Standards-Aligned Lesson Plan

High School Science: Edmondson Park (Nashville, TN)

Developed in partnership with the Metropolitan Nashville Arts Commission.

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Planning and Presenting a Science Lesson Based on CCSS

Biology 9-10

Section I: Planning

Overview: This section focuses on the elements to consider when planning for a content-specific lesson with CCSS literacy embedded, such as Content Standards, State Performance Indicators, and CCSS Literacy for the Technical Subjects. Other elements to plan include clear learning targets, task objectives, new learning for students, anticipated learning challenges, scaffolding, opportunities for differentiation, ways to prompt student thinking through assessing and advancing questions, instructional strategies to be used in the lesson, and materials and resources.

Lesson Topic: Adaptation and the Found Object Feeders	**Time Frame/Lesson Length: 6 blocks**

Content Standard	State Performance Indicators	CCS Literacy Standards	Assessments
CLE 3210.5.1 Associate structural, functional, and behavioral adaptations with the ability of organisms to survive under various environmental conditions. 3210.T/E.2 Differentiate among elements of the engineering design cycle: design constraints, model building, testing, evaluating, modifying, and retesting.	SPI 3210.5.1 Compare and contrast the structural, functional, and behavioral adaptations of animals or plants found in different environments. SPI 3210.5.2 Recognize the relationship between form and function in living things. SPI 3210.T/E.2 Evaluate a protocol to determine the degree to which an engineering design process was successfully applied.	CCSS.ELA-Literacy.RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. CCSS.ELA-Literacy.WHST.9-10.1.a Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. CCSS.ELA-Literacy.WHST.9-10.1.e Provide a concluding statement or section that follows from or supports the argument presented. CCSS.ELA-Literacy.RST.9-10.8	Summative I: Short Answer Assessment Given written descriptions of an organism's natural history, students will **identify** adaptations, classify those adaptations as behavioral, anatomical or physiological and describe how those adaptations contribute to the survival of that organism. The writing will be graded with a rubric. Associated Formatives: 1. Brainstorm 2. Adaptability Activity Responses 3. Homework response 4. Homework extension response 5. "Last word" reflections Summative II: Found Object Feeders Design Plan Posters Students will create a bird feeder out of recycled materials that meets the needs of an assigned group of birds. This

		Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.	project will be graded with a rubric. Associated Formatives: 1. Preliminary design plan and rationale 2. Labeled sketch poster 3. Gallery walk group evaluation

Planning Element	**Description**
Clear Learning Targets	1. Given written descriptions of an organism's natural history, I can identify adaptations, classify those adaptations as behavioral, anatomical or physiological and describe how those adaptations contribute to the survival of that organism. 2. I can use the design cycle to create a bird feeder that caters to the functional, structural and behavioral adaptations of an assigned group of birds from Davidson County, TN. 3. I can discuss the themes of "struggle" and "adaptation" within the context of science, and the life of artist Lonnie Holley.
Task Objectives (steps to reach mastery of clear learning targets)	Summative I: • "What is Adaptation?" Guided Investigation • Adaptation Card Cooperative Activity • African Article Annotation • Environmental Disturbance Poster • Organism Adaptability Argument Summative II: • Project Research Session (Library) • Design cycle posters • Poster Gallery Walk • Feeder building
New Learning	• Adaptation types • Design process • Bird ecology
Anticipated Learning Challenges	• Students may struggle with reading the descriptions and citing evidence. • Students may struggle with having a pre-laid design plan and working within design constraints rather than open creation and trial and error techniques.

Scaffolding opportunities (to address learning challenges)	• Adaptation Card Activity:
	  o Students will work in cooperative groups.
	  o Each student will be given an opportunity to respond to a description.

