5C44EB.m1plqscsfapp01> (Texas)

Time lapse video plant>flower>strawberry: <http://www.youtube.com/watch?v=FP5ZgawTJVw>

Bee pollination slow motion: <http://www.youtube.com/watch?v=N72KFpvliss>

Virtual Field Trip- CC Pollen Virtual Beehive <http://www.iamhomeschooling.com/virtual-field-trips?limitstart=0>

Other field trip options:

Dewberry Farms: <http://dewberryfarm.com/>

The Barry Farm: <http://thebarryfarm.com/category/houston-local-honey/>

Vocabulary:

Colony: a group of 10,000-60,000 bees living together in a beehive

Queen: the honeybee that lays all the eggs

Drones: the male honeybees that help the queen make eggs

Workers: female bees that are responsible for feeding and taking care of the colony and beehive

Pollen: the sticky, powdery yellow substance on flowers

Pollinate: when bees and other flying insects move pollen from one flower to another

Hypothesis: a scientific guess about something you don't know

Apiary: a place where honey bees and beehives are kept and taken care of by humans

For More Information:

<http://honeybeekind.com/tag/pollination/>

<http://npsot.org/wp/story/2012/2422/>

<http://txmg.org/resources/pollinators/the-trouble-with-bees/>

<http://blog.greenling.com/news/farmers/birds-bees-texas-honeybee-guild>

<http://kids.sandiegozoo.org>

<http://www.buzzaboutbees.net>

<http://biokids.umich.edu>

<http://thehoneybeeconservancy.org>

<http://www.houstonzoo.org/protect-animals/texas-conservation/pollinators>

<http://animals.nationalgeographic.com/animals/bugs/honeybee>