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Learning in the Wildland Fire Service

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Wildland Fire Lessons Learned Center
A lesson is learned when we change our behavior.

Learning in the Wildland Fire Service

Prepared by

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Preface

Wildland fire is a phenomenon essential to nature's design. Whether caused by natural force or human beings, fire can pose a threat to people and communities. The ultimate purpose of the wildland fire service is to protect life, property, and natural resources while engaging the forces of nature. Most of us made a commitment to serve our communities, our states, or our nation. We willingly accepted this unique obligation to place ourselves at risk and to put the interests of others before our own.

We are asked to make tough decisions under a compressed time frame, given limited information, in a complex and high-risk environment. This operational environment routinely brings together people, machinery, and the destructive energy of wildfire in the close, three-dimensional space of the fireground and its associated airspace.

Wildland fire operations have inherent risks that cannot always be eliminated, even in the best of circumstances. Incident management and response is a competition between human beings and the forces of nature; leaders struggle to manage the effects caused by wildfire and other natural and manmade events. The environment can rapidly and unexpectedly change from normal to emergency conditions through chaos: a condition on the edge between order and disorder, between too fast and too slow, between too much and too little. In the science of physics, chaos is an important conceptual paradox that has a precise mathematical meaning: a chaotic system is a deterministic system that is difficult to predict.

Chaos (physics): behavior so unpredictable as to appear random, owing to great sensitivity to small changes in conditions.

New Oxford American Dictionary

It is in this environment that firefighters must be prepared to thrive. Within chaos, the smallest decision and action can have the most profound effect. Often these are life-or-death decisions. In the realm of chaos, there are two ways: the way of life and the way of death. Too far in any direction from the boundaries of life leads to death. Firefighters must learn ***prudence*** to be able to rapidly discern good from ill between these two ways, and learn to take effective and decisive action ***in-time***.

Learning is vital to thriving in such a high-risk environment.

This book expresses the fundamental learning concepts specific to the wildland fire service. It outlines the pillars, tenets, and framework that guide learning in the wildland fire service across a broad range of missions. The concepts in this book are universal to every person in the wildland fire service—from first year employee to senior manager, to leaders of leaders. This book serves interagency wildland fire service interests by:

- Articulating a universal set of pillars and tenets to guide learning in the wildland fire service
- Focusing leaders on building learning organizations where the pillars and tenets are implemented daily
- Providing a reference of learning practices and concepts for everyone, from self-learners to formal course instructors

There are no simple, clear cut, by-the-book instructions for learning. We must take direct action to identify and make best use of every opportunity for learning. This takes study and practice.

This book is your guide, but it does not state policy. It cannot provide black-and-white answers to the unlimited volume and variety of situations related to learning. Instead this book simply outlines the broad concepts of learning in the wildland fire service. These are fundamental concepts by which expectations of learning may be established and demonstration of learning may be judged. They are intended to make better learners of us all.

Pillars and Tenets of Learning

Learning is the activity or process of gaining knowledge, skill, or attitude by studying, practicing, being taught, or experiencing something. A critical element for success in the wildland fire service is continual learning -- a structured inquisitive mindset expected of all firefighters who always look for new opportunities to learn and share in a dialog about learning with subordinates, peers, and senior leaders.

Within the core values and principles for the wildland fire service the duty to "be proficient in your job" and the duty to "develop subordinates for the future" emphasize that firefighters are to be both learners and teachers throughout their careers.

This book is structured around a set of learning pillars and tenets which support our core leadership values and principles. These pillars and tenets are a means of communicating "what right looks like" and illustrating effective learning in action. The three chief pillars of learning within the wildland fire service are:

Inquiry. Developing and nurturing inquisitiveness in firefighters.

Opportunity. Seeking out and creating conditions for learning.

Dialog. Sharing ideas and a passion for lifelong learning.

Why did that fire change direction so quickly? Why did that crew not sense the changing conditions, while the other crew did? What can I do to help my team find or create learning opportunities so we can better sense these conditions in the future? What motivates me to want to learn? How do I learn best? How about you, how do you like to learn?

For each of these three pillars, in Table 1 we identify two tenets that help us to understand and put into practice these pillars of learning. As you read through them, ask yourself if there are other ways you can think of to practice inquiry, opportunity, and dialog.

Look for those opportunities, talk about them, then take action to help yourself and your team improve as students of fire.

