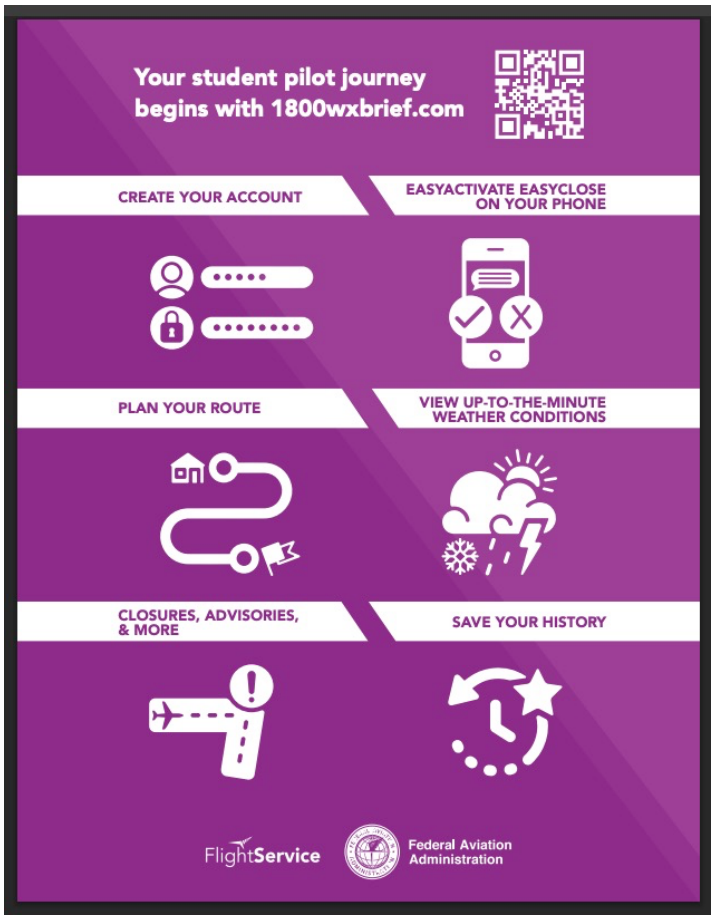
When you are asked, “Where do you actually get weather data?”

Student Response:

- Flight Service
  - 📞 **1-800-WX-BRIEF**
  - 🌐 **1800wxbrief.com**
- FAA-recognized briefing platforms



Flight Service provides:

- Standard, abbreviated, and outlook briefings
- Weather correlation with NOTAMs
- Human-assisted interpretation
- A **documented briefing record**

References:

14 CFR part 91; AC 91-92; AIM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-25, FAA-H-8083-28

Objective:

To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with weather information for a flight under VFR.
Note: Skills are not covered in the ACS Knowledge Test Study Guide

Knowledge:

The applicant demonstrates understanding of:

PA.I.C.K1 Sources of weather data (e.g., National Weather Service, Flight Service) for flight planning purposes.

"The National Weather Service (NWS) provides aviation weather observations, forecasts, and warnings for flight planning and operations."
— AIM 7-1-1
All aviation weather used by pilots originates with the **National Weather Service (NWS)**.

Primary Source of Weather Information

Flight Service (FSS)

Flight Service is the FAA-contracted interface that provides pilots with NWS weather products and interpretation.

Access:

- **Phone: 1-800-WX-BRIEF (1-800-992-7433)**
- **Website: 1800wxbrief.com**

Flight Service provides:

- Standard, abbreviated, and outlook briefings
- Weather correlation with NOTAMs
- Human-assisted interpretation
- A **documented briefing record**

Instructor emphasis:
Digital tools display weather. Flight Service **briefs** weather.

NWS Weather Objects Used for VFR Flight Planning

The NWS provides structured **weather products** (objects) that pilots must interpret and apply.

