Overview of Lesson:
Unit 1: Relationships in Habitats
2-LS4-1 Make observations of plants and animals to compare the diversity of life in different habitats.

Instructional Days: 15

In this unit of study, students develop an understanding and compare the diversity of life in different habitats. The crosscutting concepts of cause and effect and structure and function are called out as organizing concepts for these disciplinary core ideas. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas.

This unit is based on 2-LS4-1, 2-LS2-1, 2-LS2-2, and K-2-ETS1-1.

Observations of Birds and their Habitats
Lesson Summary:
Students compare the diversity of life in different habitats. Students will plan out what birds need in order to survive in their natural environment and how they can help birds thrive with their help of resources such as bird feeders, and bird seed placed in an open space. Students demonstrate grade-appropriate proficiency in planning and carrying out investigations and developing and using models. Students are also expected to use these practices to demonstrate understanding of the core ideas Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool Students will investigate where on the school grounds (courtyard) where is the best place for birds to migrate and help to help plants grow by spreading the plants' seeds, pollinating the plants themselves, and also by eating insects that are pests to plants. Students will sketch parts of a bird and predict the cause and effects of birds and how they can help plants grow by spreading the plants' seeds, pollinating the plants themselves, and also by eating insects that are pests to plants They will create bird feeders out of recyclable paper tubes and add peanut butter and protein bird seed and observe to see which birds actually are eating the bird seed and see what happens next. They will also go on a walk through to the grounds and collect twigs to use as perches to add to the feeders. Prior to this students have researched what birds are in our area and will identify the birds using the SeekiNaturalist App. They will go outside and investigate if the birds have eaten the food and if the birds will be seen more in the courtyard once the plants are planted shortly. Students will also carry out investigations of wildlife in the courtyard using a hummingbird feeder to see if the hummingbirds enter the courtyard and start eating the food in the feeder.

What it Looks LIke in the Classroom:
In this lesson of study, students explore and compare the diversity of life in different habitats.
To begin this unit's progression of learning, students observe a variety of birds from a variety of habitats in order to compare the diversity of life. Using firsthand observations and media resources, students explore and collect data about different habitats that exist in the world and how animals have structures that help them survive in their habitats. Students need many opportunities to observe many different kinds of living things, whether they live on land, in
water, or both. As students learn about the diversity of life, they begin to look for patterns and order in the natural world. As scientists, students will begin to notice patterns in the structures that enable organisms to support their existence in specific habitats. For example, webbed feet enable survival in wetlands; gills enable survival in rivers, lakes, and oceans; and blubber enables survival in polar regions

Students need opportunities to observe how living things thrive in their natural habitats.They will observe birds in wildlife and see which birds come to garden and eat off of student made bird feeders or if hummingbirds come to the garden and eat from the humming bird feeder.
They begin to understand that all cause-and-effect relationships generate observable patterns. investigations and collect data, which should be used as evidence to support the idea that all events have causes that generate observable patterns. Students will use a KWL Chart prior to investigating the benefits of birds in a garden and what kind of birds are in our area Birds of Monmouth County.
Finally, students investigate the roles that animals play in plant reproduction. Students learn that many types of plants depend on animals for pollination and/or for the dispersal of seeds.The birds help fertilize plants in the same way as any other pollinator—by transferring pollen (via their bills) from one flower to another as they flit between plants feeding on nectar As students begin to explore the interdependent relationships among plants and animals, they learn that the shape and stability of the structures of organisms are related to their function. For example, birds can help plants grow by spreading the plants' seeds, pollinating the plants themselves, and also by eating insects that are pests to plants. Healthy trees can be full of beetles, worms, caterpillars and other insect larvae. These serve as nutrition for birds and small organisms. Birds are very important pollinators of wildflowers throughout the world. All the animals that eat trees and need shelter will slowly disappear because of human interference. Planting them and protecting what we have has to be our primary goal. The birds help fertilize plants in the same way as any other pollinator—by transferring pollen (via their bills) from one flower to another as they flit between plants feeding on nectar. Bird pollination mainly occurs in tropical regions, where they help pollinate a few food crops, including bananas, papaya and nutmeg. Students will learn how birds are pollinators in plants in our school garden. Birds are very important pollinators of wildflowers throughout the world. In the continental United States, hummingbirds are key in wildflower pollination. In other areas, honeycreepers (Hawaii) and honeyeaters (Australia) are important pollinators. Students will understand that birds eat certain pests, such as slugs, that feed on your vegetable plants, causing more damage than birds. Certain varieties of birds, such as hummingbirds, orioles, robins, finches and buntings, also help pollinate crops, which can encourage a higher yield of vegetables.

