

**Animal Groups Increase Survival**  
3<sup>rd</sup> Grade Ecosystems: Interactions, Energy and Dynamics (3-LS2-1)

**Lesson 2: Insects That Work Together**  
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***Lesson Overview (Four to five 45-minute Science & ELA sessions)***

In this lesson, students continue to gather data on animals that live in groups in order to increase their chances of survival. They read a book, *Insects That Work Together* by Molly Aloian & Bobbie Kalman, to investigate group behavior of social insects. Using a jigsaw approach, groups of students become “experts” on specific types of insects. Each group creates a chart on how their insect works together in groups to help them survive. “Experts” then share out in mixed groups, then the teacher facilitates a science talk around the focus question: “How do animals work together in groups to help them survive?” Finally, students are asked to write an argument (claims based on evidence) to answer this question. This can be a combined Science/ELA assessment in the form of a formal writing piece, blog post, or digital story.

Note: This is the second in a series of lessons focusing on animal groups and how they help animals survive. Subsequent lessons will focus on different types of animals. The goal is for students to have multiple opportunities to gather evidence on different animal groups so they can compare and contrast the way that different animal groups increase survival.

***NGSS Learning Goals***

**NGSS Disciplinary Core Idea:**

- Being part of a group helps animals obtain food, defend themselves and cope with changes. Groups may serve different functions and vary dramatically in size. (LS2.D)

**NGSS Performance Expectation:**

- Construct an argument that some animals form groups that help members survive. (3-LS2-1)

**NGSS Science Practices:**

- Constructing Explanations and Designing Solutions – Use evidence to construct an explanation
- Engaging in Argument from Evidence - Construct an argument with evidence, data, and/or a model
- Obtaining, Evaluating, and Communicating Information –
  - Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence

- Compare and/or combine across complex texts and/or other reliable media to support the engagement in other scientific or engineering practices
- Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.

**Crosscutting Concepts:**

- Cause and Effect - Cause and effect relationships are routinely identified and used to explain change
- Systems and System Models – A system is a group of related parts that make up a whole and can carry out functions its individual parts cannot. A system can be described in terms of its components and their interactions.

**Overarching Essential Questions (applicable to the entire set of Animal Groups lessons):**

- Why do some animals live in groups?
- How do animals work together in groups to help them survive?

**Lesson 2 (Insects That Work Together) Essential Question:**

- How do insects work together to help them survive?

***ELA Common Core Learning Goals for 3<sup>rd</sup> Grade  
(Only standards applicable to this lesson are included)***

Reading Standards for Informational Text

*Key Ideas and Details:*

- Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers
- Determine the main idea of a text; recount the key details and explain how they support the main idea
- Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence and cause/effect

*Craft and Structure:*

- Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area
- Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently

*Integration of Knowledge and Ideas:*

- Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why and how key events occur)
- Compare and contrast the most important points and key details presented in two texts on the same topic.

*Range of Reading and Level of Text Complexity:*

- By the end of the year, read and comprehend informational texts, including history/social studies, science and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently

Writing Standards

*Text Type and Purposes-Opinion Pieces (Argument Writing):*

- Write opinion pieces [arguments] on topics or texts, supporting a point of view [claim] with reasons [evidence]
  - a. Introduce the topic or text they are writing about, state an opinion [claim], and create an organizational structure that lists reasons [evidence]
  - b. Provide reasons (evidence) that support the opinion [claim]
  - c. Use linking words and phrases (e.g., because, therefore, since, for example) to connect opinion [claim] and reasons [evidence]
  - d. Provide a concluding statement or section

*Production and Distribution of Writing:*

- With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose
- With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising and editing
- With guidance and support from adults, use technology to produce and publish writing (using keyboarding skills) as well as to interact and collaborate with others

*Research to Build and Present Knowledge:*

- Conduct short research projects that build knowledge about a topic
- Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories

*Range of Writing:*

- Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes and audiences

Speaking & Listening Standards

*Comprehension and Collaboration:*

- Engage effectively in a range of collaborative discussions (one on one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly
  - a. Come to discussions prepared, having read or studied required material; explicitly draw on that preparation and other information known about the

- topic to explore ideas under discussion [such as information recorded in science notebooks]
  - b. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion)
  - c. Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others
  - d. Explain their own ideas and understanding in light of the discussion
- Determine the main ideas and supporting details of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally
  - Ask and answer questions about information from a speaker, offering appropriate elaboration and detail

*Presentation of Knowledge and Ideas:*

- Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace
- Speak in complete sentences when appropriate to task and situation in order to provide requested detail or clarification

## ***Assessments***

**Pre-Assessment/Formative:**

- What do you think you know about how insects work in groups?

**Science/ELA Summative:**

- Write a claim about how insects work together in groups to help them survive. Back up your claim with evidence that you have gathered or learned during this lesson. Use the argument-writing rubric as a guide for determining what is expected.

## ***Materials***

- Science notebooks
- *Insects That Work Together* by Molly Aloian & Bobbie Kalman, Crabtree Publishing Company, 2005
- Chart paper and markers
- Word wall

## ***Learning Activities***

**I. Jigsaw (Two to three 45-minute Science sessions)**

Initially, ask students to respond to the following prompt in their science notebooks: “What do you think you know about how insects work together in groups?” Ask students to turn and talk, then share their responses. Chart ideas.

