

**Responses by Certified Flight Instructors who were asked to describe:**

**(a) Ways in which they taught weather-related decision-making to their primary student pilots.**

**(b) Ways in which they assessed the weather-related decision-making of their primary student pilots.**

These CFIs all gave their permission for us to post their responses on our web site, and we are very grateful for their contributions. We have not edited their comments (except for spelling). The FAA does not necessarily endorse or approve the procedures. We simply offer their comments as examples of how some of your colleagues have addressed these issues

The survey in which these comments were obtained was conducted by Dr. Barbara Burian, with San Jose State University. The final report describing the entire study is available here.

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
By looking at the conditions every day, and discussing this with the students in telephone conversations. Then I ask the student to start making the decisions, and we discuss why they came to whatever decision they have.	By having the student make the decisions during flight training, and discussions as to their reasoning.
Examples, case studies (including accident reports)	When weather is questionable prior to a flight, I ask the student for his/her evaluation before giving them much indication of my feelings about the situation. Sometimes, after we talk about that (especially for XC) I will change the picture a little (What if the ceiling is 1500 SCT at destination? Would you still want to go?) And I listen to what they tell me.
I give the student a scenario and a hypothetical set of weather conditions and ask him/her if he/she would go. Using the same scenario and slightly different sets of weather conditions I ask the same and demonstrate to the student how individual weather conditions or entire sets of weather conditions effect the go/no go decision. Sometimes I will take a student into IMC (after they have had a few hours of simulated instrument flight) to demonstrate the difficulties and hazards that may be encountered in IMC.	Before a flight I ask the student if we should fly and why.
I teach weather related decision making by walking to the flight service station and then allowing the students to get a formal weather briefing anytime the weather is questionable. Then we discuss the briefing using a series of questions and i lead the students to the proper decision. I do not try to make it for them but rather let them reach the	I assess the weather decision making of my students by ensuring they are making the conservative decisions. I encourage the conservative approach so that they do not exceed their abilities. I also encourage them to call if they have a problem or a question concerning conditions. This extends well after

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>appropriate decision. On the rare occasion that they make the wrong decision, I have flown with them in the local area so that they can see why it was the wrong one... IE high winds or turbulence.</p>	<p>passing the private check ride.</p>
<p>Use synoptic charts from Internet to have them tell me the story of what happened with the weather backed up with the prognostics from ADDS to explain how what happened differed from what was expected. I emphasize the discussion about how the air masses moved and how that might relate to what they would have experienced if they had been flying that day.</p>	<p>I find this difficult because the weather in the central valley is generally so unchangeable that if it's good enough to start the flight then it is unlikely to deteriorate markedly so as to need anything more than a 'return to base' decision. Consequently I can only assess the student's more general awareness. I try to demonstrate bad weather (visibility being poor - which is easy with the inversions and smog here) and turbulence (ridge and mountain/canyon flight) and SVFR in the winter season. This at least gives them a reference point which I believe is mandatory.</p>
<p>We plan a hypothetical long, cross country, and get the actual weather reports. I also have them get an FAA briefing. Then we go over all the information in the metar's, TAFs, FAs, FDs, airmets/sigmets and notams, and put it together into an integrated picture of the weather now and forecast over the estimated time in flight. Then we look at radar and prog charts to see how the mental picture we drew corresponds with what we are seeing graphically. We talk about whether or not current conditions and forecasts are within regulations AND personal minimums. We also discuss options if the forecasts turn out to be wrong. I talk to them about getting in flight updates and about making judgments when encountering deteriorating conditions. I emphasize that (except for military combat missions) no flight is worth dying for.</p>	<p>I ask the student to tell me whether he or she would make the cross-country flight and why or why not. I also ask them to tell me about alternatives and diversions if the flight can't be completed as planned. Finally, for regular flight lessons I wait for the student to tell me whether the weather conditions are ok for the lesson. If they never mention it, even though the weather is crappy, then I worry that they either aren't paying attention or are deferring the decision to me. In that even I remind them of their responsibility as PIC.</p>
<p>I teach weather as part of the syllabus. When there is a particular condition on the area(tropical storms, fog, thunderstorms) I ask questions to the student about those and I encourage him to find the answers on his own to go over them together.</p>	<p>We listen to the same briefing (Standard Weather briefing for Cross countries)and then we talk about it. I let the student evaluate the situation and use questions if I don't agree with something. I teach them that if they don't feel comfortable about an aspect of the flight they should get more information(from me, the FSS, or a book). I never question them if they make a no go decision even if I think the flight can be performed safely.</p>
<p>When I have a lesson scheduled and the weather turns South, I leave the decisions to fly or not to fly up to the student. If I do not feel it is safe, I will always have the final say. But if it weather I know I can deal with, but I am not sure my student can, it</p>	<p>According to how closely their go/no-go decisions correspond to my opinion of their piloting capabilities.</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>is his prerogative to make the decision and then suffer the consequences (a bumpy ride). I try to take my primary students into actual IFR so they get a sense of what their limits really are as private pilots. With basic interpretation skills, well-guided personal limits, and a healthy respect for mother nature, I feel my students are completely capable of making good go/no-go decisions. If any of those three components are missing, that is when the potential for bad decision-making emerges.</p>	
<p>Provide them with anecdotal situations which I have experienced, which had weather lessons pertinent to subject matter being taught.</p> <p>Assign them simulated cross-country flights to various destinations and various days to make the simulated trip. They must then obtain all relevant weather data, and decide if they should or should not go. They must then track weather through the course of the flight time plus 2 hours after the intended arrival time. Then they compare actual to forecast conditions and see results supported their decision to go or not.</p> <p>Have them gather weather data and make their own go/no decision. If their decision is poor and weather permits the flight without compromising safety (e.g.: we could go IFR if needed, the instructor has skill needed to recover from student's bad crosswind landing, alternatives are available to permit safe return or flight to alternate) we go and explore real conditions. In protected environment with experienced instructor aboard, student can learn by doing, these lessons tend to be the best the student could have regarding weather avoidance and aeronautical decision making. It has been known to solve attitude (invincible, anti-authority, macho, impulsive, and resignation) issues.</p>	<p>Judgment is result of risk acceptance/avoidance attitude, knowledge, and experience.</p> <p>Simply ask them what their decision is (go / no go) and why they decided that way. What is their decision based upon? Do this repeatedly. Reinforce good judgment. Provide examples. Assist in further interpretation of weather data. I had a student who accepted my decision not to go simply on my authority. He secretly disagreed with my decision. About 45 minutes later, his wife was calling him hysterically from her cell phone because a tree was blown over on her car by a microburst from severe weather that moved in.</p> <p>Best is ask them their go/go decision and have them compare reality over the next few hours vs. the forecast conditions, to further assess their judgment.</p>
<p>I like to put student in a position that he has to make the go-no-go decision. On marginal days when he makes the decision to go, I want him to make the decision "where to go from here" if he gets in trouble. Errors in judgment will be made. Use them in a debriefing to help student decide what would have been a better course of action. We learn from making errors in judgment. Let him make errors in the training environment and learn from them.</p>	<p>Either by observing the decision process or by interviewing student on ground after a solo flight. We know and accept that there will be errors. If he learns from them at some acceptable rate I consider him adequate.</p>
<p>I feel the best way for a student to understand the weather is for them to first watch the weather</p>	<p>I think my above answers this topic</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>channel prior to coming to the airport. By watching the weather channel regularly the student will become familiar with the various weather patterns in the area. We always review the chapters covering weather from our textbooks however, I feel the student gets the best detailed flight weather information from the FSS briefer. Initially we listen to the briefer together and discuss the information received. Later in training I permit the student to call the briefer on their own and make their go/no go decisions. (Of course I speak to the briefer first and compare my interpretation of the briefing to the students. I then guide them in their go/no go decision.)</p>	
<p>Examples of scenarios and actual accident statistics and write ups from various sources. Get the student to subscribe to magazines/sources that specialize in accident briefings.</p>	<p>In Michigan and Texas I have been lucky in that actual weather has provided many an opportunity to test a students decisions.</p> <p>I have no idea how one would do this in Phoenix.</p>
<p>Teaching decision making in flying is similar to other decision-making processes in life. As a college instructor, we always had our students making decisions. If flying, it's just the same. Just the possible gains, and evaluate the possible risks. Students need to know the basics of weather, and how to interpret the information. There is also a lot of emphasis on what is "safe", vs. just "legal".</p>	<p>On marginal days, I'll let the student make the go/no go decision. If they choose "go" on a really bad day, we'll discuss why I would have chosen otherwise. Same for no go. I always take the opportunity to take students up on a marginal day, one that I would like them to learn what "not" to get into. Again, I always stress the importance of "safe vs. legal".</p>
