

# Fundamentals of Instruction

# Topics

HUMAN BEHAVIOR

THE LEARNING PROCESS

EFFECTIVE COMMUNICATION

THE TEACHING PROCESS



## Aviation Handbooks & Manuals



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### Aviation Handbooks & Manuals

Title	Publication Date	Change/Add. Date
<a href="#">Advanced Avionics Handbook</a>	2009	
<a href="#">Advanced Avionics Handbook Errata Sheet (PDF)</a>	2009	11/17/2014
<a href="#">Aerodynamics for Navy Aviators (PDF)</a>	Jan 1965	
<a href="#">Aeronautical Chart User's Guide</a>	March 2018	
<a href="#">Aeronautical Information Manual</a>		
<a href="#">Air Quality Handbook</a>		
<a href="#">Airplane Flying Handbook (FAA-H-8083-3B)</a>	2016	
<a href="#">Airship Pilot Manual (PDF)</a>	Sept. 1942	
<a href="#">Airship Aerodynamics Technical Manual (PDF)</a>	2/11/1941	
<a href="#">Aviation Instructor's Handbook</a>	2020	
<a href="#">Balloon Safety Tips: False Lift, Shear, and Rotors (PDF)</a>		
<a href="#">Balloon Safety Tips: Powerlines &amp; Thunderstorms (PDF)</a>		
<a href="#">Banner Towing Operations (PDF)</a>		

### Top Tasks

[Read the Aeronautical Information Manual](#)

[Download the Airplane Flying Handbook](#)

[Download the Pilot's Handbook of Aeronautical Knowledge \(PDF\)](#)

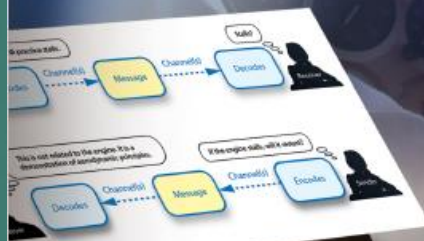
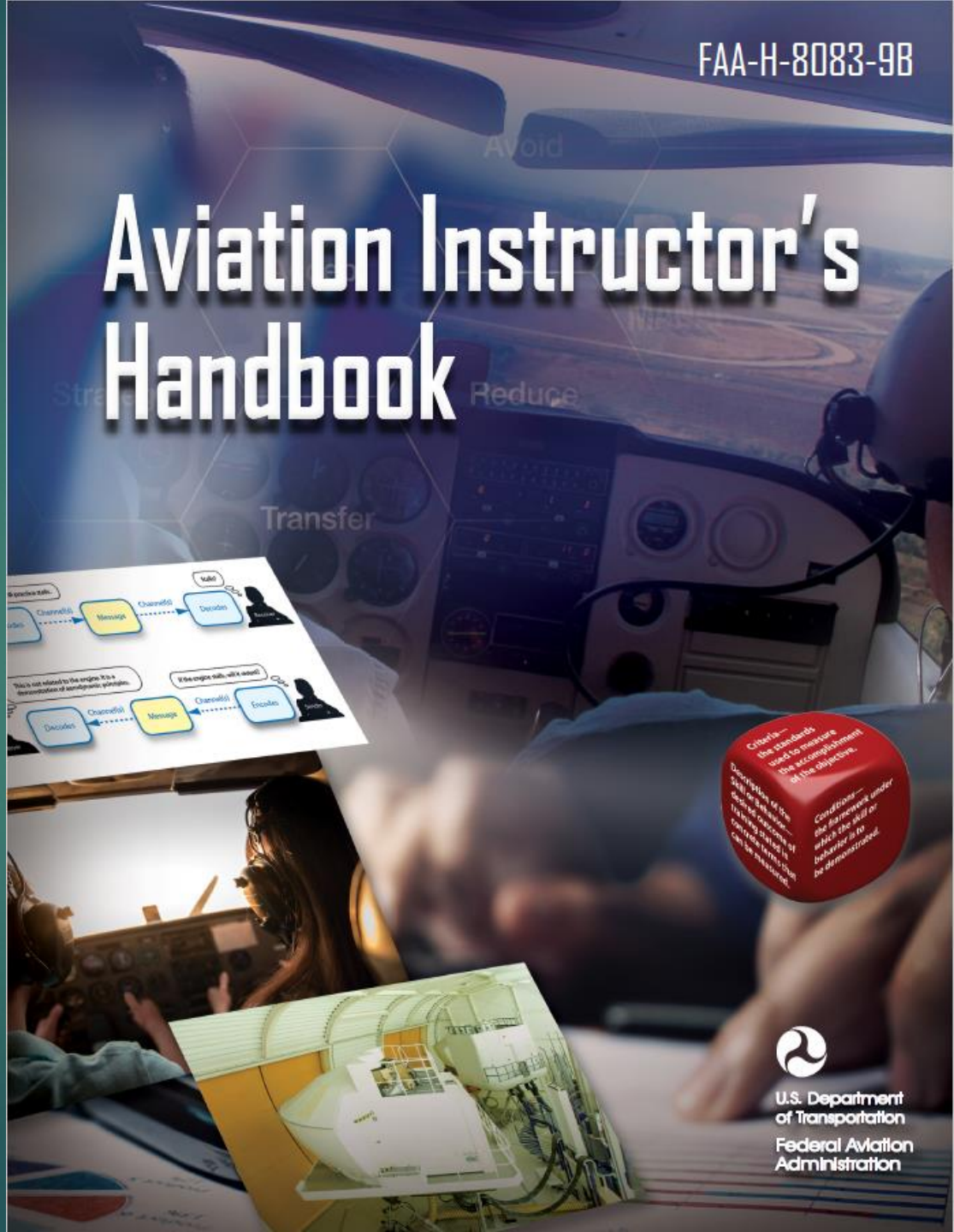
[Download the Instrument Procedures Handbook](#)