Table 1: Learning Pillars and Tenets

PILLARS	TENETS
Inquiry	**Think about the whole learning system around you as a complex-adaptive system, affected by all that you do and fail to do.** **Inquisitively think about *how you are learning* and *how you are teaching* others.**
Opportunity	**Create, resource, and provide opportunities for firefighters to teach and learn.** **Seek out existing opportunities for yourself and your team.**
Dialogue	**Make time for talking with others about learning.** **Read and discuss about past operations, communications, decisions, and actions.**

Firefighters are both teachers and students in various learning environments throughout their time in the wildland fire service. Healthy learning environments can occur every day on the fireline, at the station, on the road, during off-duty activities, as well as in formal courses. Here are some thoughts about how these pillars and tenets get played out in everyday environments.

Inquiry -- ***Think about the whole learning system***. In the early 1990s the fire behavior curriculum was not well designed for the decision makers on the fireground. A group of hotshot crew superintendents were together in a winter meeting reflecting on the confusion they saw in their crewmembers returning from the *S-390 Intermediate Fire Behavior* course. Their people were having difficulty transferring the academic concepts they learned to application on the fireground. The group worked over the next two years to develop a concise course that synthesized the key fire

behavior indicators needed to anticipate problem fire behavior. The result was the *Look Up, Look Down, Look Around* course that was cutting-edge for its instructional design at the time and spurred an effort to improve the entire fire behavior curriculum to be more useful for fireline decision makers.

While an organization and its leaders are certainly responsible to create conditions for learning, it is each individual's responsibility to ***think about how they are learning*** and seek any and all avenues to improve their knowledge and skill level. If you depend solely on a formal training system for your development, you will likely find the going slow and the range of topics to be limiting. You are responsible for leading yourself first; building on the strengths you bring to the organization, and improving the weaknesses you have. Take inventory of your gifts -- what do you do really well? What does your organization need you to do that you are not very good at? How do you learn best, and how can you better yourself so that you provide more value to your team? Know yourself and seek opportunity for self-improvement.

Opportunity -- *Create opportunities for firefighters to teach and learn*. Following the South Canyon Fire tragedy in 1994 a major effort was set underway to improve how firefighters learned from our history. One of the proposed actions was to establish a national Lessons Learned Center, which became a reality in the early 2000s. Over time, this organization developed a number of innovative products that advanced every wildland firefighter's ability to look at our past and learn. One of those products is the Rapid Lesson Sharing initiative that allows firefighters in any location to become a teacher and share their close call or best practice for others all over the country to learn.

At the crew or work unit level, leaders should ***seek out existing opportunities for their team***. It can be as simple as utilizing a prescribed fire line preparation assignment for a wildfire LCES drill or stopping by a historical tragedy fire location and doing a brief case study site visit enroute back home from a fire assignment.

Dialog -- *Talk with others about learning.* After the Dutch Creek

Fire tragedy in 2008, many people were inspired to talk about how we handle our medical emergencies on the fireground. The spectrum of voices included family members, national fire managers, field firefighters. With persistence and time, this coalition, talking and learning to work together, significantly changed the protocols for how the wildland fire service deals with emergency medical situations today.

The same approach can be used at the crew or work unit level to ***discuss past operations and decisions.*** The wildland fire service has normalized this through the adoption of the After Action Review process. Every day a crew or team can incrementally improve its performance if they are willing to make time to talk and learn from their pasts actions.

As a community of individuals and organizations who take on high-risk missions, we are a complex-adaptive system of lifelong learners who value **inquiry**, **opportunity**, and **dialog**, in order to more efficiently and effectively adapt to rapidly changing environments. Every firefighter is responsible for their own learning in order to improve themselves and their team. All are responsible for sharing their knowledge, skills, and attitudes with others. The best teachers are scholars; the best scholars are teachers. Every firefighter learns every day.

Learning moments are so valuable.
Teaching moments are so rewarding.
Moments when we can do both at once…priceless.

Dan Olsen
National Fire Director
U. S. Forest Service

Building a Learning Organization

Learning Defined
Through Training, Education, and Experience

Every day presents new opportunities for inquiry and dialog -- new opportunities for learning. **Training**, **education**, and **experience** are the three interwoven elements of learning. We learn from all three, but learning is most effective when all three are artfully combined into a well-crafted opportunity that looks both backward into experiences of the past, and forward into possibilities for the future. Whether you are teaching yourself or teaching others, try to combine all three elements, all in order to make your organization better through learning.

