



# Train the Trainer

## Session TU-E1

The 8th Annual California Unified Program  
Annual Training Conference

San Francisco, California

February 6 - 9, 2006



## Objectives

*At the conclusion of this course, trainees should be able to:*

- Describe how adults differ from children in the way they learn and explain why this is important when planning training courses for adults;
- Describe the three learning domains and explain why they are important to the planning of training courses;
- Describe aims, goals, and objectives (learning outcomes) and explain why they are important when planning training courses; and
- Describe the different kinds of course evaluations and distinguish the appropriate uses of each





# Outline

- Course Overview and Introductions
- How Adults Learn
- Planning - Aims, Goals, and Learning Objectives
- Individual Activity
- Planning - Structuring the Session
- Effective Training Techniques
- Evaluation - Why is it important to the Trainer?
- Writing Valid Multiple-Choice Test Items
- Reinforcement of Training - Team Development



# Ice Breaker





## Turn To Your Neighbor...

- Ask Their Name and Find Out:
  - Where They Work
  - Who They Train Or Will Be Training
  - How Long They've Been Training
  - List One Item They Want Covered



## How Adults Learn





## Differences Between Children and Adults As Learners

### *Children*

- Rely on Others to Decide What Is Important to Learn
- Accept the Information at Face Value
- Expect It to Be Useful in Long-term
- Have Little or No Experience
- Are Content Centered
- Are Less Actively Involved
- Are Authority Oriented

### *Adults*

- Decide for Themselves What Is Important to Learn
- Need to Validate Information Based on Own Beliefs
- Want Learning to Be Immediately Useful
- Have Much Experience
- Are Problem Centered
- Actively Participate
- Want Collaboration



## Factors Which Affect Adult Learning

**William Draves (How to Teach Adults)**

Four Characteristics Adult Learners Bring Into a Learning Situation:

1. Emotional States
  - Poor Image of Classroom Learning
  - Poor Self-image





## 2. Physical State

- Visual
- Aural, or
- Other Physical Incapacity

## 3. Mental Characteristics

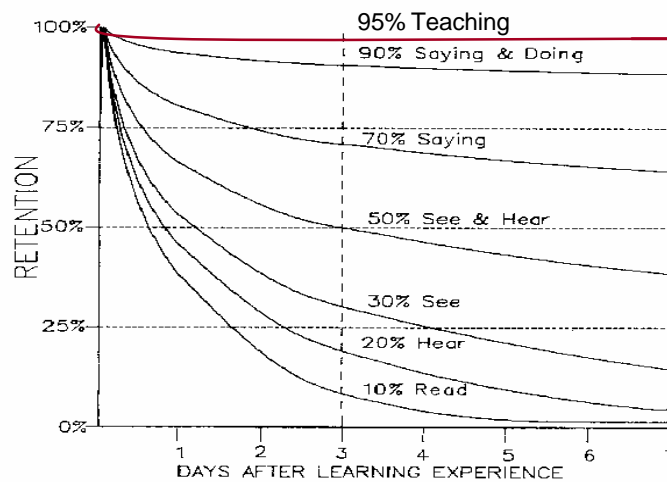
- Perceived Value of Material to Be Learned

## 4. Social Characteristics

- Diverse Backgrounds, Upbringings, Occupations, and Locations

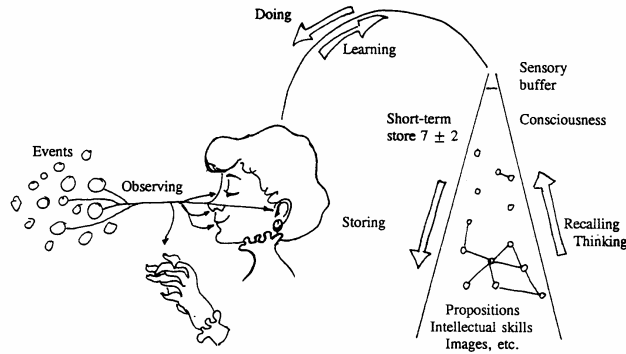


## The Retention Curve

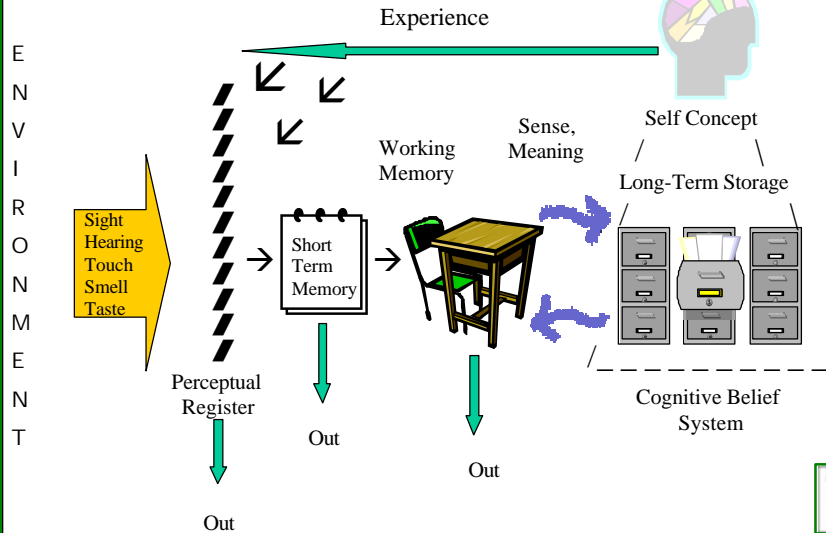




# How Adults Learn - Gagne



# Information Processing Model II





## Key Elements of Adult Learning Theory

- Key 1 - Adults Learn Best by Doing
- Key 2 - Take Individual Learning Styles Into Account
- Additionally:
  - Establish a Climate Conducive to Learning
  - Design Training to Be Approximately 35% Presentation and 65% Application and Feedback



## Also, Adult Learners

- Will Commit to Learning When Goals and Objectives Are Considered Realistic and Important to Them
- Want to Be the Origin of Their Own Learning and Will Resist Learning Activities They Believe Are an Attack on Their Competence
- Need Direct, Concrete Experiences to Apply the Learning in Real Work
- Have Their Ego Involved; Must Provide Support From Peers and Reduce Fear of Judgment During Learning





## Also, Adult Learners

- Need to Receive Feedback
- Need to Participate in Small-group Activities During the Learning to Move Them Beyond Understanding to Application, Analysis, Synthesis, and Evaluation
- Come to Learning With a Wide Range of Previous Experiences, Knowledge, Self Direction, Interests, and Competencies
- Transfer of Learning Is Not Automatic and Must Be Facilitated