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# Aviation Instructor's Handbook

- Chapter 2:
  - Human Behavior
- Chapter 3:
  - The Learning Process
- Chapter 4:
  - Effective Communication
- Chapter 5:
  - The Teaching Process



**Criteria**—  
The standards  
used to measure  
the accomplishment  
of the objective.

**Description of the  
Skill or Task**—  
The specific  
action or  
condition that  
can be mastered.

**Conditions**—  
The framework under  
which the skill or  
behavior is to  
be demonstrated.



# Human Behavior

# Human Behavior: Definitions

- ▶ Attempt to explain how and why humans function the way they do
- ▶ Product of innate nature, experience, and environment
- ▶ Result of attempt to satisfy needs
- ▶ Predictable “life stages” or “phases of growth”

# Personality types

- ▶ Theory that your personality type affects your preferred learning style
- ▶ Controversy around particular methods of categorizing types (Myers-Briggs Type Indicator)
- ▶ Implemented at many levels of education

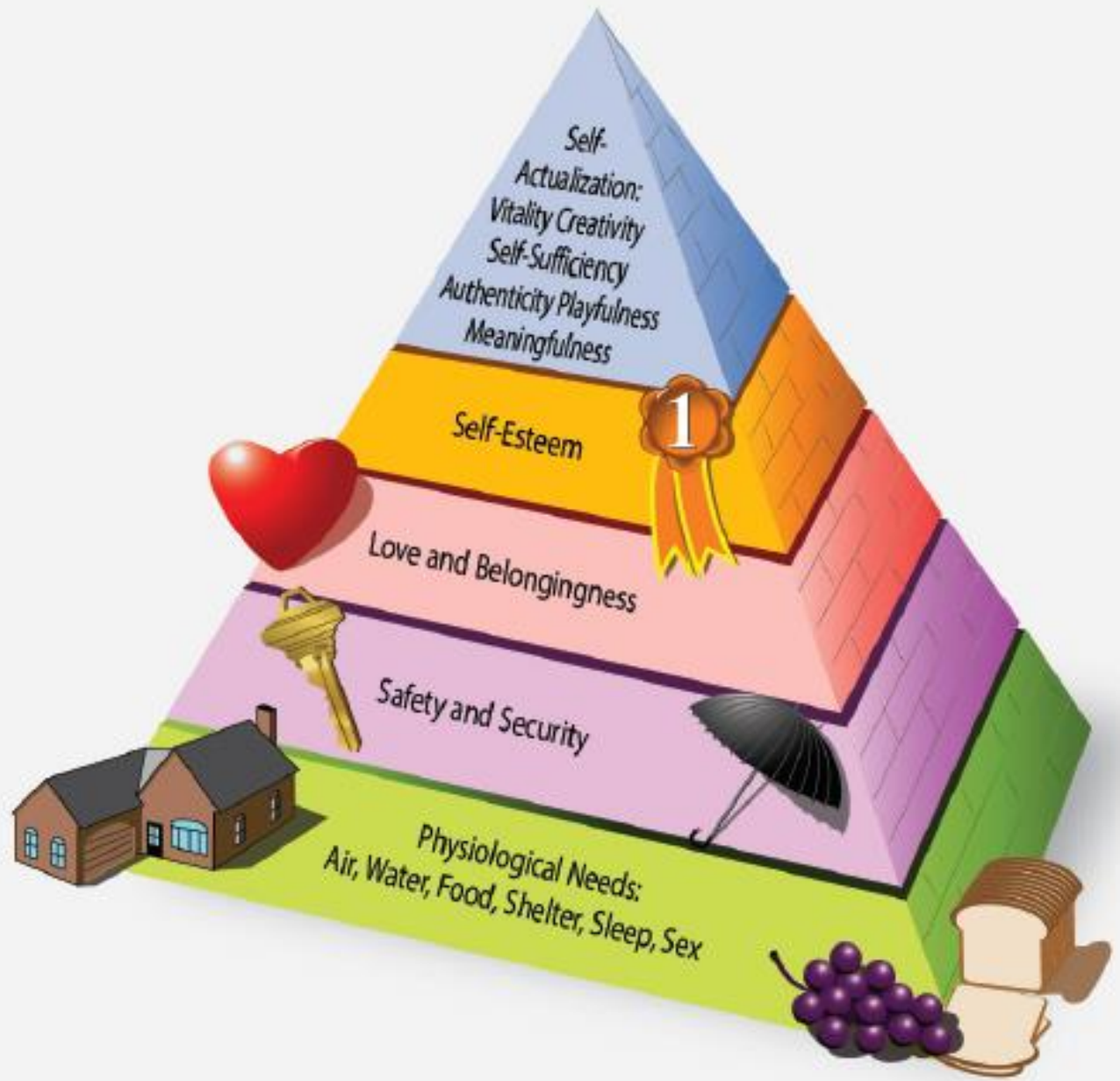
# Motivation for Learning

- ▶ Motivation is the dominant force that governs a student's progress
- ▶ Instructors who can discover what motivates a student can facilitate progress towards goals

# Maintaining Motivation

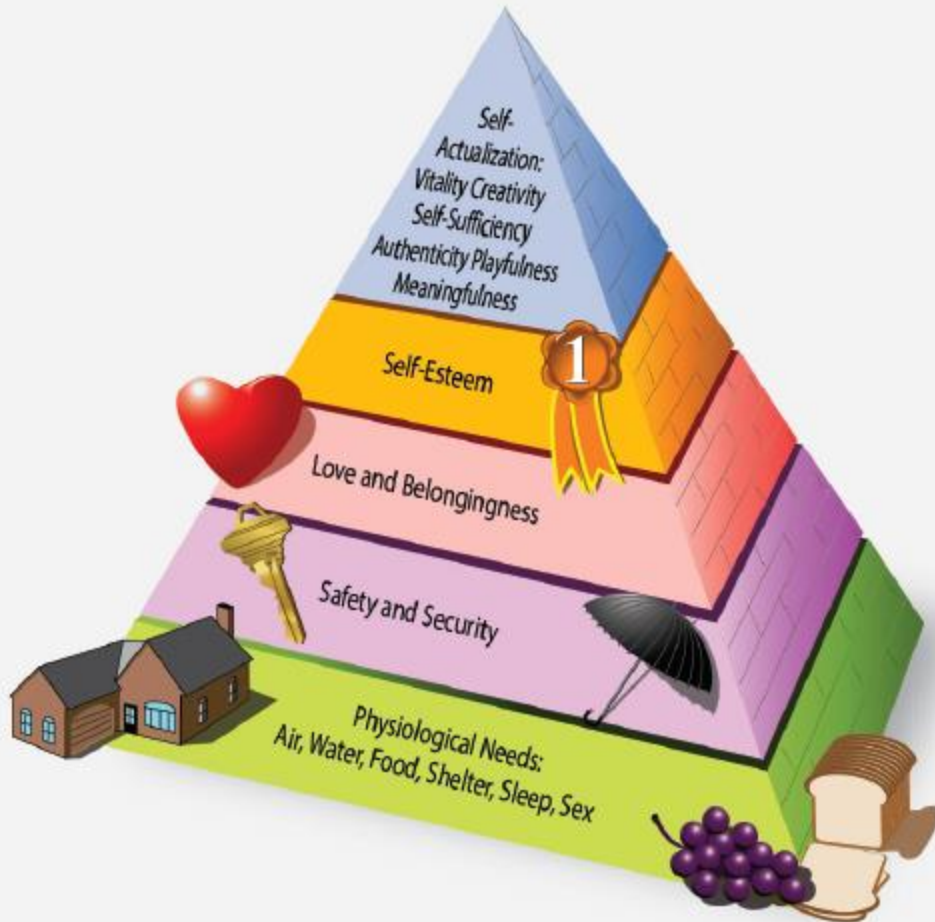
- ▶ Reward improvement by
  - ▶ Praising incremental success
  - ▶ Relate daily accomplishments to lesson objectives
  - ▶ Comment favorably on student progress and ability
  - ▶ Pair success with new challenges

# Human Needs and Motivation



# Maslow's Hierarchy of Needs

Needs are hierarchical – the ability to concentrate on needs at the top of the pyramid depends on the lower levels being adequately supplied.





