



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
1990 Volume VII: What Makes Airplanes Fly? History, Science and Applications of Aerodynamics

Introduction

This seminar followed a similar one on the topic of flight presented two years ago. This time around more emphasis was placed on the historical aspects of flight and its impact on current traffic and communications. Four of the ten Fellows present this time had participated in 1988. They wished to extend their understanding of the subject and increase the depth of their teaching units.

In the seminar, the underlying science of flight was of primary importance since the field lends itself admirably to demonstrate general concepts of physics by experiments, films, etc. In addition the history of flight provides a fascinating aspect of the history of technology, in this case a new technology that developed at a breathtaking rate. We remember that there are a few people alive who were born prior to the Wright brothers' first flight in a heavier-than-air flying machine. The impact of the rapid advances in the technology of aviation has changed the world of travel, given rise to previously unknown major industries, and joined distant countries in commerce and general interaction. This affects all our lives. Young people in particular are drawn to airplanes, and consequently the topic lends itself well to excite a more general interest in science and engineering.

The breadth of the field—as expected—led to a great variety of subjects for the units. In turn the units range from those with scientific and mathematical contents to a majority dealing with airplanes, history, traffic, industry, and the like. Specifically, one unit deals with the physics of model testing addressing high-school students. Two other units treat mathematical aspects of flight, leading to problem solving in aviation and the development of the aircraft industry. Five units contain descriptive elements of aerodynamics, such as bird and glider flight, and making and flying of paper airplanes are discussed. General remarks on airplanes round out these units. One extensive piece deals with the history of flight using the achievements of the Wrights as the centerpiece. Finally, a detailed essay on the aerospace industry and its effects on the economy was produced.

Some of the units will be useful for elementary-school pupils, others for middle-school or high-school students. Some of them will require the attention of students deeply committed to serious work. As a seminar leader, I hope that the Fellows, who are all dedicated to teaching, stimulate the interest of the students so that some of them may wish to follow the tough but rewarding path toward a career in engineering and science or in the teaching of these fields.

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