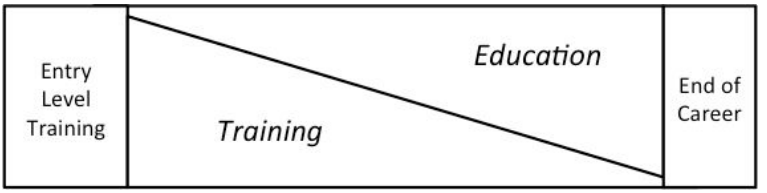
Training is an aspect of learning that sharpens body and mind. It should be designed as an edifying, confidence-building aspect of both individual (personal) and collective (organizational) development. In training, the ***answer*** is more important than the question. Often the answer takes the form of ***action*** in response to a condition. Meeting and exceeding established tasks, conditions, and standards continually "raise-the-bar" in training. Accuracy (deviation from perfection) and precision (repeatability of effects) are both sharpened through training. Individual and collective safety is a product of demanding training that always raises the bar in both accuracy and precision.

Education is a mind and spirit broadening aspect of learning. It should be designed as a humbling aspect of development in which both teacher and student explore the vastness of knowledge and possibility -- that which is known and that which is yet to be discovered. In education the ***question*** is more important than the answer. The whole idea is to get learners -- both teachers and students -- to consider all the many possibilities of a problem, then apply judgment based on experience to discuss and implement creative solutions. We educate to prepare firefighters for the uncertainties of future operating environments, by allowing them

to explore creative solutions in safe environments. This is where the possibility of empowering subordinate leaders and clear leaders intent is often realized.

Experience is the most memorable aspect of learning in body, mind, and spirit. It should be designed to incorporate elements of both education and training. In our experiences -- both crafted learning experiences and actual operational experiences -- the interplay of questions and answers, problems and solutions, produces tangible ***results***. Results must be sensed, evaluated, and used to continually improve personal and organizational character.

Training, education, and experience, together affect individual and collective knowledge, skills, and attitudes. The career-long journey of a wildland firefighter begins with an initial entry-level emphasis on training. Then as the firefighter gains experience, the learning gradually shifts to an emphasis on education. We call this the ***training and education continuum.*** Learning should be designed as a blend of training and education appropriate to the level of student experience. Leaders at all levels should approach training and education with a sense of humility and gratitude.



The Training and Education Continuum
Entry level firefighters get more training than education, but the balance gradually shifts over a career in wildland fire

Training and education are the two interdependent means to achieve learning required for operational demands. Each complements the other as they sustain the transformation along the continuum of professional development to produce technically and operationally proficient firefighters who can think critically, apply sound judgment, stay humble, and make ethical decisions to solve

complex problems in an environment of great ambiguity and uncertainty.

Training and education are mutually supporting efforts. The single most important aspect to understand about this concept is that experiences in any learning environment are comprised of an inseparable combination of both training and education that together builds individual and organizational capability and competence. As both grow in ability and maturity of a firefighter, they begin to ***sense conditions*** and on their own ***execute tasks*** that meet their designated leader's ***standard of intent***.

For example: We *train* to complete a 500 foot progressive hose lay on flat ground within 10 minutes. We *educate* firefighters about pump theory and properly laying hose on a fire. Then we *experience* that event for real and afterwards we then inquire about how we could have done it better or faster, and talk about how to be more efficient and more effective in the future, then create opportunities for more training or education as needed. We design learning experiences by "what-ifing" the conditions that we expect may occur in the future. What if the hose lay was up or down a steep slope? What if it has to be done in heavy thick brush? How do you react to a spot fire or slop over behind the lead nozzle? What if a hose ruptures?"

In any learning environment, it is a blurring or blending that occurs where training, education, and experience meet. In planning and conducting teaching and learning, ***we target behaviors for change***, yet we recognize that whether we intended to train or intended to educate, we produce effects on both - in order to prepare firefighters to ***thrive in the realm of chaos.***

Chaos Theory: the branch of mathematics that deals with complex systems whose behavior is highly sensitive to slight changes in conditions, so that small alterations can give rise to strikingly great consequences.