## DEFENSE MECHANISMS

-  Repression
-  Denial
-  Compensation
-  Projection
-  Rationalization
-  Reaction Formation
-  Fantasy
-  Displacement



# Learner Emotional Reactions

- ▶ Anxiety
- ▶ Impatience
- ▶ Flagging interest
- ▶ Physical discomfort
- ▶ Apathy

# Reactions to Stress

## Normal

- ▶ Activation of “fight or flight” syndrome
- ▶ Rational response
- ▶ Rapid action
- ▶ Heightened sensitivity to environment
- ▶ Responses will be largely automatic, which highlights need for training in emergency operations

## Abnormal

- ▶ Inappropriate reactions
- ▶ Laughter or singing
- ▶ Extreme cooperativeness
- ▶ Painsstaking self-control
- ▶ Marked mood changes
- ▶ Anger

# Teaching the Adult Student

- ▶ Learning is means to end
- ▶ Autonomous and self-directed
- ▶ Draw upon reservoir of experience
- ▶ Goal oriented
- ▶ Relevancy oriented and practical
- ▶ Desire respect and self-esteem
- ▶ Want to solve problems and apply new knowledge immediately

# The Learning Process

# Characteristics of Learning

- ✓ Purposeful
- ✓ Result of Experience
- ✓ Multifaceted
- ✓ Active Process



# Theories of Learning

## Behaviorism

- ▶ Observable and measurable responses to stimuli
- ▶ Rewards and punishments (carrot and stick)
- ▶ Positive reinforcement – instructor reinforces good performance with praise

## Cognitive Theory

- ▶ Process of thinking and learning
- ▶ Not just change in behavior, but in the way the learner thinks and understands
- ▶ Concerned with mental events

# Pioneers of Cognitive Theory



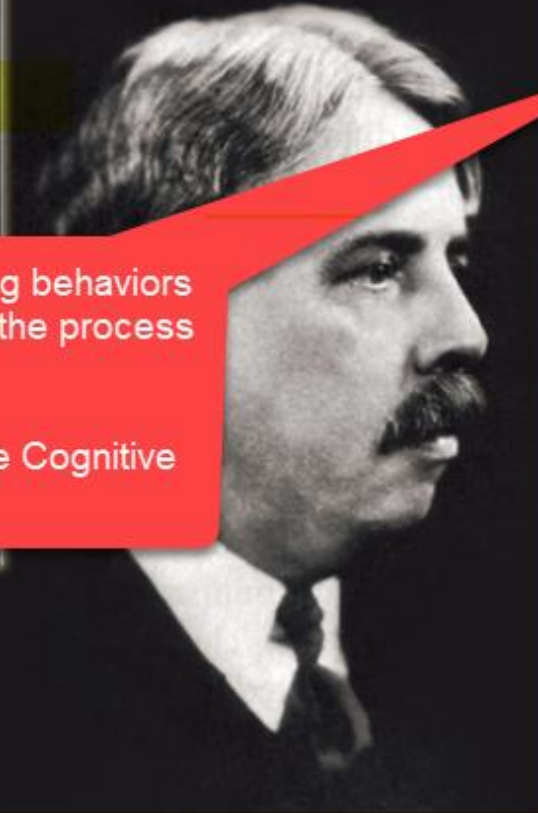
John Dewey



Jerome Bruner

Classified levels of thinking behaviors thought to be important in the process of learning:

Bloom's Taxonomy of the Cognitive Domain



E. L. Thorndike

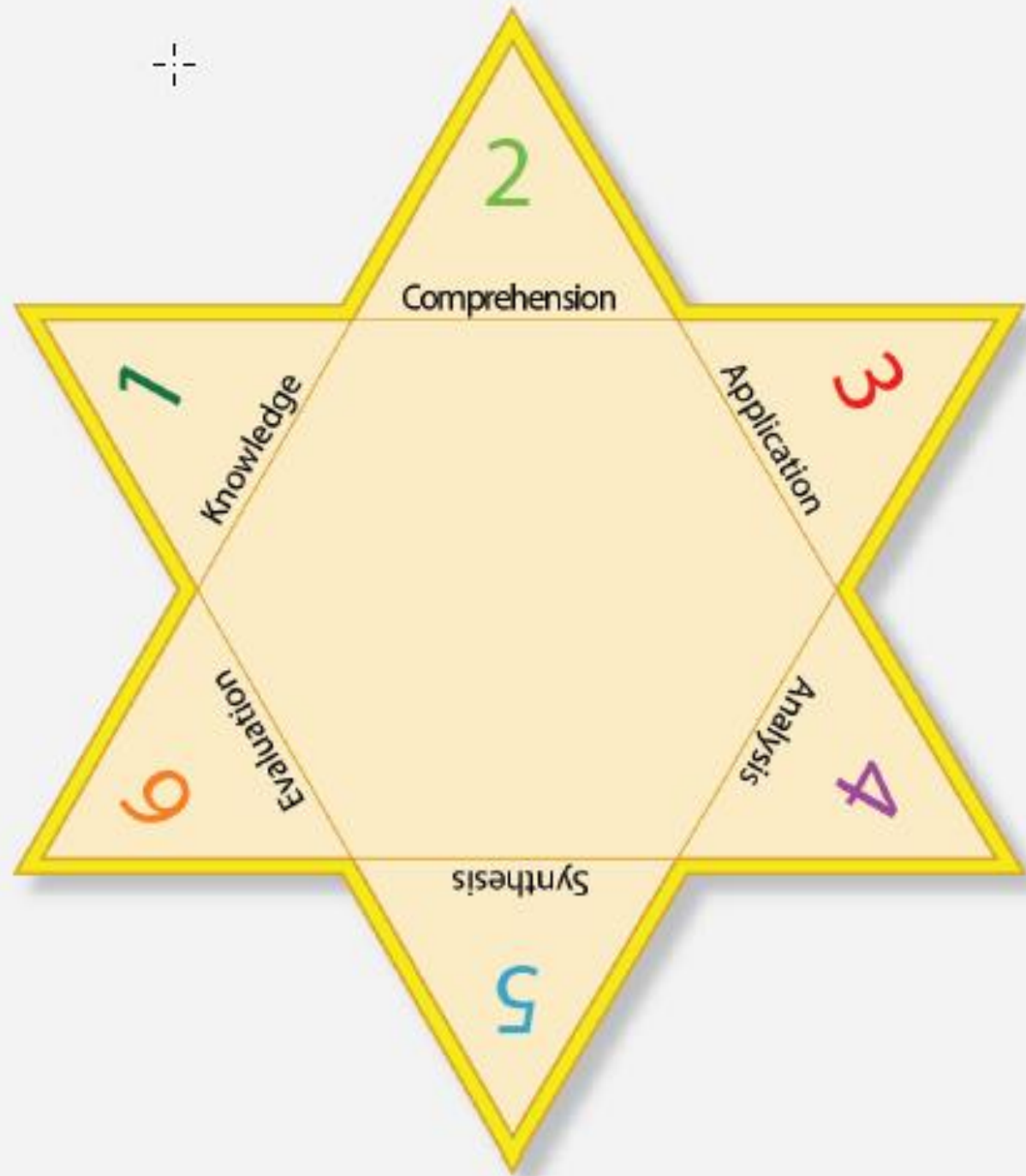


Benjamin Bloom

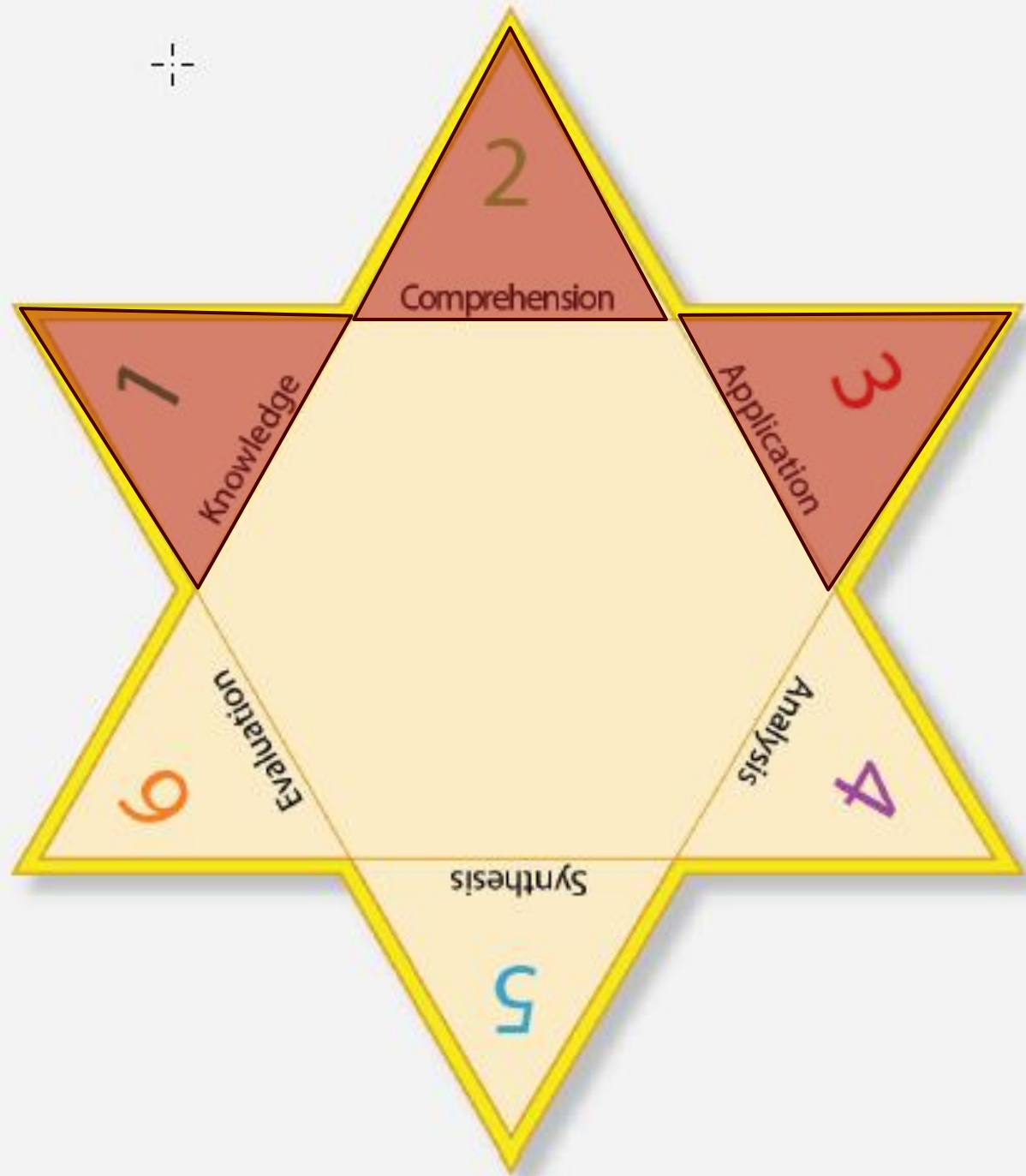


Jean Piaget

# Bloom's Taxonomy



# Acquiring Knowledge



# Steps of Acquiring Knowledge

- ▶ Memorization
  - ▶ Learning facts
- ▶ Understanding
  - ▶ Making associations