Animals eat fruits containing seeds, which are then dispersed through animals' body waste.
Second graders will need multiple opportunities to develop an understanding of the important relationship between structure and function, because they are expected to use engineering design to plan and develop simple models that mimic the function of an animal in dispersing seeds or pollinating plants. Students can use sketches, drawings or physical models to illustrate how the shape of the model helps it function as needed, and they should use evidence to support their design choices. Some common examples of models could include the following:
Using Velcro "seeds" and furry material to model how seeds with hooks adhere to animal fur.
Using pipe cleaners to gather and distribute "pollen" in a way similar to bees pollinate flowers.
In this unit of study, students learn that designs can be conveyed through sketches, drawings, or physical models, and that these representations are useful in communicating ideas for a problem's solutions to other people. As described in the narrative above, students develop simple sketches, drawings, or models that mimic the function of an animal in dispersing seeds or pollinating plants in order to illustrate how the shape of an object helps it function as needed to solve a given problem.

Connecting with English Language Arts/Literacy and Mathematics
English Language Arts/Literacy
English Language Arts can be leveraged in this unit in a number of ways. Students can participate in shared research using trade books and online resources to learn

about the diversity of life in different habitats or to discover ways in which animals help pollinate plants or distribute seeds. Students can record their findings in
science journals or use the research to write and illustrate their own books. Students can also learn to take notes in their journals order to help them recall
information from experiences or gather information from provided sources. They can add drawings or other visual displays to their work, when appropriate, to clarify
ideas, thoughts, and feelings.

Mathematic

Throughout this unit of study, students need opportunities to represent and interpret categorical data by drawing picture graphs and/or bar graphs (with a single unit scale) to represent a data set with up to four categories. This will lead to opportunities to solve simple put-together, take-apart, and compare problems using information presented in these types of graphs. For example, students could create bar graphs that show the number of seedlings that sprout with and without watering or that document plant growth. They could also create a picture graph showing the number of plant species, vertebrate animal species, and invertebrate animal species observed during a field trip or in a nature photograph. As students analyze the data in these types of graphs, they can use the data to answer simple put-together, take apart, and compare problems. This unit also presents opportunities for students to model with mathematics. They can diagram situations mathematically or solve a one-step addition or subtraction word problems. Data collected in bar graphs and picture graphs can easily be used for this purpose.

Modifications

(Note: Teachers identify the modifications that they will use in the unit. See NGSS Appendix D: All Standards, All Students/Case Studies for vignettes and explanations
of the modifications.)

• Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
• Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations,
graphs, charts, data tables, multimedia, modeling).
• Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community
helping with a project, journal articles, and biographies).
• Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple
representation and multimodal experiences).
• Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their
understanding.
• Use project-based science learning to connect science with observable phenomena.
• Structure the learning around explaining or solving a social or community-based issue.
• Provide ELL students with multiple literacy strategies.
• Collaborate with after-school programs or clubs to extend learning opportunities.
• Restructure lesson using UDL principles (http://www.cast.org/our-work/about-udl.html#.VXmoXcfD_UA).

Research on Student Learning:

Lower elementary-school students can understand simple food links involving two organisms. Yet they often think of organisms as independent of each other but dependent on people to supply them with food and shelter. Students of all ages think that some populations of organisms are numerous in order to fulfill a demand for food by another population (NSDL, 2015).

Prior Learning:

• Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything
they do.
• All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

Connections to other Units:

The following connections to disciplinary core ideas in Engineering, Technology, and Applications of Science occur in Unit 2, Properties of Matter, and Unit 5,
Changes to Earth's Land.
• Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to
other people.
• Because there is always more than one possible solution to a problem, it is useful to compare and test designs.
• A situation that people want to change or create can be approached as a problem to be solved through engineering.
• Asking questions, making observations, and gathering information are helpful in thinking about problems.
• Before beginning to design a solution, it is important to clearly understand the problem.

Common Core State Standards Connections:

ELA/Literacy —
W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). (2-LS4-1)
W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (2-LS4-1)
Mathematics —
MP.2 Reason abstractly and quantitatively. (2-LS4-1)
MP.4 Model with mathematics. (2-LS4-1)
2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (2-LS4-1)

Science and Engineering Practices:

Planning and Carrying Out Investigations
Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide Science and Engineering Practices

Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.
Make observations (firsthand or from media) to collect data which can be used to make comparisons.

Connections to Nature of Science
Scientific Knowledge is Based on Empirical Evidence
Scientists look for patterns and order when making observations about the world.
Make observations (firsthand or from media) to collect data which can be used to make comparisons.