<ol style="list-style-type: none"> <li>1. Look out the window.</li> <li>2. Call FSS and obtain, even if a complete briefing has been obtained previously, another up-to-date complete briefing, including pireps.</li> <li>3. Study the course book as well as the online or commercially-available AC reprints. Q&amp;A constantly, in-flight and on-ground.</li> <li>4. Query other students/cfi that have been/are currently in the air.</li> <li>5. Use up-to-date forecasts and maps to explain how what they see outside is either reflected in the current forecast, or how what is forecast is having an effect on what they see.</li> <li>6. Visit the FSS and get a face-to-face briefing, with all the charts and interface with the specialist.</li> <li>6. Practice.</li> </ol>	<ol style="list-style-type: none"> <li>1. I listen in on their briefings with FSS and assess their grasp of the information by the questions they ask the briefer.</li> <li>2. My students are required to regularly obtain briefings, either by fss or duat, and we sit down and decode them together, and build the 'big' weather picture from that information. The less prompting they need, the more they are learning.</li> <li>3. Whether or not they cancel for good weather-related reasons or not, and I grill them on why they are making that decision or not.</li> <li>4. In x-c work, whether their information is up to date, and the flight planning bears out the weather predictions (within a tolerance for the forecast hysteresis).</li> </ol>
<p>This is one time to violate the warm fuzzies of the FOI and inform the student that they WILL DIE if they make the wrong decision. Continued VFR into</p>	<p>I give the students scenarios and listen to the process they use to decide on a course of action. I listen for the "I would turn around</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>IMC is the number one killer of general aviation pilots for the last several years. The student has all of the weather knowledge needed to make the proper decisions by the time they take their cross country flights.</p> <p>The student is taught how to look at the negatives of their decision, and compare those. They get a scenario: "Aloft, possibly able to make the super-important meeting, and the weather is starting to go south. FSS says it is still VFR at the destination, but there are no PIREPS for the 40 miles between the current position and the destination. The clouds are getting lower. What should you do?"</p> <p>The answer is not to say land. The answer is to compare the alternatives. I could make the meeting, or not. If I don't make it to the meeting, I'll still be alive and the boss will be mad. If I push on, I might not make any meeting ever again.</p> <p>I take them up for an IFR IMC flight, showing them what worsening weather looks like. The student will lose situational awareness along the flight.</p> <p>That's ok, the goal of that cross country leg is to log some of the 3 hours of IFR training and for me to point out the visual and tactile clues of worsening weather. Then, one of the few times I raise my voice at students, as we enter the clouds, "hands OFF the yoke, feet FLAT on the floor, SCAN your instruments. Put the finger at the bottom of the DG and make that number come to the top of the DG."</p>	<p>right now" statements as we approach clouds during the cross country.</p>
<p>I first talk about the limitations for student pilots as outlined by the FAR's as well as basic VFR requirements. I then find it useful to go up in marginal conditions and discuss the in-flight conditions. I will usually give them a nearby airport to navigate to and then discuss how difficult it is for them to make the flight compared to a good day.</p> <p>This is usually apparent to most students. After we have discussed more weather forecasting and prediction I will let them make go/no-go decisions. Depending on the outcome of the flight we will discuss if they made a good decision or not. This is usually best to try during the thunderstorm season as clouds build throughout the day. It is easy to see if they take a holistic approach to their weather decision making. In a way the student learns on their own with my guidance. This approach helps to build their personal experience and they do not rely on others to make their decisions.</p>	<p>I will get a good weather briefing and then as discussed previously I will let them make the decision (I have already made a decision if we will fly based on my personal minimums). I can then evaluate if they have made a good decision. I will also ask them why they think it is ok/not ok to fly. That way I can see what information they are using to make a conclusion. I will point out errors in their decision making and show what additional information they could utilize.</p>
<p>1) Determine students level of basic weather knowledge and hit the books about all the basics. 2) Observe and describe phenomenon while flying, then discuss causes, effects, and what will happen</p>	<p>1) I look for ability to use all available sources of weather information. 2) I look for a "healthy fear" of the potential of adverse weather and the ability to anticipate</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>next.</p> <p>3) Relate what we see to regulations and common sense.</p> <p>4) Expose student to all weather information sources and use several for each lesson.</p> <p>5) Develop ability to anticipate phenomenon and changes with respect to time.</p> <p>6) Develop personal minimums and "hard" rules about get-there-itis, and recognize the hazards of perceived invincibility.</p>	<p>coming into contact with it.</p> <p>3) I look for the student to initiate safe alternative courses of action in response to weather information or conditions.</p>
<p>I look for actual weather stories usually featured in the newspaper. Then print out the weather brief for that day for that particular area. I then have my student teach me what I might expect enroute when reading the brief. Then I show them the newspaper story to see if they were right. Most stories involve a NO Go decision being made</p>	<p>see above</p>
<p>If conditions are marginal I let the student get a briefing and analyze the situation. I then ask them to make a go/no-go decision. I then quiz them on how they arrived at their conclusion. If they decide to go we go-- as long as safety is not compromised. Afterward I then ask them if their analysis was correct or not and why. If it is a no-go or safety of the flight would be jeopardized we talk about the decision on the ground. Also some scenario based questions can be helpful. Just showing the student some weather products for a certain situation and then having them make a decision based on that.</p>	<p>I assess the decision making process by analyzing the conclusions the student draws from available information. Also the thoroughness of the students information, i.e. did they just check the awos or did they get a briefing and check computerized weather. etc. Much of the decision making assessment is based on the student's attitude toward flying and weather. Many times bad decisions are made when the student is apathetic about thorough preflight preparation. Given all the information most students come to similar conclusions.</p>
<p>From the third flight, I start having my students call the shots. Unless there is weather that is just dangerous to get into (e.g., icing), I'll go ahead and take the flight with them. If we end up shooting an approach, I point out that they ended sitting in and paying for the airplane and me for an extra 45 minutes while we were getting vectored (I teach at a large school--when one wants in IFR, so do 10 others). I make it extremely clear that under no circumstances would they be able to do that as a private pilot w/o an IA rating, and imply that it was a poor decision to go on the flight.</p>	<p>Ditto above. Look at their decisions and compare them with what I would do.</p>
<p>The first thing that I stress to any student pilot is that we will have a lesson regardless of the weather. We will always incorporate a weather briefing every time we meet and the student will walk me through his/her briefing process. We will then discuss the reasons why the weather conditions are as forecast or if they are not, then we have an opportunity to research in more detail.</p>	<p>I will ask the student how they made his/her decision and then will offer reasons that I feel were either correct or needed improvement. We will then review the areas of deficiency and I will also offer examples with accident reports.</p>
<p>Description of personal experiences.</p>	<p>Quizing and analysis of answers.</p>
<p>I think the best way to teach weather decision</p>	<p>I will often ask a student to call Flight Service</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>making is to simply take the time to do it. So often we are in a hurry to get out and fly that we don't take the opportunity to discuss what's going on weather-wise. Often I will spend a little time outside prior to a flight just looking at the sky and talking about how the weather reports/forecasts compare to what we see and what we think is likely to happen. This gets students thinking and will hopefully prompt them to do this more often, even when they are not flying.</p>	<p>for a briefing prior to a flight and then I will also call and get my own briefing. Then I will ask the student to review with me what they found out and explain whether or not they would fly. It's interesting how we can come away from a briefing with such different views of the weather. We of course will then discuss what we found and will generally make a go/no-go decision together.</p>
<p>I do a few things.</p> <p>On the ground, I talk about personal minimums and how proficiency and training affects them. I will also try to give them direction in what I think is reasonable for personal minimums for them at deferent stages in the flying career. On their student endorsements I place weather restriction on them, this is an attempt to give them a definite idea on what may be good minimums. I talk a lot about experiences I and others have had that turned out OK, but were wrong, and those that did not end well. I've seen things in CAP that I can relate directly to student.</p> <p>In the air, I do believe in the MVFR to IFR flight with students. I try to set it up where the student doesn't know how bad it is. Low vis and have them fly away from the airport, and tell them to take me back. I don't help them at first. This really rocks their boat, and shows them how bad it can be. Also during the required instrument time, I'll have them under the hood, fly them into low vis or clouds, have them take the hood off and fly for a bit. It usually does not take very long for that comment, "WOW what is going on??" or "WOW, this is not cool..." or some other comment.</p>	<ul style="list-style-type: none"> <li>-what is vis and clouds</li> <li>-what will the vis and clouds be during the flight</li> <li>-can I legally and personally complete the flight</li> </ul>
<p>I teach weather related decision making the same way I teach any maneuver. I show, student does, we evaluate, and improve next time. Practice, practice, practice.</p>	<p>If the student has made a good decision we discuss it, and give the kudos. If I think the decision was marginal, I will allow the flight to allow the student to "see" the weather that was forecast. For example if the forecast for a destination airport is 1500 overcast and 6 miles we can go take a look at why they should not fly in this. If the decision is really poor, I'll not allow the flight and point out the areas that are hazardous.</p>
<p>Number one: Look out of the window! I don't care what the forecast is, what is it actually doing NOW? I can't tell you how many times a student will be out pre-flying with the weather marginal or below because "the forecast said..." The</p>	<p>Are they looking at all of the available information, including looking out of the window? Are they developing a sense of what the weather patterns are doing, and what the effect will be on a given flight? How</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>opposite is also true. "Why aren't your pre-flighting?" "The forecast said.....", and the weather cleared two hours early, easily verifiable by every METAR within 75 miles. We have many possible hazards here in the upper midwest. What will the wind off of Lake Michigan do to us today? Look at all the available information. I wake up to the Weather Channel and fit that in with everything else I can get. Learn to do your own forecast. In my opinion, a properly trained private pilot should, given equal information, be able to do as good a forecast for the local area as the Weather Channel people. Set personal minimums and stick with them. If the cross wind component is one know too high, do not go today - at least not solo. Learn to trust your own instincts. If it feels wrong, it probably is. DO NOT GO. You may miss a few flights, but the ones you do go on will end well.</p>	<p>do the TAF's, Weather Channel, Area Forecast, MEATARs and maps blend together for the big picture? Do they know this, and can they make a competent go/no go decision based on the information? I don't just mean when FSS says "VFR not recommended", they parrot it and don't pre-flight. I want the student to dig in and tell me why THEY think they should/should not go. At least 50% of the time we do go, depending on the material to be covered in that particular flight.</p>