Current Conditions

- **METAR / SPECI** — Current observed weather at airports
- **PIREPs** — Pilot-reported weather conditions

Forecasts

- **TAF** — Terminal forecast for departure, destination, and alternates
- **Winds & Temperatures Aloft (FB)** — Wind, groundspeed, fuel planning

Advisories

- **AIRMET** — Widespread weather hazards affecting VFR flight
- **SIGMET** — Severe weather hazards
- **Convective SIGMET** — Thunderstorms and convective activity

Planning & Analysis Tools

- **Surface Analysis Chart** — Pressure systems, fronts, weather movement
- **Graphical Forecast for Aviation (GFA)** — Consolidated forecast depiction
- **Convective Outlook** — Thunderstorm potential and severity

Key principle:
Weather products are **interpreted together**, not in isolation.

How Pilots Use Weather for VFR Flight Planning

Weather planning is performed in **layers**, aligned with the phases of flight.

1. Strategic (Big Picture)

- Surface Analysis
- GFA
- Convective Outlook

Purpose:
Determine whether the day is suitable for VFR flight.

2. Tactical (Route & Timing)

- TAFs
- Winds Aloft
- AIRMETs / SIGMETs

Purpose:
Identify hazards along the route and time windows of concern.

3. Operational (Right Now)

- METARs
- SPECI
- PIREPs

Purpose:
Confirm actual conditions at launch and destination.

4. Decision & Risk Management

- Compare conditions to **personal weather minimums**
- Identify **diversion triggers**
- Evaluate **go / no-go / continue / divert** decisions

Risk management guidance is framed using **AC 91-92**, with pilot responsibility defined under **14 CFR Part 91**.

Pilot Responsibility

Under **14 CFR Part 91**, the pilot in command is responsible for:

- Obtaining weather information from authoritative sources
- Understanding the limitations of weather products
- Making safe and legal operational decisions

Weather information supports decisions—it does not replace pilot judgment.

Check ride Ready Summary

- Aviation weather originates with the **National Weather Service**
- Flight Service provides FAA-recognized access and interpretation
- Weather products are tools, not answers
- VFR weather planning is layered and decision-focused
- The pilot is accountable for how weather information is used

PA.I.C.K2

Acceptable weather products and resources required for preflight planning, current and forecast weather for departure, en route, and arrival phases of flight such as:

PA.I.C.K2a a. Airport Observations (METAR and SPECI) and Pilot Observations (PIREP)

- METAR / SPECI
  - a routine aviation weather report describing **observed conditions at an airport** at a specific time.
  - not a forecast, hourly reports unless,
  - A **SPECI** is a special, unscheduled report issued when **significant weather changes**, such as VFR to IFR, occur between routine METARs.

Example:

METAR KGGG 161753Z AUTO 14021G26KT 3/4SM
+TSRA BR BKN008 OVC012CB 18/17 A2970 RMK
PRESFR

Explanation:

Routine METAR for Gregg County Airport for the 16th day of the month at 1753Z / automated source./ Winds are 140 at 21 knots gusting to 26. / Visibility is ¾ statute mile./ Thunderstorms with heavy rain / and mist./ Ceiling is broken at 800 feet, / overcast at 1,200 feet with cumulonimbus clouds./ Temperature 18 °C and dew point 17 °C./ Barometric pressure is 29.70 "Hg / and falling rapidly.

FAA PHAK
8083-25C pg 17

Qualifier		Weather Phenomena		
Intensity or Proximity 1	Descriptor 2	Precipitation 3	Obscuration 4	Other 5
– Light	**MI** Shallow	**DZ** Drizzle	**BR** Mist	**PO** Dust/sand whirls
Moderate (no qualifier)	**BC** Patches	**RA** Rain	**FG** Fog	**SQ** Squalls
+ Heavy	**DR** Low drifting	**SN** Snow	**FU** Smoke	**FC** Funnel cloud
VC in the vicinity	**BL** Blowing	**SG** Snow grains	**DU** Dust	**+FC** Tornado or waterspout
	SH Showers	**IC** Ice crystals (diamond dust)	**SA** Sand	**SS** Sandstorm
	TS Thunderstorms	**PL** Ice pellets	**HZ** Haze	**DS** Dust storm
	FZ Freezing	**GR** Hail	**PY** Spray	
	PR Partial	**GS** Small hail or snow pellets	**VA** Volcanic ash	
		UP *Unknown precipitation		