Disciplinary Core Ideas:
LS4.D: Biodiversity and Humans
There are many different kinds of living things in any area, and they exist in different places on land and in water.
LS2.A: Interdependent Relationships in Ecosystems
Plants depend on animals for pollination or to move their seeds around.
ETS1.B: Developing Possible Solutions
Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (secondary)

Crosscutting Concepts:
Cause and Effect
• Events have causes that generate observable patterns. (2-LS2-1)
Structure and Function
• The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2), (K-2-ETS1-2)

Connections to Nature of Science
Scientific Knowledge is Based on Empirical Evidence
• Scientists look for patterns and order when making observations about the world. (2-LS4-1)

Resources:
Who Needs What? Students identify the physical needs of animals. Through classroom discussion, students speculate on the needs of plants. With teacher guidance,
students then design an experiment that can take place in the classroom to test whether or not plants need light and water in order to grow. Students conduct the
associated activity in which sunflower seeds are planted in plastic cups, and once germinated, are exposed to different conditions. In the classroom setting, students
test for the effects of light versus darkness, and watered versus non-watered conditions. During exposure of the plants to these different conditions, students
measure growth of the seedlings every few days using non-standard measurement. After a few weeks, students compare the growth of plants exposed to the different conditions, and make pictorial bar graphs that demonstrate these comparisons. I Scream, You Scream, We ALL Scream for Vanilla Ice Cream!
In this lesson students design a vanilla plant pollinator. This is an end-of-the-unit task, taking about 3 days to complete. The students will view an amazing video that tells about

the problems with pollinating vanilla by hand. The students pretend to be employees of Ben and Jerry's ice cream company and help to plan and design a pollinator
for the vanilla plant so that the great vanilla flavored ice cream can continue to be produced. (This is the first of several lessons created by Jeri Faber on plant
pollination at: betterlessons.com/)

Building and Testing Our Vanilla Plant Pollinatorr: In previous lessons designed by Jeri Faber, students have learned about how animals help pollinate flowers. The
students have also planned and designed their own vanilla plant pollinator. In this lesson, students use the engineering design process to build and test the plant
pollinator they planned the day before in class.

Two Scoops Are Better Than One: This lesson is the second day of an end of the unit task to address the Performance Expectation: Develop a simple model that
mimics the function of an animal in dispersing seeds or pollinating plants. This end of unit task is expected to take 3-4 days to complete. In the previous lesson
(http://betterlesson.com/lesson/628130/i-scream-you-scream-we-all-scream-for-vanilla-ice-cream), the students were challenged to brainstorm their version of a
vanilla flower pollinator. For this lesson, students work with a partner to choose and develop their engineering plans by drawing a diagram for a vanilla plant pollinator. They also create a list of materials needed for the task.

Improving Our Vanilla Bean Pollinators This lesson is part of a series of lessons created by Jeri Faber on using the engineering design process to solve a problem. In the Ice Scream, You Scream We All Scream for Vanilla Ice Cream, the students were challenged to design a vanilla flower plant pollinator. For day 2, Two Scoops Are Better Than One, students worked with a partner to determine which design to build for their vanilla plant pollinator. For day 3, Building and Testing Our Vanilla Pollinators, the students constructed and tested the effectiveness of their pollinators based on the design plans. In this lesson, students improve their plant pollinator models and retest the pollinator's effectiveness

The Bug Chicks-Mission: Pollination (Episode 5): The Bug Chicks' five minute video provides a fun, animated way of learning about the fascinating world of pollination
and insects. In this video, the students observe interesting museums and habitats to look at lesser known insect pollinators. The student challenge at the end leads
students into their environment to look for other pollinators and encourage them to bring their observations back to the classroom to discuss.

Teacher Professional Learning Resources:
Teaching NGSS in Elementary School—Second Grade
The presenters were Carla Sembal-Saul, Professor of Science Education at Penn State University, Mary Starr, Executive Director at Michigan Mathematics and Science
Centers Network, and Kathy Renfrew, K-5 Science Coordinator, VT Agency of Education and NGSS Curator introduced the NGSS Web seminar Series for K-5
educators.
The seminar was introduced by Ted Willard, NSTA's Director for NGSS, on how Elementary School standards - and specifically for the Second Grade - fit into the
framework in terms of core ideas and performance expectations. Carla, Mary and Kathy engaged with participants to gauge their familiarity with NGSS for the second

grade, and provided a number of example activities and videos on how to implement it, e.g., explaining how solids and liquids respond in the presence of a heat
source. The web seminar was then wrapped up by Ted Willard, who suggested a number of resources and events for participants to further develop their
understanding of NGSS for the Second Grade, as well as other grade levels.
Continue discussing this topic in the community forums.