<p>Ground School per Syllabus Preflight briefing Cross Country Flight Planning instruction Post flight critique</p>	<p>Review cross country flight plans and quiz student on reasons for altitude selection, route chosen, weather expected enroute Discuss weather phenomenon as it is encountered in flight.</p>
<p>We talk about weather as part of the pre flight. First, 'the big picture', what we expect to see, what we might see, and then in flight what we actually see. Part of post flight briefing is what DID we see. That way every flight whether to fly is a conscious decision and then debriefed. That way weather is incorporated into every flight and the student from day one expects it to be. I also spend time on lesson 1 with them on how to get a weather briefing and they are expected to bring that to every lesson with their questions written out so we can talk. It takes extra time early on but the pay off is huge</p>	<p>i can tell from their organization of the briefing on their paper whether they are getting the information. I have a standard form I use and give to them. I can also tell by their questions if they have thought about the weather when they call me before leaving for the airport and have questions. When they begin to call me in advance I know they are really learning how to evaluate weather and make decisions.</p>
<p>Would you take your Kids or Mother flying in this weather?</p>	
<p>I have students evaluate weather at a location where I know it is marginal.</p>	<p>I encourage and support their no-go decisions, particularly when the weather is within my personal minimums but not theirs.</p>
<p>Tell them stories where decisions that pilots have made lead to accidents and close calls and point out where the chain of events started to turn bad. Roll play with the student and put them in deferent types of situations</p>	<p>Ask them before each flight, after they have soloed, if they thing we should go flying that day. If the student thinks we should I will go if the weather is not beyond my personal limitations. If the weather is beyond my limits we will not go and will discus why.</p>
<p>I often use accident reports where pilots went wrong in decision making--particularly to point out where pilots went flying with insufficient weather briefings.</p>	<p>As early as possible - sometimes the first dual - I leave it up to the student to decide whether we should fly or not. Then we discuss her/his decision and why it was what it was. It is never to early to get them to</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
	understand that they and they alone are responsible for their own fate - "Fate is the Hunter" - Earnst Gann! There is no second chance in critical weather.
I try to stress the seriousness of rash decision, the comfort of knowing that you will always be able to fly another day (just because you got the plane out doesn't mean you have to go flying), & the importance of making a decision early enough to allow an alternate means of transportation if necessary.	Have them take more responsibility for the decisions as training progresses.
I use real world accidents as a springboard for discussion---Particularly recent accidents that may have been in the press. Showing a vu-graph of a newspaper report of a fatal crash is a real attention-getter in the classroom. What was done right? wrong? What could have been done differently? What other factors may have been involved? I relate personal decisions & lessons learned-- right & wrong. I tie in weather, human factors, airfield problems, controller actions, aircraft problems, etc.	I make them make the go/no go decisions on all flights. I have them verbally justify their decision. Then, we either go with their decision, or I explain why I think another choice would be better.
Manuals first; each lesson is given regardless of weather. Ground school is always given on a none flying day. Look at the present weather at start of lesson by FSS or Pc info and in person. Making sure they know how to read Metars and TAFS; Weather charts. Clouds present and during flight time; visibility present and also during flight time. A standard brief I require always.	By their actions and statements about the time they are to start cross country dual.
First I describe the minimum weather conditions set forth by the FBO that I work for. Next I explain that these weather minimums are the absolute worst that the FBO will allow instructors to fly in, and it is not necessarily a good decision to fly in weather simply because it meets the FBO's minimum weather condition. Next, I explain that even I (the almighty CFI) have weather minimums set for myself. Next I teach METARS and TAFS and TIBS and 1-800-WEATHER-BRIEF and insist that the student MUST MUST MUST get a weather briefing before each flight and that we WILL NOT fly if they do not get a weather briefing and show me their notes on it. Finally, over the course of the next dozen or so lessons I leave the decision to my student on whether or not we should fly. The student's decision is final (unless of course their decision will put me in immediate danger!) I find this to work well because if the student makes a decision to fly when it wasn't appropriate (ie. high winds, low ceilings, poor visibility, etc...) then they	I ask the student what he or she used in determining whether or not to fly. If it sounds logical then it is o.k, if it makes no sense, then further instruction is needed.

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>learn a valuable lesson, and if they decide not to fly when they really should have, they see that no harm was done in being conservative.</p>	
<p>Initially, I teach the basics of understanding and interpreting weather (or preferably have them do their home study and then assess how well they have done it). Before flights I will point out weather items of interest - especially windsock, any clouds and precip, and check the weather terminal</p> <p>As they approach their first solo, they will be able to get a weather briefing from a briefer, and DUATS, and be able to navigate round an FBO's weather terminal. I quiz them on at least current conditions, on winds and temps aloft, and on forecasts, plus any AIRMETS and SIGMETS.</p>	<p>Before solo, we are already discussing weather and how it will affect each flight. I expect the student to have done the legwork to get the weather info and to be able to at least tell me what is happening and what is forecast, plus make a decision on the flight.</p> <p>By the time the student is signed off for solo, they have a set of personal minimums developed with their input that need to be met for soloing. When opportunity presents itself to go fly in some good gusty and/or xwind conditions we take it, and I may relax the weather minimums - again I want the student's input and also I want to know they can handle the conditions.</p> <p>I believe the keys to assessing their decision making include:</p> <p>1/ Making sure they are in the habit of checking weather before every flight (and not just looking out of the window)</p> <p>2/ Relating their proposed flight to the weather - forecasts for the planned arrival and return; winds and what they may do to planned flight times and fuel; hazards - AIRMETS and SIGMETS obviously, but also temp/dewpoint spreads and their relation to visibility; winds and what might happen over rough terrain</p> <p>3/ Relating what the expected weather was with what they see out of the window - i.e. confirming that the weather is developing as forecast (or not) and if appropriate changing their plans. I want to see them checking ATIS/ASOS/AWOS of places we fly past, and also Flight Watch.</p>
<p>I try to correlate out-of-the-window weather with METAR, TAF, FA &amp; ATIS, and weather theory to make the abstract theories connect to the weather seen outside of the cockpit. A good example of this is to show explain and let the student experience the turbulence and visibility change associated with an inversion, or to correlate the puffy cumulus clouds in the blue sky with associated thermals and the resulting turbulence.</p>	<p>I have them to make weather-related decisions and then ask them why they made such a decision and what they are basing their decision on...</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>I use examples of first hand experience - p. ex.: mistakes I made and how I dealt with them. I let my students know the thought process that lead to my decisions, how that decision affected my flight, what I felt during that flight and how I handled the situation. But I also share good decisions and the result of feeling confident and safe.</p> <p>I try to let my students make their own decisions even if I don't agree with them. I believe that if they learn from mistakes in a protected environment, they are more likely NOT to make those mistakes again later. However I always stress the importance of "not pushing it". Of course, if their decision is unsafe, I will stop them - followed by more ground school...</p>	<p>I try to question my students on how they reached their decision and what the motivation was. I feel that lots of them have a pretty good instinct and knowledge but may have some other driving force, like an upcoming check ride, time issues, money issues, etc. I want them to know that their well-being and safety comes first and everything else is secondary.</p>
<p>Every student obtains a weather briefing via FSS prior to each flight and we discuss his interpretation of that briefing prior to the flight, comparing our analysis of the weather situation and its suitability for the flight we propose to make. I expect the student pilot to describe the present and forecast weather, to explain to me what elements of the weather are significant for our flight and to decide whether those elements, be they wind or visibility or whatever, should preclude our flight or how we should handle those weather phenomena if we do fly. Consequently, in the course of his training each flight student will have thought through dozens of realistic weather scenarios and we will have compared our respective processes for analyzing those scenarios.</p>	<p>Through the above process, repeated many times in the course of training.</p>
<p>I allow them to make a bad decision to fly in the local area, so they can experience turbulence and cross winds beyond their ability level. This teaches them to err on the safe side.</p>	<p>I assess the decision by having them give me a full briefing and then ask questions about what that means. If the weather turns out to be much different than forecast, that becomes the subject matter of our next discussion.</p>
<p>encourage lots of hangar-flying. They can learn well from the experiences (both good and bad) of others.</p>	<p>Deliberately schedule a lesson for a day when the weather is marginal, and probe into the student's comfort level.</p> <p>If the student opts to cancel the lesson, I deem his/her decision making skills adequate.</p>
<p>I assign a cross-country trip for every lesson after a student's first dual cross-country lesson, and then critique their go-no go decision. I will sometimes start a cross-country trip and then abort it after the weather is seen to be untenable. We will then discuss why we were not able to reach the right decision on the ground, and how we could do better next time.</p>	<p>I will ask questions about how the student reached her decision and what factors she considered in reaching her decision.</p>

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Use of Jeppesen Text and practical experience during flight lessons	Written test and supervised decisions during flights
Its a text book approach training the student what kinds of weather can be flown in with me making the decision for each flight. Later I leave the decision to he students but I still retain the final decision.	I leave the decision making to the students (I still retain the final decision). This way I can evaluate not only decision making but how well he/she interprets the weather information.
