



ELEVENTH GRADE CURRICULUM

THE FLYING ENVIRONMENT

SEMESTER ONE

This course is foundational for both manned and unmanned aviation, and will prepare students to take either of two Federal Aviation Administration tests: the Private Pilot Knowledge Test or the Part 107 Remote Pilot Knowledge Test. Topics include: pre-flight procedures, airspace, radio communications, aviation phraseology, regulations, airport operations, aviation safety, weather, cockpit management, and emergency procedures.

Unit 1: Aviation Weather Theory

What makes weather, and why does it matter to pilots? In this unit, students will examine the building blocks of weather. Early lessons will cover broad concepts, such as heat exchange, the role of atmospheric water, and the movement of air masses. Later lessons will focus on understanding specific weather phenomena, including clouds and fog, thunderstorms, and wind shear.

	No. of Sessions Per Lesson	Day of Semester
<u>Pre-Course Exam</u>	1	1
<u>Section A – Why Weather Matters</u>		
Lesson 1 Introduction to Aviation Weather	1	2
<u>Section B – Understanding Atmosphere</u>		
Lesson 1 Makeup of the Atmosphere	3	5
Lesson 2 Atmospheric Circulation and Winds	3	8
Lesson 3 Clouds and Precipitation	4	12
Lesson 4 Air Masses and Fronts	4	16
Lesson 5 Thunderstorms	4	20
<u>Unit 1 Exam</u>	1	21
Total Sessions Unit 1	21	
Semester Total	21	



Unit 2: Aviation Weather Services

To fly safely, pilots must have good insight into the weather around them. Weather observations, forecasts, and charts are vital to a pilot’s understanding of the weather both before takeoff and as a flight progresses. In this unit, students will learn about the sources of weather observations, including radiosondes, radar, satellites, and more. They’ll also learn about various weather products and services available to pilots and how to interpret these essential tools to make good decisions about the viability of a proposed flight.

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Weather Observations and Forecasts</u>			
Lesson 1	Introduction to Aviation Weather Services	1	22
Lesson 2	Aviation Weather Observation & Reporting	4	26
Lesson 3	Aviation Forecasts and Weather Charts	4	30
<u>Section B – Getting Weather Information</u>			
Lesson 1	Preflight Weather Planning	3	33
Lesson 2	In-flight Weather and Tactical Weather Decision Making	3	36
<u>Unit 2 Exam</u>		1	37
Total Sessions Unit 2		16	
Semester Total		37	



Unit 3: Airport Operations

Every flight begins and ends at an airport. To keep airports running smoothly and safely, pilots need to understand the “rules of the road.” Signs and pavement markings help pilots navigate the complex and sometimes busy world of the airport. Specialized lighting makes it easier to find your way at night. In this unit, students will learn the meaning and function of the many signs and markings used at airports.

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Understanding Airports</u>			
Lesson 1	Introduction to Airports and Airport Data	2	39
Lesson 2	Airport Markings and Signs	4	43
Lesson 3	Airport Lighting	2	45
Lesson 4	Traffic Patterns	2	47
Lesson 5	Communications	4	51
Lesson 6	ATC	2	53
Lesson 7	Pilot Communications in the Airport Environment	3	56
Lesson 8	Airport Safety and Pilot Considerations	2	58
<u>Unit 3 Exam</u>		1	59
Total Sessions Unit 3	22		
Semester Total	59		



Unit 4: Introduction to Aeronautical Charts and Airspace

A good flight starts with a good plan, and the first thing a pilot may turn to is a map. In aviation, the maps are known as aeronautical charts, and they provide a wealth of information for pilots. Knowing how to read the charts is critical for any pilot, and this unit provides an introduction to the main features of the charts as well as an introduction to the National Airspace System which governs where and under what circumstances drone and manned pilots may fly their aircraft.

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Introducing Aeronautical Charts and Airspace</u>			
Lesson 1	Introduction to Aeronautical Charts	4	63
Lesson 2	Introduction to the National Airspace System	4	67
<u>Unit 4 Exam</u>		1	68
Total Sessions Unit 4	9		
Semester Total	68		



Unit 5: Post-Course Exam Review

After a semester full of weather, airport operations, and navigation, it's time to review for the Post-Course Exam. In this unit, students become the teachers as they select topics to review from weather theory to types of airspace, plan review activities, and present their lessons or activities to their classmates.

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Post-Course Exam Review</u>			
Lesson 1	Review or Project: Student/Teacher Choice	1	69
	<u>Post-Course Exam</u>	1	70
Total Sessions Unit 5	2		
Semester Total	70		

PROPRIETARY

ELEVENTH GRADE CURRICULUM: PILOT

FLIGHT PLANNING

SEMESTER TWO

This course will cover the remaining topics necessary for students to take the Federal Aviation Administration's Private Pilot Knowledge Test. Students will review regulations, cross-country flight planning, weight and balance, performance and limitations, human factors, chart use, night operations, navigation systems, and aeronautical decision making. At the end of this course, a school may choose to arrange for students to be signed off to take the Federal Aviation Administration's Private Pilot written exam.