New Oxford American Dictionary

Desire and Responsibility to Learn

If you choose to lead others you will have a legacy. I suppose I would want my legacy to be that firefighters begin to realize the importance of being a student of fire, and that I was able to help make that happen.

Paul Gleason
Deputy Regional Fire Director
National Park Service

Being a student of fire requires that you develop a thirst for lifelong learning, and "cast your net widely" through inquiry to discover and take advantage of new opportunities to learn.

The desire to learn is something that may come and go along your journey. Learning is not always easy. It takes effort. It is sometimes painful. It is understandable that the desire to learn will wax and wane.

The responsibility to learn is a different matter; it does not go away. To be effective in this dynamic, high risk occupation we must accept the perpetual cycle of acquiring, shaping, and honing knowledge and skills. The learning journey is never finished.

The nature of our organization is such that everyone we train and educate is an adult learner. However, not all adult learners or learning environments are alike. Before attempting to design, develop, or implement training or education for firefighters, it is necessary to know more about who the students are and how they learn.

One of the factors that leaders consider when creating or implementing training and education is establishing who will learn. Entry-level firefighters learn in a very structured, teacher-centered environment because they lack experience or knowledge of the firefighting community. Firefighting, all-hazards incident management, and the specific skills within those broad

disciplines are all new to them. More structure must be provided for instruction to be efficient and effective. At the same time, however, it is important to treat them like adults. They do bring life experience into the classroom and they will exhibit some characteristics of adult learners. Young firefighters will be more motivated and more apt to take responsibility for their learning if they are respected as adults.

By contrast, senior and mid-level firefighters bring a wide range of knowledge and experience into the instructional environment. As such, more learner-centered activities are needed to allow the students to use and build upon the knowledge and experience they already possess. This section will discuss adult learning theories in broad terms and how they apply when designing, developing and implementing instruction for different populations of firefighting students.

Leaders evaluate performance at all levels to understand the causal factors of successes and failures. All those involved learn incrementally, applying today's lessons to the next assignment. This focus on continuous process and product improvement brings with it a responsibility to share lessons learned throughout the organization.

In a learning organization, leaders treat honest mistakes as opportunities to do better next time. Understanding that failure is a part of learning, they establish command climates in which young leaders are motivated by desire to succeed rather than fear of failure.

In a learning organization, every member of a team is responsible for leading themselves in learning, and sharing what they know with their peers. Firefighters are responsible to help their captains and chief officers design effective learning opportunities. Captains and chiefs are responsible for creating a command climate where learning is valued, and learning initiatives from firefighters are encouraged. The following ***opportunities*** for ***inquiry*** and ***discussion*** are hallmarks of a learning organization.

These are experiences that ***you*** can make happen, regardless of what position you hold in your organization.

Professional Reading

Most successful organizations with sustained high-risk missions have professional reading programs, and a key part of those programs is the recommendation that every leader read at least two books a year. Many corporations have required readings for their supervisors and managers.

For several hundred dollars, a fire organization can put together a good library and implement a reading program on their home unit. How many young firefighters know what happened at Mann Gulch or South Canyon? How many have read anything that discusses the principles of sound leadership? How many have read stories from other disciplines or endeavors that describe leaders in action?

This is not busy work; this is not drudgery. Encourage readings within your organization that will provoke reflection, discussion, and debate. Read and discuss together, with a view toward how you can apply lessons from the past in future operations.

Simulations and Drills

Transfer of knowledge and skills from the learning environment to the job is most likely to happen when the conditions of learning best replicate what is being required on the job. Students are more likely to remember when instruction is active and geared toward their learning style within the actual operating environment they work in, with all the variables of direct human interaction, field conditions, stress and fatigue. Whenever possible, integrate learning objectives into live simulations and drills, where real people are put in situations where they have to make decisions and communicate them effectively under true workplace conditions.

Live simulations are low risk, educational or training experiences, which substitute for some aspects of a real world situation.

Typically these exercises involve people and equipment operating in a realistically simulated setting. Time is continuous, as in the real world. The spectrum of live simulations ranges from several individuals running through a hose lay drill, to several crews doing a medivac rehearsal, to Incident Management Team trainees running a theoretical fire in a full scale role-play exercise.

Virtual simulations are a learning tool that utilize computer hardware and software in which students interface with trainers that resemble, to some degree, the equipment or situation that is to be encountered on the job such as a flight simulator or virtual reality applications. These are also part of the simulation arsenal, though more difficult to support from a logistic and finance perspective.