## Gagne's Theory of Instructional Design

- Learning Causes an Observable Change in the Learner
- Skills Should Be Learned One at a Time
- Each New Skill Learned Should Build on Previously Acquired Skills
- Learning and Knowledge Are Both Hierarchical in Nature





## Gagne's 5 Major Categories of Learning

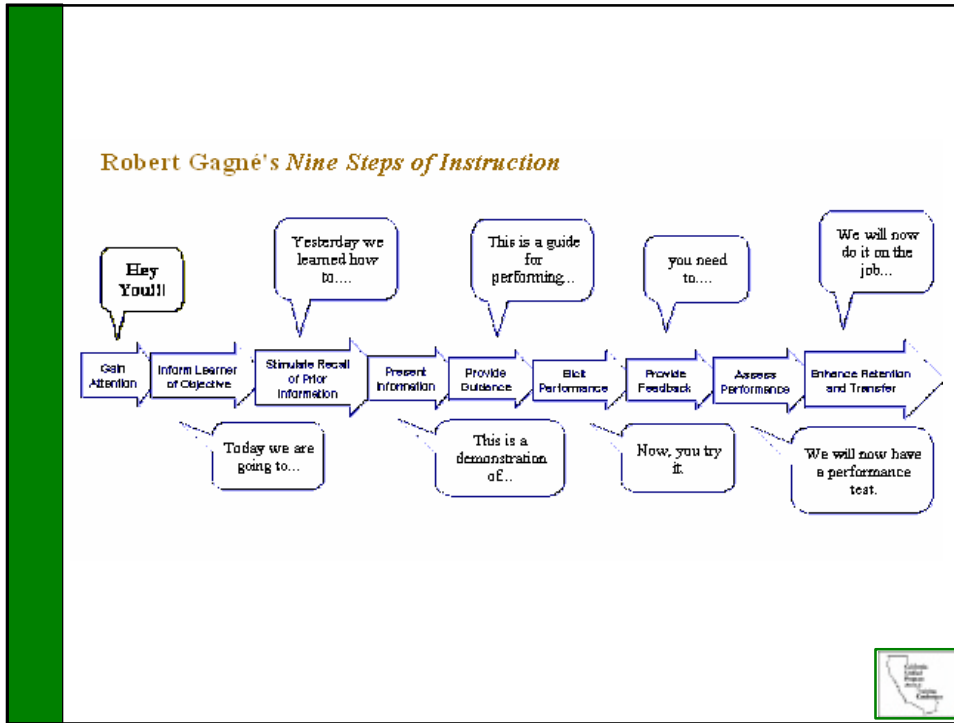
- Verbal Information
- Intellectual Skills
- Cognitive Strategies
- Motor Skills
- Attitudes



## Gagne's 9 Conditions for Successful Learning

1. Gaining Attention (**Reception**)
2. Informing Learners of the Objectives (**Direction**)
3. Retrieval (**Recall**)
4. Presenting New Material (**Content**)
5. Providing Learning Guidance (**Application Level 1**)
6. Eliciting Performance (**Application Level 2**)
7. Providing Feedback (**Application Level 3**)
8. Assessing Performance (**Evaluation**)
9. Retention and Transfer (**Closure**)





## Three Learning Domains

- **Cognitive:** *the Development of Intellectual Abilities and Skills (Bloom)*
- **Psychomotor:** *the Coordination of Physical Movements and Bodily Performances (Harrow)*
- **Affective:** *the Development of Attitudes, Beliefs, and Values (Krathwohl)*

Note: Different Levels Do Not Imply Desirability.





## Cognitive Domain Levels (from most common to least common)

- **Knowledge** - requires learner to remember or recall information (facts, terminology, or problem-solving strategies).
- **Comprehension** - requires some degree of understanding (translate, restate what is read, make connections or recognize relationships)
- **Application** - requires the use of previously acquired information in a different setting.
- **Analysis** - requires learner to identify logical errors; differentiate among facts, opinions, assumptions, hypotheses, and conclusions; draw relationships; compare and contrast
- **Synthesis** - requires learner produce something unique or original; solve unfamiliar problems in a unique way; and/or combine parts to form unique, novel solutions.
- **Evaluation** - requires the ability to form judgments; make decisions about the value of methods, ideas, people, or products; and state the basis for the judgments.



## Psychomotor Domain Levels (from most common to least common)

- **Imitation** - requires learner observe and be able to repeat action being visually demonstrated
- **Manipulation** - requires learner perform selected actions from written or verbal directions and to complete the action by reading or listening to instructions
- **Precision** - requires learner perform an action independent of either a visual model or written set of directions
- **Articulation** - requires learner to display coordination of a series of related acts (establish appropriate sequences; perform accurately with speed and timing)
- **Naturalization** - requires learner perform with least expenditure of energy; actions become routine, automatic, and spontaneous





## Affective Domain Levels (from most common to least common)

- **Receiving** - requires learner to simply listen or be attentive
- **Responding** - requires learner attend or react to stimuli
- **Valuing** - requires learner to display behavior consistent with a single belief or attitude, demonstrate a preference, and/or display a high degree of certainty and conviction
- **Organization** - requires learner to organize likes and preferences into a value system and then decide which will be dominant (forming reasons for values and making choices)
- **Characterization** - requires that all behavior displayed is consistent with values (a consistent philosophy of life), and behaviors at all previous levels be acquired



## Goldstein's Categories

- **Knowledge**—an organized body of knowledge, usually factual or procedural, which if applied makes adequate job performance possible.
- **Skills**—capability to perform job operations with ease and precision. Implies a performance standard that is required for effective job operations.
- **Abilities**—cognitive abilities necessary to perform a job function, requiring the application of some knowledge base.

As referenced by Margaret Samways





# Planning

Aims, Goals and  
Learning Objectives



# Planning

“If you don’t know where you are going, how  
will you know when you get there?”

## *Corollary*

“We may be lost, but we’re making  
great time!”