	○ Group members can discuss and strengthen responses so all students understand the activity. ○ Descriptions will be read out loud in cooperative groups. ○ Classifications, evidence and conclusions will be placed into charts. • Students will have access to highlighters to isolate key information. • Students will write reflections to isolate strengths and weaknesses with material. • The teacher will facilitate discussions and cooperative grouping to guide students with questions and feedback. • Students are heterogeneously grouped. • Students will receive feedback on writing and will have opportunities to correct answers. • Students will receive feedback on model plans from the teacher and the group. • Students will have opportunities to view other student plans to help with their own.
Opportunities to Differentiate Learning (explain how you address particular student needs by differentiating process, content, or product)	• Student writing and models will be graded on a rubric which will be handed out in advance. The teacher may plan to differentiate this rubric, based on student abilities. • Students will receive feedback on writing and will have opportunities to correct answers. • Students will work in groups and the teacher may choose to group students based on ability levels. • Students will receive feedback on model plans from the teacher and the group.
Questioning: Planning to Illuminate Student Thinking	*Assessing questions:* • What is one adaptation of _____ (from cards)? What type of adaptation is it? How does this adaptation help the organism survive its environment? • What are the feeding needs of _____ (bird)? How will the bird interact with the feeder to get food? How will you test the feeder? How are we selecting for certain birds with our feeder? *Advancing questions:* • Are all members of a population successful in adapting and surviving? Give a situation in which some members of a species are better at adapting than others. Why is this? Where does this advantage come from?
Instructional Strategies	Cooperative, visual, hand-on, independent
Materials and Resources	Internet Resources: "The Lonnie Holley Story" available at http://vimeo.com/92289640 www.listverse.com www.blueplanetbiomes.org www.allaboutbirds.org Hands-on Materials: • Adaptation cards (will use www.listverse.com to make these) • Various recycled materials

	• Glue, string • Poster paper

Section II: Presentation
Overview: This section focuses on the steps involved in presenting the lesson. The lesson presentation is divided into segments, such as "Framing the Lesson," "The Texts and Task," "Sharing, Discussing, and Analyzing" and "Closing the Lesson," and "Extending the Learning." For each of these lesson elements, there is an explanation of the procedure, teacher actions, and student outcomes.

Block 1:

Framing the Lesson (20 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will independently answer the "Struggle" questions listed on the "What is Adaptation" handout (included in the appendix to this lesson). • Students will complete a Pair-Share discussing the "Struggle" questions. What causes us to struggle? How do we adapt to struggle?	• Introduce the pair–share questions and frame the discussion.	• Students will be introduced to the themes of struggle and adaptation, within the context of artist Lonnie Holley's life.
• Students will watch trailer for documentary called "The Lonnie Holley Story"	• Show trailer for documentary called "The Lonnie Holley Story" available at http://vimeo.com/92289640 • Walk around and listen to discussions looking for points to mark during the group share out.	
• Students will participate in a class discussion about Lonnie's struggle and adaptations.	• Lead a discussion on Lonnie Holley with students.	
Exploring the Texts and Task (30 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will brainstorm animal adaptations that they can recall.	• The teacher will introduce the brainstorm, will ask for examples from students, and will ask clarifying	• Students will connect past knowledge about adaptations from elementary and middle school science.

	questions about the examples.	
• Students will independently read and annotate adaptation explanation. • Students will use the selection to write definitions of each of the three types of adaptations.	• Teacher will instruct students to read text selection, annotate and write definitions for the types of adaptations.	• Students will become familiar with the types of adaptations.
• Students will participate in a discussion about the adaptation types.	• The teacher will facilitate a discussion of each of the adaptation types in order to gauge mastery.	
• Students will classify their brainstormed list of adaptations.	• The teacher will facilitate the classification activity.	• Students will be able to classify types of adaptations.
☺ **Sharing, Discussing, and Analyzing (30 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• The students will engage in a group activity in which they will complete the Hostile Environment Adaptation Chart (found in the appendix to this document). • Students will take turns reading each of the adaptation descriptions. • After each description is read, students will discuss work together to fill in their adaptation charts.	• The teacher will explain activity and place students into cooperative groups. • The teacher will distribute "10 Animal Adaptations to Hostile Environments" cards to student groups found at web link included in the appendices. • The teacher will monitor and facilitate discussions.	• Students are formatively assessed and will work toward demonstrated mastery of the first learning target: *Given written descriptions of an organism's natural history, students will identify adaptations, classify those adaptations as behavioral, anatomical or physiological and describe how those adaptations contribute to the survival of that organism.*
☐ **Closing the Lesson** (10 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
	• The teacher will signal the class to close and will collect the Adaptations to Hostile Environments cards.	• Students are formatively assessed and will work toward demonstrated mastery the first learning target: *Given written descriptions of*

