

# Teaching Lightning Bolt Books™ *How Flight Works*



Interest Level: Grades K-2

Reading Level: Grade 2

**LEARNER**  **SOURCE™**

## Titles in this series:

*How Do Hang Gliders Work?*

*How Do Helicopters Work?*

*How Do Hot Air Balloons Work?*

*How Do Jets Work?*

*How Do Parachutes Work?*

*How Do Space Vehicles Work?*

## Standards

### Next Generation Science Standards

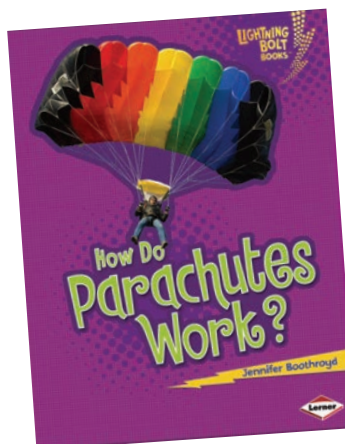
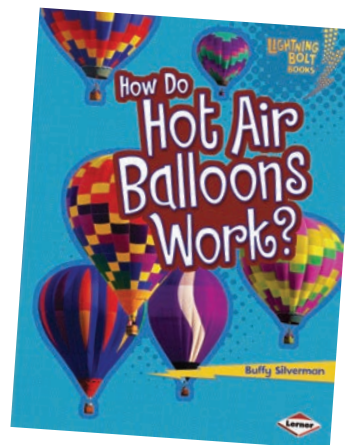
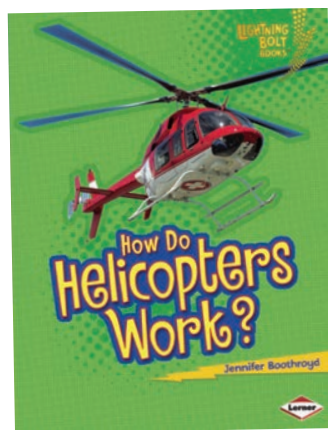
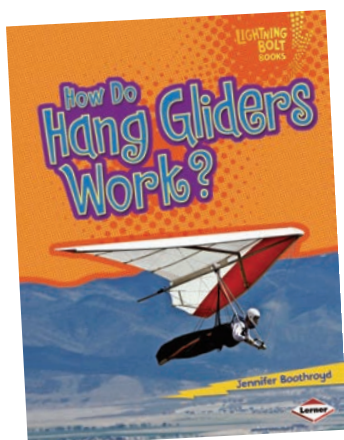
- 1.2: Developing and using models
- 1.3: Planning and carrying out investigations
- ETS1: Engineering Design

### Common Core Reading (Informational Text)

- Range of Reading and Level of Text Complexity

## Multiple Intelligences Utilized

- Verbal-linguistic, visual-spatial, bodily-kinesthetic, logical-mathematical, intrapersonal, interpersonal



# Lesson 1

## KWL Chart

### Purpose

Students will complete a KWL chart as they read.

### Materials

- How Flight Works series
- KWL Chart p. 6
- pencils

### Prepare

- Copy KWL Chart p. 6 for students or prepare to show it electronically.
- Choose a How Flight Works book to use as an example.

### Pretest

- What flies? How does it fly?

### Model

- Show KWL Chart p. 6 electronically. Show students the How Flight Works book. Ask what

students know about the topic of the book. Write their answers in the first column.

- Ask students what they want to learn about the topic. Write their answers in the second column.
- Read the example How Flight Works book with the class. Ask students what they learned. Write their answers in the third column.

### Practice

- Students will complete the first two columns of KWL Chart p. 6 before reading.

### Read

- Each student will read a book from the How Flight Works series.

### Practice

- Students will complete the third column of KWL Chart p. 6 after reading.

### Discuss

- Group students according to the books they chose, and have them share their completed charts.
- As a class, discuss the process of completing KWL Chart p. 6. Did students learn what they wanted to learn?
- Why is it helpful to think about what you know about a topic before you read a book about it?

### Evaluate

- Evaluate completed KWL Chart p. 6.

## Lesson 2

# Experiment with Gravity

### Purpose

Students will track how long it takes for dropped objects to reach the ground.

