Merit Badge Information Sheet [MBIS]
November 14, 2026

Merit Badge:	Aviation
Counselor Name:	Ed Rafacz
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Preferred Method of Contact:	
Prerequisites: *list all requirements which need to be completed in advance*	When you email, put your name on the subject header. If you can, send all the documents in one email. **To comply with Youth Protection guidelines, scouts should copy a leader or parent on all email communication with the counselor. Ed.Rafacz@nonrevwebsite.com** **1.(b) Provide a brief overview of the evolution of flight, and write a short summary about three notable times in history important to aviation.** *Resources:* • The Wright Brothers, First Successful Airplane (1903) (video) • The First Flight Around the World—U.S. Army Air Service (1924) (video) • First Solo Transatlantic Flight —Charles Lindbergh (1927) (video) • First Solo Transatlantic Flight—Amelia Earhart (1932) (video) • First Commercial Jet Airliner—de Havilland Comet (1949) (video) • First Commercial Supersonic Flight—The Concorde (1969) (video) • First Flight Around the World Without Refueling—Rutan Model 86 Voyager (1986) (video) • FAA Approves Unmanned Aerial Vehicles (UAV's AKA Drones) (2006) (video) **1 (d) Explain the operation and write a short summary of the piston, turbine, and jet engines.** *Resources:* o Piston Four Stroke Engine – Video Four Stroke Engine o Turbine - Video Turboprop o jet engines - Video Jet Engine **1(h) Write a brief summary of the purposes and functions of these instruments found in a typical single-engine aircraft:** **Attitude Indicator** *Resource:* Attitude Indicator Video **Heading Indicator** *Resource: Video* Heading Indicator Video

Altimeter
Resource: Altimeter Video

Airspeed Indicator
Resource: Airspeed Indicator Video

Turn and Bank Indicator
Resource: Turn and Bank Indicator Video

Vertical Speed Indicator (VSI)
Resource: Vertical Speed Indicator (VSI) Video

Compass
Resource: Compass Video

Tachometer
Resource: Tachometer Video

Oil Pressure Gauge
Resource: Oil Pressure Gauge Video

Temperature Gauges
Resource: Video Temperature Gauges Video

3

(a) Look at using a flight simulator software package, set a course and fly the headings you have established with a successful take-off and landing. Be ready to understand how to fly the simulator.
Resource: Taking Off and Landing The Simulator At JuneauAnchorage

- ***If you want to practice before the class (recommended)***

Resource: **Download a FREE Flight Simulator Onto your Phone**
Resource: How to Download The Juneau Software

4. Airport Operations. Do ONE of the following:

- **(a) Visit an airport. After the visit, report on how the facilities are used, how runways are numbered, and how runways are determined to be "active." In the interest of time – this is the requirement that will be discussed in class – if a different option was completed, please email the Merit Badge Counselor.**

- **(b) Visit a Federal Aviation Administration facility: Airport Traffic Control Tower (ATCT), Terminal Radar Approach Control (TRACON), Air Route Traffic Control Center (ARTCC), or Flight Standards District Office (FSDO). Report on the operation and your impressions of the facility.**
  Resource: **FAA's Facility Locator (website)**
- **(c) Visit a military aviation facility. Learn how that facility supports defense and/or civilian activities. Report on the operation and your impressions of the facility.**
  Resource: **Identify a Nearby Military Aviation Facility (website)**
- **(d) Visit an aviation museum or attend an air show. Report on your impressions of the museum or show, and what you learned from the experience.**
  Resources: **Smithsonian Affiliations (website)**
  Air Shows (website)
  Miltary Air Shows (website)
  Recreational Aviation Events (website)
  Find a Museum (website)

5.

- **(a) Write a brief summary of explaining the following: the student pilot, the recreational pilot, the remote pilot, and the private pilot certificates.**
  Resources:
  - Student Pilot
  - Recreational Pilot
  - Remote Pilot
  - Private Pilot

- **(b) Write a brief summary Describing the benefits of the instrument rating.**
  Resources:
  - Benefits of instrument Rating
- **(c) Write a brief summary Explaining the following: the commercial pilot certificate, the airline transport pilot certificate, and certified flight**

instructor (CFI).
Resources:
- Pilot Licenses Explained (video)
- Certified Flight Instructor (video)
- ATP

- **(d) Identify an Aviation Exploring Post in your area. Learn about their activities and membership requirements and write a brief summary.**
  Resources:
  - Aviation Exploring Posts (website)

  Write a brief summary of the

(e) Identify three career opportunities that would use skills and knowledge in aviation. Pick one and research and do a written summary on the training, education, certification requirements, experience, and expenses associated with entering the field. Research the prospects for employment, starting salary, advancement opportunities and career goals associated with this career. Discuss what you learned with your counselor and whether you might be interested in this career.
Resources:
- Careers in Aviation (video)
- Aerospace Engineer Careers (video)
- Career as a Flight Dispatcher (video)
- How To Become a Helicopter Pilot (video)
- Career as a Aircraft Maintenance Technician (video)
- 5 Qualities To Be a Good Air Traffic Controller (video)
- Career as a Flight Attendant (video)
- Unseen Airport Jobs You Won't Believe Exist! | Inside Hidden Roles That Keep Airports Running (video)
- Airline and Commercial Pilots Occupational Outlook (website)

Class Work: ***list all requirements which will be completed in class***

1.
(a) Define "aircraft." Describe four kinds of aircraft today, and their typical uses.
(c) Explain the difference between a fixed wing and a rotary wing aircraft, and the benefits of each. *Resource:* Airplane or Helicopter—Which Should You Choose? (video)

(e) Using a model aircraft, describe the four forces that act on an aircraft in flight.
Resources: Video Four Forces Acting on an Aircraft

(f) Explain how an airfoil generates lift, specifically noting Bernoulli's principle.
Resource: Video How a Wing Creates Lift

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	(g) Identify and describe the aerodynamic control surfaces on the aircraft of your choice, and explain how they operate to control its attitude and direction of flight. *Resource:* Video Aircraft Control Surfaces Explained
Use of "Online" Workbook:	Not supported – the site that provided them stopped updating them last year
Merit Badge Booklet:	**Aviation.pdf**
Number of Sessions needed: ***each session is 1 hour 25 minutes***	4
Maximum Class Size:	5
Notes and/or Comments:	