The weather groups are constructed by considering columns 1–5 in this table in sequence:
intensity, followed by descriptor, followed by weather phenomena (e.g., heavy rain showers(s) is coded as +SHRA).
* Automated stations only

Figure 13-5. *Descriptors and weather phenomena used in a typical METAR.*

PHAK 8083-25c

- PIREP
  - an in-flight observation submitted by pilots describing actual weather conditions encountered.
  - provide **real-world observation** of weather hazards that may not yet appear in surface observations or forecasts. (Best kind of report)

Example:

UA/OV GGG 090025/TM 1450/FL 060/TP C182/SK
080 OVC/WX FV04SM RA/TA 05/WV 270030KT/TB LGT/RM
HVY RAIN

Explanation:
Type: .....Routine pilot report
Location: ..... 25 NM out on the 090° radial, Gregg County VOR
Time: ..... 1450 Zulu
Altitude or Flight Level: 6,000 feet
Aircraft Type: .....Cessna 182
Sky Cover: .....8,000 overcast
Visibility/Weather: .....4 miles in rain

Temperature: .....5 °Celsius
Wind: .....270° at 30 knots
Turbulence: .....Light
Icing: ..... None reported
Remarks: ..... Rain is heavy

Encoding Pilot Weather Reports (PIREPS)			
1	XXX	3-letter station identifier	Nearest weather reporting location to the reported phenomenon
2	UA	Routine PIREP, UUA-Urgent PIREP.	
3	/OV	Location	Use 3-letter NAVAID idents only. a. Fix: /OV ABC, /OV ABC 090025. b. Fix: /OV ABC 045020-DEF, /OV ABC-DEF-GHI
4	/TM	Time	4 digits in UTC: /TM 0915.
5	/FL	Altitude/flight level	3 digits for hundreds of feet. If not known, use UNKN: /FL095, /FL310, /FLUNKN.
6	/TP	Type aircraft	4 digits maximum. If not known, use UNKN: /TP L329, /TP B727, /TP UNKN.
7	/SK	Sky cover/cloud layers	Describe as follows: a. Height of cloud base in hundreds of feet. If unknown, use UNKN. b. Cloud cover symbol. c. Height of cloud tops in hundreds of feet.
8	/WX	Weather	Flight visibility reported first: Use standard weather symbols: /WX FV02SM RA HZ, /WX FV01SM TSRA.
9	/TA	Air temperature in celsius (C)	If below zero, prefix with a hyphen: /TA 15, /TA M06.
10	/WV	Wind	Direction in degrees magnetic north and speed in six digits: /WV270045KT, WV 280110KT.
11	/TB	Turbulence	Use standard contractions for intensity and type (use CAT or CHOP when appropriate). Include altitude only if different from /FL, /TB EXTRM, /TB LGT-MOD BLO 090.
12	/IC	Icing	Describe using standard intensity and type contractions. Include altitude only if different than /FL: /IC LGT-MOD RIME, /IC SEV CLR 028-045.
13	/RM	Remarks	Use free form to clarify the report and type hazardous elements first:

Pilot's Handbook of Aeronautical Knowledge,pg-13-8
Pilot Access

Limitations & Traps

- METARs are **point observations**, not route-wide conditions
- SPECI reports indicate rapidly changing weather
- PIREPs are **subjective**, but invaluable
- Absence of PIREPs does **not** mean absence of hazards

Risk Management & ADM Tie-In

- METARs confirm legal VFR minimums
- SPECI and PIREPs signal **changing risk**
- PIREPs support continue / divert decisions
- Decision framing guided by **AC 91-92**
- Final responsibility rests with the pilot under **14 CFR Part 91**

Checkride-Ready Summary

- METARs and SPECI reports describe **current airport conditions**
- PIREPs provide real-time pilot-reported weather
- These products confirm **what is happening now**
- Used together, they support go / no-go and inflight decisions
- The pilot is responsible for proper interpretation and use

Oral Exam One-Liner

"METARs and SPECI reports provide current airport weather observations, while PIREPs provide pilot-reported in-flight conditions used to validate hazards and support VFR decision-making."