  - ▶ Noticing similarities
- ▶ Application
  - ▶ Using new knowledge to expand

## Memorize

A student pilot correctly recites the memory items for an engine failure after takeoff

## Understand

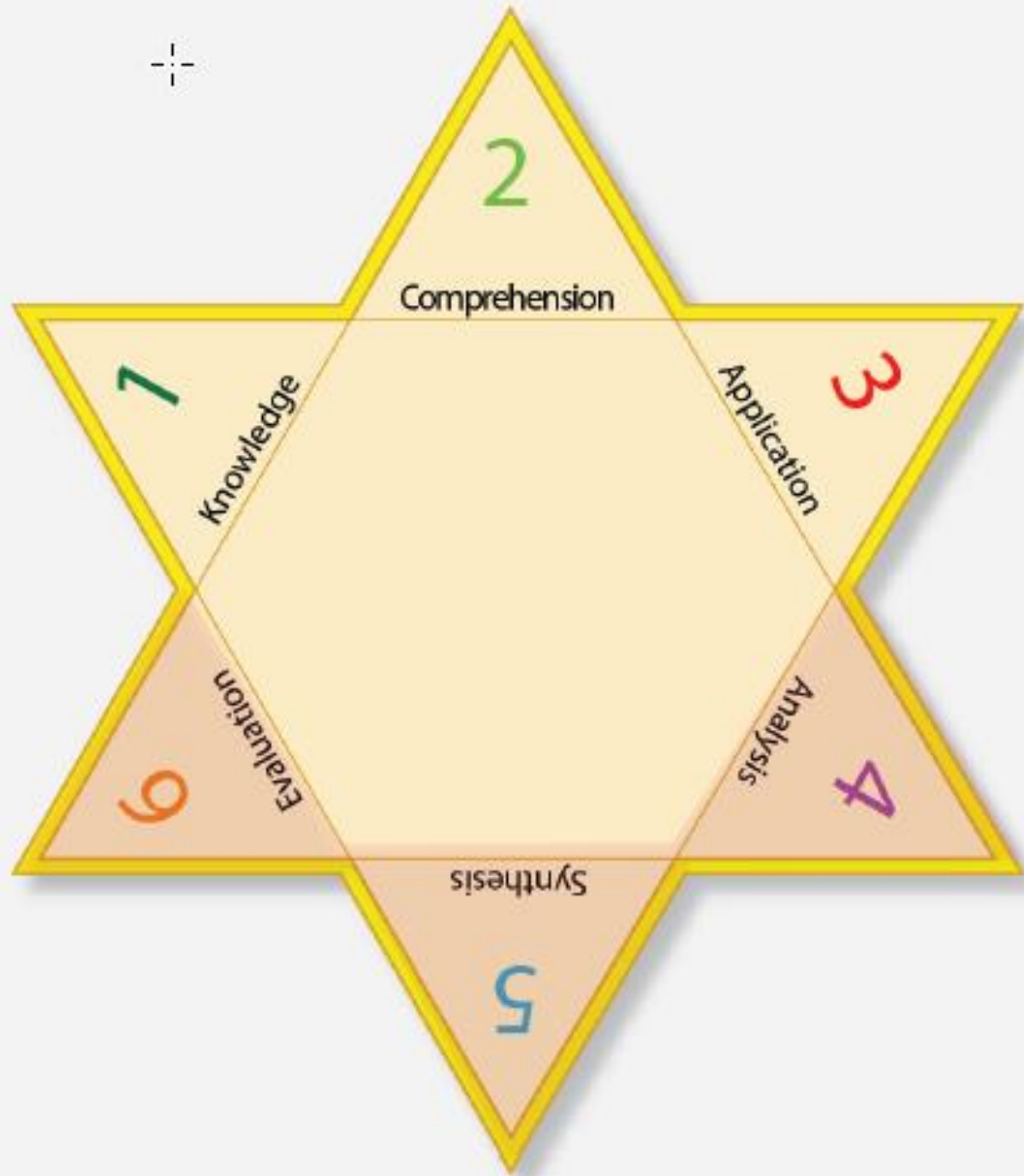
The student explains why we use a best glide speed during an engine failure

