# Regulations Overview

**Session Time:** One, 50-minute session

## DESIRED RESULTS

### ESSENTIAL UNDERSTANDINGS

Aviation an activity with specific rules that are found in Title 14 of the Code of Federal Regulations and are commonly known as the Federal Aviation Regulations (FARs).

Pilots are expected to have a working knowledge of the Federal Aviation Regulations that apply to the types of flying activities they engage in.

The Federal Aviation Administration (FAA) and National Transportation Safety Board (NTSB) produce additional documents that pilots must familiarize themselves with.

### ESSENTIAL QUESTIONS

1.
Where do pilots find the rules and regulations that govern aviation in the United States?

### LEARNING GOALS

**Students Will Know**

- The various types of publications produced by the FAA and NTSB that apply to general aviation flight operations, and the type of information that can be found within each of them.
- Which publications are regulatory and which publications are advisory in nature.

**Students Will Be Able To**

- *Distinguish* the differences between the four types of publications produced by the FAA and NTSB publications applicable to general aviation flying. [DOK-L2]
- *List* regulations with which they are already familiar. [DOK-L1]

## ASSESSMENT EVIDENCE

**Warm-up**
Students will work in small groups to list as many aviation rules and regulations as they can remember.

**Formative Assessment**
Students will list important and interesting facts from the lesson and apply their understanding of the various sources of aviation rules and regulations.

**Summative Assessment**
Students will answer multiple-choice questions, modeled on the FAA Private Pilot Knowledge Test, to apply their understanding of the various sources of aviation rules and regulations.

## LESSON PREPARATION

### MATERIALS/RESOURCES

- Regulations Overview Presentation
- Regulations Overview Student Activity 1
- Regulations Overview Student Activity 2
- Regulations Overview Student Activity 3
- Regulations Overview Student Notes
- Regulations Overview Teacher Notes 1
- Regulations Overview Teacher Notes 2
- Regulations Overview Teacher Notes 3

**Materials for Student Activity 2 (per group)**

- Internet-connected device for accessing the following online resources:
    - Federal Aviation Regulations
    - Aeronautical Information Manual
    - Notices to Airmen
    - Airworthiness Directives
    - Advisory Circulars
    - NTSB Part 830

### LESSON SUMMARY

**Lesson 1: Regulations Overview**

The lesson will begin with a warm-up in which students write down all the aviation rules and regulations they can think of, based on what they have learned in previous lessons. The teacher will allow students to share their lists in a class discussion.

In the next part of the lesson, students will complete a jigsaw activity by dividing into small groups of "experts." Each expert group will briefly review one or more publications containing aviation rules and regulations. Experts will then return to their "home" groups to report on what they learned.

During the next part of the lesson, students will be introduced to the contents and purposes of the Federal Aviation Regulations (FARs), the Aeronautical Information Manual (AIM), and the other publications from the jigsaw activity. Students will then complete a brief formative assessment to demonstrate their understanding of these publications.

Finally, students will apply their understanding of the contents and purposes of these publications by identifying scenarios in which pilots might consult each publication. A summative assessment allows students to answer sample FAA Knowledge Test questions.

### BACKGROUND

The need for regulations in aviation became apparent soon after the Wright Brothers' first flights. Over the years, regulations have evolved to include rules and policies extending from pilot certification to daily operations to aircraft design. The goal of the FARs is to create an environment of safety that protects not only those involved in aviation but also the public at large.

FARs are a part of Title 14, Aeronautics and Space, of the Code of Federal Regulations. Regulatory requirements are contained within the FARs, which are themselves divided into several parts. Aviation facilities, procedures, and

procedural advisories are found in the Aeronautical Information Manual (AIM). Notices to Airmen (NOTAMs) are special advisories, often of a short-term duration, that affect operations in specific locations. The National Transportation Safety Board has also published regulations pertaining to the reporting requirements for aviation accidents and operational failures.

Still other publications detail requirements for aircraft maintenance and special operational considerations.