Simulations are constructed based on verified models of actual systems and procedures. Simulations can be very simple and inexpensive drills at the tactical level or very complex and expensive full-scale role-play rehearsals at the strategic level depending on the degree of fidelity and resolution needed to achieve the learning objectives and outcomes relative to operation of the actual system.

Tactical Decision Games (TDGS)

Tactical Decision Games are role-playing small group exercises designed to place individuals in some sort of decision space. TDGs are valuable because pattern recognition skills, decision making skills, and communications skills, can all be practiced, refined, and improved.

TDGS are a simple, adaptable, and effective method of repeatedly challenging a firefighter with tactical situations that include limitations of time and information. By requiring a decision regarding the situation and the ability to communicate it in the form of clear instructions, the firefighter will gain precious experience and skill in actual tactical decision-making. There is no substitute for experience of the real thing, but that can be hard to

come by and tragically unforgiving.

Because TDGs build experience in decision-making and communication, it is important to employ this process frequently at the crew or module level. Require people to actually make the communications as they would for real. DO NOT accept "I would tell them to…." Require participants to actually make the communications through role playing. In addition to developing individual decision-making skills, the practice will allow crewmembers to learn about themselves, each other, and gain an understanding of how each crewmember thinks. Each game played, like every fire experienced, adds to collective experience.

Sand Table Exercises (STEX)

Tactical Decision Games can be delivered using various table-top visual platforms such as sand tables, solid terrain models, computer generated terrain animations, terrain photographs, topographical maps, sketch maps or even dirt, sticks and rocks on the fireground. The sand table platform has the additional advantage of being easily and quickly re-configured for any variety of terrain representations.

The tactile component of these table-top platforms will generate a more engaging learning experience. Having a hands-on spatial frame of reference will help participants suspend their disbelief and draw them into their role within the exercise.

Staff Rides

The intent of a staff ride is to put participants in the shoes of the decision makers on a historical incident in order to learn for the future. Staff rides are conducted on the actual ground where an incident or event happened. A staff ride is more education than training, but normally combines both aspects as an exceptionally effective experiential learning event. A staff ride consists of three distinct phases:

- A systematic ***Preliminary Study*** of a selected fire, battlefield, or other high-risk incident
- An extensive ***Field Study*** to the actual site(s) associated with the incident
- An opportunity for ***Integration*** of the lessons derived from the study and visit

Staff rides provide opportunity to inquire and discuss both the art and science of firefighting, but this requires maximum participant involvement before arrival and at the site to guarantee thoughtful analysis and discussion. Participants should have a enough fireground experience to have a context for understanding questions regarding leadership and decision-making. The study of leadership aspects in a staff ride transcend time and place.

Site Visits

A Site Visit is different than a Staff Ride where as a site visit will not have all three phases and is often an "opportunity" type learning. It is a field study and visit conducted on the ground where an incident or event happened. It can provide opportunity to gain meaningful perspective and insight. Site visits are often completed while in travel status home from an incident. Others are done on a local unit for new or visiting firefighters.

Virtual Staff Ride or Site Visit

A virtual staff ride or site visit follows the same methodology as a "live" or the "field" but because travel restrictions preclude a trip to the incident location. The terrain is replicated in a virtual environment.

Case Study

A Case Study is an analysis of persons, events, and decisions that are studied holistically. It does not need to be conducted at the site

of the incident, but could include a visit to the incident location. Case Studies are used to demonstrate a thesis or principle and are usually led and require facilitation.

After Action Reviews (AARs)

An After Action Review (AAR) is a professional discussion of an event, focused on performance standards, that enables firefighters to discover for themselves what happened, why it happened, and how to sustain strengths and improve on weaknesses. It is a tool leaders and units can use to get maximum benefit from every incident or project.

AARs are foundational to local unit learning. They provide an opportunity for dialog and inquiry following every action and operation that your unit participates in. Firefighting leaders walk the talk of a learning organization by scheduling routine debriefings to evaluate performance and apply the lessons learned. AARs maximize learning from every operation, training event, or task; they represent a powerful tool for team and organizational learning.

AARs allow people to share honest opinions and learn from each other. Fire leaders make sure that debriefings focus on *what* instead of *who;* we use them to improve weaknesses and to sustain strengths.