Explain that the class will be exploring the focus question: “How do animals work together in groups to help them survive?” using a book, *Insects That Work Together* by Molly Aloian and Bobbie Kalman. Everyone will read the introductory sections of the book (*What are Insects?* and *Working Together*) first (either individually or as a group) to provide background, then each student will become an expert on a specific type of insect.

The class is divided into small groups (4 students each) and each student in these “home” groups is assigned a different section of the book (honeybees, hive wasps, termites or ants). Each student will become an “expert” on how their type of insect works together in groups to survive. (The shorter section on Migrating in Swarms could also be assigned as a 5<sup>th</sup> topic—allowing small groups of 5 students each.)

Students read and take notes on their assigned insect from the book, then join other students who have the same insect to form “expert” groups. Each group will discuss how their insect works together in groups to help them survive (using evidence they gathered from reading their section of the book). They will create a chart or poster describing: Insect Behaviors and How These Behaviors Help the Insects Survive.

Students then rejoin their home groups and take turns sharing their evidence with the rest of the group. They can add to their chart or poster during these discussions if needed.

For more information on the jigsaw cooperative learning strategy go to: <http://olc.spsd.sk.ca/DE/PD/instr/strats/jigsaw/>.

## **2. Science Talk (One 45-minute session)**

When all groups have had a chance to share, the teacher can facilitate a science talk around the focus question: “How do insects work together in groups to help them survive?” In this talk, students will make claims based on evidence that they gathered from the book. They can refer to the charts that they created during the jigsaw. A class chart can be created to compile the information. At this point, it would be helpful for the teacher to begin creating a word wall. (Alternatively, students could create a visual word wall themselves—including the word and a visual to describe it and/or the definition written in their own words.)

## **3. Argument Writing Assessment (One 45-minute session)**

Ask students to write an argument (claims based on evidence, connected by reasoning) to answer the focus question: “How do insects work together in groups to help them survive?” Model writing an argument together as a class using the word wall and sentence frames. Then take away the example and ask students to write an argument of their own (using the word wall and sentence frames). This can be a combined Science/ELA assessment.

This assignment could also be completed as blog posts. Students could then critique each other's arguments online.

For more information on supporting students in argument writing, refer to *Writing in Science in Action* by Betsy Rupp Fulwiler.

**4. Insect Groups are Systems**

Introduce or review the concept of systems. What is a system? How do the parts of a system work together to do things that individual parts cannot?

Individually (writing in science notebooks), ask students to reflect on the question: "How are the insect groups that you studied like a system?" Ask them to share their ideas in small groups, then share with the whole group. Chart their ideas:

Insect	Group Member (Part)	Function of the Group Member (How Does It Help the Whole Group?)	When All the Group Members (Parts) Work Together, What is the Outcome?

**Vocabulary**

- |             |                     |                |
|-------------|---------------------|----------------|
| Abdomen     | Invertebrate        | Queen          |
| Antennae    | King                | Reproduce      |
| Backbone    | Larvae              | Reproductives  |
| Beeswax     | Legs                | Royal chamber  |
| Cells       | Locusts             | Saliva         |
| Chambers    | Migrate             | Scents         |
| Colony      | Monarch butterflies | Silk           |
| Communicate | Mounds              | Social insects |
| Crops       | Mouthparts          | Soldiers       |
| Drones      | Nectar              | Swarm          |
| Egg         | Nests               | Termites       |
| Exoskeleton | Nymphs              | Thorax         |
| Head        | Paper wasp          | Tunnels        |
| Hexagon     | Pollen              | Waggle dance   |
| Hive        | Population          | Wings          |
| Honeybees   | Predator            | Workers        |
| Hornet      | Prey                | Yellow jackets |
| Insect      | Pulp                |                |

**Supports/Materials for Different Types of Learners**

**Instructional strategies for ELL and Special Education students:**

- Comprehensive resource:  
<http://schools.birdville.k12.tx.us/cms/lib2/TX01000797/Centricity/Domain/2804/SIOP.pdf>
- Interactive word walls (including photos)
- Visual concept maps (including photos)

#### **Extensions:**

- Students could use other resources (books, websites, videos) to learn more about their insects and create digital stories, Prezis, or other types of presentations to show their understanding of the disciplinary core idea.

#### ***Integration with Other Areas of the Curriculum***

- *Insects That Work Together* includes instructions on building a honeybee hive model using hexagons, connecting to the Common Core Math standards for Geometry.

#### ***Teacher Background***

- *The Essentials of Science and Literacy: A Guide for Teachers*, Karen Worth et al., Heinemann, 2009. An excellent resource for facilitating science talks, using science notebooks and much more.
- *Writing in Science in Action*, Betsy Rupp Fulwiler, Heinemann, 2011. In this book, Betsy outlines strategies for using modeling and scaffolding to help all students be successful with argument writing in science. The accompanying DVD (which comes with the book) contains several fabulous videos of these strategies in action (e.g., the Soils video).
- Saskatoon Public Schools, Instructional Strategies Online,  
<http://olc.spsd.sk.ca/DE/PD/instr/strats/jigsaw/>.