It is imperative that pilots understand the breadth of regulations that govern their activities and know which publications to go to as direct references. Given the many different publications, finding the exact reference for a specific rule or procedure is often a source of frustration, even for seasoned pilots.

## MISCONCEPTIONS

Most students are probably familiar with the FARs. Some notable FARs have been mentioned in previous lessons. Students may be less familiar with other important documents and publications, including the AIM, airworthiness directives (ADs), advisory circulars (ACs), and NOTAMs. In addition to these publications, Part 830 of the NTSB regulations details pilot responsibilities and duties for reporting aircraft accidents and other events that could impact flight safety. While some of these publications are regulatory in nature, others may be de facto regulatory, while others are simply advisory.

As covered in a previous lesson, there are no police officers of the air or police aircraft looking for pilots violating rules. There are, however, FAA inspectors and enforcement officers who are empowered to take action against pilots who violate the rules. Air traffic controllers, though not enforcement officials themselves, are empowered to report any violation of the FARs or procedural rules they observe to the local FAA district office, where an inspector will investigate and take the appropriate action.

## DIFFERENTIATION

To support students with low working memory in the EXPLAIN section of the lesson plan, encourage students to take notes. They might find it helpful to add their notes to the Regulations Overview Student Notes handout (either in the table or on the back of the sheet). You can offer additional support to students by allowing them to use their notes when completing the **Formative Assessment**.

# LEARNING PLAN

## ENGAGE

**Teacher Material:** Regulations Overview Presentation
**Student Material:** Regulations Overview Student Notes

**Session 1**

**Slides 1-3:** Introduce the topic and learning objectives of the lesson.

**Slide 4:** Conduct the **Warm-Up**.

**Warm-Up**

Divide students into pairs or groups of three or four, and distribute a copy of **Regulations Overview Student Notes** to each group. Partners or groups should complete the table in the activity worksheet by listing as many aviation rules and regulations as they can remember from previous lessons, as well as the specific publications that contain them.

Give each group about five minutes to compile their lists, then briefly discuss everyone's ideas as a class. Divide the board into six categories (one for each publication listed in **Regulations Overview Student Notes**) and record ideas in the appropriate columns.

Finally, explain that in this lesson, students will get a brief overview of these publications; in later lessons, students will learn more about the specific publications and FAR parts.

## EXPLORE

**Teacher Materials:** Regulations Overview Presentation, Regulations Overview Teacher Notes 1
**Student Material:** Regulations Overview Student Activity 1

**Slide 5:** Distribute **Regulations Overview Student Activity 1**. Divide students into "home" groups of five, and then have group members count off by five to form "expert" groups. Groups will follow the instructions in the activity worksheet to complete a jigsaw activity in which different expert groups review specific types or parts of publications that contain aviation rules and regulations. Students will then return to their home groups and briefly report on what they learned about their assigned publications. Sample responses are provided in **Regulations Overview Teacher Notes 1**.

**Teaching Tips**

This activity is intended to be brief: approximately 20 minutes. Students are not expected—nor will they have time—to read their assigned publication(s) closely; instead, they should skim the table of contents, the subparts, and section headings to take note of rules or regulations that seem particularly interesting or important. Here is a suggested time allotment:

- 4 minutes to explain the process and gather into home and expert groups
- 10 minutes to review assigned publication(s) and answer questions in worksheet
- 1 minute to return to home groups
- 5 minutes for experts to report to home groups

## EXPLAIN

**Teacher Materials:** Regulations Overview Presentation, Regulations Overview Teacher Notes 2
**Student Material:** Regulations Overview Student Activity 2

**Slide 6:** Title 14 of the Code of Federal Regulations has six chapters, and the FARs are a subset of many regulations governing aeronautics and space. Rules pertaining to the same area of operation are grouped together; this makes accessing information easier for pilots, and limits the amount of searching that must be done.