Most people (especially young firefighters) want to share their experiences. In order to get things started, try sharing with your crew your positive or negative thoughts related to the day's events. Once you (the leader) have demonstrated that the AAR works and that it will be part of your team's Standard Operating Procedures, the discussion will become more open.

The critical step is to tap into your crewmembers' emotions. Finding out what they did is not nearly as important as why they did it. Good active listening skills are essential. Do not

immediately solve or correct the issue, but let it play out. Try to get to the root of the problem. Encourage everyone to speak their mind.

In order to maximize the AAR, the conversation must have a certain level of candor and allow individual emotions to surface. Remember, this is not the time to reprimand; nor is it time for personal disputes to dominate. Only issues that are related to the team's performance should be addressed.

Facilitating an AAR requires patience. Initially it is necessary for the leader to set the tempo. The leader must be a part of the AAR and will have to occasionally accept criticism. This is important because the team will be looking for affirmation of the AAR process. Some tips:

- Hold an AAR as immediately after an event as possible by the personnel involved.
- Leaders ensure there is skilled facilitation of the AAR.
- Make sure everyone participates.
- Pay attention to time; set a start and ending time.
- Establish clear ground rules: encourage candor and openness, all participants have equal ownership, focus on improving performance, and keep all discussions confidential.
- End on a positive note.

Lessons Learned Identification

The intentional passing on of lessons observed from past fires and all-hazards incidents to the next generation of firefighters is a characteristic of a learning organization.

All the rules of engagement currently used by wildand firefighters have evolved from hard won lessons on the fireground. Developing staff rides from previous incidents and operations for such lessons in a valuable method of inquiry.

The wildland fire service has made notable progress in the realm of documentation and use of past incidents. There are a number of sources for information to develop such case studies. Most of the reports on past incidents are now readily available in digital format through an on-line database; there are several formal Lesson Learned Center products distributed on a regular basis; the Facilitated Learning Analysis process now provides a methodology for learning from near-miss incidents; and the Annual Refresher Training products include recent case studies scenarios.

One significant benefit of case studies is that they can be utilized by individuals on their own as well as being part of more formal group or classroom settings. Examining lessons from our past in order to be better prepared for the future is probably one of the most powerful avenues for self-development available to wildland firefighters.

Summary on Learning Organizations

All wildland firefighters need to undergo similar entry level training and then career progression training and education designed and implemented as an acculturation process. This common lifelong learning experience provides all firefighters shared situational awareness, a proud heritage, a set of values, and a common bond of comradeship.

Basic individual skills are an essential foundation for fireline effectiveness and must receive heavy emphasis. All firefighters, regardless of their specialty, must be trained and educated in basic firefighting skills. At the same time, organizational skills are extremely important. These are not simply an accumulation of individual skills; adequacy in individual skills does not automatically mean organizational skills are satisfactory. Crews and teams must experience learning together, so they can collectively improve their knowledge, skills, and attitudes that are in keeping with our leadership values and principles.

In a March 2008 article in *Harvard Business Review*, Professors ask: *"Is Yours a Learning Organization?"* The authors propose that an environment to support learning has four characteristics:

- Psychological safety. To learn, employees must be comfortable expressing their thoughts.
- Appreciation of differences. Recognizing the value of different tactical and operational outlooks increases energy and motivation, sparks fresh thinking, and prevents lethargy and drift.
- Openness to new ideas. Learning is about crafting novel approaches. Learners should be encouraged to take risks and explore the untested and unknown.
- Time for reflection. When people are too busy or overstressed, their ability to think analytically and creatively is compromised. Supportive learning environments allow time for a pause in the action and encourage thoughtful review of the organization's processes.

Finally, leaders must establish concrete learning processes and practices, and reinforce the value of a learning culture. The next section of this publication helps you do just that by establishing a framework for learning.

By discussing the pillars and tenets of learning, using the framework for learning, and implementing ideas about building a learning organization, wildland firefighters can significantly improve our individual and collective levels of competence and maturity. With competence and maturity comes an increased degree of safety. ***Learning is an essential duty*** for leaders at all levels, as we pass on our lessons learned to the next generation.

Have fun learning together!

