**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?***

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| ***Question(s)*** | ***Phenomenon*** | ***Scientific Practice(s)*** | ***What We Figured Out******(DCI) - (CCC)*** ***Common Core)*** | ***Learning goals******(Learning Performances)*** |
|  *Does better territory mean more eggs?*  | ***In certain parts of the wetland, there were more birds and more nests.*** | *represent data in tables and graphical displays* | **LS4-2 Differences in the territory of the RRBB can help them reproduce.**“Area \_\_\_\_\_ was better for nests. It had an average of \_\_\_\_\_ more eggs than area \_\_\_\_\_. “ccc. cause and effect  | Students will create a graph of nests in chosen areas and tabulate the average number of eggs for each territory. They will discover that territory has a correlation to the number of eggs for each male’s claimed territory.  |

**Grade Level:** **3**

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

Driving question of lesson: *Why is territory important?*

**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)

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**Lesson Summary**

Students will simulate the nesting habits of the RWBBs. They will use a chart with the average number of eggs per bird to discern whether a higher quality territory means more offspring.

Learning performance goals: Students will create a graph of nests in chosen areas and tabulate the average number of eggs for each territory. They will discover that territory has a correlation to the number of eggs for each male’s claimed territory.

Evidence: By the end of this lesson, students will be able to explain using a map and a graph that there is a relationship to the number of eggs a male RWBB has and the quality of his territory .



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

Students will use technology: video, ‘Educreations’ for example, to record events and observations.

**Time Required**

60 minute lesson.

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| **Materials*** Maps of wetland field trip with areas sectioned off with the notes the students took about the different areas (one for each group, or one for the whole class),
* props of birds if necessary to aid understanding
* nest ‘symbols’ to tape onto the maps for each ‘female’
* Ipads or video cameras for recording
* science notebooks and pencils
* reference materials about red-winged blackbirds.
 | **Preparation*** Decide where in the room you will have the different areas for the birds to make their nests. An example could be on the rug, by one of the tables, on the floor and by the door, for example.
* Do a private run-through of what this role-play might look like beforehand
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**Teacher Procedures: **

1. (Bring out the sentence co-created with the class during the [last lesson](https://docs.google.com/document/d/1KokmUoP-nnKoECvyVbs5VJpLZzez-Lz2pOxGmMEobXg/edit). (On the [slideshow](https://docs.google.com/presentation/d/1IaKsu2rEMHBydjUKQNV4vth3DgXLuP-o51NCnj-884Q/edit#slide=id.g36bec3a568_0_13) it is slide 6) It should say something about how most RWBB keep their territory when they have epaulets and that the ones who had their epaulets ‘blackened’ lost their territory. It should also say which territory is the best for building a nest and why from the last lesson). Ask a student to summarize the ‘story’ so far.
2. Say: We know that the birds who have epaulets are the males. Today we’re going to look at why the territory is so important to them. Today we will investigate how the nesting part of the life-cycle works with the female red-winged black birds. We are going to act out what happens and then discuss how certain factors become more or less important to the survival of each individual bird due to how they choose where they will build their nest. Scientists often need to model their thinking and have many different ways to do this. In class, we will act out, using the maps and our field trip observations, to find out what might be happening.
3. In the room, create the ‘areas’ that have been marked in the front of the room with tape or landmarks in the room. There are other possibilities to simulating the nesting habits: Another way is to have large copies of the map for groups of three of four and the students can use props, such as the cut out birds to use to determine where the nests will be built. The groups document their decisions, by writing notes to share with the class when done, or videotaping their discussion. If the class decides to do it whole-group, the entire simulation should be videotaped. The teacher can decide who will be the female birds and the male birds. This need not be based on the genders of the students.
4. Tell the students that there are two waves of red-winged blackbirds into the wetlands: first the males come in and choose their territory. Next the females come in and choose their nesting sites. The females do not pay attention to the males at all, but decide to put their nests in the area they think is best. The male who has claimed that territory will be the father all of the chicks whose nests are in that area.
* The ‘females birds’ leave the room while the ‘males’ choose their territories. While they are choosing, they should be given some time to explain why they are choosing the area. This is recorded secretly on a piece of paper. The ‘males’ sit down. Then the ‘females’ come in and choose where to build their nests
1. Rules for deciding where to build the nest:
* Nests need to be far enough away from each other so that there is enough food sources for each, but they do not all need to be in different areas.
* The female birds should decide where to build their nests independently, based only on what they think is the best place to build it for the survival of their chicks.
* Once they are decided, no one is able to move their nests from their chosen area. They may move them slightly so that they are far enough away from the other nests, however.
* Once the nests have been decided, the ‘males’ claim their territory.