## Planning

- Is the Systematic Process of Deciding What and How Students Should Learn
- Calls for the Course Developer/Instructor
  - Reflect Upon Past Experiences
  - Make Observations of Present Need
  - Collect Data Regarding the Need



## Resources for Planning

- The Instructor's Knowledge of the Goals for the Course
- Knowledge of the Students
- Knowledge of the Subject Matter and Available Instructional Materials
- Knowledge of Appropriate Training Methods to Meet Instructional Goals





## Using Learning Objectives for Planning

- Learning Objectives Guide
  - The *Content* of the Instructional Materials
  - Presentation *Methods* of Instruction
  - Methods for *Evaluation* of Achievement



## Objectives What They Do

- Establish Clear Learner Goals
- Guide the Instructor's Methods to Reach Those Goals
- Provide a Basis for Evaluation of Training
- Guide Validation and Measurement of Effectiveness





## Learning Objectives

- Help to Plan and Organize Instruction in Ways That
  - Save Time
  - Avoid Redundancy
  - Ensure That Critical Learning Needs Are Being Addressed



## A Learning Objective

- Contains a Specific *Action Verb* and Specific *Object*
- Has a Beginning and Ending
- Is Observable and Measurable
- Is Independent of Other Actions





## Objectives

### What They Are

- Clear Statements
  - What The Learner Is Expected to Do
  - The Conditions Under Which They Are to Do Them
  - Standards of Acceptable Performance



## First Step

- Do Some Thinking...





## Second Step

- Be Specific
  - What Do You Want Them to Learn?
  - List the Key Points



## How to Set Objectives

### Keep In Mind

- Learning Domains
  - Cognitive/Knowledge
  - Psychomotor
  - Affective/Attitudinal





## How To Set Objectives

- Task Statement
- Condition Statement
- Standard Statement



## Task Statement

- Action Verb
- Describes What Learners Will “Do” to Demonstrate Learning Has Occurred
- Accompanied With Object to Specify Behavior
- Appropriate to the Learning Domain Targeted by the Objective(s)





## Task Statement

*Example:*

Inspect Chemical Protective Clothing  
(Action Verb) (Object)

Essentially “Do What?” - “To What?”



## Examples

- Cognitive Domain:  
“At the End of This Session the Students Will Be Able to List and Discuss the Four Major Factors Involved in ‘Learning Fatigue’.”





## Cognitive Domain Level Verbs

- **Knowledge** - Define, Describe, Identify, Label, List, Match, Recognize, Name
- **Comprehension** - Translate, Convert, Defend, Distinguish, Estimate, Explain, Extend, Generalize, Infer, Give Examples, Paraphrase
- **Application** - Change, Compute, Demonstrate, Discover, Manipulate, Modify, Operate, Prepare, Predict, Produce, Show
- **Analysis** - Break Down, Diagram, Differentiate, Discriminate, Distinguish, Identify, Illustrate, Infer, Outline, Point Out, Relate, Select
- **Synthesis** - Categorize, Combine, Compile, Compose, Create, Design, Devise, Rewrite, Summarize
- **Evaluation** - Appraise, Compare, Conclude, Contrast, Critique, Describe, Discriminate, Explain, Justify, Interpret, Relate, Support



## Examples

- Psychomotor Domain  
“At the End of This Session Students Will Be Able to Accurately Demonstrate, With a Partner to Appropriate Music, the Reverse Side Step of the Argentinean Tango.”





## Psychomotor Domain Level Verbs/Adverbs

- **Imitation** - (With Verbal Instruction and Direction)align, Balance, Follow, Grasp, Hold, Place, Repeat, Rest (On), Step (Here)
- **Manipulation** - (With Written Instruction) Construct, Assemble, Form, Put Together
- **Precision** - Accurately, Without Error, Independently, Proficiently, With Control, With Balance
- **Articulation** - Confidence, Coordination, Harmony, Integration, Proportion, Smoothly, Quickly
- **Naturalization** - Automatically, Effortlessly, Naturally, Professionally, Routinely, Spontaneously, With Ease, With Perfection, With Poise



## Examples

- **Affective Domain**  
“At the End of This Ten-week Course Students Will Choose the Jarrell Method Over Others When Developing Their Assigned Instruction Plans.”





## Affective Domain Level Verbs

- **Receiving** - Attend, Be Aware, Control, Discern, Hear, Listen, Look, Notice, Share
- **Responding** - Applaud, Comply, Discuss, Follow, Obey, Participate, Play, Practice, Volunteer
- **Valuing** - Act, Argue, Convince, Debate, Display, Express, Help, Organize, Prefer
- **Organization** - Abstract, Balance, Compare, Decide, Define, Formulate, Select, Systematize, Theorize
- **Characterization** - Avoid, Display, Exhibit, Internalize, Manage, Require, Resist, Resolve, Revise



## Condition Statement

- Describes Circumstances
- Specifies the Controlled Environment
- Lists What Resources Will or Will Not Be Given





## Condition Statement

### *Examples:*

- (Without Notes), List the Criteria For A Permit Required Confined Space
- (Using a Detector Tube), Measure the Toluene Vapor Concentration in the Test Drum
- (Using the “Buddy” System), Demonstrate Escape Procedures During SCBA Failure



## Standard Statement

- Defines Degree of Accuracy or Proficiency
- Indicates Whether or Not or How Well a Learner Has Met the Objective





## Standard Statement

- Accuracy (w/in 2 Decimal Places)
- Direction (w/out Supervision)
- Quality (With a Cheerful Demeanor)
- Time (w/in 1 Minute)
- Tolerance (w/in 0.01 mg)
- Combination of Above



## Standard Statement

**Example:**

While Wearing a Hood to Simulate a Smoke-Filled Environment, Complete the Obstacle Course Wearing Full Turnout Gear and SCBA in Under Fifty Minutes





## What Are the Three Domains?

- Cognitive/Knowledge
- Psychomotor
- Affective/Attitudinal



## What Are the Three Types of Statements?

- Task Statement
- Condition Statement
- Standard Statement





**“Education is what survives when  
what has been learned has been  
forgotten.”**

B.F. Skinner (1904-1990)



# Planning

Structuring the Session





## Decide Whether Training is Appropriate

- If Problem Is the Result of:
    - Poor communication
    - Lack of feedback
    - Inadequate supervision
    - Inappropriate or inadequate rewards
    - Inferior procedures
- ...Then Training Is Not the Answer!*



## Training Requirements

- OSHA
  - 10 and 30 Hour Courses: Contact Time and Topics
  - HAZWOPER: Topics and Means/Methods
  - OSHA 7600: Topics and Means/Methods
- EPA Asbestos
  - Topics and Means/Methods
- EPA/HUD Lead
  - Topics and Means/Methods





## Other Training Limits

- Tool Box Talks/Chats/Huddles
  - Limited In Time
  - Should Be “Just In Time” Learning ***Not*** “Just In Case” Learning
- In-House Training Requirements
- “The Mind Can Take In Only As Much As The Bottom Can Endure...”



## Teaching Outlines

- *Must* Fit the Subject
- *Must* Fit the Group
- *Must* Fit the Time Available





## Objectives Review

- Set Specific Objectives
  - What Should They Learn?
  - Jot Down 3 to 4 Specific Points
- Analyze the Group
  - Who Are They?
  - What Do They Already Know?
  - How Can You Get Them Interested?
  - Why Is This Important to Them?



