NASA AT 50
1985: Research Begins on Wind Shear Detection System
Teacher's Guide

Grade Level: 6–12 **Curriculum Focus:** Science, Social Studies **Running Time:** 4 minutes

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Introduction

NASA at 50 acquaints students with key innovations and milestones in chemistry, physics, engineering, and space exploration from NASA's fifty-year history. Each clip serves as a gateway for extended lessons in science and history, promoting critical thinking and inquiry as essential components of scientific literacy.

Program Description

Profiles NASA's contribution to the wind shear detection system, a form of radar that detects columns of sinking air and helps aircraft avoid potentially dangerous situations. The program explains how microbursts, or localized columns of sinking air, are a threat to aircraft during takeoff and landing. After a series of crashes in the late 1970s and early 1980s, NASA began researching microbursts and developed a new form of radar designed to give pilots extra warning time before entering a microburst.

Learning Objectives

After viewing the program and participating in discussion, students will be able to:

- Explain what a microburst is;
- Describe how a wind shear detection system functions;
- Consider why microbursts threaten aircrafts;
- Identify the importance of research.

Classroom Connections

Why was there so much public pressure on NASA to research and solve wind shear problems for aircraft?

What is a microburst? Draw an illustration of a microburst.

Why are microbursts more dangerous during takeoff or landing?

How did NASA solve the microburst problem?

Classroom Activities

Students should explore the National Oceanic and Atmospheric Administration's (NOAA) Web site (www.noaa.gov). Hypothesize how closely NOAA and NASA are related and how much they work together. In what ways are they similar or different? Students should decipher radar images of incoming weather in their area.

The wind shear detection system is only one of many NASA projects that has changed our daily lives. Using the NASA Web site (www.nasa.gov), have students research other NASA inventions and projects that have lead to advances in aviation, industry, and research. Each student should write a brief paragraph about the selected project or invention and its impact.

Target Vocabulary*

cumulus cloud - a dense puffy cloud form having a flat base and rounded outlines often piled up like a mountain

microburst - a violent short-lived localized downdraft that creates extreme wind shears at low altitudes and is usually associated with thunderstorms

radar - a device or system consisting usually of a synchronized radio transmitter and receiver that emits radio waves and processes their reflections for display and is used especially for detecting and locating objects

velocity - quickness of motion

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Academic Standards

National Science Teachers Association
The National Science Teachers Association (NSTA) has developed national standards to provide guidelines for teaching science. To view the standards online, go to http://www.nsta.org/publications/nses.aspx .

This guide addresses the following standards:

- Science and Technology
- Earth and Space Science
- People, Places, and Environments
- Science in Personal and Social Perspectives
- History and Nature of Science

National Council for the Social Studies
The National Council for the Social Studies (NCSS) has developed national standards to provide guidelines for teaching social studies. To view the standards online, go to http://www.socialstudies.org/standards/strands/.

This guide addresses the following standards:

- Time, Continuity, and Change
- People, Places, and Environments
- Science, Technology, and Society
- Individuals, Groups, and Institutions