Printed DUAT briefings, FBO computer based weather information (realtime graphics), I like to fly to a FAA facility for a personal tour and in-person briefing with students.	Personal attitude about weather, knowledge, and interest in safety.
Recommend they use internet available information	Oral test before cross country flying
Using weather-tap on computer, metar and taf Show students actual weather progressions by print-outs of conditions as compared to forecast conditions.	Have students check weather with fss and decide if it is safe for flights locally or cross-country. Compare the students' decision with forecasts and current conditions.
I deal with a lot of surface winds in my area. After a student has soloed, I begin making the go/no go decision for them, but I always explain why. As training progresses, I ask them how they feel and what would they do. At first they just stare at me as if to say, " I don't know???" If it is a condition that I feel they aren't ready for, I might still take them up just to show them what a 17-18 kt crosswind is like in a light aircraft. By coaching them along and asking a lot of questions on 'what do you think' and sharing my input, I feel that they slowly get a picture of what is safe to fly in and what is not. We also have a lot of thunderstorms in the spring/summer here. As most of my students are familiar with the damage they do on the ground, they are scared enough of them as it is. The only challenge there is to teach them ways to determine if they can complete a planned flight before the storms pop up.	I basically ask them all the same weather-related questions I would ask myself during the preflight planning, and taking into consideration their skill level, I make my own decision on whether I feel that they should go or not and compare that to their decision
ground school classes, pre-flight discussion's, during flight showing examples of weather and possible problems	I know the answers before I ask the question,
I have the student assist me in collecting weather information, we discuss the plan for that flight, and determine how the current and future conditions will affect our flight.	I stress the importance of having current weather info prior to each flight, and as the training progress I insist that the student take more responsibility for the go/no-go decision.
I also relate events and situations I have been in, the decisions I made, and how the day played out. I try not to use third party	I inquire as to their background with respect to outdoor activities, and ask what weather experiences they have had during those trips

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>stories of which I had no part in to try to avoid passing judgment on other's decisions.</p>	<p>or activities. Ask if they follow weather patterns on days they are not scheduled to fly.</p>
<p>Mostly from example.. When the weather is yucky we'll talk about what is bad about it and then I'll say to them 'if I have trouble deciding to go or not to go then that's a good reason NOT to go'... It's just not worth it... We fly mostly for fun and when it's not fun why bother flying???</p>	<p>I simply ask them if they think it's a good idea to fly.. I find that the students are very conservative.. I suspect that the only problem they may have is determining if the wind is above their limits... I hope they will do a go around if it's not right. We talk about the problem all pilots (me included) have with aborting a landing.. I ask them to practice go arounds during their solo practice. I hope that makes going around a non-event... I hope.. Go arounds are good!!!</p>
<p>First we have a discussion about the weather on the ground. We will step outside and look at the weather (clouds, winds, visibility) and talk about them. If the student makes a questionable does not seem to grasp the concept of the talk, we might go fly and give them a real life look at it.</p>	<p>Through discussions.</p>
<p>On every flight, unless the weather is virtually perfect, we talk about the weather, what limitations there might be and often, whether or not the weather is suitable for the flight we intend. During the solo portion of the student's training, I set limitations for the student and instruct him/her to contact me if there is ANY question about the weather being suitable for the flight. During the solo crosscountry portion of the student's training, I have him or her get a complete weather briefing. I also get a complete weather briefing and we talk about what conditions exist and whether or not the weather is suitable for the flight.</p>	
<ol style="list-style-type: none"> <li>1. Have them research the weather sources available and have them make the go/no go decision.</li> <li>2. present possible scenarios that may occur while enroute</li> <li>3. Present possible senerios that may happen if they arrive late.</li> <li>4. Present senerios that may occur if they arrive later than anticipated.</li> <li>5. How does this time line affect your flight with the impending weather.</li> </ol>	<p>If the student has taken all factors into consideration, and has contingency plans for the "worst" case scenario, and I concur, they are free to go. If not, they don't go and I explain why they made a bad decision based on their experience.</p>
<p>Weather is obtained before every flight by phone and/or computer by the student. They are given time to time to review it and make their own go/no go decision. They then discuss their decision with me and i help them to evaluate their decision. As their knowledge and skills grow the evaluation of</p>	<p>As the student evaluates the weather and makes their decision, I listen to how and why they made the decision to go or not. I then discuss with them why they made a good decision or not. By started from the first flight if feel that by the time they are ready for solo</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>the weather becomes more in-depth. I also teach a lesson on weather after their first few flights and before cross-countries. I try to make weather decisions part of each flight. If a particular weather phenomenon occurs during a flight, I take to opportunity to discuss it with the student during or after the flight (EI: A frontal system has moved through the area and is marked by a change in wind direction as seen by the students during flight in the traffic pattern. We discuss why the wind changed and how this will affect our flight - change in runway, discontinue flight, etc.)</p>	<p>they understand weather enough to make the go/no go decision for themselves. It shows not only in their evaluation of the weather, but in their confidence in their own ability to make a good decision.</p>
<p>1.Expose students to weather. 2.Set minimums</p>	<p>I leave the go/no go decision to them and then if I see that they make the wrong decision, we talk.</p>
<p>I find that the only way to teach a subject that is not particularly interesting is to tell "stories" i.e hangar flying. I tend to teach the basics of weather interpretation, then spend considerable time MVFR with the student, letting him/her SEE what was depicted on the radar screen or in the TAF. I try to take each student along on an IFR flight, if possible. All along I tell stories of my own and others- modified if necessary-that show how a bad situation resulted not from fate or luck or satanic intervention, but rather from a poor or uninformed decision somewhere back there- by the pilot. Pilot's are control nuts, typically...so I demonstrate that you have no control over weather, once you leave the ground. The only way to slay the evil weather dragon is to do it by NOT going. I've collected a number of photos, depicting aircraft demolished by hail or bent by T'storms or what have you- I arranged these in an album and we will look at it at some point. We'll discuss the pilot of these planes, and how he probably felt as he launched prior to this event. No doubt he felt that he would be a winner- right? Yet he lost.</p>	<p>I allow students to do all cross country planning and weather interpretation on their own. I don't second-guess them at all, nor do I comment before the flight.(I do get my own briefing, however) We launch based on their opinion. I only do long cross country work in IFR aircraft, so that I can let things deteriorate considerably before taking over and activating my pre-filed IFR flight plan (in deference to the overworked FSS folks) Students typically start off cocky and end up cautious. Of course, here in Alaska I don't have to worry about making all of their cross country flights without encountering adverse weather...in some areas this may not work as well.</p>
<p>Start by setting personal minimums for them during solo operations based on what you feel their capabilities are, and add them as limitations to their solo logbook endorsements. Over the course of their training, teach them about the hazardous whether situations and how to apply them to adjusting these minimums as they gain experience. By giving them a starting point, they have a base from which to make go/no go decisions.</p>	<p>Its primarily based on how well I see they student react to weather situations during the initial training. Do they struggle finding the airport during lower visibility days? How well can they safely operate in turbulence and crosswinds? I always fly with a student below the minimums I will eventually add as limitations to their solo endorsements. My base criteria for a new student is 10sm visibility, 10 kts max wind, 5 kts max crosswind, 3000 foot ceilings minimum. For some students I may allow them to fly in the pattern with lower ceilings, and/or greater winds if we have experienced them before</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
	and I feel confident in their abilities. Others may get lower minimums too.