• The students will write a reflection that lists two new things they have learned and two things that they need help with. • Materials will be collected from students and final questions will be taken. • The students will learn about the extension homework activity (see below).	• The teacher will facilitate the reflection. • The teacher will collect and assess charts. • The teacher will explain the homework assignment (see below).	*an organism's natural history, students will identify adaptations, classify those adaptations as behavioral, anatomical or physiological and describe how those adaptations contribute to the survival of that organism.*
🕮 **Extending the Learning**: The students will research one organism of choice, list that organism's adaptations, and classify the adaptations.		

Block 2:

🔔 **Framing the Lesson (20 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will review the three types of adaptations. • Students will annotate an assigned article looking for and classifying adaptations given. • Students will engage in a "pair-share" activity.	• The teacher will facilitate the review the three types of adaptations. • The teacher will distribute at random the African animal articles (link included in the appendix). There are six different articles. • The teacher will give directions for students to read and annotate article. • Circulate and monitor student progress. • Teacher will instruct students to engage in a "pair-share" in which they share some of the adaptations of their assigned organisms.	• Students will frontload past knowledge about adaptations from previous block. • Students will read and analyze an informational text.
Exploring the Texts and Task (10 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will organize into groups based upon the article they read and annotated.	• While students are engaging in the pair-share activity, the teacher will organize students into groups of 2-3 according to article assigned (e.g. zebras together, baboons together).	

• Students will understand the requirements for a poster project: students are to create a poster in which they create charts of the adaptations of their organisms, use their research to predict survival to an environmental disturbance, and illustrate that event with a visual.	• The teacher will instruct the newly formed groups to sit together. • The teacher will distribute the resource "Adaptation to environmental change poster sheet" (included in the appendix of this plan) • The teacher will introduce the poster activity and explain the three steps of the poster as students follow along with the poster sheet. • The teacher will direct one member of each group come to collect poster paper. • The teacher will instruct students to discuss whether their organisms will survive. • As students work, the teacher will circulate and monitor, and inform students of time remaining,	• Students will further investigate the connections of adaptation and environment. • Students will locate and cite evidence. • Students will use evidence to introduce and support a claim.
☺ **Sharing, Discussing, and Analyzing (45 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will participate in a gallery walk and take notes. • Students will decide which organism is the most adaptable and support that finding with evidence from class posters.	• Teacher will instruct students to examine each other's posters to determine which organism is the most adaptable. • The teacher will assist students in displaying posters around the room. • The teacher will orchestrate a gallery walk.	• Students will strengthen ability to collect and evaluate evidence. • Students will compare and contrast information,
☐ **Closing the Lesson (15 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will write an organism predictability argument—concluding independently which organism is the most adaptable.	• The teacher will instruct students to write their conclusions independently. • The teacher will signal the class to close.	• Students will use research to write an argument supported by evidence.
🕮 **Extending the Learning**: Students will research the effects of the last eruption of Mt. St. Helens on local organisms. Were some organisms able to adapt more effectively than others?		

Block 3:

Framing the Lesson (25 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will interpret a table of data called "**TABLE 3:** Imperiled Species within the 35 Fastest Growing Large Metropolitan Areas"	• Before class, the teacher will prepare by providing copies of the table of page 26 at the following link: http://www.nwf.org/pdf/wildlife/endangeredbysprawl.pdf called "**TABLE 3:** Imperiled Species within the 35 Fastest Growing Large Metropolitan Areas"	• Students will interact with relevant information concerning the theme of adaptation in their local area.
• Students will discuss the need for the development of green spaces like Edmondson Park	• The teacher will draw attention to Nashville's data and direct a discussion about the importance of adapting our urban areas to meet the needs of endemic species with strategies such as bird feeders.	
• Students will discuss what they remember from Block 1 about Lonnie Holley and his work.	• The teacher will explain that students will research bird feeding adaptations to create a feeder using found objects like Holley uses in his work.	
• Students will understand the bird feeder project. • Students will brainstorm about their assigned bird groups.	• Place students into heterogeneous groups of four according to present academic performance, gender and ethnicity. • Assign each group one set of four Tennessee birds, using the "Bird Feeder Species Assignment Sheet" (included in the appendix of this plan). • Students will brainstorm what they know about these birds. • Teacher will facilitate a discussion about how students will research bird adaptations and use this information to create bird feeder that caters to all of the birds feeding strategies. • The teacher will ask for share outs.	• Students will self-assess knowledge level about assigned birds.
• Students will review the Engineering Design Cycle.	• The teacher will facilitate review of the Engineering Design Cycle.	• Students will draw on prior knowledge and apply it to feeder project.

Exploring the Texts and Task (30 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will explore the "All About Birds" website (link included in the	• The teacher will use the projector to take the students on a tour of the "All About Birds" site and point out	• Students will research information about birds, using an informational source.

appendix). • Students will become familiar with the "Let's Meet Our Birds" research chart document (included in the appendix). • Each student will select one bird from their group's list and complete one row of each research chart for their bird.	useful aspects for their research. • The teacher will explain the "Let's Meet Our Birds" research chart. • Instruct students to have a quick group discussion in which each student will be responsible for one of the four birds to research. • Set an amount of quiet research time for students to learn about their birds.	
☺ **Sharing, Discussing, and Analyzing (25 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will give five-minute presentations to their small groups about their assigned birds. • Other group members will listen and complete the chart for the other three birds.	• The teacher will explain that each group member will give a five minute presentation to their group about their bird while the other group members record information. • The teacher will use a timer and time each presentation. • After the fourth presentation period, the teacher will instruct students to engage in a five minute clarification session in which students can question group members and revise and complete their charts. • The teacher will collect charts at this time or at the end of class.	• Students will cite evidence and participate in academic discussion in small groups.
☐ **Closing the Lesson (10 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will listen to a short presentation about Holley and become familiar with the bird feeder building process.	• Introduce Holley and his design process and relate this process to the bird feeder building process. • The teacher will introduce the homework assignment at this time and informs students that they will become more familiar with Holley's design process through their research. • Signal the class to close.	• Students will become familiar with bird feeder project parameters.
• 🕮 **Extending the Learning** Instruct students to do an internet search of Holley and write a description of one sculpture found including the web		

link to the sculpture picture, what found objects Holley used in the sculpture and the perceived message of the sculpture.

Block 4:

Framing the Lesson (30 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will get into their bird groups. • Students will become familiar with the building materials.	• The teacher will introduce the building materials, but will not yet distribute the materials.	• Students will progress toward goal of building the bird feeder.
Exploring the Texts and Task (20 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will review their research.	• The teacher will re-distribute the bird research charts ("Let's Meet Our Birds"—students completed in groups prior to this class).	• Students will progress toward goal of building the bird feeder.
• Students will use the Bird Feeder Idea chart to brainstorm about how they would use the materials to build their feeders.	• The teacher will distribute the Bird Feeder Idea Charts (included in the appendix).	
• Students will generate and write one design idea into the idea chart.	• The teacher will instruct students to independently review their research in the context of the building materials and generate one design idea, and then record it into the Idea chart.	
Sharing, Discussing, and Analyzing (35 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will share out ideas in their groups and create a group list of ideas.	• The teacher will have students share out their ideas and fill in the rest of the idea charts.	• Students will progress toward goal of building the bird feeder.
• Students will prune their ideas and settle on a design idea.	• The teacher will direct students to discuss and settle on a building design that will be displayed on a poster.	
Closing the Lesson (15 minutes)		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will independently write a	• The teacher will prompt students to write	• Students will locate and cite evidence.

description of their group's design plan and justify the plan using evidence from the research.	a description of the group's design idea and justify that design with evidence from the bird research. • The teacher will collect idea charts and bird research. • The teacher will explain the homework assignment. • The teacher will ignal the class to close.	• Students will use evidence to form a claim. • Students will support the claim with evidence.
• 🕮 **Extending the Learning** The teacher will instruct students to write a reflection about the productivity of the design team up to this point and offer suggestions to improve group performance.		