NSTA Web Seminar: Teaching NGSS in K-5: Constructing Explanations from Evidence
Carla Zembal-Saul, Mary Starr, and Kathy Renfrew, provided an overview of the NGSS for K-5th grade. The web seminar focused on the three dimensional learning of
the NGSS, while introducing CLAIMS-EVIDENCE-REASONING (CER) as a framework for introducing explanations from evidence. The presenters highlighted and
discussed the importance of engaging learners with phenomena, and included a demonstration on using a KLEWS chart to map the development of scientific
explanations of those phenomena.
Continue discussing this topic in the community forums.

NGSS Core Ideas: Earth's Systems
The presenter was Jill Wertheim from National Geographic Society. The program featured strategies for teaching about Earth science concepts that answer questions
such as "What regulates weather and climate?" and "What causes earthquakes and volcanoes?"
Dr. Wertheim began the presentation by introducing a framework for thinking about content related to Earth systems. She then showed learning progressions for
each concept within the Earth's Systems disciplinary core idea and shared resources and strategies for addressing student preconceptions. Dr. Wertheim also talked
about changes in the way NGSS addresses these ideas compared to previous common approaches.
Participants had the opportunity to submit questions and share
their feedback in the chat.
Continue the discussion in the community forums.

Seek iNaturalist App
https://youtu.be/ZBVVLTz4xuQ Pollinators and Our Garden
https://www.generationgenius.com/videolessons/pollination-and-seed-dispersal-video-for-kids/ Pollination and Seed Dispersal
Birds
All About Birds
Birds in Monmouth County
How to draw a bird easy for kids
Work Samples

app.seesaw.me/#/activities/class/class.ae1a9690-3

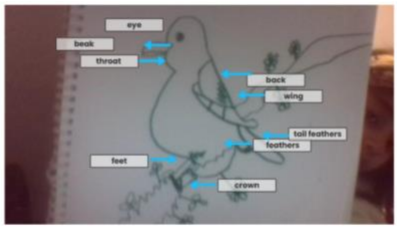
Apps Genesis Login to our Servic... Google Classroom

In response to: Parts of a bird

In response to: Parts of a bird

3 / 3

Add a photo of your bird and then label it



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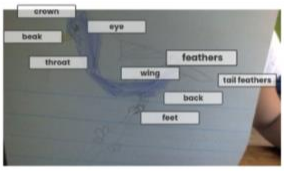
In response to: Parts of a bird

3 / 3

Add a photo of your bird and then label it



K-W-L Chart

Topic: Birds

What I Know	What I Want to Know	What I Learned
I know that birds can fly. and their over 7,000 spices of birds.	How are woodpecker beaks are so strong. What are woodpecker beaks made out of. And how are woodpecker beaks so strong able to break wood.	I learned that a american bird is the slowest land bird. ostrich is the fastest land bird because a american land bird can go three kilometers and the ostrich

K-W-L Chart

Topic: Birds

What I Know	What I Want to Know	What I Learned
Birds can make noises they can fly and they can use their beak to attack they looks like brown blue and black	Where do they live? Why do they make noises?when do they start eating?why do they attack people?	The fastest bird can go 400mph per hour the slowest bird can go 8mph per hour thats slow and ostanch are birds they cant fly but their fast they can go 70 mph per hour

K-W-L Chart

Topic: Birds

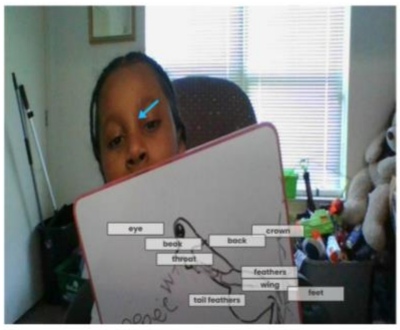
What I Know	What I Want to Know	What I Learned
Birds are noisy and some are mother and some birds have different kind fethr.	How many does the mother have baby birds?And why do birds need fethr? And how do birds fly?	I learned is that birds can flap the wings in 2000 time and birds can be in the

whysospecial.com

In response to: Parts of a bird

Add a photo of your bird and then label it

3 / 3



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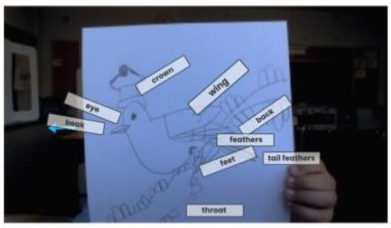
Like Comment

In response to: Parts of a bird

Add a photo of your bird and then label it

3 / 3



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Like Comment

K-W-L Chart

Topic: Birds

What I Know	What I Want to Know	What I Learned
Birds have feathers. **Birds can fly.** **Birds live in trees.**	**How many different types of birds are there?** **Can birds fly really high?**	Birds make all different types of sounds. Birds help plants pollinate.

whysospecial.com

In response to: Parts of a bird

Add a photo of your bird and then label it

K-W-L Chart

Topic: Birds

What I Know	What I Want to Know	What I Learned
Birds can lay eggs and eat worms and baby birds can eat worms and birds have feathers and the mom bird has to learn how to fly to the baby birds and it look like black and they can be a blue but just a little and they live in trees .	Why birds eat worms? How can birds fly ? Why do birds have peck? Why do birds are not scarce of highs? Why birds live in trees?	I learned that pidgin can swim fast than the fish and i learned that ochitch can run fast than the man with a bike.