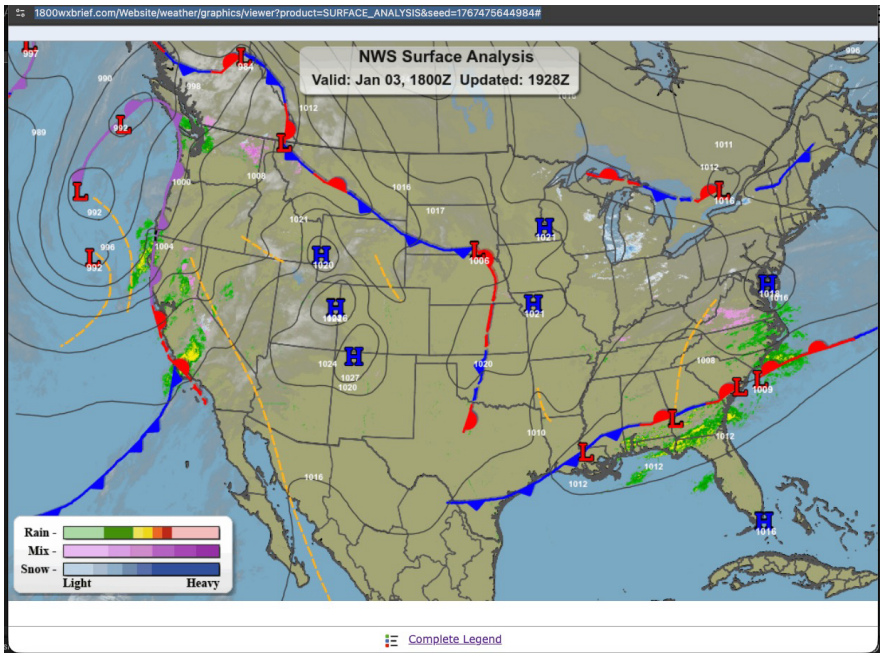
PA.I.C.K2b — Surface Analysis Chart & Ceiling and Visibility Chart

Primary References

- AIM Chapter 7 — Weather Information Services
- FAA-H-8083-25C
  - Air Masses PHAK pg 12-17
  - Fronts PHAK pg 18- 25

Surface Analysis Chart
https://aviationweather.gov/gfa/#progchart
A snapshot of current surface weather, showing:

- **Highs and lows**- high/low pressure areas
- **Isobars** - lines indicating equal pressure
- **Fronts** - symbols showing different pressure area boundarys
  - Comparison of cold and warm fronts. PHAK pg 12-20 thru 27
- **Pressure gradients** – shows how quickly air pressure changes by isobar distance (close isobars mean faster change and higher winds)
- General wind flow



CVA — What It Is
Graphical Forecasts for Aviation of ceiling and visibility categories, showing:

- Where Visual Flight Rules (VFR) Marginal VFR(MVFR) / Instrument Flight Rules (IFR) is expected

- How conditions change with time and location

FAA-Expiration of the use of standalone CVA chart

- Go to aviationweather.gov.
  - Navigate to the GFA: LoLook for the "GFA" (Graphical Forecasts for Aviation) option, often under "Observations".
  - Select "Ceiling & Visibility": Within the GFA interface, find the weather tab to select whether to display Flight Category, Ceiling, or Visibility. (See upper right of screen “Helicopter tab)

PA.I.C.K2c c. Terminal Aerodrome Forecasts (TAF)

Reference

Aviation Forecasts PHAK pg 13-9

What is a TAF?