For example, Part 1 of the FARs deals with definitions. Everyone participating in aviation must clearly understand these definitions to ensure there are no miscommunications. Part 1 defines basic terms such as *airplane* and *aircraft*. An aircraft is any "device that is used or intended to be used for flight in the air," whereas an airplane is "an engine-driven fixed-wing aircraft." Part 1 also defines more complex terms, such as *altitude engine* ("a reciprocating aircraft engine having a rated takeoff power that is producible from sea level to an established higher altitude"), as well as acronyms that may be new to student pilots. These include VFR (visual flight rules) and IFR (instrument flight rules); the many V-speeds that define aircraft performance parameters (e.g., VA means "design maneuvering speed" and VY means "speed for best rate of climb"); and dozens of others.

**Slide 7:** Aircraft maintenance is also a highly-regulated part of aviation. To make sure that aircraft are maintained properly by trained mechanics, the FAA developed Part 43 of the FARs. This part goes into great detail about how aircraft are to be maintained, who may do that maintenance, and how to prove that the required maintenance was performed. Part 43 connects with Part 91 (General Operating and Flight Rules), Subpart E, which contains rules for maintenance, preventative maintenance, and alterations.

For example, Part 43 specifies that most aircraft maintenance must be done by licensed aviation technicians (airframe and powerplant mechanics, or A&Ps). A&Ps must undergo thorough training and pass comprehensive tests to become certified to work on aircraft.

Part 43 also details that aircraft must be inspected annually by an A&P, and that the pitot-static system must be certified every 24 months if the aircraft is to be flown under IFR. These FARs also specify what must be inspected, from the engine and ignition system to the airframe and control cables and hinges. Major repairs to the airplane must be documented, and all work on the airplane—inspections, repairs, and maintenance—must be recorded in the aircraft's maintenance logbooks.

Appendix A to Part 43 outlines maintenance that owners may perform without a mechanic signing off on the work; for example, oil and tire changes.

**Slides 8-9:** Part 61 of the FARs spells out in detail the flight and training time required for all levels of pilot and instructor certification. These FARs also require prospective pilots and instructors to pass various knowledge tests throughout their training, and to complete a practical test in certain instances. These practical tests consist of one or more sessions with an FAA examiner or inspector who administers an oral exam followed by a flight test where the applicant for a certificate demonstrates their ability to perform tasks in the FAA's Airman Certification Standards.

Part 61 encompasses some practical details as well. For instance, it spells out a number of administrative procedures, including how to replace a lost pilot certificate and how to report a change of address. It also provides guidance on how to maintain pilot logbooks, what flight times must be logged, and how pilots must undergo a flight review to maintain their flying privileges. It also regulates drug and alcohol testing and details what may happen if a pilot refuses to submit to a test.

Part 61 also contains a number of Special Federal Aviation Regulations (SFARs); these rules pertain to only a limited number of pilots or types of operations. For example, special regulations apply only to the Robinson R-22 and R-44 helicopters; these SFARs were put in place in 1995, following a number of accidents involving these particular aircraft.

**Slide 10:** Medical certification and BasicMed criteria are spelled out in detail in Parts 67 and 68 of the FARs.

- Part 67 details the many requirements, limitations, and other rules pertaining to the issuance of first, second, and third class medical certificates. This part of the FARs also specifies the valid times for each class of certification, the special authorizations that medical providers must have to perform examinations and issue certifications, and the provisions for special issuance certificates.
- Part 68 deals with the criteria used to operate small aircraft without a medical certificate. The BasicMed program rules are contained within Part 68. Part 68 details the qualification criteria, procedures, and limitations associated with BasicMed, the duration of such privileges, and the steps available to request special consideration in case a pilot's condition may not qualify under the normal provisions of this part.

**Slide 11:** There is an old saying in aviation: "Part 61 tells you how to earn a pilot's certificate, Part 91 tells you how to lose it." In many ways, that old saying remains true. While Part 61 of the FARs spells out in detail the training, flight, and experience requirements for earning a pilot certificate or rating, Part 91 specifies in detail the operating rules and procedures that pilots are expected to follow. A pilot who violates any of these rules risks losing their privilege to fly, either temporarily through a certificate suspension, or permanently through outright revocation.