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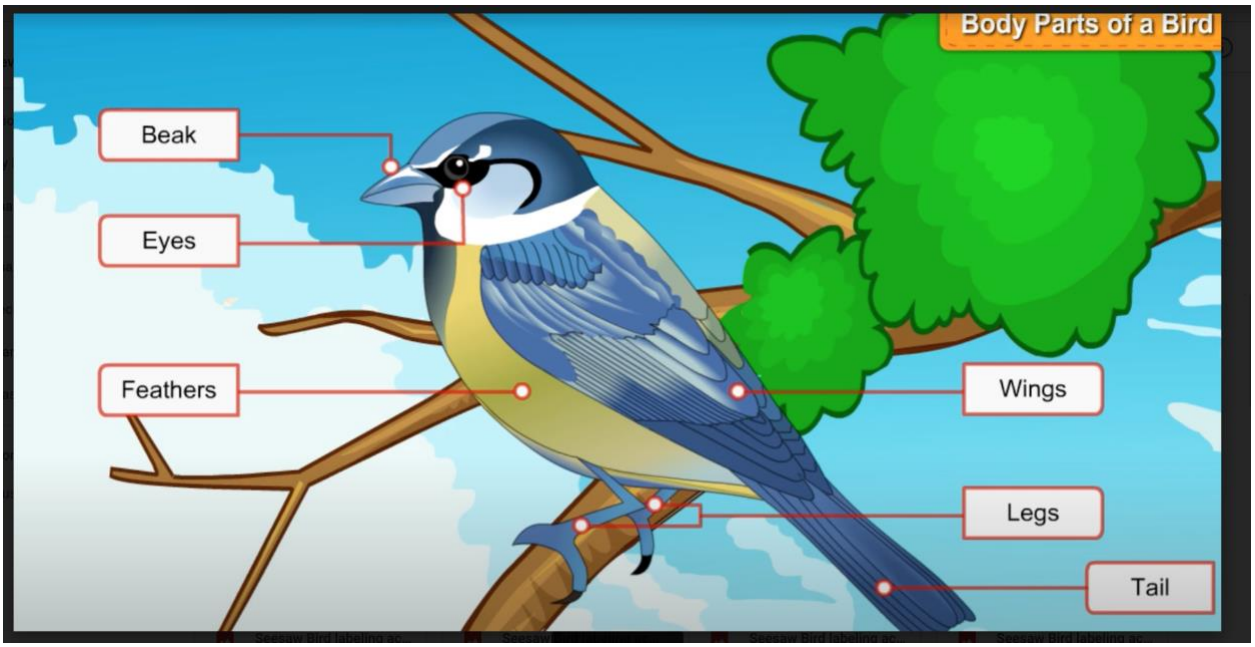
