

The Art of “Green” Flying

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Suggested Grade Levels: 5 - 6

Subject Areas: Visual arts, science, technology education

Rationale:

The environmental “footprint” made by conventional airplanes is an issue with which we know that we need to come to terms. There are, however, many examples of flying “machines” that use only wind power (e.g., birds, gliders, kites, airships) and people have always been fascinated by them. This lesson will give students an opportunity to do some detective work about how wings are designed and how birds and various inventions actually do fly. Representations of birds in native Canadian artwork will serve as a springboard for discussion and creative work. After viewing designs for flying machines by such inventors as Alexander Graham Bell and Leonardo da Vinci, students will individually “invent” a flying machine that does not require fossil fuel.

Logistics:

Classroom set-up

Access to computers or the library will assist students with individual research.

Materials

- Reference books, magazines about the science of flight
- Drawing paper, pencils, crayons, coloured pencils or markers

Suggested resources / images

www.angelfire.com/electronic/awakening101/leonardo.html (drawings of wing structures, Leonardo’s designs)

www.flyingmachines.org (list of flying machine experiments with drawings)

<http://travel.howstuffworks.com/glider3.htm> (explains how gliders work)

images of birds in native Canadian art (e.g., works by Norval Morrisseau)

Suggested Outcomes:

Students will be expected to:

- Demonstrate a sensitivity toward the natural and built environment (visual arts)
- Use a combination of visual elements and principles of art and design in art-making (visual arts)
- Communicate effectively in talk and writing and by preparing diagrams and drawings (science)
- Demonstrate an understanding of the theory of flight (science)

Introduction:

To prepare for the lesson, students could be engaged in brainstorming a list of all the things that fly without the use of fossil fuels. They might also be asked to bring to class drawings of imaginary “flying machines” that they have found in children’s books, comics, or on the Internet. They might also bring photographs of birds in flight. These drawings and photos should be saved in a class folder for reference at the conclusion of the lesson.

Suggestions for Teaching and Learning:

1. As a whole group, view sculptures and drawings of birds in native Canadian art. It would be excellent to visit a gallery for this part of the lesson. The permanent collection of the Art Gallery of Nova Scotia has wonderful works by Norval Morrisseau such as “Young Gulls Watching” and “Composition with Loons” and other artwork such as “Ravens Defending Nest” by Soroseelutu Ashoona, “Two Mi’Kmaq Catching Loons” by David J. Brooks and “Bird with Wings Tipped” by Kopie Tukiki. Students could talk about how the artists have represented these creatures that are capable of flight. They could also talk about the sense of grace, majesty or awe that is found in these representations.
(Note that if a visit to a gallery is impractical, similar on-line images could be viewed as a class.)
2. Using the Internet and available science reference materials, invite students, in groups of 2-3, to investigate one of the following:
 - How wings are constructed
 - How things fly (the science of flight)
 - Flying machine inventions from the past
3. As groups share with the class one or two neat things that they learned during their research, ask students to note one or two of these findings that they find most fascinating.
4. As a class, consider what the requirements for a “green” flying machine would be. What could be power source be? You might choose to make a list of all the various “green” flying machines (kites, gliders, birds, airships) to provide focus for this discussion.
5. Invite students to draw a “green” flying machine of their own invention. Their design could be whimsical, fantastical, or no-nonsense. It should be based on what they have learned about wings, lift, and the science of flight. Some students might choose to use shades of the colour green to enhance their design. Others might create the design on the computer, using a drawing program.
6. When the drawings are complete, ask students to prepare an accompanying “designer’s statement”, suggesting a name for their invention and explaining the key aspects of their design.

7. Mount an exhibition that includes: “postcards” that show birds in native Canadian art; drawings of imaginary “flying machines” from other sources; and students’ own designs. The exhibition could be titled “The Art of Green Flying” or students could decide on their own title. This exhibition could be displayed beyond the classroom - in the local library or airport terminal.

Extension of Ideas:

Some students might choose to construct a working model of the “green” flying machine that they have designed.

A pilot who lives in the community might be invited to the class to view the exhibition and talk about flying.

Students might write a “pitch” to an aerospace company that has asked for cutting-edge designs for flying machines.

Suggestions for Assessment:

Students could reflect individually and as a class about all that they learned about flight and designing a flying machine. Journals could be used to record these reflections – diagrams would be an excellent addition to written notes.

Students could complete peer assessment rubrics, based on given criteria, as they view the completed exhibition.