**Bird Species Study**

**Heredity and Inheritance of Traits and Biological Evolution: Unity and Diversity,**

**Driving questions of unit:** Kid friendly **“*Did you ever wonder what the Red Winged Blackbird's epaulet was FOR?”***

***NGSS question addressed: How do physical features within bird species help them survive and reproduce?***

**Subject:** **Biological Evolution: Unity and Diversity**

***field trip lesson two and follow-up***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Question(s)*** | ***Phenomenon*** | ***Scientific Practice(s)*** | ***What We Figured Out***  ***(DCI) - (CCC)***  ***Common Core)*** | ***Learning goals***  ***(Learning Performances)*** |
| *3. What do we observe in the RBB’s behavior and habitat?* | ***The wetland landscape is varied and diverse.*** | *Plan and conduct an investigation*  ***The RWBB’s behavior and habitat can help us answer and evaluate questions and claims*** | **TS1.B: Developing Possible Solutions**  Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2)  *“We can be scientists and make observations and collect data”*  **ccc.scale,proportion and quantity** | Students will collect data about behavior and the habitat of the RBB while on a field trip in a wetland. |
| ***Follow-up***  ***Questions:***  *What do our observations tell us?* | ***Red-winged blackbirds do unusual things in their environment.*** | *analyze and interpret data.*  *make a claim about the merit of a solution to a problem* | *“Based on what we observed, some of our claims can be adjusted, discarded, or added”* | Students create explanations based on their collected evidence about how animal behavior affects survival based on evidence and prior knowledge |

**Grade Level: 3**

**Subject: Biological Evolution**

Driving question of lesson: *What do we observe about the habitat and features of the RWBB?*

**Topics:**

**Biological Evolution:** LS4.B: Natural Selection: Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)

**Author: Miller and Severson**

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**Lesson Summary**

**Students will use a map of the wetland to record RWBBs, their behavior, nest sightings, and other natural features of the wetland (trees, area of long grass, etc).**

**Learning performance goals:**

Students will collect data about the observable actions and behaviors of RWBB and of the different features of the wetland, where they observe RWBBs. They will write and draw about the experience and look for patterns in the behaviors.

Evidence: Students will have detailed observations and features of the wetlands placed on the correct areas on their maps.****

**Technology, Social Studies, art, music**

Students will use technology to observe the phenomena. They have a choice to use technology and/or art in their presentations and models

**Time Required:**

Field trip and 30 minute follow-up

**Materials:**

* Chart with claims and evidence from lessons A and B. Or you can use [this slideshow](https://docs.google.com/presentation/d/1IaKsu2rEMHBydjUKQNV4vth3DgXLuP-o51NCnj-884Q/edit#slide=id.g36bec3a568_0_5) (slide 5)
* Large map of wetland with different areas marked off and numbered 1-5 with one area that is has most of the body of water in it (if possible), another with primarily grassland, another more in the woods, another with the parking lot, etc so that the areas can be contrasted and compared based on the physical natural features of each area for display and discussion
* Students’ copies of maps with their observational notes
* Large poster paper or videotape equipment or student notetakers for documentation of reasoning and evidence,
* Students’ science notebooks and writing utensils

**Preparation:**

* If you are going on a field trip to a marsh, get a map from google maps to use. If you will be going on a neighborhood bird watching trip, then you can print a google map of the area around the school. You will want one big map for the whole class and smaller ones for student pairs.

**Lesson Plan**

Introducing the Activity:

**Preparation:** During this introductory lesson, students will go on a field trip (or a neighborhood bird walk paired with a virtual field trip) to a wetland area. They will use their maps and notes to ‘think like a bird’ during this field trip; they will determine if there are ‘better areas’ to build a nest (based on food sources readily available, places to build a nest, areas with better visibility, and places to hide in case of predators). They will take notes of all observations they make and fill in the map with features of the landscape they notice.