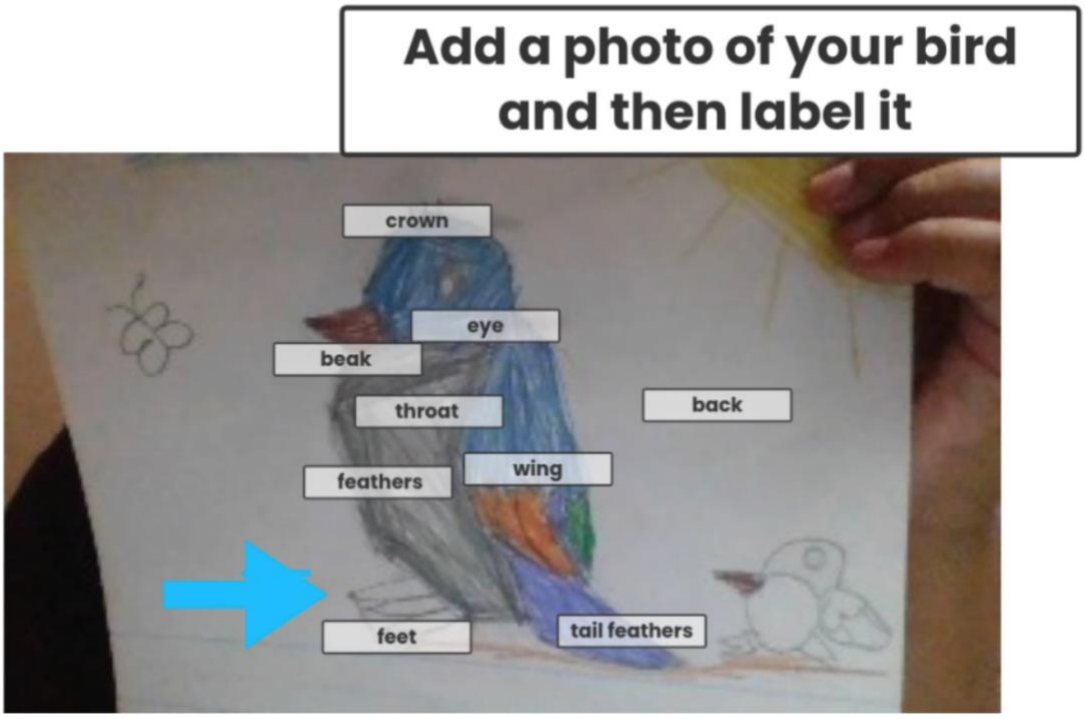
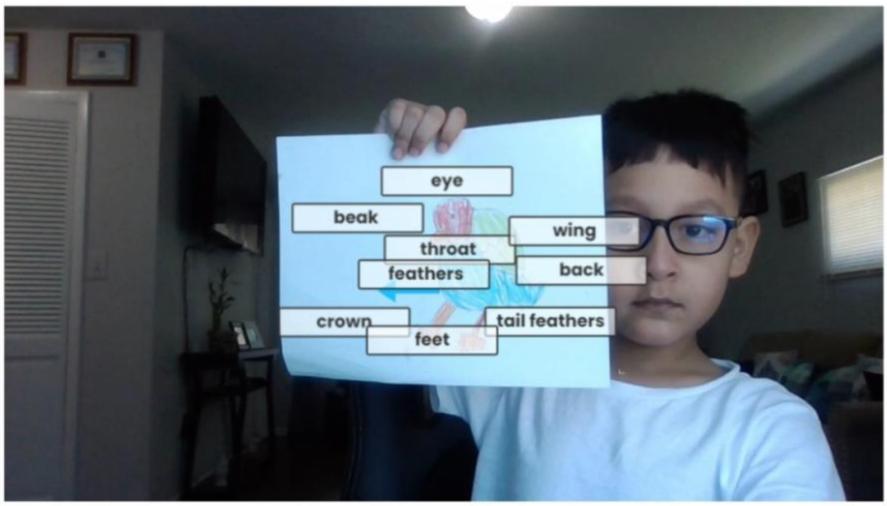
