**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)*** |
| *6.How can we design a solution for ourselves that would work like an epaulet and warn others when we want to be alone but can also change to show others that we ‘are friendly and want to play?* | ***Red-winged blackbirds sometimes fly and look for food in groups*** | *design solutions*  | **LS2-1 The RWB challenges birds sometimes for food, land, or mates, but at other times needs to be in a group. He changes his behavior for these two situations. .** “I needed to change/adjust/discard my claim because …” ccc. cause and effect  | Students will construct model for themselves that will mimic an epaulet to show that they are ready to work or play in a group or not.  Students will witness the natural design of the RWBB and compare it with their own designs.  |

**Summative assessment question:** Design a solution for a third grader that will mimic the epaulet but will have some way to show when the third grader is ready to work or play in a group.

**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** 

Summative assessment where students design an instrument for themselves so that they can have a ‘patch’ to warn others to ‘stay away’ AND also tell students when they want to work in a group.. After design, students learn RWBB’s ability to ‘cover’ their epaulet when they want to work in groups.

**Learning performance goals:**

Students will use design an ‘epaulet’ for themselves so they can send a non-verbal message others to stay away (when they want time alone) but also have some ability to communicate friendliness so that they can work in groups when necessary for survival. Understanding of concepts will be used for summative assessment.



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

Students will use technology to observe the phenomena. Students will use [educreations](https://www.educreations.com/features/) (an App that allows teachers and students to create dynamic videos with commentaries) if possible to explain their drawing and their ideas with the class. Students can use the powerpoint or create a flowchart to share with other classes. Students will use art or other materials to design their solution.

**Time Required**

60 minute lesson.

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| **Materials*** ipads and video playing equipment
* materials for creating their engineering design
* papers for drawing and explaining solutions
* large version of ‘science story’ for the class
* materials for writing and drawing
* [Student Sheet](https://docs.google.com/document/d/1Rlr_67Zc45AxS8Ue06zpDdrWyH0VfPbHwyOpgSs0_9w/edit)
 | **Preparation*** Gather odds and ends and craft materials for this project, the more variety the better.
* Make enough copies of the [Student Sheet](https://docs.google.com/document/d/1Rlr_67Zc45AxS8Ue06zpDdrWyH0VfPbHwyOpgSs0_9w/edit) so that each student or student group can have one.
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**Teacher Procedures:** 

1. Bring out finished ‘story’ of the RWBB from previous lessons. (On the [Slideshow](https://docs.google.com/presentation/d/1IaKsu2rEMHBydjUKQNV4vth3DgXLuP-o51NCnj-884Q/edit#slide=id.g36bf76825b_0_76) it is slide 6)

(example of possible lesson ‘story’)

***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.***

Read it aloud with the class. Discuss in small or large group or think-pair-share what this means briefly.

1. Ask for ‘popcorn share’ (students share out at the same time without raising their hands) if they can think of a time when it would be necessary for a RRBB to work in a group with other RWBBs. Write these ideas on the board. Ask the kids if there are any that also apply to them at recess or at school.
2. Say, let’s pretend that we all of epaulets to show when we want to be left alone. Can you think of a time this might be helpful? (Get some ideas). I’d like you to design a communication device in your groups that you could use to tell kids when you want to be left alone, but also have something you can change so that others can know when you are ready to play and work in a group. A dog, for example, uses its tail to signal danger but can also wag it to tell others he’s friendly.
3. Get ideas some ideas from others about what this could look like. Model the engineering piece with one of the students’ ideas. Students can work in groups or independently. This would be great to have on educreations (if students have access to an ipad) so that they can record their ideas and their drawings simultaneously .

|  |  |
| --- | --- |
| my design  | how does this work?  |
|  |  |

1. Students share engineering designs with the class. They can take questions or comments when finished.
2. Your ideas were great! Did you know that RWBB also have a sign to show others when they want to work with them? Show the video from the field trip of red-winged blackbirds covering their epaulet. Next, show the video from the medias <https://www.youtube.com/watch?v=c0Lw23yQFwQ> from 2:30 - 2:50 without sound.
3. Think-pair-share what they noticed. Compare the real ‘natural engineering’ with the ideas from the class. Was it similar to any of the students’ ideas? How was it different?

8. Finish your ‘science story’ with a last sentence.

**When RWBBs need to work in groups to survive, they …**

possible example of ‘finished science story’

***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.***

***. When RWBBs need to work in groups to survive, they cover up their epaulets with a piece of black feather.***

**Wrap up:** Students create a poster, a powerpoint, or a flowchart to show to another class what they’ve learned about RWBBs, including their engineering design and the natural engineering version.

**Assessment:**

**On-going assessment of discussion (speaking and listening) rubric**

**Formative assessment:**

Pass out post its at the end of the class so that kid can put ‘gots’ on one and ‘needs’ on the other.

As they leave, they can put these on the board. You can ask them to put their names on the underside if you’d like to see who said what.

This will give you a quick overview of the understanding of the students.

 **Assessment of science journal entry with adjustment to new evidence**

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| **component** |  1 |  2 |  3 |  4 |
| **need for revising claim and or model/ and or connections to or questions about everyday life** | Student does not question accuracy of what they produce | Student questions accuracy when prompted | Student sees the need for revision of questions, connections, model or claim and explains why | Students see the need for revision and takes steps to revise |

**Commonly Held Student Ideas**

* [http://assessment.aaas.org/misconceptions/EN](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

|  |  |  |
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| **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**  | **✓powerpoint** |
| * **models and figures**
 | **✓flow charts**  | **✓educreations** |

**Teacher Content Background** 

Red-winged black birds often look for food in groups, when they do this, they hide their epaulets by covering them up with adjacent black feathers to signify that they are not engaging in territorial/threatening behavior.

**References: (web sites)**

*The national Audubon Society*

*Journey North Red winged black birds*

*Wild birds unlimited*

 **Assessment of engineering design**

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| **component** |  1 |  2 |  3 |  4 |
| **Making connections within the whole science unit create solutions**  | **Student needs support to create a solution that incorporates understanding from the unit. .**  | **Engineering solution does not incorporate understanding from the unit**  | **engineering solution incorporates some understanding from the unit.**  | **engineering solution incorporates understanding from the unit and can apply this to real world understanding.**  |

 **Assessment of science journal entry to incorporate all of the lessons**

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| --- | --- | --- | --- | --- |
| **component** |  1 |  2 |  3 |  4 |
| **Making connections within the whole science unit to draw conclusions.**  | **Student needs support to make connections of the larger picture of the science concept.**  | **Student has some understanding about how the size of the epaulet relates to the number of chicks the male fathers.**  | **Student can articulate how the size of the epaulet relates to the number of chicks the male fathers** | **Student can articulate how the size of the epaulet relates to the number of chicks the male fathers *and* can connect this information to another similar phenomena in nature.**  |