Block 5

🔔 **Framing the Lesson (10 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will become familiar with the Bird Feeder Design Plan rubric. • Students will become familiar with the design poster format.	• The teacher will distribute and explain the Design Plan rubric. • Instruct students to get into their bird groups. • Distribute needed materials for posters.	• Students will progress toward goal of building the bird feeder.
🖊 **Exploring the Texts and Task (40 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students work in their groups to create a bird feeder design poster.	• Circulate and assist groups.	• Students will create project design poster.
☺ **Sharing, Discussing, and Analyzing** 20 minutes		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will participate in a poster gallery walk in which they evaluate and offer the feedback on feeder design.	• The teacher will assist students in displaying their posters. • The teacher will orchestrate a gallery walk in which students will use project rubrics to evaluate and offer feedback on each design. • The teacher will post an evaluation page next to each poster.	• Students will increase understanding of project expectations by using project rubric to evaluate design posters.

☐ **Closing the Lesson (20 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will read feedback and revise design idea.	• The teacher will distribute to groups their poster and evaluations. • The teacher will instruct students to use their feedback to strengthen their design ideas. • The teacher will collect the materials and explain homework assignment.	• Students will progress toward goal of building the bird feeder.
• 🕮 **Extending the Learning** The teacher will have students write a reflection about what was learned from the gallery walk.		

Block 6

🔔 **Framing the Lesson (10 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will sit in their groups and will organize their design materials.	• The teacher will facilitate distribution of bird feeder building materials.	
✍ **Exploring the Texts and Task (10 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will review their plans and prepare to build.	• The teacher will direct students to review their plans and prepare to build.	
☺ **Sharing, Discussing, and Analyzing (60 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will create their feeders in their groups.	• The teacher will direct students to build their feeders. • The teacher will direct one student from each group collected needed materials. • The teacher will circulate and assist groups.	• Students will build feeders.
☐ **Closing the Lesson (10 minutes)**		
Detailed Procedure	**Teacher Actions**	**Student Outcomes**
• Students will turn in their completed feeders for credit.	• The teacher will collect the finished products and explain homework assignment,	• Students will complete and turn in bird feeder (summative).
• 🕮 **Extending the Learning** The students will write a description of the level of the success their group had in implementing their design		

idea. What would they change if they had a second day to build?

Appendices (attach resources used, such as handouts, etc…):

- Trailer for documentary called "The Lonnie Holley Story" available at http://vimeo.com/92289640
- List of adaptations to hostile environments available at http://listverse.com/2013/05/28/10-animal-adaptations-to-hostile-environments/
- Hostile Environment Adaptation Chart
- African animal articles can be printed out from http://www.blueplanetbiomes.org/african_savanna_animal_page.htm
- Adaptation to environmental change poster sheet
- "**TABLE 3:** Imperiled Species within the 35 Fastest Growing Large Metropolitan Areas" can be found of page 26 of http://www.nwf.org/pdf/wildlife/endangeredbysprawl.pdf
- Bird assignment sheet
- Bird research chart
- Idea chart sheet
- Bird feeder design poster parameters

What is Adaptation?

Introduction:

What causes us to struggle?

_____

_____

How do we adapt to struggle?

_____

_____

Adaptation Brainstorm:

Types of Adaptations

An **adaptation** is any inherited characteristic that increases an organism's chance of survival. Successful adaptations, Darwin concluded, enable organisms to become better suited to their environment and thus better able to survive and reproduce. Adaptations can be anatomical, or structural, characteristics, such as a porcupine's sharp quills. Adaptations also include an organism's physiological processes, or functions, such as the way in which a plant performs photosynthesis. More complex features, such as behavior in which some animals live and hunt in groups, can also be adaptations. -text

What are the three types of adaptations? List and define them below:

1. _____
   _____
   _____
2. _____
   _____
   _____
3. _____
   _____
   _____

On the back of this sheet, classify our brainstormed examples into one of the three types above.