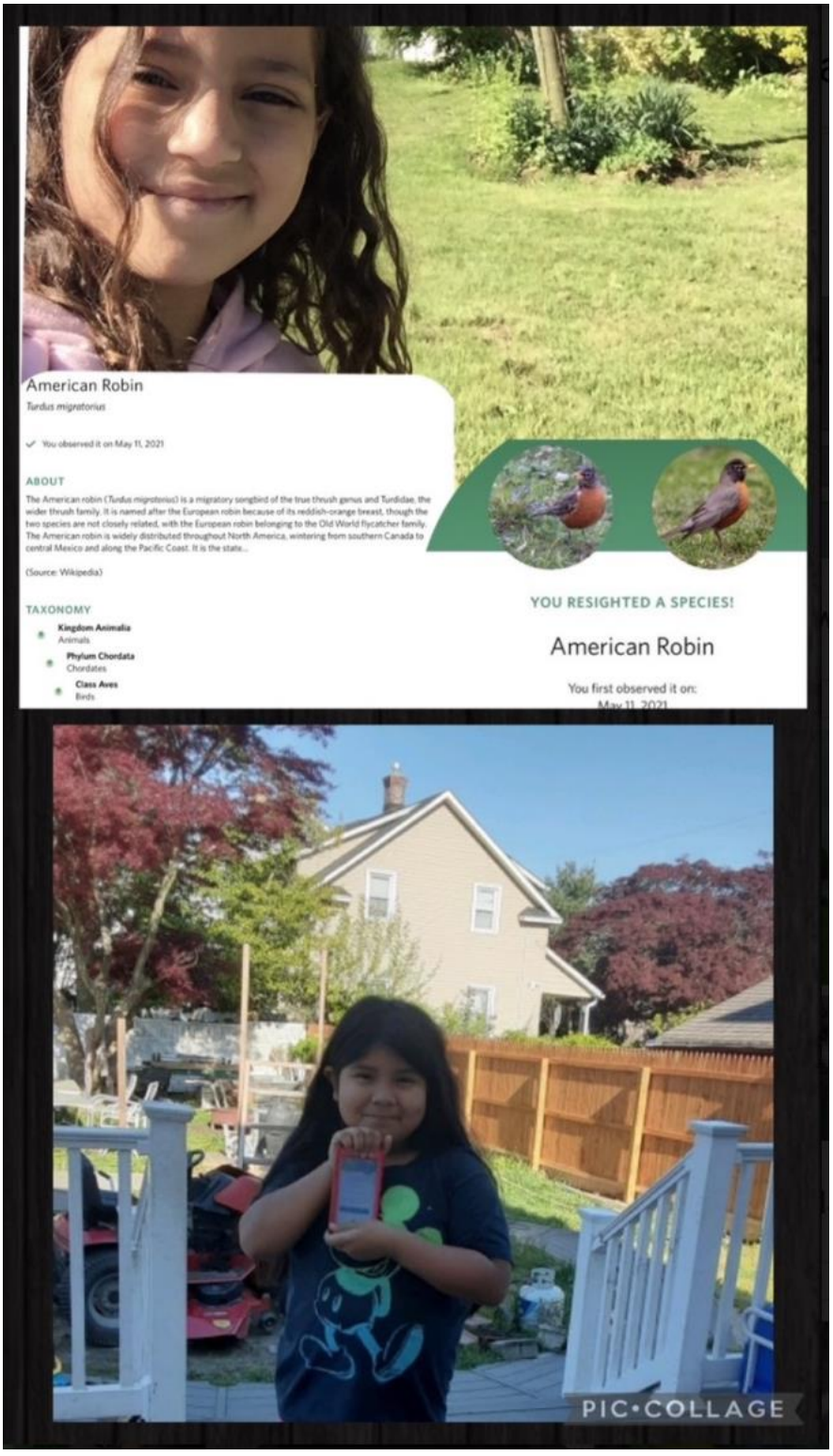
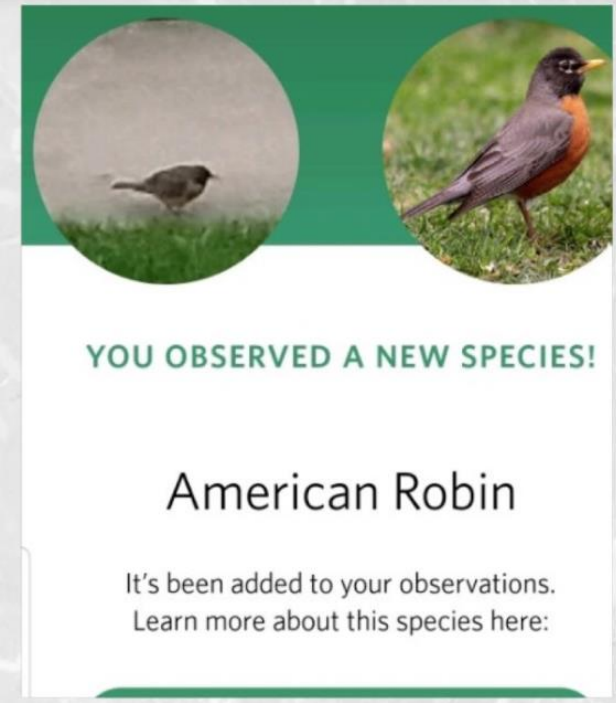