*Note: These rules are also on the* [*slideshow*](https://docs.google.com/presentation/d/1IaKsu2rEMHBydjUKQNV4vth3DgXLuP-o51NCnj-884Q/edit#slide=id.g36bf76825b_0_76) *slide 15*

 4. Once all of the nests have been recorded, all of the groups (if there is more than one) will share their ideas by sharing their videotape or educreations. Each group will share their process with the class either by showing the videotape of their simulation, or by showing the videotape of their educreations design. Discussion should be encouraged and supported. After each one, the students can weigh in with the end results, or interesting points about their decision making process. They can also ask questions for clarification or understanding.

 5. **Possible teacher prompts:**

* What do you think would be different about the baby chicks in each area?
* Which area do you think would have the most birds live until adulthood? Why do you think that?
* Does where you decided to put your nests look similar to where we found nests on our field trip?
* Why do you think a RWBB would want a river (or a tree, or a lake) by their nests?
* Which area do you think would be best for spotting predators? Which area would be best for hiding a nest?

 6. Ask a student to look up in a reference book or online how many eggs each female lays. It will be 3- 5 eggs. This can be averaged out to four. (Students in third grade do not know how to calculate averages yet. It can be done together as a class, or an ‘in between’ number can be chosen). Have the students calculate how many chicks are hatched from each area. (math connection to multiplication and repeated addition).

7. Return to your ‘story’ on the board:

***The male RWB is displaying his epaulet because it doesn’t want to lose its territory and it wants the best territory for making nests and having chicks. The best territory has high grass so the nest can be hidden with only a few trees so the bird can spot danger from far away and water nearby so there is a lot of bugs my evidence is…scientists from Stanford found that when they blackened the epaulets, most of these birds lost their territory. And birds with the best territory have more nests and more eggs.This is like other animals because when bears show their teeth, they warn other bears to stay away.***

8.. Question for their science notebooks: ***How territory important to the survival of the Red-Winged Blackbirds?***

**Wrap up:** Today we looked at why the territory was so important to the males RRBB. We found that the females put their nests in the best territory and that the male who has claimed that territory gets to be the father of all of the chicks in that area. We learned that the females put their nests in the best territory. This means that the male with the best territory has more chicks.

**Formative assessment : www.**gosoapbox.com for multiple choice quiz

code: 706-132-470 quiz title: nesting (the teacher can also use the science notebooks to check for understanding).

**Commonly Held Student Ideas**

* [http://assessment.aaas.org/misconceptions/ENM](http://assessment.aaas.org/misconceptions/ENM029/264)

**Differentiated instruction:**

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| **Sensory Support** | **Graphic Support** | **Interactive Support** |
| **Real-life objects (*realia*)**  | **✓Charts** | * **In pairs or partners**
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| **Manipulatives** | **Number lines** | * **In triads or small group**
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| * **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**
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**Teacher Content Background **

There are many species of Red winged black birds that live all over the world. Most live in wetlands. They are related to black birds, which live less often in wetlands. Red winged blackbird males arrive first to the wetlands to stake out their territory before the females arrive to build their nests.

Red-winged black birds are polygamous and can mate with as many as 15 different females in one mating season.

Territory is important, because the females do not choose to nest based on any characteristics of the male, but by the quality of the land and availability of food.

**References: (web sites)**

*The national Audubon Society*

*Journey North Red winged black birds*

*Wild birds unlimited*