## Apply

During simulated engine failure at 500 feet AGL, the student immediately applies the proper memory items and sets up for a landing in a suitable field



# Higher Order Thinking Skills (HOTS)



# Higher Order Thinking Skills (HOTS)

- ▶ Simple to complex
- ▶ Concrete to abstract
- ▶ Strategies and methods:
  - ▶ Problem-based learning
  - ▶ Real problems
  - ▶ Learner-centered
  - ▶ Active
  - ▶ Cooperative
  - ▶ Customized

## Analyze

A student pilot analyzes why emergency approach was unsatisfactory



## Evaluate

The student evaluates how the emergency checklist might need to be altered to adapt to different situations



## Create

Student develops personalized checklist to supplement standard emergency checklist

	Competence	Skills Demonstrated	Example
I	Knowledge: remembering information	Define, identify, label, state, list, match, select	<ol style="list-style-type: none"> <li>1. State the standard temperature at sea level.</li> <li>2. Define a logbook entry.</li> </ol>
II	Comprehension: explaining the meaning of information	Describe, generalize, paraphrase, summarize, estimate, discuss	<ol style="list-style-type: none"> <li>1. In one sentence explain why aviation uses a standard temperature.</li> <li>2. Describe why a log entry is required by the FAA.</li> </ol>
III	Application: using abstractions in concrete situation	Determine, chart, implement, prepare, solve, use, develop, explain, apply, relate, instruct, show, teaches	<ol style="list-style-type: none"> <li>1. Using a standard lapse rate, determine what the temperature would be at a pressure altitude of 4000'.</li> <li>2. Determine when a logbook entry is required.</li> </ol>
IV	Analysis: breaking down a whole into component parts	Points out, differentiate distinguish, examine discriminate, compare, outline, prioritize, recognize, subdivide	<ol style="list-style-type: none"> <li>1. Compare what the different temperatures would be at certain pressure altitudes based on the standard lapse rate.</li> <li>2. Determine information required for logbook entry.</li> </ol>
V	Synthesis: putting parts together to form a new and integrated whole	Create, design, plan, organize, generate, write, adapt, compare, formulate, devise, model, revise, incorporate	<ol style="list-style-type: none"> <li>1. Generate a chart depicting temperatures for altitudes up to 12,000'.</li> <li>2. Write a logbook entry for an oil change.</li> </ol>
VI	Evaluation: making judgments about the merits of ideas, materials, or phenomena	Appraise, critique, judge, weigh, evaluate, select, compare and contrast, defend, interpret, support	<ol style="list-style-type: none"> <li>1. Evaluate the importance of this information for a pilot.</li> <li>2. Evaluate the necessity of keeping logbook entries.</li> </ol>

Effective

Communication

# Basic Elements

- ▶ Source (speaker, writer, instructor)
- ▶ Symbols (words or signs)
- ▶ Receiver (listener, reader, student)

# Source

- ▶ Select and use appropriate language
- ▶ Use meaningful symbols
- ▶ Avoid unexplained acronyms
- ▶ Be confident
- ▶ Treat subject respectfully
- ▶ Use material that is accurate, up-to-date, and interesting