<p>During the pre-solo phase, I make the go/no-go decisions, but involve the student in the process and make clear what influences my decisions. I then start having the students start making decisions as indicated in question 2, give them feedback, and then make the final decision myself.</p> <p>I continue this process so that by the time they are ready for the first dual cross-country, most of my students can make sound decisions and I rarely have to override them.</p>	<p>While I retain the final decision-making responsibility, I have the student make the initial decision by asking them "What are you going to do?" This can be used in any number of circumstances: deciding whether to fly on a windy day, deciding whether to fly the cross-country plan with weather not as good as forecast, deciding whether to press on during the cross-country if conditions are less than forecast, etc. This can also be used in any number of other decision-making situations (of course, when time and safety permit), like when is a go-around required, entering the traffic pattern from a different direction than normal, etc.</p> <p>I then give some feedback to the student, good or bad, and make the final decision.</p>
<p>I try to take my students up in weather conditions that are less than ideal to show them what the weather can look like or feel like. Then I say "how would you like to be up here all by your self"? They usually say "I'm glad you're up here with me" I think this helps the students to develop their own personal minimums because they get to see what different types of weather conditions look like, first hand.</p>	<p>Do they understand the hazards of different types of weather?  Do they understand their own personal minimums?  Do they understand the current conditions and forecasts?</p>
<ol style="list-style-type: none"> <li>1. Review flight profile and look at weather in areas of travel.</li> <li>2. Think about effects will have on conduct of flight and the enjoyment received.</li> <li>3. How will weather effect your passengers?</li> <li>4. Discuss and brain storm options with pilot during his flight training.</li> <li>5. Have student explain his thoughts on abort and diverts.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss the options and alternates the student has during the planned flight.</li> </ol>
<p>I dont feel that you can just TEACH weather related lessons, or AIRCRAFT related lessons. Each lesson must be a lesson in integration. The weather, and its effects on flight conditions is an important part of each lesson, before, during and after. It can only be taught properly while it is effecting the conditions in which you operate.</p>	<p>This is probably the hardest thing to do. Each student is different, each student has his own understanding of his own abilities, and how current weather will effect it. I ask myself if the student is ready for the level he is attempting, if yes we go on, if no we go back and do it again.</p> <p>basically the same way that you decide when a student is ready to solo.</p>
<p>I prefer to use real world weather and develop a flight scenario that provides an opportunity for the student to make a go/no go decision and discuss it. A good scenario would be a cross-country flight that they will or have made and apply various</p>	<p>This is difficult because of the stringent minimums placed on a student pilot. I would discuss their decision to go/no go using real world weather and a real or developed flight scenario. Then I would quiz the student pilot.</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>weather situations as they occur or are forecasted to occur. Additionally, I have them receive a weather briefing prior to every flight after solo so that they are familiar and comfortable with it.</p>	
<p>I think that the best way to teach weather-related decision making is to provide the student with the appropriate stimulus. This stimulus must be actual experience in the types of weather in which he might expose himself through the decision making process. This must be reinforced with instruction on the indicators present within the weather phenomena. These indicators can be derived from weather briefings, various weather products, or personal visual observation, both on the ground and in flight.</p>	<p>I always require the student to make the go-no-go decision. Based upon that, we then discuss the decision, and why it is a good one or a not so good one. There are instances which become useful, based upon the actual weather conditions, when the execution of the flight is made based upon the student's go decision. The weather conditions might be less than desirable or comfortable, but much can be learned about the weather and the student's personal skill level in the weather conditions. The student then starts to form the parameters within which he will operate in the future, and the personal skill limits he will use that serve as the foundation of the decision making process.</p>
<ol style="list-style-type: none"> <li>1. I go over current weather with students, and we have a guided discussion about how that impacts the day's flight.</li> <li>2. We discuss systems and what would likely happen if systems change.</li> <li>3. We go over what-if scenarios, what we will do if we run into certain weather.</li> <li>4. We discuss why we are making the decision we are making.</li> <li>5. I have the student make a go-no-go call for himself/herself. (I have already made an independent call for myself.)</li> </ol>	<p>I ask about the reasons for their decisions. Depending on their response, we may spend time talking about it.</p>
<p>During flight lessons I point out conditions and quiz them about visibility, cloud separation, wind, etc. Would you go alone on a day like this? How would you get a weather update for your destination? Where could you go if you could not safely continue? Would you be willing to turn around and go back?</p> <p>I show them what minimum visibility looks like from the air, below, in, and above various minimum conditions.</p> <p>What caused the current weather conditions, is the weather likely to get better or worse? Set and adhere to your personal weather minimums.</p>	<p>The student obtains a complete weather briefing, explains it to me and tells me their opinion of current conditions and whether they would go.</p> <p>I determine if there is any additional information required or if I need to listen to a current standard briefing and compare my findings with their information.</p> <p>Students do not fly solo without a discussion of the weather, even if it is just in the pattern.</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
I set strict weather minimums for early solo, advanced solo and near completed training solo students.	
Preflight discussion of weather while showing them my "techniques" for go/no-go decisions.	I use a kind of "guided discussion" oral quiz.
<p>I use a variant of the Navy's Operational Risk Management theory:</p> <ol style="list-style-type: none"> <li>1. Identify the weather hazards you may encounter</li> <li>2. Assess the likelihood of encountering said hazards and the gravity of such an encounter</li> <li>3. List risk controls/alternatives (e.g., fly around t-storm activity or wait out the fog)</li> <li>4. Make a worst case scenario and list exit strategies (if cannot get around the storms, is there an acceptable divert field?)</li> <li>5. Make a risk decision based upon your lists above</li> <li>6. Most importantly, continue to update the above items before and during your flight!</li> </ol>	I have the student give a formal coherent brief on the hazards, the risks involved with those hazards, the controls that he is going to use to counter those hazards, exit strategies, and risk decisions that he has made. This exposes me to his thought process as well as giving him a means to organize his thoughts. En route I will ask him his thought process on the decisions that he is making from time to time.
I try to carefully expose them to less than ideal weather and relate that to weather reports. I strongly encourage them to develop personal weather minimums.	After some introductory lessons on weather I start the lesson with the question, "How the weather look?" it creates the expectation they start making their own weather decisions. From this I can assess their strengths or weakness.
<p>after discussing basics of weather and the difficulty in being 100% accurate, i try to role play with my students, giving them various scenarios to get their reactions. we then discuss their approaches. i also try to give students stories regarding various weather incidents i have had and why i made the decisions the way i did.</p> <p>we usually follow this up with discussions in pre-flight on what weather we;re likely to encounter and what implications that has.</p>	<p>if they are unable to come to reasonable conclusions in the scenarios we discuss them in more detail.</p> <p>if the discussion points out areas of misunderstanding i try to get us to cover the basics again in the areas where the student seems unsure or overconfident.</p>
Most of my instruction is with initial entry military flight students in helicopters and fixed wing instruction for all ratings SE nd ME land. I seek to instill a definite mind set in students not to violate any FAR. I also teach each student to make a risk assessment of the weather based on his/her experience, the aircraft, and equipment available. Always and Always worst case the weather and don't let your desire to get there influence your decision to go.	Average to above average
By actually flying in conditions that require you to make a go no go decision.	I always before every flight ask them to tell me if we can make the flight safely.