***prep for observations:*** *If there hasn’t been a specific lesson on observations, it’s a good idea to do this beforehand. Model with a picture or a brief movie how you would do observations. Remind them that this is not what the viewer is guessing about, but only what the viewer actually sees and observes. Show them how to draw a brief drawing and that you can write just a couple of words, as long as the writer knows what it means. Show a brief movie or even a picture and ask the students to do observations for five minutes. Then, at the end of this time, showcase some of the observations and ask students for input about what was included and not included in the observations. It may also be helpful to show two very different observations so students can see the various ways observations can be done. Pick one with quick drawings and few words that can still demonstrate the meaning. This may need to be repeated more than once before the field trip.*

**1.** Before the field trip, hand out maps of the wetlands to each student. (If there is no access to natural areas to watch bird behavior, a video on RRWB behavior can be shown. if there is no wetland nearby, a map to a more distant wetland could be utilized or an invented map to foster discussions and adhere to the learning objectives). On the map, mark areas - areas 1, 2, 3, 4, 5 with boundaries that will be visible to the students as they walk. The areas should have different features in them, such as a river or stream, a woods, high and low grass, etc. Tell and show the students the type of place where Red-Winged Blackbirds build their nests (in the long grass) and what kinds of foods they eat (fruits, insects, seeds). Students will work together in small groups to brainstorm all of the possible places each food source can be found (e.g., insects can be found on and near the water and also under tree bark.) When the large group comes together, the best places for each food source is circled on the enlarged classroom map. Model and then have students demonstrate how they would take notes about what they see. They can draw symbols on the map or write notes on the page. The most important thing is that what they choose to do or write about their observations is understandable to them. Stress that any behavior should be noted as well as where the RWBB was and what was around it. Also it’s important to write down how many RWBBs they see, where they are, and what they are doing.

2. Say, “Last class, we looked at the epaulet of the RBB and made claims based on evidence about how this might help them in reproduction, survival, and finding mates. (Show chart from [last time](https://docs.google.com/document/d/1524_8e_wdyM5nRpxN1iSVbNR_1N1skLCzfVmjeqlR_Q/edit)). We started our ‘science story’ with this statement . (***The male RWB is displaying his epaulet because… my evidence is…).*** Read statement made from last class together. On our field trip, we’ll be observing the habitat of the RWBB. We’ll be taking observational notes that may help us cross out some of these reasons and add or change others.

Today, when we go on the wetland field trip, we’ll be ‘thinking like birds, or like biologists, or animal scientists’. We’ll be looking at different areas of the wetland and thinking about whether the area has food, how many places there are to build a nest, hide from danger, and watch for danger. Every observation you make could help us determine our question from last time: ***How does the epaulet help a bird in survival, finding a mate, or in reproduction***?.”

3. On the field trip, students should bring their maps, clipboards and pencils with them to write notes about what they see and observe *(or optional observation sheet see materials)* in the different areas of the wetland. A student or the teacher should also bring along a video camera and take videos of the RWBB whenever one can be seen.

**Follow up**

1. When the students arrive back to the classroom, ask for observations from the students. Students can take turns, where one student is stating an observation while the next one draws or writes it down on the large class map. This could also be done in partners or groups of three so more students can be active at a time.

2. In pairs, students will partner share observations and questions. Remind students that scientists can look for patterns in nature to answer questions about something. Give them an example (or have a student give an example) of a pattern observed on the field trip. Explain that his information can help evaluate the claims in order to change them, discard them, or keep them the same.

Some possible questions to focus on: which areas did they see more RWBB? What areas did they think were the best for them? Did the RWBB use its epaulet in different ways? Did the students observe any unusual behavior?

Students should partner-share for a few minutes. Afterwards, close the discussion and pick people to share.

***After and during the field trip, you made observations and wrote your notes about what you saw in each area.***

*Bring out the chart from the lesson one and go over what the students thought and what they predicted they would see or observe while on the field trip. Tell the students that scientists are just as happy to have a claim proven wrong as to have one supported with evidence. Discuss the claims in light of the evidence one by one. This should be done as a class.*