Notes

A Framework for Learning

Integrity is one of the wildland fire leadership values, one of its principles is "know yourself and seek improvement." There does not always need to be two people in traditional roles assigned as teacher and student for learning occur. Self-directed learning is one way to create, resource, and provide opportunities for yourself and others to teach and to learn. Seek out opportunities to teach yourself and then share what you've learned with your team.

Much of the learning we have experienced growing up as children was in the classroom using the classic teacher-student model. Adults learn differently than children. Firefighters are adults. In the classic model, teacher was at the center of instruction and considered to have all the answers, while students were merely the passive receptors of what the teacher delivered. Little thought was given to the experiences and knowledge that students brought to the learning environment, especially what adult learners had to offer. Fortunately, the past 50 years have seen rapid growth in adult learning theory and the adoption of new techniques as described earlier for the training and education of wildland firefighters.

Characteristics of Adult Learners

Most adults have developed a sense of self that they expect will be respected and appreciated in a learning environment. These and many other characteristics have been found to be somewhat universal amongst adult learners. These characteristics should be studied and carefully considered when creating learning opportunities for firefighters.

- They prefer self-direction.
- They have experience that should be used and built upon.
- Their readiness to learn depends on their needs.
- Their orientation to learning is life or problem-centered.

- They often learn best in small groups.
- They need a supporting and challenging environment.

Self-Direction. Adults avoid, resist, and resent situations where they are not respected as adults. They desire to be treated by others as capable of self-direction.

- Adults need a learning climate that provides them with a sense of acceptance, respect and support. Criticizing or judging adult learners can quickly shut down the learning process. When necessary, those in the role of teacher must correct the adult learner in a supportive and respectful manner.

- Anxiety, fear, and lack of confidence are emotions that can negatively affect a student's ability and willingness to learn. Well designed and delivered instruction that considers the potential for anxiety can reduce or eliminate fears. At times there is a need for time-pressured simulations or assessments that purposefully raise the level of anxiety. This is by design with the goal of lowering fear and building confidence, yet the stress and anxiety should be considered. It is far better for firefighters to learn how to overcome their anxieties in the safety of a simulation exercise, rather than for the first time on an active fireline.

- Students and teachers have a shared responsibility for learning. The teacher provides the atmosphere, resources and guidance the students require for success; the student is responsible for the learning.

- Teachers take on the role of facilitator, mentor, or coach, providing scaffolding (providing supports and gradually taking them away as students progress) and “just-in-time” assistance to guide the student in their quest to build knowledge and gain skills. Activities that have students reflect upon their learning and self-evaluate can be very effective for adult learners because it gives them

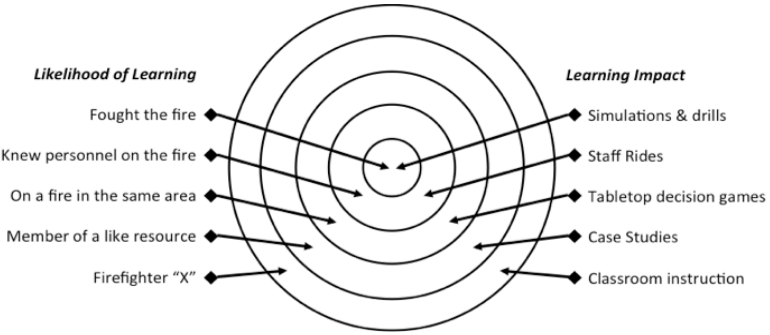
"ownership" of the problem and the solution.

Learner Experience. Adults have had a great deal of previous learning, comprised of formal education, training, culture, reading, and life experience. Based on this prior learning, adult learners formulate assumptions about the world. Their assumptions can either help or hinder the learning of new material. Learning new concepts is more difficult for students whose assumptions differ from what is being taught. Adults enter the learning environment with a wide range of experiences. The older the learners, the more experience they have and the more varied the group; some good, some bad. A more experienced learner may have a learned skill that needs to be corrected to meet agency or local policy (such as a new hire from the logging industry on starting and use of a chainsaw).

People attach more meaning to what they gain from experience than what they acquire passively, thus it is critical that teachers and curriculum designers consider and make use of student experiences during the instructional process.

As lessons from past fires and incidents are passed on through training and education, those most closely affected by the incident are most likely to learn from them. We strive to increase the likelihood of learning for those farther removed through choice of learning experiences.