Part 91 covers virtually all aspects of flying, from preflight planning to touchdown. Since these rules are so numerous, Part 91 has been broken down into subparts, including:

- General (Subpart A)

- Flight Rules (Subpart B), including sub-sections on general flight rules and VFR
- Equipment, Instrument, and Certificate Requirements (Subpart C)
- Maintenance, Preventative Maintenance, and Alterations (Subpart E)

There are ten other subparts, but the four listed above are most relevant to this unit.

**Slide 12:** The AIM—which is also published by the FAA—is a tremendously valuable resource for pilots. The manual consists of 10 chapters and over 700 pages of up-to-date, authoritative information, ranging from details about the different classes of airspace to the different types of approach lighting systems and acceptable phraseology to use in communications.

The AIM is full of practical information on just about any topic concerning the process of flying an aircraft, as well as "how to" guidance covering a wide range of piloting scenarios. Though the procedures found in the AIM are not strictly regulatory, they are often treated as such—"de facto" regulatory—because they establish a standard way of doing things that all pilots are expected to follow. Standardization keeps all pilots safe, and the AIM provides that standardization. If an accident or incident resulted from a pilot not following a procedure recommended in the AIM, an investigator may consider the pilot at fault and take action against the pilot.

**Slide 13:** The FAA is not the only federal agency that imposes requirements on pilots. The NTSB has published rules that apply specifically to pilots and aircraft operators as well.

Basically, if harm comes to the aircraft or any occupant of the aircraft between the time any person climbs aboard the aircraft (with the intention of going flying) and the time everyone has gotten off the aircraft, the NTSB will need to be notified.

NTSB Part 830 sets forth the conditions under which pilots must report an accident or incident. The NTSB differentiates between accidents and incidents. Accidents involve serious injuries or major property damage; incidents do not involve injury or damage but affect safety of flight. Additionally, the rules require that wreckage and any cargo at the scene of the accident be secured until proper authorities can take charge.

**Slide 14:** Several other publications set out rules and regulations that pilots must follow. For example, NOTAMs are created by a variety of government agencies, as well as individual airports; they give special advisories to pilots and keep them informed of changes could affect safety or efficiency of flight.

- For example, flight data center (FDC) NOTAMs inform pilots about changes to their maps or charts or to the requirements for aircraft to land in bad weather. FDC NOTAMs are regulatory and must be complied with.
- Temporary Flight Restrictions (TFRs) are NOTAMs that advise pilots to remain clear of a specific area or follow special rules. They are also mandatory.
- Other kinds of NOTAMs are advisory, and provide useful information to pilots. An example of this type of NOTAM would be a warning that birds have been seen in the vicinity of an airport, or that a certain obstruction light in the area is no longer working.

Advisory circulars (ACs) are another type of FAA publication that pilots find useful. ACs give guidance to pilots on a specific topic; they may be relatively short documents or complete books. For example, AC 00-6B is titled "Aviation Weather," and it is a textbook. There are dozens of ACs available to pilots on a wide range of topics. Pilots typically refer to these resources to clarify their understanding of certain topics, procedures, or regulations. The FAA publishes a searchable list of ACs on its website.

Airworthiness directives (ADs) are legally enforceable regulations that require aircraft owners or operators to make specified repairs or inspections. ADs are similar to car recalls, in that work may be required to be performed on an aircraft years or decades after its manufacture. Aircraft owners are advised via mail that their aircraft is subject to a new AD, and the owners are given a specific deadline for completing the requirements of the AD. A complete list of ADs for all aircraft is available on the FAA website.

**Slide 15:** Complete the **Formative Assessment**.

**Formative Assessment**

Distribute **Regulations Overview Student Activity 2**. Students should answer the questions individually. If time permits, lead a brief classroom discussion of students' answers. Correct answers may be found in **Regulations Overview Teacher Notes 2**.