## Draft An Outline

- What Are the Major Points to Be Covered? (What's 1<sup>st</sup>, 2<sup>nd</sup>, etc.)
- What Techniques Will You Use?
  - How Will You Get Participation/Involvement?
  - How Will You Provide a Sense Of Structure, Order or Progress?





## Polish the Outline

- Write Out the Plan
- Prepare the Introduction
- Prepare Your Summary
- Time It



## Checklist for Planning

- Topic
- Who Is The Audience
- What Are Their Needs
- What Are Your Objectives





## Checklist for Planning

- Plan Your Agenda
  - How Long
  - What's First
  - What Methods
  - Any Outside Instructors?



## Checklist for Planning

- What Will You Need?
  - Where Is the Training to Take Place
  - How Will You Get People to Attend
  - What Materials Will You Need
    - Handouts
    - AV Equipment
    - Blackboard, etc.





## Checklist for Planning

- How Will You Evaluate the Session?
- What Do You Need From Management or Supervisor to Proceed?



## Planning Questions for Competency-Based Training

- What Do You Want the Trainees to Know/be Able to Do (Competencies) After the Training?
- What Is the Best Way to Teach These Competencies?
- How Will You Determine That the Trainees Know/can Do What You Have Taught Them?





## What Do You Want the Trainees to Be Able to Do or Know?

- Pre-training Evaluation
  - Interviews
  - Surveys
  - Records
- Behavior-Based Safety
- Regulations, e.g.:
  - OSHA
  - DOT
  - EPA



## Using Learning Objectives as Tools for Planning

Learning Objectives Guide:

- The Content of the Instructional Materials
- Presentation Methods of Instruction
- Methods for Evaluation of Achievement





## Matching Goals With Techniques



## Training Methods

- Instructor Focused
- Learner Focused
- Media Focused





## Instructor Focused Methods

- Lecture
- Lecture with Questions and Answers
- Panel of Experts



## Instructor Focused Methods



- Large Audiences
- Factual Material in Logical Manner
- Audience Involved During Q&A
- Panel Allows Different Opinions
- Change of Speakers Keeps Learner's Attention



- Experts Not Always Good Instructors
- Audience is Passive
- Difficult to Gauge Learning
- Panel May Not Present in Logical Order
- Time (Limits Q&A Periods)





## Learner Focused Methods

- Speak Out
- Brainstorm
- Discussion
- Small Group Discussion
- Case Studies
- Role Play
- Report Back Session
- Worksheets, Surveys, Reaction Sheets
- Discovery Exercises



## Learner Focused Methods



- Active
- Allows Participation by All; Everyone's Opinion Heard
- Develops Analytical and Problem Solving Skills
- Incorporates Individual's Skills and Experiences



- Must Adhere to Time Limits
- Needs Good Facilitator
- Dominant Individual Can Overpower Group
- Need Quality Exercises
- Discovery Method Needs Access to Workplace





## Media Focused Methods

- Audiovisual Materials
  - Overheads
  - Games
  - PowerPoint®/Slides
  - Video/Video Clips
  - Distance Learning/Computer Based Training
- Hands-On - Learning by Doing



## Audiovisual Materials



- Entertaining
- Keeps Audience's Attention
- Effective for Large Groups
- Effective if Q&A or Exercise After Presentation



- Too Many Issues, at Times, to Have Focused Discussion
- Passive
- Needs Functioning Equipment
- Need to Have Backup Training Material





## Hands-On



- Immediately Reinforces Material by Actual Performance
- Active Learning
- Can be More Enjoyable
- Less Rigid



- Need Enough Materials for All Learners or Enough Activities to Allow Sharing
- Need Instructors Capable of Using and Demonstrating Equipment



## What Works Best

- Combination of Methods
  - To Impart Information
  - To Reinforce Learning
- Topic Dependent
  - What Needs to Be Learned
  - What Depth of Understanding





## **Provide Facts and Information**

- Lecture and Discussion
- Films and Filmstrips
- Reading (Combined With Other Techniques)
- Charts, Graphs and Diagrams



## **Stimulate Greater Understanding**

- Discussion (Best)
- Previous Methods Coupled With Discussion
- Role-play
- Reading Followed By Discussion
- Films
- Visual Aids





## Develop Skills

- Learning to Apply Facts, Information and Understanding of New Situations or Problems
  - Discussion and Buzz Groups
  - Role-Play
  - Workshops/Hands-On
  - Films
  - Demonstrations



## Develop Skills

- Learn a Specific Process or Perform Various Jobs
  - Workshops/Hands-On
  - Individual Projects (Including CBT)
  - Films and Film Clips





## Change Attitudes

- Discussion and Buzz Groups
- Role-Play
- Films and Film Clips
- Workshops



## Stimulate Action

- Workshops
- Role-Play
- Discussion Programs





## OSHA's ADDIE Model

- Analysis
  - Involves Goal and Learner
  - Identifies Problems and Proposes Solutions
  - May Include Need, and Job or Task Analysis
  - Main Outputs: Overall Instructional Goal, Training Objectives or Identification of Tasks
- Design
  - Plan a Strategy for Developing the Instruction
  - Outline Is Produced, the Instructional Delivery System Is Selected and the Instruction Is Sequenced
- Development
  - Determining the Instructional Strategies
  - Outputs Are Lesson Plans, Training Materials, Development of All Training Media or Tools, and Supporting Documentation for the Training



## ADDIE Model

- Implementation
  - The Purpose (and Output) of This Phase Is the Effective and Efficient Delivery of Instruction
  - Promotes Mastery of the Objectives and Ensures Transfer of Knowledge From Instruction to Job
- Evaluation
  - Involves Formative and Summative Evaluations
  - Measures the Effectiveness and Efficiency of the Instruction
  - Should Occur Throughout the Entire Instructional Design Process





## Instructional Systems Design's Learning Styles

(a student's consistent way of responding to and using stimuli in the context of learning)

- Theorists
- Pragmatists
- Activists
- Reflectors



## Theorists (or Assimilators)

Like to learn using *abstract conceptualization and reflective observation (lecture, papers, analogies)*.

They ask: "How does this relate to that?"





## Pragmatists (or Convergors)

Like to learn using *abstract conceptualization and active experimentation (laboratories, field work, observations)*.

They ask: “How can I apply this in practice?”



## Activists (or Accommodators)

Like to learn using *concrete experience and active experimentation (simulations, case study, homework)*.

They tell themselves: “I’m game for anything.”





## Reflectors (or Divergers)

Like to learn using *reflective observation* and *concrete experience* (logs, journals, brainstorming).

