Star Treff, Ellen Murphy, Tiffany Davis
Facilitated by: Jo Topps

Stem-Echolocation

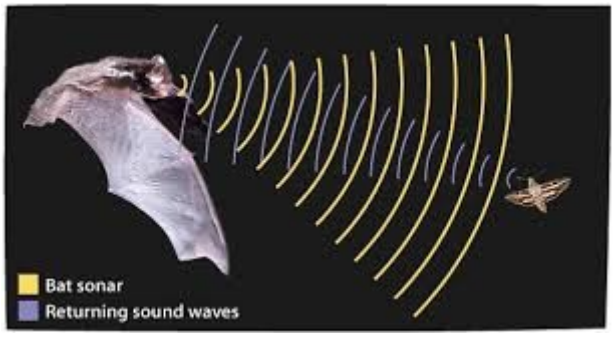
Friday's Schedule:

Meet at Rogers at 8:00
Tiffany's Classroom (Rm. 7): Teach at 8:25-9:25
Debrief (Rm. 8): 9:25-10:30
Lunch: Maria's (close to Cooley Ranch)
Drive to Cooley Ranch
Star's Classroom (Rm. 10): Teach at 12:30-1:30
Debrief (Library): 1:30-2:30

Standard:

- 4-LS1-2
- Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- [Clarification Statement: Emphasis is on systems of information transfer.]
- [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]

Phenomena: Natural or build world that cause us to ask questions

- Echolocation Video
  - Anchoring Phenomenon: Bats use echolocation to locate food in the dark.
  - 

  - Investigative Phenomenon: animals (bats) receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
    - Specifically speaking about bats

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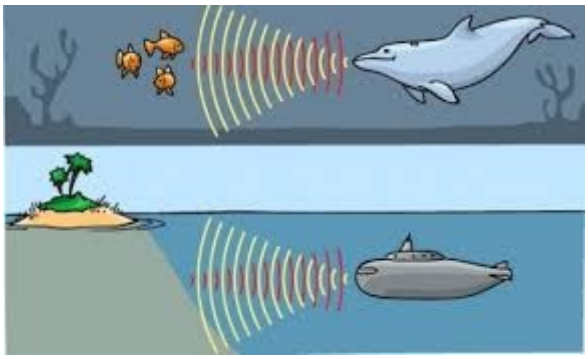

Teacher Prep: 3 pieces of white printer paper to make a mini notebook. Cups (1 per student), tennis balls (5-6), iPads (optional).

Learning Sequence Concept: Bats receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

*Plan backwards, start at the DCI/SEP/CCC column in the Explain row.
*Second, go up to Engage….Stay in DCI column.
*ESR's grow up and turn into Rubrics. :)
*TPR- total physical response

5E Stage	Teacher Does	Student Does	DCI/SEP/CCC
Engage (12 minutes) Tiffany and Star teaching on 10-19-2017	**Draw a model about how bats get their food at night. (page 1 of mini notebook)** -Label your picture. -Show what's happening in your picture. -Write a sentence about what is happening in your picture. **Have students share** -Turn to their tables and describe what's going on in their	**Pre-assessment:** -Draw a model about how bats get their food at night! Share with your table/partner what is going on in your picture. **Expected Student Responses (ESR):** -Draw a bat -Draw a moon -Draw a food source -Label parts -Relationships (might) -Write a sentence.	**Students will know:** -5 senses -Bats come out at night -Bats hang upside down -animal instincts (might) **Model will be used to surface student's understanding System Models: A system can be described in terms of its components and their interactions. **Misconceptions (for us):** -Bats are blind

