NGSS & Common Core Standards	Lesson Title	Materials
 SL.8.4: Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence and sound valid reasoning. MP.2: Reason abstractly and quantitatively. SC.5.N.2.1- Recognize and explain that science is grounded in empirical observations that are testable; explanations must 	ID? MORE LIKE IDK! Warmup Questions 1. Why do you think scientists track, tag, and photo ID animals? 2. What do you think we can learn about	 Spotted eagle ray photos Pencil and notepad Magnifying glass Highlighter Pictures of the spotted eagle rays Located at the end of this worksheet Printer to print out ID photos (optional)
 always be linked with evidence. MS.PS.3.1: Construct and interpret graphical displays of data to describe relationships. SC.5.L.17.1 - Make comparisons and contrast observations using identification skills such as tools, technology, and animal biology as a case study. 	 animals from photo identification? 3. What do you think we can learn about habitats from identification? 4. List different ways scientists can track animals: 	
Vocabulary		ID Subject Note
Identification; Migration; Pelvic Fin; Spiracles; Rostrum		are owned by the <u>Mote Marine</u> <u>Laboratory's Sharks and Rays</u> <u>Conservation Research</u> <u>Program</u> and the animals were captured and released for scientific research under a series of Florida Fish and <u>Wildlife Service Special</u> <u>Activity Licenses</u> . All ID subjects were handled by trained scientific professionals. It is illegal to handle protected species without the proper scientific permits or without the supervision of the proper authorities.

Activity Instructions		
1. Ximena Arvizu, from the Eagle Ray Conservation Research Program ha photo catalog will be compared wit Mexico. Ximena needs your help to be added into her catalog!	y Project – Mexican Caribbean, and Mote's Sharks and Rays ave teamed up to share spotted eagle ray photos. Mote's h Ximena's to see if the rays studied in Florida travel to o match the images collected by Mote Scientists so they can	
1. Look over the images of the heads and the pelvic (back) fins (reference the spotted eagle ray diagram at the end of the worksheet) on the last pages of this worksheet. Take notes on your observations of the patterns.		
2. First, take a closer look at the head shots:		
1. In the first grouping of he (you can print out the pho	ad photos, try to match the photos using the spot patterns otos and highlight distinguishing spots to help).	
1. What did you no	tice? Were you able to group all of the photos in each round?	
2. In the second grouping of (Hint: not all of the photo	head photos, try to match the photos using the spot patterns s may match in this round!).	
1. What did you notice? Were you able to group all of the photos in each round?		
3. Now, take a closer look at the pelvic (back) fins:		
1. This is the area of the body that Ximena uses for her ID research. Try to match all the		
photos in this group.		
1. What did you notice? Were you able to match all of the photos in this group?		
10 , , 100 010 5 00 10	thee. Were you able to match an of the photos in this group.	
What did we learn?	Why am I learning this?	
What did we learn? Tracking, and Photo Identification:	• Discover how the world around you works.	
What did we learn? Tracking, and Photo Identification: • Scientists can track animals, such as using	 Why am I learning this? Discover how the world around you works. Provide inspiration for a career in science. 	
What did we learn? Tracking, and Photo Identification: • Scientists can track animals, such as using natural markings such as spots on eagle rays,	 Why am I learning this? Discover how the world around you works. Provide inspiration for a career in science. Compare the requirements of STEM professions. 	
What did we learn? Tracking, and Photo Identification: • Scientists can track animals, such as using natural markings such as spots on eagle rays, to provide long-term, continuous information	 Why am I learning this? Discover how the world around you works. Provide inspiration for a career in science. Compare the requirements of STEM professions. Understand you could be the next scientist to solve 	
What did we learn? Tracking, and Photo Identification: • Scientists can track animals, such as using natural markings such as spots on eagle rays, to provide long-term, continuous information on the behavior and movements of individual animals or to make observations on	 Why am I learning this? Discover how the world around you works. Provide inspiration for a career in science. Compare the requirements of STEM professions. Understand you could be the next scientist to solve unknowns! 	
What did we learn? Tracking, and Photo Identification: • Scientists can track animals, such as using natural markings such as spots on eagle rays, to provide long-term, continuous information on the behavior and movements of individual animals or to make observations on the species as a whole.	Why am I learning this? • Discover how the world around you works. • Provide inspiration for a career in science. • Compare the requirements of STEM professions. • Understand you could be the next scientist to solve unknowns!	
 What did we learn? Tracking, and Photo Identification: Scientists can track animals, such as using natural markings such as spots on eagle rays, to provide long-term, continuous information on the behavior and movements of individual animals or to make observations on the species as a whole. Scientists use photo ID data to study animal populations, analyze what impacts humans might have on an animal population, and determine if there are enough individuals of a particular species in an area. 	 Why am I learning this? Discover how the world around you works. Provide inspiration for a career in science. Compare the requirements of STEM professions. Understand you could be the next scientist to solve unknowns! Share Your Skills Share with a friend or family member one new method you learned to understand why scientists need to track animals because the more we share, the more we care! Connect with us on Flipgrid (https://flipgrid.com/seatrek) to share your findings or submit any questions! 	

Real world applications?

- 1. What challenges did you have ID-ing the spotted eagle ray photos?
 - 1. If you didn't have any challenges, describe your strategies!
- 2. Which did you think was harder: ID-ing the heads or the pelvic fins? Why?
 - 1. Did you notice anything special about Round Two's photos in the pelvic fin grouping?
 - 2. Why do you think that's such a special case?
- 3. Ximena uses the pelvic fins to ID the rays used in her research. Why do you think she only uses this area of the body?
 - 1. What do you think could be some benefits or some challenges only using the pelvic fins?
- 4. Do you think anything can alter the data?
 - 1. Do you think the spots can change? Do you think anything could change the spot pattern?
- 5. What do you think are some limitations to tracking animals using photo ID?

Observation Notes



Spotted Eagle Ray Diagram



Teacher: MML, SDRP, CZS

<u>First Grouping (head photo):</u> <u>Round One:</u>

(Spotted Eagle Ray Capture Dates: 23Apr10; 31May11; 04Oct11; 27Oct11)











<u>First Grouping (head</u> <u>photo); Round Two:</u>

(Spotted Eagle Ray Capture Dates: 22Jul09; 27May10; 02Oct09; 12Jun12) Teacher: MML, SDRP, CZS

<u>Second Grouping (head</u> <u>photo); Round One:</u>

(Spotted Eagle Ray Capture Dates: 21Jul09; 30Jul09; 28Aug09; 29Jul10)











<u>Second Grouping (head</u> <u>photo); Round Two:</u>

(Spotted Eagle Ray Capture Dates: 11Aug09; 22Jul09; 09Sep09; 22Apr10) Teacher: MML, SDRP, CZS

<u>Third Grouping (pelvic</u> <u>photo); Round One:</u>

(Spotted Eagle Ray Capture Dates: 28Aug09; 29Jul10; 21Apr11; 26May11)











<u>Third Grouping (pelvic</u> photo); Round Two:

(Spotted Eagle Ray Capture Dates: 16Sep09; 01Jun10; 16Jun11; 21Jun11)