Body Parts of a Bird
Beak
Eyes
Feathers
Wings
Legs
Tail


Add a photo of your bird and then label it
crown
eye
beak
throat
back
feathers
wing
feet
tail feathers

Add a photo of your bird and then label it




American Robin
Turdus migratorius
You observed it on May 11, 2021
ABOUT
The American robin (Turdus migratorius) is a migratory songbird of the true thrush genus and Turdidae, the wider thrush family. It is named after the European robin because of its reddish-orange breast, though the two species are not closely related, with the European robin belonging to the Old World flycatcher family. The American robin is widely distributed throughout North America, wintering from southern Canada to central Mexico and along the Pacific Coast. It is the state...
(Source: Wikipedia)
TAXONOMY
Kingdom Animalia
Animals
Phylum Chordata
Chordates
Class Aves
Birds
YOU RESIGHTED A SPECIES!
American Robin
You first observed it on:
May 11, 2021
PIC•COLLAGE



YOU OBSERVED A NEW SPECIES!

American Robin

It's been added to your observations.
Learn more about this species here:


WE BELIEVE THIS IS A MEMBER OF THE CLASS
Birds
But Seek couldn't identify the exact species.
You can try a different angle, zoom in, or try to get a clearer shot of the organism.


PIC•COLLAGE

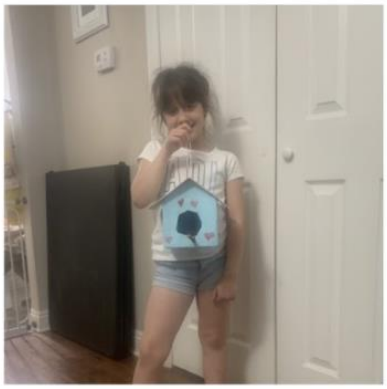

NIKE


PIC•COLLAGE







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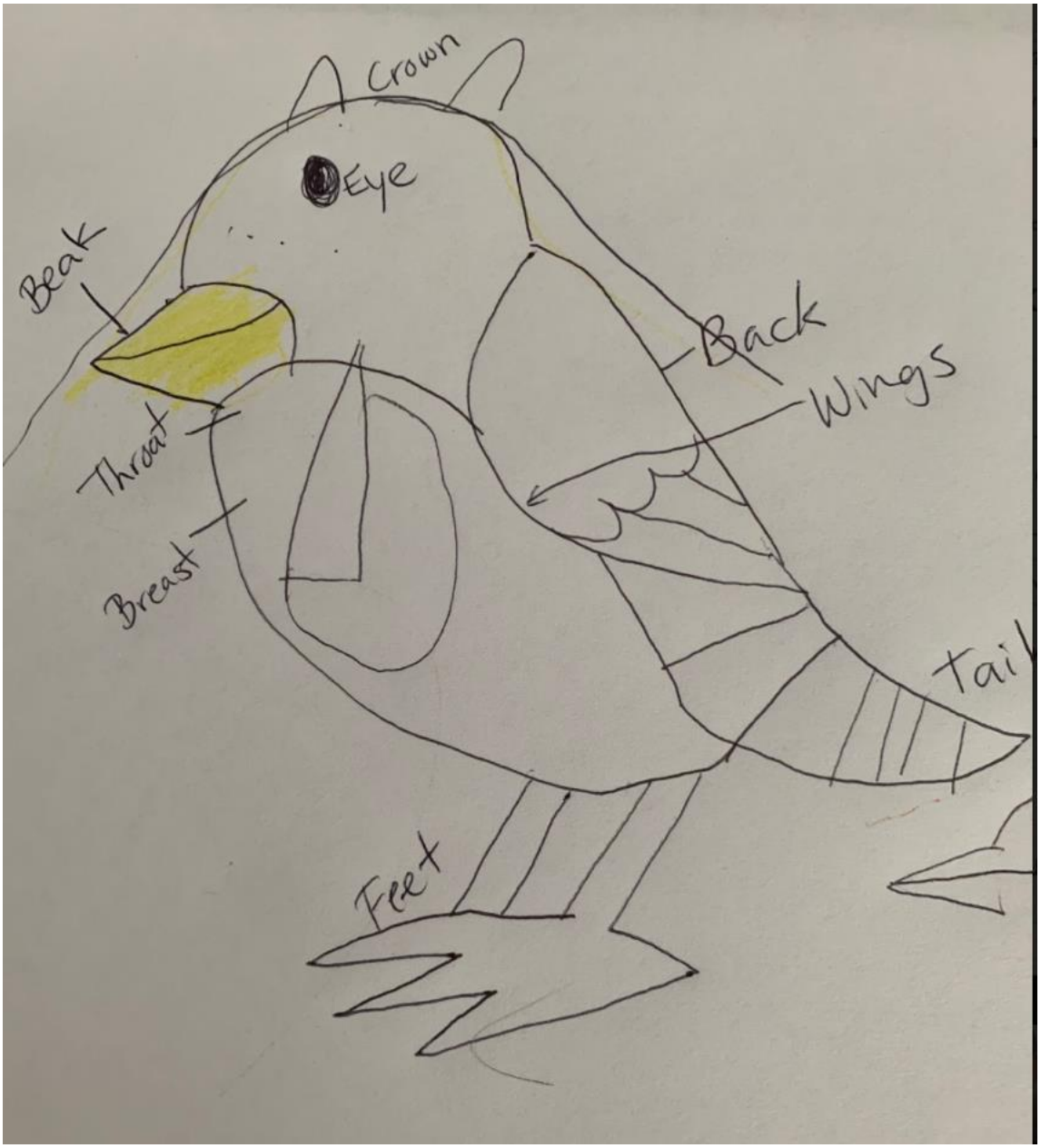
Crown
Eye
Beak
Back
Wings
Throat
Breast
Tail
Feet