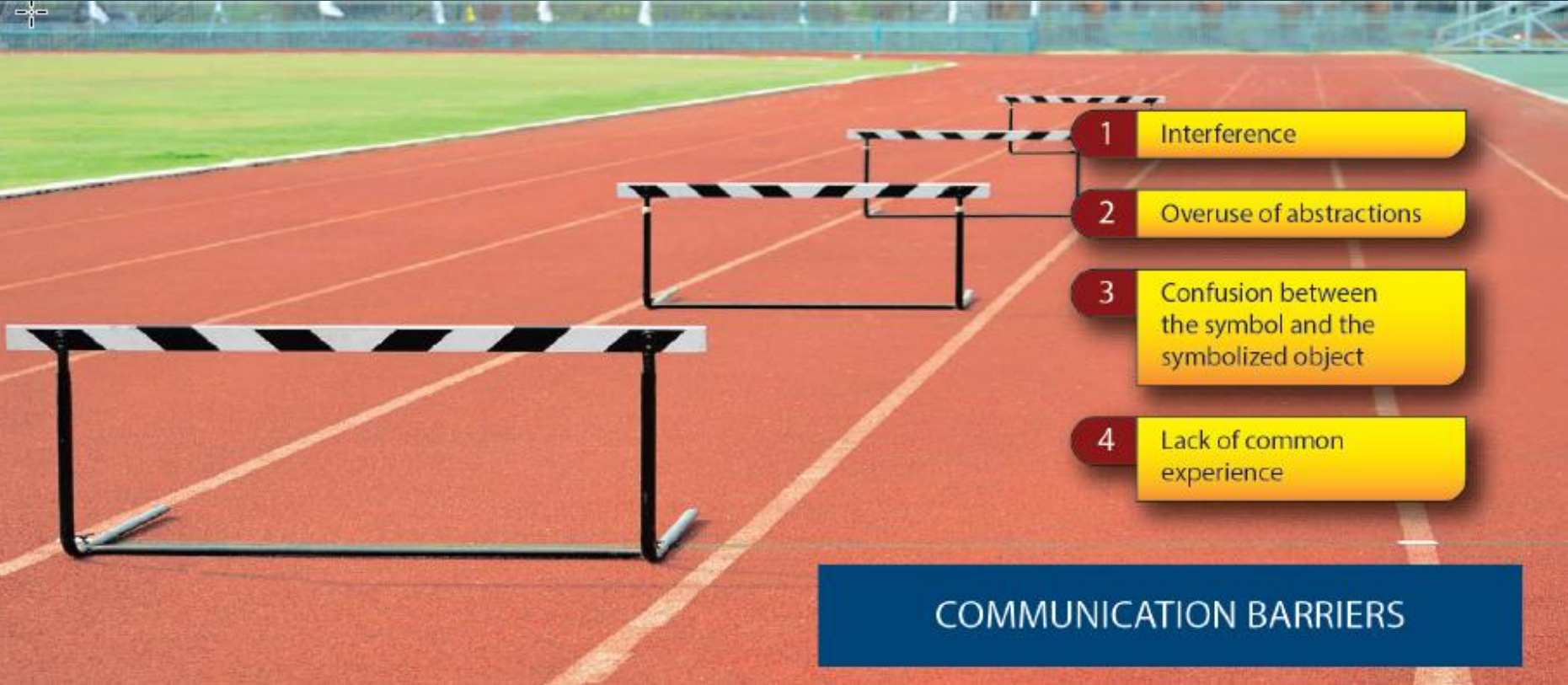
# Symbols

- ▶ All communication, even written/spoken language, uses symbols
- ▶ Symbols are perceived through three channels
  - ▶ Visual (seeing)
  - ▶ Auditory (hearing)
  - ▶ Kinesthetic (touching, using, doing)

# Receiver

- ▶ Understand the receiver's **abilities** (experience, culture)
- ▶ Pitch your communication to the receiver's **attitudes**
- ▶ Use your receiver's **experiences**. In aviation we have an advantage – students are usually highly motivated and come to us with a range of experience

# Barriers to Communication



1 Interference

2 Overuse of abstractions

3 Confusion between the symbol and the symbolized object

4 Lack of common experience

COMMUNICATION BARRIERS

# Barriers to Communication

Message gets garbled, truncated, or overly complicated. Reduce by getting feedback from students to make sure the message was received as transmitted

- 1 Interference
- 2 Overuse of abstractions
- 3 Confusion between the symbol and the symbolized object
- 4 Lack of common experience

COMMUNICATION BARRIERS

# Barriers to Communication

Use of general instead of specific terms means the teacher can say something that the students hear as something else.

- 1 Interference
- 2 Overuse of abstractions
- 3 Confusion between the symbol and the symbolized object
- 4 Lack of common experience

COMMUNICATION BARRIERS

# Barriers to Communication



# Barriers to Communication

Words are symbols that potentially can have more than one meaning. What does "stall" mean? A stalled engine? A stalled wing? (A place where you put your cow?)

1 Interference

2 Overuse of abstractions

3 Confusion between the symbol and the symbolized object

4 Lack of common experience

COMMUNICATION BARRIERS

# Barriers to Communication

Words do not carry information the same way a truck carries bricks. There has to be a mutual vocabulary and background for communication to succeed.

- 1 Interference
- 2 Overuse of abstractions
- 3 Confusion between the symbol and the symbolized object
- 4 Lack of common experience

COMMUNICATION BARRIERS

# The Teaching Process

**People Skills**

**Subject Matter Expertise**

**Management Skills**

**Assessment Skills**




**People Skills**

**Subject Matter Expertise**

**Management Skills**

**Assessment Skills**



Effective communication  
Active listening  
Interact respectfully  
Know when they're lost  
Provide motivation  
Challenge intellectually

**People Skills**

**Subject Matter Expertise**

**Management Skills**

**Assessment Skills**

High level of knowledge/skill  
Maintain learning and  
professional growth



**People Skills**

**Subject Matter Expertise**

**Management Skills**

**Assessment Skills**

**Plan  
Organize  
Lead  
Supervise  
Effective Time Management**



**People Skills**

**Subject Matter Expertise**

**Management Skills**

**Assessment Skills**



Written testing  
Authentic assessment  
Provide practical and specific feedback  
Assess yourself as well as the student