SCIENCE NORTH SCIENCE NORD
SUDBURY, ONTARIO, CANADA

**Flight Part 1** **Grade 6 – Flight**

# Lesson Plan

| | |
|---|---|
| Assessment | AFL, questions, model |
| Cross-curricular | |

## Big Ideas

- Flight occurs when the characteristics of structures take advantage of certain properties of air.

## Learning Goals

- Understand the connection between the forces of flight and airplane controls
- Build a simple helicopter model
- Learn about modern flight

## Specific Expectations:

**2.1** follow established safety procedures for using tools and materials and operating flying devices (e.g., aim flying devices away from each other when launching them; fly kites and airplanes a safe distance from overhead hydro wires)
**2.3** investigate characteristics and adaptations that enable living things to fly (e.g., a bat's wings are made up of long, thin bones covered with a very light membrane that forms an airfoil surface; insects can twist and turn their wings, which helps them to hover in the air or even fly back- wards; some seeds, such as the keys of a maple tree or dandelion seeds, have parachutes or wings like a glider that allow them to be carried by the wind)
**2.4** use technological problem-solving skills to design, build, and test a flying device (e.g., a kite, a paper airplane, a hot air balloon)

## Description:

This is the **first** lesson in a five-lesson unit on flight. Each day the students will build something that flies, progressing in their designs just as real flight progressed throughout history. Today we will start with the earliest experiments on flight and build a kite.

## Materials/Resources:

Paper – Letter size
Skewers, Stapler
String, Tape
Scissors
Material for tails – flagging tape, or ribbon
Hole punch

## Safety Notes

## Introduction

**Slide Show**

- Slide 1: Humans have long dreamed of flying. They were inspired by the world around them.
    - Can you think of some things that can fly? … Most things that fly beat their wings.
- Slide 2: So how do birds and other animals actually fly?
    - Watch a few short videos of flying creatures in slow motion.
    - Discuss. Could humans ever fly like this? (NO – we are not built for it – we are too heavy, would not be able to beat wings fast enough. Our muscles are not strong enough to make that motion).
- Slide 3: From this realization came the Greek story of Icarus and Daedalus.
    - Briefly tell the story or watch a video on Icarus and Deadalus: https://www.youtube.com/watch?v=YvrjaxNmf24
    - So do you think that really happened? Why not? (It wouldn't have worked, it doesn't get hotter as you fly higher, the Greeks told many stories that were not meant to be taken literally but interpreted for the tale within the story.
    - What might the story of Icarus and Deadalus really be about?
        - The danger of becoming overconfident
        - The importance of heeding your parents warnings
        - The limits of technology
        - Etc.
- Slide 4: The Chinese were successful at getting things to fly very early on though.
    - Realized that HOT AIR RISES, leading to hot air balloons.
    - If you trap hot air it can push something up into the sky. These are Chinese hot air balloon lanterns
- Slide 5/6: The Chinese invented kites. Some were so large they could lift humans into the sky!
- Slide 7: Man carrying kites were used in World War I to spy on enemy lines!
- Slide 8: How do you think a kite works?
    - When you hold it and air hits it, it pushes it up due to its angle
    - Have you ever held your hand out the car window when it was going pretty fast and let the air push it up and down? That is exactly the force that makes a kite rise!
    - You can see how higher air pressure below the kite, and lower pressure above leads to an upward lifting force.
    - We will revisit these forces when we talk about airplanes!

Let's build a kite to see how it works!

## Action

**Fly a Kite**

You can find tons of kite designs online. We suggest building a simple kite that works well and that students will have chance to test at the end of the class (so it shouldn't take too long to build). We are including two suggested designs here. Not everyone has to build the same kite either. Comparing them can be fun and educational!

- The first design is simpler but the kite in the second design definitely works a bit better too.
- Each student should collect the materials listed on their kite design instruction sheet.
- Build the kite by following the instructions on the handout.
- Attach enough string to be able to fly it up to 10 feet in the air or so.
- Optionally wind up the string on a pencil or other round object, so it can be gradually released.
- **Test the kite:**
    - If there is enough of a breeze outside to make the kites lift in the air, take the class outside and try out the kites. Make sure to stand far enough apart that strings don't tangle!
    - If there is no wind or the weather is bad, you can try flying the kites by running down a hallway with them. It may take a bit of experimenting and it may be best to take turns so there are no collisions!

## Consolidation/Extension

- Discuss results of flight-testing. Why did some work better or not as well?