They want time to “think about it.”

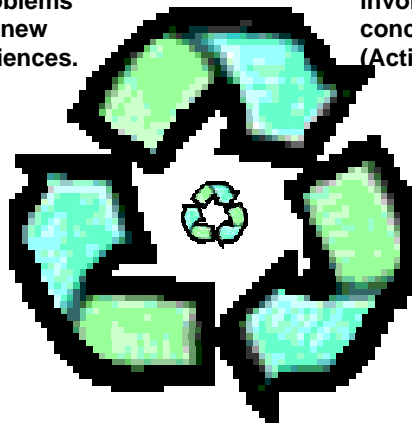


Learner experiments with similar problems which result in new concrete experiences. (All)

Learner is personally involved through concrete experiences. (Activist/Reflector)

Learner applies this meaning to form a logical conclusion. (Pragmatist)

Learner reflects on this experience, looking for meaning. (Theorist)





## Examples

### Learning to ride a bicycle:

- **Theorists – Understanding the theory and having a clear grasp of the biking concept.**
- **Pragmatists – Receiving practical tips and techniques from a biking expert.**
- **Activists – Leaping on the bike and having a go at it.**
- **Reflectors – Thinking about riding and watching another person ride a bike.**



### Learning a software program:

- **Theorists – Reading the manual to get a clearer grasp on what was performed.**
- **Pragmatists – Using the “help” feature to get some expert tips.**
- **Activists – Jumping in and doing it.**
- **Reflectors – Thinking about what they just performed.**





**Learning to coach:**

- **Theorists – Reading articles to find out the pros and cons of different methods.**
- **Pragmatists – Having a coach guide them in coaching someone else.**
- **Activists – Use their people skills with what they have learned to achieve their own coaching style.**
- **Reflectors – Observing how other people coach.**



**Learning algebra:**

- **Theorists – Listening to explanations on what it is.**
- **Pragmatists – Going step-by-step through an equation.**
- **Activists – Practicing.**
- **Reflectors – Recording their thoughts about algebraic equations in a learning log.**





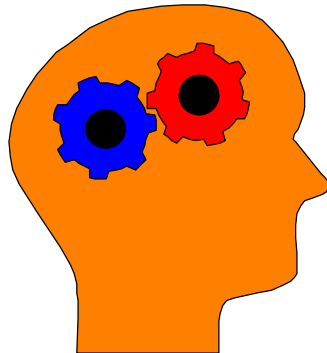
## Effective Training Techniques for Learning Transfer



- Clarity
- Variety
- Sufficient Time
- Success
- Practice with Feedback
- Structure



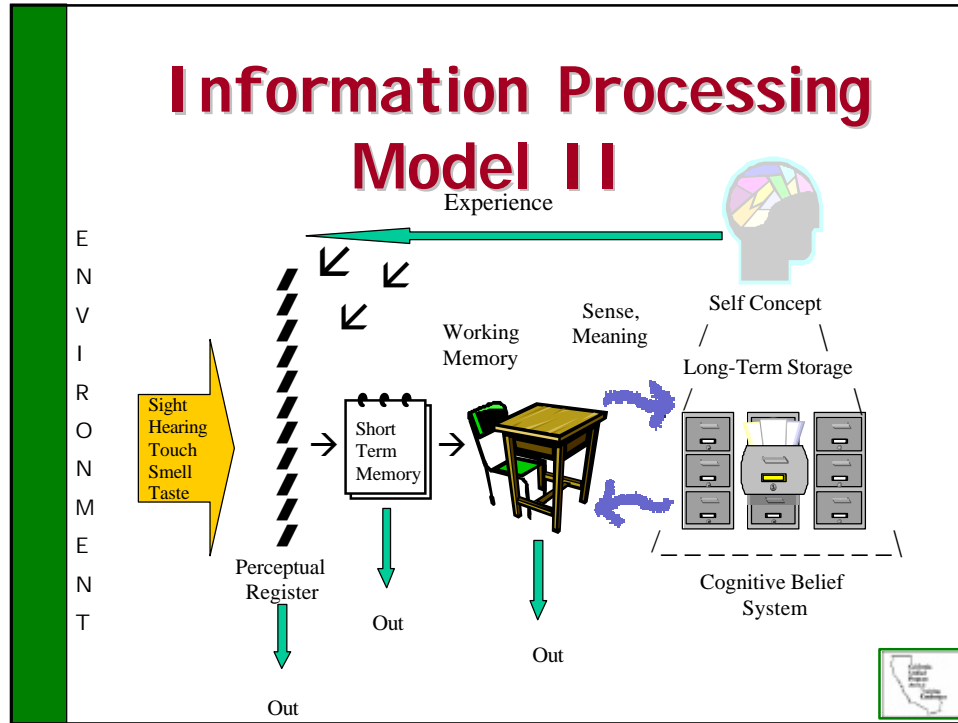
## How to Structure to Facilitate Learning



Five “E’s”

- Engage
- Explore
- Explain
- Elaborate
- Evaluate



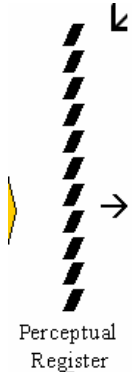


ENVIRONMENT  
 → Sight, Hearing, Touch, Smell, Taste  
**Engage – The trainees must be engaged in the learning activity.**



Long-Term Storage


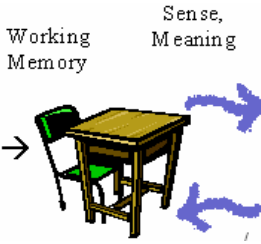
**Explore –  
Encourage trainee  
exploration of past  
experiences to  
provide a link to  
already-learned  
information**



Perceptual Register

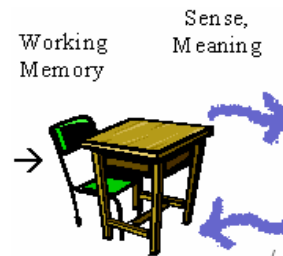
**Explain – Follow  
the exploration with  
explanations/examples  
of the concept.**

Working Memory      Sense, Meaning

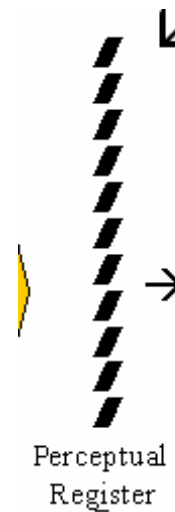
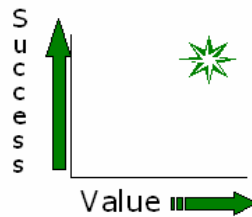




**Elaborate – Help the trainees to code the new concept/information by encouraging them to apply the learning to a new situation.**



**Evaluate – encourage the trainees to evaluate the concept based on previously learned information or information given during the**





# What Is the Best Way to Teach It?

## Effective Teaching Techniques

### 1. Variety in - Presentations

- Lecture
- Demonstration
- Hands-on activities
- Small group work

Use your learning objectives to determine which are appropriate!