I allow my students to view my "King Weather Wise" tape. We discuss weather prior to every	Block 1. would cover most of the answer to this question. I simply ask and quiz my

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>flight. I like to make it fun for them by asking them to identify clouds when we're out on the ramp. When a weather event is moving in, I quiz them on what they might expect the weather to do. Bottom line, I ask them, would you fly in this weather? Would feel safe taking your children, wife/husband flying in this weather. most important I try to make it fun. I find they sure retain this knowledge easier and better.</p>	<p>students to assess their weather making ability and monitor their progress.</p>
<p>Start as a team in weather decisions. Getting briefs, assessing situation, making the decision. Slowly shift the decision making to the student by not telling him/her what my decision would be and having them tell me what they think. I either override their decision or if the weather is above marginal but less than optimum for training...we may give it a go to demonstrate another tool they should understand...the in flight abort and RTB (return to base).</p>	<p>Have student get a weather brief then make the go/no go decision without my input. If they boldly elect to launch into marginal conditions....discussion is warranted.</p>
<p>It all comes down to being the captain. With the privilege comes the responsibility. That means having the motivation to have the best information that you can have and then acting in accordance with the limitations you have in that situation. Saying no can be hard. It can be very unpleasant at times, in fact. But being the one that makes that decision, means you accepted that when you got in the seat. All the knowledge in the world will not help if you don't have the courage to stand behind your convictions. We have to encourage the student and let them know that this is not just OK but demanded in aviation. Until we do, they will make themselves unwitting victims of people( and maybe even themselves) who push to hard. "It is your decision captain and you are the one who will live or die by it." Armed with that, they should be much better prepared to asses and respond to whatever comes there way.</p>	<p>If I see them living by the saying of, 'when in doubt, chicken out' I tend to think that they are thinking things through at least a little. And a little fear goes a long way towards keeping you alive in my book. It may sound simple minded but it works and it speaks volumes to me.</p>
<p>Through discussion and discussing the methods that I utilize in arriving at a go/no-go decision. Emphasizing the importance of multiple factors (weather, airplane, pilot, environment). And using scenarios - pointing out the process that pilots would hopefully utilize in arriving at a competent decision in terms of go/no-go.</p>	<p>Using scenarios that are realistic to the particular student - usually involving a flight that we are planning on taking together for instruction.</p>
<p>I discuss different types of weather and how that weather relates to an airplane. Such as different levels of thunderstorms (Level 1 - Level 5) and the vertical development inside that storm. Also all the related weather outside of thunderstorms such as hail and wind shear.</p>	<p>I assess what weather information they gather for a particular flight. Where they get the information and how current that information is. Then let them give me their reasons for a go or no-go flight and why. That way I may understand their reasoning and decision making.</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>I discuss Icing as it relates to light aircraft and the affects icing has on flight and why.</p> <p>FAR's are also discussed at length as far as VFR rules.</p> <p>I believe if a pilot knows what precipitates a weather mass and outcome it will help them make educated decisions about flight.</p>	<p>There is one aspect of flight instruction that I believe is true and that is common sense. I do not believe it can be taught. So many factors of flight depend on common sense and the ability to make well informed decisions. A pilot license is a license to learn just as a flight instructors learns from his students. How a pilot uses what he learns is what makes him a good pilot.</p>
<p>I rely heavily on NTSB accident data base to select helicopter accident reports related to the subject that I am presenting (i.e. weather related, night operations, wire strikes, high density altitude, etc.). This seems to be extremely effective and realistic from a decision making point of view and gives the student a "real life" scenario. The purpose of this type of training is to demonstrate to the student that he/she can best prevent an accident by learning from those that have been involved in an accident. Not all pilot error accidents are caused by obvious errors in judgment.....many are a result of simply missing a minor detail or forgetting a procedure at a critical point in a flight.</p>	<p>Whenever possible or practical, I attempt to place them in a weather related scenario and allow them to make the decision whether it is safe to continue the flight or seek an alternative. I also insist that they show for a lesson if there is a chance that we might fly and let them make the decision when they arrive at the airport (most students, of course, choose not to fly unless conditions are perfect). If weather conditions are not good, we do ground school instead.</p>
<p>Aviation Weather and Weather Services are excellent texts and should supplement any course material a student may have. I cover temperatures/dewpoints - pressure trends, clouds and meanings, stable and unstable conditions, windshear and density altitude. Students are quizzed as to their knowledge and I then have them read articles where there incident/accident due to a disregard of the hazards of weather. I teach them the old saying "its better to be down here wishing I was up there rather than up there wishing I was down here". I also let them know that while others might encourage them to operate beyond their limits these same poeple will be the first to let you know you made a mistake. I teach that they should error on the side of caution.</p>	<p>When we are making a local flight I require that they make the decision to go or no go. They must explain the basis for the decision. If it is a no go decision I will determine if the decision would be different if it were a dual flight. If they make a go decision on a no go day then I need to determine if it is weather knowledge related of attitude related so that the error can be addressed properly. For both dual and solo cross countries I require DUAT reports including weahtther charts. I also get the reports so that I can do an analysis before meeting with the student. If it is a no go day I will not cancel the lesson so that we can take advantage of the knowledge that can be obtained or demonstrated from the analysis of weather information. The student is also required to obtain a FSS briefing before our meeting. I have developed a cross country review that includes current/forecast weahtther conditions.</p>
<p>I teach them basic and applied weather early on in their training, and then have them obtain a briefing eve very day (whether or not they're flying) and then have them make the go/no-go decision - which I reveiw with them. Then I will decide whether or not to override the decision.. and why.</p>	<p>I review the briefing they received (I call for a briefing - and try to use the same briefer- my clients ask for the briefer's initials)... I then determine how accurately they have copied the information, and how thoroughly they understand it. I then ask them to make the</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
	go-no go decision... and explain why, and what could develop during the flight ... I tell them it is their job to tell me when they would terminate the flight.
I use a lot of scenario-based based weather instruction. Thunderstorms, icing, low visibility, wind shear, etc. are not everyday occurrences. So, as vividly (visuals help) as possible I depict the situation and discuss the go/no-go process by incorporating the FAR's, aircraft certification, and their personal minimums.	More often than not students are hesitant to fly into weather they have not already been in. 95 out of 100 times I've seen students be much more conservative in their decision making than they were eager to go. If they can make a decision and back it up using the regulations, their experience level, or other method they used, I would assess that as good decision-making.
Standard briefing for each X-C flight, discuss options & contingencies	discussion with student
Chalk board entries showing basic criteria	Review their responses, point by point
Every time a student shows up for a flight lesson is a chance to teach weather related decision making. I would have my students check the weather and then we would discuss whether we should go or not. Once the student made their decision, we would discuss why or why not it was a good one. By immersing them into a real world situation, it affirms or corrects their own evaluation process. I find it true that you best teach by example.	While discussing our go/no go decisions at every lesson, it would give me an insight to how the student perceives the weather information presented. When working on cross country planning, giving them a series of created weather reports allows you to control the weather for that scenario. This allows you to see if they are interpreting the data presented to them by duats, FSS, or other means.
Very few people are inherent "decision-makers". I find most new students need to watch me walk through the process of gathering the data, analyzing it and applying it to the instant flight planning. As the training progresses, I have the student take the lead, and critique the performance, raising additional issues. I try to instill the concept that average handling skills are acceptable, but excellent decision-making is the key to safe flying. I reinforce that by refusing to sign off a student who is reluctant to accept the importance of decision-making.	As set forth above, by passing to the student an increasing responsibility to take the lead in gathering weather data, analyzing it and applying it to the current flight planning. By recommendation time, there should be very little critique required.
Decision Making is taught in general and weather is merely one of the factors in reaching the go-no-go decision. I try to apply a Human Factors, decision model that explains the decision making steps (input/ perception/analysis and decision/execution/feedback) and then identify obstacles to sound decision at all steps in the process grouped as physiological, knowledge, or psychological interference items. The key being knowledge of the way it works, the facts and yourself will lead to quality decisions.	As we approach the first solo area of training, I will ask the student about their evaluation of the current weather conditions and if they would fly solo if given the opportunity. This will usually provide an opportunity for discussion of weather and/or aircraft operating limits.

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>The primary example that we apply throughout our glider flying club is our triumvirate of authority (crew chief, duty instructor, and tow pilot) any one can "shut down" the operation. All must agree to open operations.</p> <p>A general principle we espouse is - "If you find you are having a long discussion about weather to fly or not, do not fly."</p>	
<p>We read allot of weather related accident reports and discuss them when were done. I will ask the student where did the pilot go wrong and what could he have done different.</p>	<p>I will check the weather before the student gets to the airport. Then I will have him check it. I will ask him if he thinks we should go or not. If it's a bad weather day and he says we should go, Then we will spend that lesson on the ground going over more accident reports, the go/nogo des. making, spatial disorientation and weather.</p>
<p>I teach weather related decision making by describing my own process of decision making. What does the weather briefing say and mean? How does it apply to my proposed flight? What alternatives are there if the weather reports aren't correct or the weather changes faster than anticipated or forecast? Is the flight safe from a weather standpoint? I also set personal weather related minimums for myself as well as for the student, regardless of regulatory weather minimums. To me, 3 or 4 miles visibility in haze (typical for Southern Calif) is not a "safe" environment.</p> <p>I try to go through as complete an analysis as I can. I find this helps me also understand the weather better and to make a more competent decision.</p>	<p>When the student is near soloing I start to discuss personal minimums and how and why to set them. We have talked about minimums from the beginning, but make it a definite discussion topic before each flight as they get near to soloing. Before flights I ask them to describe the weather conditions (current and forecast) as clearly as they can and to discuss how these weather conditions will affect their flight. Assuming conditions aren't so bad as to preclude the flight completely, we then go over the flight plan to see how the weather will affect each portion or leg of their proposed flight and what alternatives, if required, may be available. (Flying around areas of turbulence, or thunderstorms, etc.) If it is a solo flight, we discuss getting another briefing prior to the return flight and emphasize that if there are any questions or uncertainties to call me to discuss. It is always made clear that "get-home-itis" is not acceptable.</p>
<p>Initially discuss ATIS and what the terms mean. Then discuss about temp-dew point spread and restrictions to visibility and their possible effects in San Diego. Discuss weather regulations and regulatory minimums and personal minimums. After a few lessons have student call FSS and obtain Standard Briefing and discuss the briefing and its implications. Have student obtain briefing before every flight, except possibly if staying in the pattern. After solo endorsement, give student weather limitations more stringent than "Basic VFR" as to when he is "allowed" to fly. This forces him to understand briefings/ATIS and to make a</p>	<p>They seem to be very conservative. Whether this is because of me or in spite of me I don't know. I typically obtain a weather briefing and then compare my interpretation to theirs and discuss conditions and possible effects and then try to understand their thought processes. I will give them scenarios in an attempt to find their "limits."</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
decision.	