Unit 6: Navigation: Plotting, Pilotage, Paperwork

An in-depth review of sectional aeronautical charts and instruction in the use of a plotter and mechanical flight computer called the E6B allows students to plan a short cross country flight.

	No. of Sessions Per Lesson	Day of Semester
<u>Pre-Course Exam</u>	1	1
<u>Section A – Charts and Airspace Review</u>		
Lesson 1 Advanced Aeronautical Charts	2	3
Lesson 2 Latitude, Longitude, and Time	2	5
<u>Section B – The Geometry of Navigation</u>		
Lesson 1 Drawing and Measuring Courses 8	3	
Lesson 2 Which Way to Steer?	4	12
Lesson 3 Flight Computers	3	15
<u>Section C – Planning a Cross-Country Trip</u>		
Lesson 1 Plotting Your Course	2	17
Lesson 2 Helpful Documents	2	19
Lesson 3 VOR and GPS Navigation	4	23
<u>Unit 6 Exam</u>	1	24

PACING GUIDE

Total Sessions Unit 6 **24**
Semester Total **24**



Unit 7: Aircraft Performance

“Will I have enough fuel for this trip? How much baggage can I bring aboard the aircraft? Is the runway length at my destination long enough for landing and takeoff?” Answering these important preflight safety questions requires a pilot to know how to read aircraft performance charts. In this unit, students will learn flight planning procedures that involve determining aircraft performance, which could be affected by weight, atmospheric conditions, the runway environment, and more. Students will learn to use performance charts to determine takeoff, climb, range, endurance, descent, and landing performance.

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Reading Aircraft Performance Charts</u>			
Lesson 1	Weight and Balance	3	27
Lesson 2	Density Altitude	2	29
Lesson 3	Takeoff and Landing Distances	2	31
Lesson 4	Aircraft Power Settings	4	35
<u>Unit 7 Exam</u>		1	36
Total Sessions Unit 7		12	
Semester Total		36	

Unit 8: Aeromedical Factors: Am I Safe to Fly?

Aircraft move and operate in many different environments, and sometimes pilots are subjected to conditions that can affect their health and safety. Optical illusions and spatial disorientation are just two of the conditions students will learn about in this unit.

Additional topics include medical certification requirements, drug and alcohol use, and aeronautical decision making strategies.

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Certificates, Regulations, and Safety</u>			
Lesson 1	Medical Certificates	1	37
<u>Section B – Anatomy and Physiology</u>			
Lesson 1	It’s Getting Harder to Breathe	2	39
Lesson 2	Your Eyes are Deceiving You	4	43
Lesson 3	Disorientation and Motion Sickness	1	44
<u>Section C – Drugs and Alcohol</u>			
Lesson 1	Drugs and Alcohol	1	45
<u>Section D - Aeronautical Decision Making</u>			
Lesson 1	Aeronautical Decision Making	2	47
<u>Unit 8 Exam</u>		1	48
Total Sessions Unit 8	12		
Semester Total	48		



Unit 9: FAA Regulations Review

Throughout your study of aviation in the United States, students have seen references to the Federal Aviation Regulations or FARs. The United States Code of Federal Regulations has many parts (called Titles) regulating activities in the USA. Title 14 relates to Aeronautics and Space, and it is commonly known as the FARs. This unit covers the most common private pilot-related regulations in Part 61 (certification for pilots) and Part 91 (general operating and flight rules).

		No. of Sessions Per Lesson	Day of Semester
<u>Section A – Overview</u>			
Lesson 1	Regulations Overview	1	49
<u>Section B – Part 61 Regulations</u>			
Lesson 1	FAR Part 61 Review	3	52
<u>Section C – Part 91 Regulations</u>			
Lesson 1	FAR Part 91 Review	4	56
<u>Section D – AIM, NTSB, and More</u>			
Lesson 1	Aeronautical Information Manual	2	58
Lesson 2	ACs, ADs, NOTAMs, and the NTSB	1	59
<u>Unit 9 Exam</u>		1	60
Total Sessions Unit 9		12	
Semester Total		60	



Unit 10: Private Pilot Projects

In this final unit, students get to practice being ground instructors as they select a topic from the Pilot’s Handbook of Aeronautical Knowledge, craft a lesson, teach their lesson to the class, and administer an assessment. This hands-on experience further develops their aviation knowledge in preparation for the FAA Private Pilot Knowledge Test.

Students are also given time to assess and update their career portfolio with reflections, artifacts, and documentation from any work experiences, interviews, competitions, or coursework they have participated in throughout the year.

	No. of Sessions Per Lesson	Day of Semester
<u>Section A – Ground Instruction</u>		
Lesson 1 Teach a Private Pilot Lesson	8	68
<u>Section B – Career Planning</u>		
Lesson 1 Career Portfolio Development	1	69
<u>Post-Course Exam</u>	1	70
Total Sessions Unit 10	10	
Semester Total	70	