	picture		-Bats drink blood.
Explore (Video/ questions 15 minutes) (Tiffany does) (Cups/discuss 10 minutes) (Star does) (Tennis Ball/video/ Write 25 min) (Ellen does)	Teacher shows the video Echolocation Video -Watch the video once just to see whats happening. -Watch it a second time and write down as many questions as possible **Teacher will include questions also **(picture)** -Watch a third time and try to answer as many questions as possible. **Total Physical Response:** -Lead students in cups TPR activity -Leads a discussion about what they observed. -How is this similar to what happened in the video? (i.e.., bat & moth) -Tennis Ball named "Sound" -How can you show me that sound starts at one place and then comes back to you? -Think, pair, share Moth target:	Kids will watch the video 3 times. 1. Just watch. 2. Think and write questions. 3. Answer questions that you have written. **Total Physical Response:** -5-7 students at a time make beeps/echos into a cup with back turned to class. -Hands out-stretched and slowly bringing cup towards mouth stopping when cup touched nose. -Repeat till all students experience **ESR** -My voice echoed back to me. -I am the bat -When I got closer to the cup, it got louder. I could hear my voice echoing/coming back towards me. -Think, Pair, Share with your group -Students write what a narrator would say while reviewing their mini video they created (in response to sound)	LS1.D: Information Processing -Different sense receptors are specialized for particular kinds of information which may then be processed by an animal's brain. Animals are able to use their perceptions and memories to guide their actions. Using Models: use a model to test interactions concerning the functioning of a natural system. System Models: A system can be described in terms of its components and their interactions. 4.W.1: Write opinion pieces on topics or texts, supporting a point of view with reasons and information. SL.4.5: Add audio recordings and visual displays to presentation when appropriate to enhance the development of main ideas or themes.

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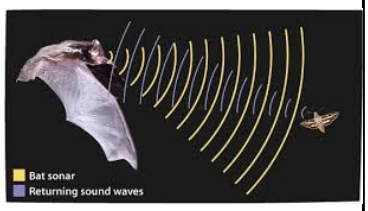
	 -Students record each other showing how to move sound -Turn the sound off -Write what a narrator would say to match the video		
Explain (draw and label 12min) (homeroom teacher)	Ask students to redraw their models of how bats get their food, using labels and the relationship between it and its prey	 Redraw a model of how bats get their food. -Include labels -Include relationship that the sound wave comes from the bat, bounces off of the food source, and returns to the bat so it knows where the food is.	LS1.D: Information Processing -Different sense receptors are specialized for particular kinds of information which may then be processed by an animal's brain. Animals are able to use their perceptions and memories to guide their actions. Using Models: use a model to test interactions concerning the functioning of a natural system. System Models: A system can be described in terms of its components and their interactions.

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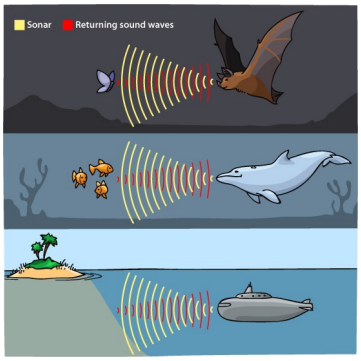
Elaborate (Same concept in a new situation)	 -What is a submarine? -What do you notice about it? -How can you see what's around you? -How do they know how far they are from the iceberg? https://www.youtube.com/watch?v=FqDNSFzWNTA	**ESR** -Boat under water -Small, no windows, -looks like a missile -Cameras? -radar -long telescope	LS1.D: Information Processing -Different sense receptors are specialized for particular kinds of information which may then be processed by an animal's brain. Animals are able to use their perceptions and memories to guide their actions. 3-5-ETS1-2: Influence of Engineering, Technology, and Science on society in the natural world: People's needs and wants change over time as do their demands on new technologies. Using Models: use a model to test interactions concerning the functioning of a natural system.
Evaluate	 -What do you think is	**ESR** -They all are using sound to find something (prey or location). -GATE might be able to make the connection that 1 is in the air, 1 is man-made, 1 is	

	going on with the dolphin in the picture? -Write in the journal. Use the models to describe the similarities and/or differences for 2-3 of the examples. Give this worksheet to your students!	natural underwater.	

Engage:

- Give students a chance to practice their own echolocation.
  - Choose one student to be the bat, and blindfold him or her.
  - Arrange the other students in a circle around the bat, and select another student in the circle to be the bat's prey.
  - Ask the bat to call out **ECHO** from the center of the circle.
  - The prey should respond **LOCATION.**.
  - The bat continues to say echo, moving slowly toward the location of the prey.
  - Once the bat has found the prey, he or she stops and takes off the blindfold. Allow other students to take turns at being the bat or the prey.

Explore:

- Explore

Explain:

- Explain

Extend:

- Extend

Evaluate:

- Evaluate

https://www.smithsonianmag.com/science-nature/what-is-killing-the-bats-16824335/