<p>My approach to weather related decision making consist of many steps. First I tell the student to simply look outside, and ask "does it look like "flying weather"? In many cases the decision is made at that point. If the answer is "yes" then we proceed to check the weather conditions at our destination. Again this may be the last step in the decision making process. If the weather is acceptable at the destination and will continue to be that way by the time we arrive, then we check the enroute condition along the course we have chosen. Depending on the student and how far along we are in training will be a factor in deciding if optional routes are permissible. In other words if the student is still early in training and building self confidence, a straight line from "A to B" is the only acceptable route.</p> <p>If the student is well into training then a route around hazardous weather may be considered. My discussion is focused mostly on a cross country situation, whereas local or in the pattern would be different and other parameters would come into play.</p> <p>I also teach by example. If the weather is marginal but I say lets go any way this is setting up a bad example for the student. I want the student to remember that a decision was made not to go when it was the best decision to make, and not let outside influences interfere with a good sound decision of not to go.</p> <p>Another teaching method for decision making is what I call "perspective" Set up a situation where a bad decision is likely to be made, ie: Gotta make this flight or the big business deal will fail! Then put it in perspective. Will the deal fail if you crash? Will the deal fail if the crash is fatal?</p> <p>If you don't make the flight and live can you move on to another opportunity? What will be the impact of your decision in 6 months, a year? These thoughts can provoke some new ways to look at decision making.</p>	<p>Reviewing their planning for a flight. When do they conduct their solo practice? Picking up on key words during a conversation regarding a flight that took place or a planned flight.</p> <p>I also tend to take notice on other decisions not necessarily weather related. Chances are if a student is making bad decisions in other areas he/she will do the same regarding weather.</p>
<p>At the student's early stages, I explain the weather related decisions I am making, including the factors involved. I always show where I got the info, what info I am using for which type of decision, and try to get the student involved in getting the info as early as possible in the training. For instance, on a gusty day, I explain the proximity of another airport with a runway more in line with the wind as a fall back. As the student</p>	<p>The single best way to assess the student's decision making is to let them make the decisions. Ask questions to understand the basis for the decisions made. Allow the student to act upon a wrong decision (too gusty) (poor viz) and get a little over their head and allow them to get out of it (assuming the safety of the flight is not in doubt. See if they learned from the</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>progresses, I let the student participate in the decision making and point out factors that need to be considered. I make sure the student notes that I take IFR charts along when we fly on marginal days and I discuss how I will get a clearance if the weather deteriorates. This is an effective way of showing that you have to have an out available and that flight in marginal conditions may be safe if you have the IFR to fall back on, but not safe without it. By the time we get to cross country flying, the student is making the weather decisions subject to review.</p> <p>One thing I always do at least once during the early pre-solo training and again during the cross-country training, is cancel a flight on the grounds that I "just don't really feel like flying today." I want my students to know that anything is a valid reason for not going and not to be afraid to say they are uncomfortable.</p>	<p>experience the next time the situation comes up.</p> <p>The principal objective is to transfer the decision making to the student as early in the training as possible so you can help refine the process as training continues. If you make all the decisions, especially the go/no go decisions, the student will never learn how to do it well. By the same token, you must have the student explain the decision making to you or else you will never pick up on the things they are getting wrong.</p>
<p>You need to take every opportunity to discuss the current weather with the student and potential issues with that weather. From there you should introduce them to marginal weather (in my opinion anything less than 5 miles visibility is good enough to have an impact) to let them experience their limitations in a controlled environment. I try to ask questions that guides them through the decision making process.</p>	<p>I ask questions to guide them through the decision making process. When the students start providing information without prompting from me I know they are making progress. When they can lay out a coherent plan for the flight with little input from me I know they have developed the necessary decision-making skills.</p>
<p>Use a 100 mi radius within the local airport.</p>	<p>Ask questions based on the time of year.</p>
<p>Before EVERY Flight, we read the current weather conditions as stated on Metar/TAF and compare them to REALITY. Try to explain why it is or is not correct and reasons for it not being correct. I try to let the student figure out the flying ramifications of the numbers, then let him experience flight within those numbers. So rather than just saying its a 20 knot wind, fly in that wind to have a correclation of what that wind is, vs other conditions.</p>	<p>Have the student describe to me what flight conditions he expects based on reported and observed weather reports.</p>
<p>During the initial (first 20 hours) instructional period I discuss the days weather, forecasts, and flyability.</p>	<p>During the post solo portion of the instructional period I ask the student to give me a through weather briefing. During dual cross country flights I propose different weather and ask for decisions/actions to be taken. I take the student along on a real IFR flight in actual weather.</p>
<p>Very simple, if you have a doubt - Don't Go!</p>	<p>The way they make the decision to go or not to go on a hop.</p>
<p>White Board discussion and reference to actual conditions. Review of frontal maps in papers and their forecasts and comparisons with what we can see. Relating intense phenomena to temperature</p>	<p>I try to discover how they perceive conditions and how they will respond by letting them ask questions. I try to find out whether they are aware or are</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>events as perceived. Wind experiences when fronts pass. Weather channel for scale of weather. Duats and map drawing examples and comparing with published maps.</p>	<p>they afraid. Typically with wind, do they link headwind to fuel needs. With clouds, can they distinguish between convective weather and stratified cloud. Do they understand and react to turbulence by slowing down or relating it to ground features and steering around. Do they endure conditions or do they try to adjust the experience. Do they plan for the next ten minutes. Can they make a timely decision that they should be thinking about landing while the option is still there.</p>
<p>I use a video of a slide show called "On Weather" (I also use this when working with Boy Scouts on their weather merit badge.) I review the MNWAS web site (available through <a href="http://www.mnaero.com">http://www.mnaero.com</a>) and I review the DUATS site with the student. I encourage students to read Weather Flying by Buck. I have my students call the FSS prior to each flight. Initially I sit in on the calls (via speakerphone -- FSS doesn't like use of the speakerphone but they are OK with it when I explain what we are doing.). In time I have the student handle the briefing solo and I have the student brief me on the briefing.</p>	<p>By discussion, especially on questionable days.</p>
<p>Exposure to as much as possible. Introduction to actual IMC</p>	<p>Asking lots of "what if" questions</p>
<ol style="list-style-type: none"> <li>1. always have an alternate available or co not go,</li> <li>2. know aircraft demonstrated crosswind limits,</li> <li>3. know your limits at the time of the flight due to currency and past experience,</li> <li>4. know the forecast,</li> <li>5. only fly into improving conditions,</li> <li>6. if you must fly toward deteriorating conditions, keep alternate available,</li> <li>7. schedule to fly with your instructor when you would not go with yourself,</li> <li>8. observe how your instructor determines what the weather is and whether he will fly or not,</li> <li>9. be able to quantify the weather you see and compare it with the forecast, and</li> <li>10. use all the available weather sources when conditions appear marginal or are forecast to be.</li> </ol>	<p>Be sure they know the legal minimums will most always be lower than their own personal ones. Many minimums are not specified (eg. winds and turbulence). New students will most likely have been in only one type of airplane and do not know how some handle the weather better than others.</p> <p>Are they willing to take the time to get a good weather briefing when going cross-country?</p> <p>Have students do slips to landings when weather is not a crosswind to see how they do.</p> <p>Give them the authorization to fly a cross country but let them know that it is their decision to go. If they make the correct decision to NOT GO, congratulate them on exercising caution. Explain how you would have stopped them if they had attempted to go.</p>
<p>Get weather briefings for imaginary, later real, flights and examine the factors which most influence the decision. I also collect DUAT briefings on "interesting" days for use in ground</p>	<p>Was the student able to complete the planned flight or did weather interfere? How? Why? Did the student's plan with regard to winds aloft and fuel consumption work out? If</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
instruction. For example, on days when no sane person would fly, the METARS and TAFS contain codes the student is unlikely to see at other times.	not, why not? Were there any weather-related surprises (good or bad)? Why was the surprise not anticipated? Could it have been anticipated or did it surprise the forecasters, too?
Weather-related decision making must first be learned by knowing the weather. I share my experiences with the students as well as accounts from other people. A good example is NTSB reports. Display the statistics of weather related accidents in comparison with the total number of accidents. Most importantly I take ALL of my students into IMC conditions at least twice. Preferably once in the beginning of their training and then once later on in their training prior to solo X-C. Also an outline of the state is on their flight plan forms, it should be shaded in with fronts, highs, lows, areas of precip., etc...	As I am sure most CFIs do I ask questions. What did you base your decision on. Was it a duats report?A pilot report? The ATIS sounds fine does that mean we are good to go? What is the overall picture and trend? Would you take your mom flying for her first time in these conditions?
I use and teach the student to use the personal minimums checklist provided by the FAA. I also set the students personal minimums (to begin with)and work with them on when and how they would be raised or lowered.	observing the students planning, information gathering and decision making process leading to the go/nogo decision.
I teach them some basic minimums and let them make the decisions from there. If they make a poor decision, we fly anyways and they see why their decision was a bad one. For example, if a student wants to fly in 5 miles, we fly and the student sees why they shouldn't do that on their own.	I let them assess it when we're flying.