### Materials

- How Flight Works series
- a variety of objects, such as rocks, feathers, paper, pencils, or balloons
- a stopwatch
- Drop Speed Chart p. 7
- pencils

### Prepare

- Copy Drop Speed Chart p. 7 for each group.
- Collect a variety of objects with different weights.
- Find a place where students can drop objects safely.
- Divide students into small groups.

### Pretest

- What happens to your pencil if you drop it? What force causes this?

### Read

- Read the How Flight Works series.

### Model

- Explain what gravity is.
- Show Drop Speed Chart p. 7 electronically.
- Drop one object and use the stopwatch to time how long it takes the object to hit the ground.
- Show students how to enter the object and time in Drop Speed Chart p. 7.

### Practice

- Each group will get a small set of objects. They will drop each item, time the drop, and record the data in Drop Speed Chart p. 7.

### Discuss

- Which objects dropped faster? Which objects dropped more slowly? Why do you think they dropped at different rates?

### Evaluate

- Assess students' participation and understanding of the assignment.

## Lesson 3

### Make It Fly

#### Purpose

Students will make flying objects out of everyday materials.

#### Materials

- How Flight Works series
- a variety of craft supplies, such as construction paper, cardboard, rubber bands, tape, glue, feathers, balloons, or popsicle sticks

#### Prepare

- Gather craft supplies and set up an area for students to assemble their flying objects.

#### Pretest

- What kinds of things fly? How do they do it? What makes something fly?

#### Read

- In small groups, read How Flight Works books.

#### Discuss

- What are some traits of the machines described in these books? What do you think makes them fly?
- As a class, make a list of these traits.

#### Model

- Explain that students will use the craft supplies to create flying objects. Describe how designers usually sketch their ideas before actually making them.

#### Practice

- Students will sketch the flying objects they plan to make.
- Students will make flying objects from provided craft materials.
- Find a safe space for students to test out their flying objects.

#### Discuss

- Which objects flew best? Which ones had more trouble?
- What traits did the flying objects share? What do you think is needed for an object like this to fly?

#### Evaluate

- Evaluate students' participation and completion of the assignment.

## Lesson 4

### Explore Primary Sources

#### Purpose

Students will glean information from primary source photographs.

#### Materials

- How Flight Works series
- online access to the Library of Congress: From Fantasy to Flight at <http://www.loc.gov/teachers/classroommaterials/presentationsandactivities/presentations/fantasy-flight/index.html>
- Primary Source Questions p. 8
- pencils

#### Prepare

- Select two or three photos from the Library of Congress: From Fantasy to Flight collection. Recommended examples follow.
- An image of the first hot air balloon launching: <http://www.loc.gov/pictures/item/2002736265/>

- An early Wright brothers glider: <http://www.loc.gov/pictures/resource/ppprs.00571/>
- A 1908 plane in flight: <http://memory.loc.gov/cgi-bin/ampage?collId=magbell&fileName=137/13700505/bellpage.db&recNum=0>

#### Pretest

- How do we know what things looked like in the past?

#### Read

- Read books from the How Flight Works series.

#### Model

- Show one of the selected images electronically. Ask students what they see.

- Ask students how old they think the image is. Why do they think so?
- Discuss how the flying object in the photograph is like the things described in the How Flight Works series. How is it different?

#### Practice

- Students will look at another image from the Library of Congress: From Fantasy to Flight collection. They will answer the questions in Primary Source Questions p. 8.

#### Evaluate

- Evaluate the responses to Primary Source Questions p. 8.

Name \_\_\_\_\_

Date \_\_\_\_\_

## KWL Chart

What I **know**

What I **want** to find out

What I **learned**

Name \_\_\_\_\_

## Drop Speed Chart

**Directions:** Write the objects you will drop in the first column. Next, one member of your group will drop each item. Someone else will time each drop. Use the second column to write down how long the drop took.

Object	Total drop time

Name \_\_\_\_\_

## Primary Source Questions

**Directions:** Look at the primary source photograph and answer the following questions.

1. What do you see in the picture?

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2. How old is this picture? How do you know?

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3. How is the flying object in the picture like the things in the How Flight Works books?

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4. How is the object in the picture different from the things in the How Flight Works books?

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