#### and Media

- Overheads
- Slides
- Props



### 2. Application to trainees' concerns

Relate what trainees are learning to on-the-job responsibilities.

(Adult trainees are task-oriented--they want to know how the learning will help them on their jobs)





### **3. Clarity of Presentation**

- Use examples that relate to what they already know
- Ask questions



### **4. Sufficient Time**

Plan sufficient time for training and guided practice





## 5. Success

Start off with simple examples/concepts and progress to more difficult examples/concepts



## 6. Practice...Practice...**PRACTICE!!**





## Additional Tips

- Whenever presenting safety & health training, have the workers sign an attendance sheet.
- Keep a copy of your presentation for each training session attached to the corresponding attendance sheet.
- If an exam was given, keep a copy of the results.



## Five Helping Behaviors for Effective Training

### 1. Use of Trainee Ideas & Contributions

- Acknowledging
- Modifying
- Applying
- Comparing
- Summarizing





## Helping Behaviors, Cont'd.

2. Structuring
  - advance organizers
  - verbal markers
3. Questioning
4. Probing
5. Trainer Affect



## Questioning

- Types:
  - Closed
  - Open
- Wait Time:
- Used as Punishment - DON'T!





## Seven Great Training Blunders

Adapted from "Speaker's Idea File," Lawrence Ragan

1. **NOT** Having Enough Illustrations to Make Points
2. **NOT** Repeating Your Message Enough
3. **NOT** Answering the Trainees' Most Major Question
4. Burying Your Point
5. Forgetting to Practice
6. Forgetting to Check Visual Aids
7. Getting Distracted Before You Train



## Evaluation of Training: What, Why, and How?





## What Should Be Evaluated?

- Problem/Need
- Resources
- Implementation
- Impact
  - short-term
  - long-term



## Why is Evaluation Important?

- Evaluation, or diagnosis, of a problem is the basis on which any action should be taken.

When might training not be the solution?





- Evaluation of resources available to solve the diagnosed training need determines viable solutions regarding:

- staffing
- physical facilities
- equipment
- funding
- time



- Evaluating how the program is running alerts you to necessary adjustments.

- adequacy of time
- costs
- materials
- feasibility of strategies
- instruction formats
- instructor effectiveness





- Evaluation for impact will supply needed data for:
  - justification for the program
  - necessary revisions before repeating



## How? Approaches to Evaluation:

- Stufflebeam's "CIPP" Model:
  - Context
  - Input
  - Process
  - Product





- Kirkpatrick Model
  - Student Reaction
  - Learning Assessment
  - Behavioral Skills Transfer
  - Training Impact



- Howley's Model
  - Needs Assessment
  - Formative
  - Process
  - Outcome
  - Impact





- Jedrziwski's Model - Monitoring Effectiveness:
  - Prior to the Training Event
  - During the Training Event
  - After the Training Event



## How? Evaluation Tools:

- Diagnosis/Needs Assessment:
  - interviews
  - focus groups
  - observation
  - unobtrusive measures--examination of records





- Available Resources:
  - unobtrusive measures- examination of existing data/records
  - questioning stakeholders



- Process:
  - trainee evaluations
  - program director observation
  - outside audit team observation
  - records evaluation





- Product - Learning Outcomes (Short-term)
  - Pencil/paper tests
  - Observation
  - Oral examination
  - Likert scales, semantic differentials, adjective checklists



- Product - Impact (Long-Term)
  - Paper/pencil post-test
  - Questionnaire (trainee and/or supervisor)
  - Observation
  - Examination of Records





- Examination of Records:
  - line down-times
  - defects in products
  - time on re-work
  - accidents
  - in/decreased insurance costs
  - workers' compensation claims
  - damaged equipment



## Essay Questions

- Tests complex cognitive skills by requiring the student to organize, integrate, and synthesize knowledge, to use information to solve new problems, or to be original and innovative in problem solving.
- Two types: Extended-Response and Restricted-Response Items





## Extended-Response Item Example

“Compare and contrast the presidential administrations of George Bush and Ronald Reagan. Consider economic, social, and military policies. Avoid taking a position in support of either president. Your response will be graded on objectivity, accuracy, organization, and clarity.” Borich



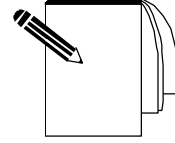
## Restricted-Response Items Example

“List the major similarities and differences between U.S. participation in the Korean War and World War II, being sure to consider political, military, economic, and social factors. Limit your answer to one page. Your score will depend on accuracy, organization, and conciseness.” Borich





## Drawbacks to Essay Questions



1. They take a lot of time for respondents to answer comprehensively.
2. They usually don't thoroughly cover all the material taught during the course.
3. Consistent, unbiased scoring is difficult.



## Short-Answer Questions

*Must be restricted to a single topic or function and must be preceded by instructions which contain:*

1. A brief explanation of what is expected by the test giver;
2. A description of the constraints that will be enforced when scoring each item;  
and
3. How points will be awarded and what will be considered a good score.





## Short-Answer Item Example

“Use the space provided to write a brief outline of how to do each of these things. Your answers should indicate how you know there is a problem, what you do to find it, and, briefly, what you do to solve it. Each question is worth three points. A score of 17 or better is needed to pass.”  
Westgaard



## Fill-in-the-Blank Questions

- Ask the respondent to fill in a single word or phrase.
- Are suitable for direct recall of specific facts, serving to establish the presence of enabling knowledge.
- Reduces guessing because a specific response is required.
- Allow more content to be covered.





## Drawbacks to Fill-in-the-Blank Questions

- May end up testing reading comprehension rather than knowledge.
- Encourage a low level of response complexity.
- Can be difficult to score if ambiguity exists in stem.



## Fill-in-the-Blank Question Example

- **Poor:** “The \_\_\_\_\_ type of test item usually is graded \_\_\_\_\_ than the \_\_\_\_\_ type.”
- **Better:** “The multiple-choice type of test item usually is graded more objectively than the \_\_\_\_\_ type.”

Borich





## True/False and Matching Questions

- Easier to score;
- less ambiguous;
- less time consuming;
- good for measuring associations between facts;
- familiar to respondents; and
- provide immediate feedback.



