

LESSON PLAN | ADVANCED LEVEL

Grades: High school (9–12)

Subjects: Science and visual arts

Time required: 3–4 class periods

Lesson Overview

- Students study **insects** depicted in a seventeenth-century drawing. They research winged insects, identifying unique characteristics and those common to all insects. Students closely observe winged insects and create detailed drawings of wings.

Learning Objectives

Students will:

- Use observation, research, and prior knowledge to describe characteristics shared by all insects.
- Use knowledge about insect anatomy to differentiate among various **species** of insects represented in a seventeenth-century drawing.
- Understand that insects are **invertebrates** with **exoskeletons**.
- Draw insects using a variety of **shapes, lines**, and textures.
- Use **value** to create the illusion of three-dimensionality in drawings.

Materials

- Materials listed in the intermediate-level lesson (p. 23)
- Winged-insect specimens
- Tweezers
- Scalpels
- Magnifying glasses

Lesson Steps

1. Complete steps 1–4 of the beginning-level lesson, adapting for grade level as appropriate.
2. Complete steps 2–7 of the intermediate-level lesson, adapting the steps to focus only on the winged insects depicted in Jan van Kessel's drawing.
3. Introduce the terms *invertebrate* and *vertebrate* to students. List types of animals that fall into each category.

4. Once you have identified insects as invertebrates, ask students to speculate about how insects move and keep their shapes without internal bones. Discuss exoskeletons and their functions. Explain that wings are part of the exoskeleton.
5. Hand out **specimens** of houseflies, butterflies, dragonflies, moths, wasps, or any other winged insect that is represented in Van Kessel's drawing.
6. Have students use tweezers and scalpels to detach the insects' wings from the points at which they join the body. Using magnifying glasses and colored pencils, students will draw diagrams of wings, including as much detail as possible. Students should use line, shape, and **color** to visually describe the various textures of the wings. On the same page as the drawing, have students write a paragraph describing the wings to someone who cannot see them.
7. Instruct students to work with a partner to compare and contrast their drawings of insect wings with the wings depicted in Van Kessel's drawing. Students should speculate about how various characteristics of wings could allow different insects to move in distinct ways. Have student pairs share their speculations with the entire class.