1.I feel the best way to teach the above is by exposing the student to hazardous weather. With only a few rare exceptions the lesson is firmly taught that haz.weather is not to be taken lightly. Of course an assessment of the students own hazardous attitudes is necessary along with the realization that some students will interpret exposure to haz. weather as an endorsement that they, too, can tackle it solo. Obviously this would be the wrong message. For most students the lesson is quickly learned that it is better to be down here wishing we were up there, than vice/versa. How else will they learn this if not experientially? I allow a student to make a "go" decision (within limits) when clearly a "no-go" is proper, and then allow them to recognize/realize the error of their decision. Certainly my own personal minimums override students faulty decisions, and when those minimums are met it is a "NO GO!"	On the ground: By comparing my own independent weather briefing and assessment, with the students briefing and decision. In flight: By encouraging the student to make the decisions to divert without input from me.

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>For any flight in which weather conditions may be a factor, I discuss with the student how the weather could effect our flight and what we might want or need to do to avoid or mitigate negative effects or take advantage of positive effects. I lead them through scenarios -- "what ifs" to show them the implications of various weather developments and the choices we have if conditions develop in any number of different ways. These scenarios are then exercised in flight in our en-route decision making or perhaps even no/go or abort decisions. Included in these discussions are personal and legal weather minimums, including the students own perceptions of their ability to handle the conditions.</p> <p>Another avenue for teaching is to use accident / incident databases, news articles, and various sources of personal experience stories to look at a wide variety of weather conditions and how people dealt with them, either successfully or unsuccessfully.</p>	<p>As students progress through training I ask them to assess the weather conditions and their implications on each proposed flight, including alternatives to the planned flight. I also ask how they'd feel about flying solo under the current, forecast, or possible conditions.</p> <p>In flight, I ask questions and observe their behavior to see if they are perceiving various weather factors and how they deal with them.</p> <p>Post flight I ask about how they felt about the conditions, weather they'd feel comfortable flying in them solo, and their assessments of how well they handled the conditions.</p>
<p>They need to know what information they need to have for weather decision making, and they need to decide if they have enough info to make a decision. They also need to know how to improve their weather data gathering after they start the flight. They need to have a plan if the weather becomes worse than reported/expected.</p>	<p>I assess what data they have gathered and how they have interpreted it. I assess if they are correct and confident in their decision making and if they have an alternative plan.</p>
<p>Weather decision making training begins well before the student solos. I show the student all of the available sources for weather. This includes the Weather Channel, ASOS, FSS, the web, and the FBO weather machine. Just about every lesson after that I ask them what the weather looks like now and what they forecast. This is after I have received a briefing. A lot of the decision making with come after the student has some time logged and has seen different weather patterns. I take them up into marginal VFR weather and show them 5 miles visibility. Their amazed at how hard checkpoints are to pick out or how low flight visibility is. I tell them then that they are "legal" to fly in 3 miles visibility. Would they feel comfortable in that kind of weather. All of them answer no. Hazardous weather is usually easier to teach because most of us are familiar with the incredible energy a thunderstorm produces and they can relate to what is required for icing to occur.</p>	<p>They are assessed every time they come out to fly. I ask them if they received a weather briefing yet. The times the weather is borderline are the best times to assess the students thinking process. They have to take into account the three limitation I mentioned earlier in the survey (Pilot, Aircraft, and Weather) to make a decision if they can safely complete the flight. The toughest part of the equation to teach is the "get homeitis" that strikes just about any pilot who may get weathered in. A training flight is hardly ever necessary, but a business meeting in the morning or the prospect of having to stay in a hotel and miss a day of work are strong motivators. They are definitely discussed.</p>
<p>The question to answer for a pilot is What are your options if your decision to go turns</p>	<p>Difficult. You can ask the student, based on available information, whether or not he would go, but often he's trying to please the</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>out badly? Deciding to launch on a low ceiling, low visibility day does not give the non-instrument-rated pilot any options at all, if the ceiling and visibility turn out worse than expected, or he gets lost.</p> <p>Departing on a day with a crosswind close to the pilots limits may not provide any options if the wind increases beyond what was forecast.</p> <p>To be safe, the pilot needs several fall-back positions; if he can't define them, then stay home.</p>	<p>instructor with the "correct" answer, not necessarily the one he would use if he were actually making the decision himself.</p>
<p>Use examples of weather related accidents and incidents and show how the decisions made by those pilots were in error.</p>	<p>Given the actual conditions, or simulated, ask what they would do, and why.</p>
<p>Look for trends, not absolute forecasts Set personal minimums Get the big picture ALWAYS have an alternate planned where the weather and the terrain is really good</p>	
<p>Thru experience.</p>	<p>I quiz the student before each flight about the appropriateness of the his go/no go decision. I NEVER criticize a student who decides that the weather is beyond his/her capabilities.</p>
<p>I ask them to look at the sky as part of the preflight. I ask them to estimate the ceiling by comparing the clouds with the surrounding mountains. I have them keep track of these conditions during the flight. Our weather here is seldom marginal, it is either good or terrible. I explain about pressure movements and what the wind direction usually means regarding weather trends. I emphasize that if they decide to park the airplane on a cross country FOR ANY REASON we will come get them and that no one will make fun of them but rather they will gain respect for their good decision making. When it is windy I take them to various airports to demonstrate that the wind varies from location to location and that you can often find a nearby airport with more favorable wind. I teach that every flight is a series of go/no go decisions and ask them as we fly which way the wind is blowing, how strong, what the ceiling is doing, how the temperature/dew point spread is heading and what that means. I try to instill an awareness in the importance of weather and how to keep track of it during flight.</p>	<p>I quiz them on current conditions and the probable outlook and what it means to them as a pilot.</p>
<p>evaluate conditions for each flight. Practice, practice, practice!</p>	<p>evaluate conditions compared to prior experiences and how today's conditions are different.</p>
<p>First I make sure that they know where to go to</p>	<p>I like to determine if the student has obtained</p>

Teaching Weather-Related Decision-Making	Assessing Weather-Related Decision-Making
<p>obtain weather information and how to interpret it, then if there is any significant weather we discuss it. After which I critique the decision and make my comments, good or bad.</p>	<p>a weather briefing and has understood it; if I agree with what I have heard then I see if they have implemented it in a safe and appropriate manner.</p>
<p>A gradual introduction to weather as the environment in which we fly. Usually a weather cancelled lesson opens the door to discussion of the importance of weather and the consequences of ignoring it. Next, the student is introduced to simulated flight, with a weather encounter along with emergency procedures. Wind sheer, turbulence and thunderstorm avoidance are daily occurrences in Colorado and afford much hands on experience with the "unseen enemy", which instills respect for weather and it's related phenomenon. The solo usually takes place about here. I subscribe to many aviation related magazines, especially accident related studies. This provides ample examples of "what not to do" and opens the door to introducing the student to the NTSB files. This is a delicate moment. I feel that the potential hazardous nature of flight, that study and understand of aircraft and human limitations is essential to good decision making. This must be done with proper respect and learning environment. Fear tactics have no place here. During the last phase of training (after cross country and before the check ride), I introduce "added value experiences" which might include a tag along ride in IMC, with approaches at our local airport (COS). I also teach mountain flying courses and encourage my students to continue their study after the private ride to include emergency tactics, instrument rating and mountain flight. This makes for well rounded and safe pilots. It is also fun for all of us!</p>	<p>This is an ongoing process, beginning at the first lesson. I assess the students willingness to learn and respect my experience and knowledge. I try to teach by example and always fly the way I teach. In Colorado, we rarely have to wait long for some interesting cloud species to appear in our sky or some form of wind sheer. This provides ample experience for discussion and interpretation of that environment we fly into. I always take time to listen to my students, even when I am busy. I am not perfect at this and allow mutual feed back early on in the training process. I require that my students have phone numbers for local ATIS, ASOS, AWOS and FSS. We are lucky to have many sources of weather information accessible to the student. I always watch the weather channel and utilize my computer for briefings. I habitually study weather and hope that my enthusiasm catches on. I find that the more that I know about local conditions, the easier to discern when students "haven't done their homework" regarding weather. I take an entire lesson regarding filing of flight plans and receiving of briefings from FSS's. I quiz the advanced student on briefing's they have had prior to each flight, as well as a debrief of what weather was actually encountered. I am an advocate of providing pireps and listening to enroute weather on every cross country flight. Listening to other pilots, their approaches to weather, enroute briefings and how they give pireps is very instructive. After a while, the instructor develops a "feel" for their student's decision making.</p>
<p>Brief the student on extant weather and its potential effect on a planned VFR flight. Followed by dual in-flight exposure to the weather within the bounds of safety. Flight followed by a de-brief as to appropriate go/no-go decision for that flight.</p>	<p>Have the student brief me on weather factors obtained prior to flight and then discuss the factors he has applied in making a go/no-go decision.</p>
<p>After a thorough weather brief for a cross country, we'll sit down and disseminate what we expect conditions to be like along our route of flight. After the flight, we'll compare our observations of actual vs briefed weather to include use of the EFAS or FSS in-flight briefing.</p>	<p>Ask them to make a go-no go decision prior to every flight and notify me if they aren't going to fly that day.</p>