## Drawbacks to Matching and True/False Questions

- Respondents don't have to remember the answer, just recognize it.
- Tend to emphasize rote memorization.
- Require careful construction to test higher levels of cognitive learning.





## Multiple-Choice Examination Items

Example:

The most important factor in New York City's development as an important seat of commerce is its: (stem)

- a. large, foreign-born population )
- b. population of industrious citizens ) (distractors)
- c. scenic setting, worth visiting )
- d. excellent harbor facilities\* (correct answer)



## Writing Multiple-Choice Items

Helpful Suggestions (Westgaard & Others):

1. Use plausible or logical distractors.
2. Make certain the stem consists of a statement, an idea, or a question, not just a single word.





3. Place all common elements in the stem of the item. Examples:

**Bad:** One of the major functions of the adrenal gland is:

- a. to regulate the amount of sugars in the blood\*
- b. to regulate the amount of proteins sent to body cells
- c. to regulate the secretion of wastes
- d. to regulate the secretion of insulin.

**Better:** One of the major functions of the adrenal glands is to regulate the:

- a. amount of sugars in the blood\*
- b. amount of proteins sent to the body cells
- c. secretion of wastes
- d. secretion of insulin.



4. When dealing with items that have numerical answers, arrange the answers in order from large to small or vice versa. (also dates in history or in a list of centuries/decades, etc.)

5. Avoid the use of clues that reveal the correct answers:





- Ending a stem with the article “an” would rule out any answers which began with a consonant. If you must end your stem with an article, use “a/an” or have all distractors begin with a vowel.
- Try not to make the correct answer much longer or shorter than the distractors.
- Be careful that one item does not contain the answer to another item.
- Be sure that each distractor makes a good, complete sentence when attached to the stem.



6. Make each item completely independent of every other item.

7. Eliminate all unrelated details from an item.

Example:

“Singapore, *a large and beautiful city founded by the British several hundred years ago and noted for its export of rubber and tin* is located:” ...

The purpose of the item is to locate Singapore!





8. Use clear, unambiguous, precise language.

9. State the questions and options positively.

10. Avoid use of “none of the above” and “all of the above,” especially when always the correct answer. Use “both a and c” responses sparingly.

11. Use a random number table to randomize the position of the correct answers.



12. Try to state your item and responses simply, clearly, and in language your trainees understand.

13. Do not test more than one point per item.

14. Cover important material.

15. Revise and edit.





## Multiple-Choice Items for *Higher-Level Cognitive* Objectives

- “Best-Answer” - requires trainee to do some thinking, but are difficult to develop.
- Scenario, graph, picture items--often can generate several higher-level items.
- Analogies - calls for students to be familiar with the terms and understand how they relate.



## “Best-Answer” Item Example

The major purpose of trainee evaluation is to:

- a. Provide information for grading
- b. Improve learning\*
- c. Make grouping of trainees possible
- d. Gather data for effective follow-up

Westgaard





## “Analogy” Item Example

Physician is to humans as veterinarian is to

- \_\_\_\_\_
- a. fruits
  - b. animals\*
  - c. minerals
  - d. vegetables

Borich



## Multiple-Choice Items Disadvantages

- difficult and time-consuming to construct
- no topic is probed in depth
- some skills are better measured by other types of items





# Evaluating Distance Learning Formats



## What Is Distance Learning?

Distance learning is a system and a process that connects learners with distributed learning resources.

Characteristics:

- Separation of place and/or time
- Interaction conducted through one or more media





## What Needs to Be Considered?

- How Adults Learn
- Learning Objectives
- Effective Training Techniques for Learning Transfer



## Recall: Learning Objectives

Guide:

- the content of the instructional materials,
- presentation methods of instruction, and
- methods for evaluation of achievement.

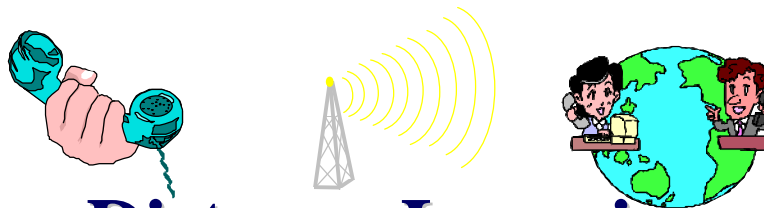




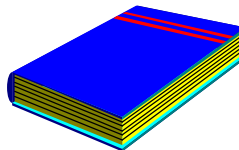
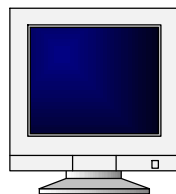
## What Else?



- Do a culture check
- Analyze the Benefits
- Do a Technology Check



## Distance Learning Technologies





## Audio Teletraining

- one of the simplest forms of interactive Distance Learning
  - learners can hear the instructor and instructor can hear the learners through use of a “convener” (similar to a speaker phone)
- can be enhanced through the distribution of prepared learner materials:
  - print-based workbooks
  - video tapes
  - 35-mm slides
  - other



## Audio Teletraining

### Advantages

- inexpensive
- easy to set up
- minimal training on equipment
- uses existing phone lines

### Disadvantages

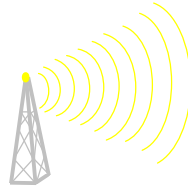
- Difficult to learn psychomotor skills
- Instructor does not get visual feedback
- requires pre-distribution of visual materials





# Audiographics

Conference-call audio interaction coupled with ability for the instructor and learners to share computer-generated graphics and slides with each other in a live interactive mode.



# Audiographics

## Advantages

- inexpensive
- easy to set up
- minimal training on equipment
- uses existing phone lines
- ability to share charts, graphs, digitized photos
- whiteboard capability

## Disadvantages

- instructor does not get visual feedback
- may require pre-distribution of computer image files
- requires some degree of computer literacy to create course materials.





## Interactive Television

Learners see and hear the instructor by viewing live television. Instructor receives feedback and interacts with learners through an audio connection or a viewer response keypad, or a combination of both.



## Interactive Television

### Advantages

- ability to transmit live video and audio to multiple sites in widely dispersed locations
- significant cost-efficiencies for large audiences
- large inventory of facilities already in place available for use
- when used with viewer response pads, allows data input from learners

### Disadvantages

- requires extensive equipment to broadcast signal
- requires installation of satellite downlink dishes at remote sites
- requires thorough training on equipment at remote sites
- Does not allow visual feedback to instructor





# Video Teleconferencing

Two-way transmission of both video and audio that allows the learners to see and hear the instructor and the instructor to both see and hear the learners.



