

Basic approach to teaching HOTS:

1. Set up the problem.
2. Determine learning outcomes for the problem.
3. Solve the problem or task.
4. Reflect on problem-solving process.
5. Consider additional solutions through guided discovery.
6. Reevaluate solution with additional options.
7. Reflect on this solution and why it could be the best solution.
8. Consider what “best” means (Is it situational?).

## **Types of Problem-Based Instruction**

A problem-based lesson usually involves an incentive or need to solve the problem. It includes a decision on how to find a solution, a possible solution, an explanation for the reasons used to reach that solution, and then reflection on the solution. A discussion of three types of problem-based instruction follow: scenario-based, collaborative problem-solving, and case study.

### ***Scenario-Based Training Method (SBT)***

SBT uses a highly structured script of real-world experiences to address aviation training objectives in an operational environment. It presents realistic situations that allow learners to rehearse mentally and explore practical application of various bits of knowledge. Pilot decisions cause a significant percentage of all accidents and the majority of fatal accidents, and SBT challenges the learner or transitioning pilot using a variety of flight scenarios with the goal of avoiding accidents. These scenarios require the pilot to manage the available resources, exercise sound judgment, and make timely decisions. Such training can include initial training, transition training, upgrade training, recurrent training, and special training. Since it has been documented that learners gain more knowledge when actively involved in the learning process, SBT is also used to train AMTs.

The scenario may not have one right or one wrong answer, which reflects situations faced in the real-world. It is important for the instructor to understand in advance which outcomes are positive and/or negative and give the learner freedom to make both good and poor decisions without jeopardizing safety. This allows the learner to make decisions that fit his or her experience level and result in positive outcomes.

Once the class has mastered the ability to compute weight and balance, Bob decides to give them a real-world scenario. A customer wants a tail strobe light installed on his Piper Cherokee 180. How will this installation affect the weight and balance of the aircraft?

The learners need to plan to remove the position light, install a power supply, and also install the tail strobe light. Then they need to consider all the actions and procedures that affect the final weight and balance of the aircraft. What if part of the assembly does not fit properly? The real-world problem forces the learner to analyze, evaluate, and make decisions about the procedures required.

For the flight instructor, a good scenario tells a story that begins with a reason to fly because a pilot's decisions differ depending on the motivation to fly. For example, Mark and his college fraternity brothers bought tickets for a playoff game at their alma mater. Mark volunteered to fly all of them to the game in an airplane he rented. Another friend is planning to meet them at the airport and drive everyone to the game and back.

Mark has strong motivation to fly his friends to the game, so he checks the weather for College Airport which is reported as clear and unrestricted visibility. His flight is a go, yet, 15 miles from College Airport he descends to 1,000 feet to stay below the lowering clouds and encounters rain and lowering visibility to 3 miles. The terrain is flat farmland with no published obstacles. What will he do now?

Remember, a good inflight scenario is a learning experience. SBT is a powerful tool because the future is unpredictable and there is no way to train a pilot for every combination of events that may happen in the future. A good scenario:

1. Is not a test;
2. Will not have one right answer;
3. Does not offer an obvious answer;
4. Should not promote errors; and
5. Should promote situational awareness and opportunities for decision-making.