

Lesson Plan: Paper Airplanes and Flight

Basics

Grade: 2nd Grade

Subject: Science

Duration: 45 minutes

Objective: Students will explore how paper airplanes fly and learn about forces like push and pull (thrust and gravity) through hands-on experimentation.

Assessment

Observe participation during plane-making, testing, and recording.

Review worksheets for recorded distances and reflection responses.

Check for understanding in discussions (e.g., connecting throwing to distance or gravity to landing).

NGSS Alignment

2-PS1-2: Matter and Its Interactions:

Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

K-2-ETS1-1: Engineering Design: 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.

K-2-ETS1-3: Engineering Design: Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Lesson Outline

Introduction (10 minutes)

Engage: Ask, "Have you ever seen something fly, like a bird or an airplane? What makes it go up in the air?" Discuss ideas (e.g., wings, pushing it).

Explain that students will be scientists testing paper airplanes to learn about push (throwing the plane) and pull (gravity pulling it down).

Show a pre-folded paper airplane and demonstrate a gentle throw. Highlight that they'll test how far it flies.

Materials

- ❑ Plain paper (8.5x11 inches, 1-2 sheets per student) and/or pre-folded paper airplanes
- ❑ Crayons or markers (for decorating)
- ❑ Measuring tape or yardstick
- ❑ Open space (classroom or hallway)
- ❑ Chart paper, whiteboard, or printable [worksheet](#) for recording observations
- ❑ Optional: [Video](#) about, and/or [diagram](#) of, the four principles of flight.

Activity: Make and Test Airplanes (25 minutes)

Step 1: Create (10 minutes)

Provide paper and a folding guide

Note: We suggest the [Flyer](#) for a dart type of plane or the [XO](#) for an aerial plane—instructions for both are available at PaperAirplaneGuru.com, where you can also find a variety of printable templates for both designs.

Consider providing pre-folded planes either for all students or for those who may struggle with folding their own

Let students decorate their planes with crayons/markers.

Step 2: Test (10 minutes)

In an open space, students throw their planes one at a time from a marked starting line. Measure and record how far each plane flies (using measuring tape or steps) on the [worksheet](#).

Encourage trying gentle vs. harder throws to see differences.

Step 3: Observe (5 minutes)

Discuss as a class: “Did some planes go farther? Why?” Guide students to notice the force of their throw (push) and gravity’s pull.

Discussion/Wrap-Up (10 minutes)

Record a few observations on chart paper (e.g., “My plane flew farther when I threw it harder”).

Ask: “What did you learn about how planes fly?” Connect to push (thrust) and pull (gravity).

Encourage students to complete the worksheet’s reflection question and visit paperairplaneguru.com for more designs.

Notes for Teachers

Safety: Ensure throws are in one direction to avoid collisions.

Differentiation: Provide pre-folded planes for struggling folders; let advanced students fold their own. Allow students to draw rather than write about what they learned from testing their paper airplane.

Extensions:

Add the element of throwing overhand versus underhand (for the XO design) or sidearm (for the XO or the Flyer designs).

Have students try a new plane design at home, either of their own creation or found online or in a book.

For dart-type of planes, have students tweak the wings at different angles to see what happens.