# Video Teleconferencing

## Advantages

- allows the instructor to see the learners
- flexibility of multiple “instructor” sites
- enables learners to interact with each other visually

## Disadvantages

- high costs for transmission of courses
- high costs for establishing sites
- difficulty of managing visual interaction with several sites





# Computer-Based Training

Using personal computers and software written to train the learners in a particular subject area. Range from simple, mostly text-based screens to more complex software that includes video, sound, and animation.



# Computer-Based Training

## Advantages

- allows self-paced training
- inexpensive distribution costs
- evaluation built into instruction
- enables use of existing videos and visuals

## Disadvantages

- high costs for development
- lengthy development timelines
- individuals need moderate computer literacy to use
- interaction with instructor & other students not real time





## Internet and Intranet-Based Training (e-Learning)

A network of linked computers allows learners and instructors to interact using e-mail, online computer conferencing, and e-mail message boards. Course and reference materials are made available online for learners to view or download.



## Internet/Intranet-Based Training

### Advantages

- materials readily updated
- inexpensive distribution costs
- access to multiple courses with training on single piece of Web software
- self-paced learning
- reach more people
- enhance live training
- cyclical instruction methods possible
- tracking of trainees' progress possible





## Internet/Intranet-Based Training

### Disadvantages

- need moderate to high degree of computer literacy to create Web training sites
- video and sound transmission extremely limited in many cases
- security measures to prevent unwanted viewing
- security issues regarding testing
- must arrange for access to instructor for questions/interaction



## Top 10 Satisfaction Indicators

1. High quality content
2. Ability to receive credentials
3. Effective delivery using lots of interaction
4. Strong web-based measurement capabilities
5. Stellar technical and customer service
6. Robust learning management system
7. Enterprise-wide, scalable solution
8. Global user support
9. Consulting/installation assistance
10. Understanding of how consumers use the products

Corporate University Xchange





## A Team Effort!!

- Subject Matter Experts
- Instructional Designer
- Project Manager
- Programmer
- Graphic Artist



## Quotable Quotes!

“If you bring an application or solution into your business because it’s the latest and greatest whatever, shame on you. If you bring in an application that will provide measurable results and support your business, then you’re a model corporate citizen.... Remember, a fancy solution with no problem to solve is just a fancy solution.”

Darin Hartley, *Training & Development*,  
September 2000, pg. 30





“Information is a perishable commodity. Timeliness, quality of information, usability, and credentials are the qualities that draw audiences. The top universities, medical centers, and associations are the credible sources for this information.”

Ricardo Martinez, MD

Sr. VP Health Affairs  
WebMD



## References

- [Teaching at a Distance with the Merging Technologies: An Instructional Systems Approach](#), Thomas E. Cyr with Eugenia D. Conway, 1997, Center for Educational Development, New Mexico State University.
- [Distance Learning: A Step-by-Step Guide for Trainers](#)  
Karen Mantyla and J. Richard Gividen, 1997, ASTD, Alexandria, VA





## More References

e-learning; The Magazine of Distributed Learning, Santa Ana, CA, for free subscription:  
1-888/527-7008

Training Magazine, Bill Communications, Inc., Minneapolis, MN, 1-612/333-0471

Training & Development Magazine, ASTD, Inc. Alexandria, VA, 1-703/683-8100



## Reinforcement of Training

### Safety Team Development





## **Management Commitment and Employee Involvement**

- Management Committed With as Much Emphasis as Other Organizational Purposes
- Employees Develop and/or Express Commitment for Themselves and Co-Workers



## **Management Commitment and Employee Involvement**

- Clearly Stated Worksite Safety and Health Policy
  - Foundation of Safety and Health Management
  - Point of Reference for All Safety and Health Decisions
- Establish and Communicate Clear Goals and Objectives for the Safety and Health Program





## Management Commitment and Employee Involvement

- Provide Visible Top Management Involvement
  - Actions Speak Louder Than Words
  - Managers Complying With PPE Requirements
  - Performing Periodic Inspections Demonstrate Involvement



## Management Commitment and Employee Involvement

- Encourage Employee Involvement in Program and Decisions Affecting Safety and Health, e.g.,
  - Inspection/Audit Teams
  - Hazard Analysis Teams
  - Developing or Revising Safe Work Rules
  - Training New Hires or Co-Workers
  - Providing Programs for Safety Meetings
  - Recognition (Award) Teams
  - Assisting in Accident Investigations





## Management Commitment and Employee Involvement

- Employee Involvement
  - Joint Labor-Management Committees
  - Labor Safety Committees
  - Safety Circle Teams
  - Rotational Assignments of Employees to Safety and Health Functions
  - Employee Volunteers



## Management Commitment and Employee Involvement

- Assign and Communicate Responsibility for All Aspects of the Program
  - Everyone Has Some Responsibility
- Provide Adequate Authority and Resources to Responsible Parties
  - Adequately Trained and Equipped Personnel
  - Adequate Operational and Capital Expenditure Funds





## Management Commitment and Employee Involvement

- Hold All Personnel Accountable for Meeting Their Responsibilities
  - Must Track Performance, Reward When Competent and Correct When Not
  - Accountability Must Be Applied to Everyone, From Senior Management to Hourly Workers
- Review and Evaluate Program Operations at Least Annually Revise Performance or Objectives as Needed



## Safety and Health Training

- Addresses the Safety and Health Responsibilities of **ALL** Personnel
- Most Effective When Incorporated Into Other Training About Performance Requirements and Job Practices
- Complexity Depends On the Size and Complexity of Worksite and the Nature of the Hazards
- Means of Verifying Comprehension Essentials (Tests, Oral Questioning, Observation, etc.)





## Safety and Health Training

- Recommended Actions
  - Ensure All Employees Understand Potential Hazards and How to Prevent Harm to Themselves and Others
    - Critical For Employees Assuming New Duties



## Safety and Health Training

- Minimum Information Needs
  - General Hazards and Safety Rules of the Worksite
  - Specific Hazards, Safety Rules and Practices Related to Particular Work Assignments
  - Employee's Role in Emergency Situations





## Safety and Health Training

- Ensure Supervisors Carry Out Their Safety and Health Responsibilities
  - Analyzing the Work Under Their Supervision to Identify Unrecognized Potential Hazards
  - Maintaining Physical Protections in Their Work Areas
  - Reinforcing Employee Training Through Continual Performance Feedback and Enforcement of Safe Work Practices



## Safety and Health Training

- Ensure That Managers Understand Their Safety and Health Responsibilities





# Thank You!

John Dimos, MS, CIH

209 S. Oak Park Avenue, #301

Oak Park, IL 60302

(708) 763-8874 Phone/Fax

John@JohnDimosCIH.com