***Example of possible chart revisions***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| epaulet is used to | category | evidence | what we would see | other information |
| ~~scare off predators~~ | survive | I know the monarch butterfly uses its colors to warn predators  We didn’t see any predators around when the RWBB was flashing its epaulet. | RBB flashing its epaulet whenever a predator (like a fox) would come by | They would not flash it when there wasn’t danger  They could make noises too, to scare away predators |
| attract females | reproduce  Find a mate | I know that the cardinal uses its color to attract females | RBB flashing its epaulet when females are around | Might happen more in the spring |
| find food | survive | The owl uses its eyes to find food | Bugs flying around the epaulet | the RBB eating |
| warn other RWBB to stay away | reproduce  Find a mate | When the bear shows its teeth to other bears, it warns them to keep away. We noticed that all the RWBBs were far apart from each other. | RWBBs scaring other RWBBs away or fighting. |  |

Model with the claim on the board. Was there any evidence that was observed on the field trip that showed that this claim might be true? Anything that would show that it was not true?

***The male RWB is displaying his epaulet because… my evidence is… (evidence would be from experience or discussion).***

***(possible sentence example)***

***The male RWBB is displaying his epaulet because*** *it wants to warn other RWBBs to stay away because it wants more room****… My evidence is….*** *This is like other animals because when bears show their teeth, they warn other bears to stay away.*

Based on what the students say, add or cross out or make changes to the claim. You may need to use some other examples from the students. Remind them that in science, you are telling a story. Last class, the students made models of their own claims with a drawing. They should use their observations to either change, adjust or add to their own claims. They can work in language groups, groups based on their claims, partners or independently.

Students should write for 10-15 minutes. Invite one or two students to share.

**wrap up:** Today we made observations of the habitat and behavior of the RWBB. We then adjusted and changed our claims by adding evidence.

**Formative assessment:**

Students hold up one finger if they feel that their claim was supported by evidence, two fingers if it was adjusted by evidence, and three fingers if their claims were erased by the evidence.

**Commonly Held Student Ideas**

* <http://assessment.aaas.org/misconceptions/ENM029/264>

**Differentiated instruction:**



Differentiated instruction includes modifications as specified in the IEP. These differentiations for delivering instruction and engaging with content material are available as needed for all students to meet grade level standards. They fall into three categories Sensory, Graphic and Interactive supports. Other modifications to assignments, such as modifications to print size, larger spaces for writing, dictation, etc., are included in a case by case basis

|  |  |  |
| --- | --- | --- |
| **Sensory Support** | **Graphic Support** | **Interactive Support** |
| **✓Real-life objects (*realia*)** | **✓Charts** | * **In pairs or partners** |
| **Manipulatives** | **Number lines** | * **In triads or small group** |
| **Pictures and photographs** | **Tables** | **Using cooperative groups structures** |
| **Illustrations & diagrams** | **Graphs** | **Using the Internet or software programs** |
| **Magazines & newspapers** | **Timelines** | **In the native language** |
| * **Physical activities** | **Graphic Organizers:** | **With mentors** |
| **✓Video/films** | **Other Engineering model** | **✓sentence starters** |
| **Broadcasts** | * **Maps** |  |
| * **models and figures** |  |  |

Extensions

* Parents, after-school staff, invited to take a wetland walk with students
* Students observe behaviors of birds on school playground/field
* Students read Burgess Book for Children by Thorton W. Burgess
* Read aloud: Frightful’s Mountain by Jean Craighead George

**Teacher Content Background**

”Wetlands are the link between land and water, and are some of the most productive ecosystems in the world. Some common names for different types of wetlands are swamp, marsh and bog. Depending on the type of wetland, it may be filled mostly with trees, grasses, shrubs or moss. To be called a wetland, an area must be filled or soaked with water at least part of the year. Some wetlands are actually dry at certain times of the year!

Wetlands have many important functions that benefit people and wildlife.

Provide habitat for a wide variety and number of wildlife and plants.

Filter, clean and store water - in other words, acting like kidneys for other ecosystems!

Collect and hold flood waters.

Absorb wind and tidal forces.

Provide places of beauty and many recreational activities

Wetlands also act like sponges by holding flood waters and keeping rivers at normal levels. Wetlands filter and purify water as it flows through the wetland system. Plants found in wetlands help control water erosion.”

-- *quote verbatim from* [www.defenders.org/wetlands](http://www.defenders.org/wetlands)