[DOK-L1; *list*]

## EXTEND

**Teacher Material:** Regulations Overview Presentation

**Slide 16-27:** The six pairs of slides in this section present brief scenarios that require students to think about which FAA publication contains the desired information. Students should vote as a class on the correct answer for each slide; the second slide in each pair contains the correct answer (boldfaced).

**Teaching Tips**

Here are explanations for the correct answers to each slide:

- *Slides 16-17: The Federal Aviation Regulations contain rules pertaining to pilot certification and operating regulations.*
- *Slides 18-19: NOTAMs are the type of publication that would reveal information of a temporary nature that could affect flight safety. A runway closure is a good example of the type of information found in a NOTAM.*
- *Slides 20-21: The AIM contains practical advice about pilot procedures such as entering a traffic pattern properly.*
- *Slides 22-23: NTSB Part 830 contains regulations relating to accident and incident reporting. It is the only publication that details the time frames required for such reporting.*
- *Slides 24-25: Airworthiness Directives are the publications that notify owners and operators that their aircraft must undergo a specified repair or an additional inspection. These notifications are generated when the FAA discovers a potential mechanical or structural defect that has caused or could cause a safety issue.*
- *Slides 26-27: Advisory Circulars are publications that provide guidance on a wide range of topics relevant to pilots, operators, and airport managers. Standards for installing airport signage are contained in AC 150/5340-18G (Standards for Airport Sign Systems).*

## EVALUATE

**Teacher Materials:** Regulations Overview Presentation, Regulations Overview Teacher Notes 3
**Student Material:** Regulations Overview Student Activity 3

**Slides 28-38:** Conduct the **Summative Assessment**.

**Summative Assessment**

Distribute **Regulations Overview Student Activity 3**, which contains sample FAA Knowledge Exam-style questions. Students should complete the worksheet individually; then, discuss the answers as a class by proceeding, one question at a time, through slides 29-38. (Odd-numbered slides restate the questions; even-numbered slides identify the answers.) **Regulations Overview Teacher Notes 3** also identifies the correct answers and provides rationales for the incorrect answers.

Rather than distribute the activity worksheet, you may simply use slides 29-38 to quiz the entire class; students can vote on each correct answer.

[DOK-L2; *distinguish*]

**Summative Assessment Scoring Rubric**

- Follows assignment instructions
- Responses show evidence of one or more of the following:
  - Ability to recall the proper names of the various FAA publications
  - Basic knowledge of the types of information found in the various FAA publications
  - Ability to identify in which publications to search for the answers to specific regulatory or procedural questions
- Contributions show understanding of the concepts covered in the lesson
- Contributions show in-depth thinking including analysis or synthesis of lesson objectives

**Points Performance Levels**

9-10 Demonstrates a thorough understanding of the lesson objectives. Answers all 5 questions correctly.
7-8 Demonstrates a sufficient understanding of the lesson objectives. Answers 4 questions correctly.
5-6 Demonstrates an insufficient understanding of the lesson objectives. Answers 3 questions correctly.
0-4 Demonstrates little or no understanding of the lesson objective with many gaps in understanding. Answers 0-2 questions correctly.

## STANDARDS ALIGNMENT

### COMMON CORE STATE STANDARDS

- **RST.11-12.2** - Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- **RST.11-12.4** - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11-12 texts and topics*.
- **RST.11-12.9** - Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- **WHST.11-12.6** - Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.

- **WHST.11-12.7** - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- **WHST.11-12.7** - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- **WHST.11-12.7** - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
- **WHST.11-12.8** - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.
- **WHST.11-12.9** - Draw evidence from informational texts to support analysis, reflection, and research

## REFERENCES


- Federal Aviation Regulations (Parts 1, 43, 61, 91)
- Aeronautical Information Manual (AIM)
- Pilot's Handbook of Aeronautical Knowledge
- NTSB Part 830
- https://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/systemops/fs/alaskan/alaska/fai/notam/ntm_overview/
  https://www.faa.gov/regulations_policies/airworthiness_directives/
- https://www.cfinotebook.net/notebook/publications-and-references/advisory-circular
- https://www.faa.gov/about/initiatives/notam/what_is_a_notam/