Adaptation to Environmental Change

1. **Adaptation Chart:** Make a chart that lists the adaptations, adaptation classification, justification of classification and explanation of how the organism uses the adaptation to survive.
2. **4 Prediction Statements:** Predict the degree of adaptation your organism will have with the following environmental change. Justify your responses. The disturbances are listed below.

   Environmental Disturbance:

   - Drought
   - Poachers
   - Grass Fire
   - Flood
3. **4 Disturbance Illustrations:** Provide visuals that represent how your organism will adapt to the disturbance.

4. **Who is the most adaptable? Justify your response using insights from the posters.**
    a. elephant
    b. zebra
    c. Wild dog
    d. Crocodile
    e. Baboon
    f. lion

Investigating the Top Ten Adaptations to Hostile Environments:

Organism(s):	Describe the struggle:	Describe the adaptation:	Classify the adaptation:	Justify the classification:

Let's Meet Our Birds:

Name: _____

1. Using www.google.com examine multiple images of each bird species and write comparisons into the chart below:

www.allaboutbirds.org

Bird Name	Coloration	Body Size:	Beak Description:	Claw size relative to body	Claw shape

2. Go to www.allaboutbirds.org. This site contains an extensive collection of information about many north American bird species. Look up each of your birds.

Bird Name	Body Description including dimensions	Food Sources	Behavior description	Nesting Description

Bird Feeder Idea Chart:

	Describe the idea:	Sketch and label the idea:	Sell Your Idea: (Justification)
1			
2			
3			
4			

Bird Feeder Species Assignments:

Name: _____

A. Red-bellied woodpecker, Black-capped chickadee, Brown Thrasher, Northern Cardinal
B. Downy Woodpecker, Tufted Titmouse, American Goldfinch, Blue Jay
C. Hairy Woodpecker, Eastern Bluebird, Scarlet Tanager, Indigo Bunting
D. Northern Flicker, American Robin, Summer Tanager, Red-winged Blackbird
E. Pileated Woodpecker, Hermit Thrush, Eastern Towhee, Song Sparrow
F. Red-headed woodpecker, Wood Thrush, Blue Grosbeak, House Finch
G. Eastern Meadowlark, Rose-breasted Grosbeak, Brown Creeper, Gray Catbird
H. White-breasted nuthatch, northern mockingbird, Purple finch, Brown-headed cowbird

Group Member Names:

1. _____
2. _____
3. _____
4. _____

Bird Name:	What Do You Know?

Bird Feeder Design Plan Rubric:

Name: _____

	Below Basic 0	Lower Basic 1	Upper Basic 2	Proficient 3	Advanced 4
Sketch	• No sketch present	• Sketch present		• Sketch present • Materials labeled	• Sketch present • Materials labeled • Clear and easy to follow
Assembly Description	• No assembly description is present.	• Assembly description is present but is limited and/ or difficult to follow.	• Assembly description is present and easy to follow.	• Assembly description is present, thorough and easy to follow.	• Assembly description is present, thorough and easy to follow. • The description is visually connected to the labeled sketch.
Bird Accommodations	• No assembly description is present.	• Bird accommodations are present but are limited (e.g. missing food sources, etc.) and/ or difficult to follow.	• Bird accommodations are present for each bird and food source needs for each bird.	• Bird accommodations are present for each bird and include food source needs, anatomical and behavioral adaptations.	• Bird accommodations are present for each bird and include food source needs, anatomical and behavioral adaptations. • The bird accommodations are visually connected to the labeled sketch.
Modification Explanation	• No explanation is given as to design modifications.	• Limited explanation is given as to design modifications.		• Adequate explanation is given as to design modifications.	• Detailed explanation is given as to design modifications.
Design and Model Alignment	• Feeder model does not align with the design plan.				• Feeder model adequately aligns with design plan.