- a report established for the **five statute mile radius** around an airport.
- TAF reports are **usually given for larger airports**.
- Each TAF is **valid for a 24 or 30-hour time period**
  - updated four times a day at **0000Z, 0600Z, 1200Z, and 1800Z.**
- The TAF **utilizes the same descriptors and abbreviations as used in the METAR** report.

Example:

TAF
KPIR 111130Z 1112/1212
TEMPO 1112/1114 5SM BR
FM1500 16015G25KT P6SM SCT040 BKN250
FM120000 14012KT P6SM BKN080 OVC150 PROB30 1200/1204
3SM TSRA BKN030CB
FM120400 1408KT P6SM SCT040 OVC080
TEMPO 1204/1208 3SM TSRA OVC030CB

Explanation:

Routine TAF for Pierre, South Dakota…
on the 11th day of the month, at 1130Z…

valid for 24 hours from 1200Z on the 11th to 1200Z on the 12th…
Temporarily, between 1200Z and 1400Z, visibility 5 SM in mist…

From 15:00 Zulu time (UTC):

- Wind is forecast from 160 degrees (south-southeast) at 15 knots, with gusts up to 25 knots.
- 6 Statute Miles visibility or greater
- Scattered clouds at 4,000 feet above ground level (AGL).
- A higher layer of Broken clouds at 25,000 feet AGL.

From the 12th at 0000Z

- Wind from 140° at 12 knots.
- Visibility greater than 6 statute miles
- Broken clouds at 8,000 feet and overcast at 15,000 feet.
    - From between 0000Z and 0400Z:

Between 0000Z and 0400Z on the 12th:
30% probability of the following conditions occurring:

- Visibility 3 statute miles.
- Thunderstorms with moderate rain showers
- Broken clouds at 3,000 feet, including cumulonimbus (thunderstorm) clouds.

Between 0400Z and 0800 on the 12th …

- winds from 140° at 8 knots…
- visibility greater than 6 miles…
- clouds at 4,000 scattered and overcast at 8,000…

Temporarily between 0400Z and 0800Z…
visibility 3 miles…
thunderstorms with moderate rain showers…
clouds overcast at 3,000 feet with cumulonimbus clouds

PA.I.C.K2d d. Graphical Forecasts for Aviation (GFA)

Same as CVA.

PA.I.C.K2e e. Wind and Temperature Aloft Forecast (FB)

PA.I.C.K2f f. convective Outlook (AC)

PA.I.C.K2g g. Inflight Aviation Weather Advisories including Airmen's Meteorological Information (AIRMET), Significant Meteorological Information (SIGMET), and Convective SIGMET

AIRMETs (WAs) PHAK pg 13-11

- **inflight weather advisories that are issued every 6 hours** with intermediate updates issued as needed for a particular area forecast region.
- operational interest to all aircraft, but the weather section concerns phenomena considered potentially hazardous to light aircraft and aircraft with limited operational capabilities.

- There are 3 classifications of AIRMETs
    - **Sierra**
        - IFR and mountain obscuration
    - **Tango**
        - turbulence, strong surface winds, and low-level wind shear
    - **Zulu**
        - icing and freezing levels.

SIGMETs PHAK pg 13-11

SIGMETs (WSs) are inflight advisories concerning non-convective weather that is potentially hazardous to all aircraft. They report weather forecasts that include severe icing not associated with thunderstorms, severe or extreme turbulence or clear air turbulence

(CAT) not associated with thunderstorms, dust storms or sandstorms that lower surface or inflight visibilities to below three miles, and volcanic ash. SIGMETs are unscheduled forecasts that are valid for 4 hours unless the SIGMET relates to a hurricane, in which case it is valid for 6 hours.

A SIGMET is issued under an alphabetic identifier, from November through Yankee. The first issuance of a SIGMET is designated as an **Urgent Weather SIGMET (UWS)**. Reissued SIGMETs for the same weather phenomenon are **sequentially numbered** until the weather phenomenon ends