The "bulls-eye" chart developed by the Wildland Fire Lessons Learned Center plots the likelihood of learning for various students, and the learning impact of various learning environments. We seek opportunities to move Firefighter "X" closer to the bulls-eye through impactful learning experiences, especially simulations and staff rides in which students can meet those who fought the fire.



The Bulls-Eye Chart

Classroom instruction does not improve the likelihood of learning for "Firefighter X." Simulations, drills, and staff rides that bring Firefighter X closer to those who actually fought the fire have greater learning impact

Giving veterans of a fire the opportunity share their learning experiences with others brings healing to the entire community. The telling of stories about individual and collective experience is one of the most impactful additions to any learning environment. Through the telling of stories, individual and collective learning and healing occurs as memories are physically recreated in the mind of each learner.

All history is remembered history. The action of the individual only gains historical significance through individual relation to the life of a social group.

Paul Tillich
Theology of Peace

Here are some instructional techniques that can be used to capitalize on student experiences and storytelling are: problem solving, case studies, small and large group discussions, role-playing, staff rides, and simulation exercises.

- Effective questioning techniques provide one way to uncover student experiences that may have bearing on a lesson. Allow students to provide real-world examples to help anchor and solidify instruction.

- Group and individual projects involving real-world problems can be used to allow students to apply what they have learned and to hone their problem solving skills.

- Exposure to multiple perspectives and experiences challenge students to question their previous assumptions. Learning is accomplished through evaluation of differing experiences, judging best and worst practices, and creating synthesis born of collective experience.

Readiness to Learn. Adults are motivated to learn when they feel the learning is relevant to their jobs or their personal lives. They need to know why information or skills are important to them, what they can anticipate learning, and how it will be taught. It is important to provide this information in the introduction to the lesson. Conversely, they are not usually motivated to learn what they will have little or no use for. However, there are times when firefighters must attend training regardless of their motivation to do so. The implication for leaders and curriculum developers is that they must know their audience so they can choose subject matter and appropriate delivery methods, and also effectively explain their relevance. Learner attitude is a choice, and is often contagious. If the learner has a poor attitude and chooses to not learn or participate, the teacher must deal with it before it propagates through the class.

Orientation to Learning is Life or Problem-Centered. Training and education must be attuned to the concerns of the students. Adults are motivated to learn to the extent that they perceive the new knowledge or skills will help them perform tasks or deal with problems that they confront in their daily lives. Learning themes should include materials that address real life concerns. Staff rides,

simulations, and practical applications using realistic settings provide a problem-centered orientation. Those teaching can also demonstrate the relevance of concepts by relating them to the experiences of their students.

Small Groups. Research on adult learning has shown that most adults learn best in small groups. This makes students responsible not only for their own learning, but for the learning of the group. Students who grasp concepts faster help those who do not, and the collective experience of the group adds to the process of learning. Further, small groups allow students to hear and consider multiple perspectives and present their ideas to the group. Small groups (6 to 15 people) provide enough diversity of thought without letting students hide in the group. Strive to keep small groups within those bounds.

Supportive and Challenging Environment. Being openly criticized by the one teaching is a sure way to stop the learning process. Teachers must provide and maintain a learning environment that assists students in meeting goals and objectives. Leaders must educate, train, and supervise newly assigned teachers in order to help reduce this barrier to learning. A true leader and teacher will inspire, not manipulate learners. Teachers of adults must become proficient in the use of constructive feedback and positive reinforcement. Teachers can remove or lessen anxieties by spelling out clearly up front expectations for participants, and setting up group norms; for example, letting participants know that active participation is encouraged, divergent opinions are welcomed, and that you are there to help them learn. Further, teachers must learn how to be effective facilitators, encouraging groups to discuss their solutions to problems and facilitating the interaction between group members, groups themselves, and the class as a whole.

Additionally, curriculum developers and teachers must strive to create learning environments that build upon the experience of the students and ***challenge them to go beyond what they know*** or can do. Two approaches to creating such an environment are “without

the information given" (WIG) and "beyond the information given" (BIG). "WIG" environments provide the students with little guidance, which forces them to discover on their own solutions to the given problem. "BIG" environments provide the students with a scenario and a possible solution, but they must delve deeper and find other, better solutions. Scaffolding, mentoring, and coaching are other effective instructional techniques. In both cases, require students to make decisions and communicate action in the absence of all the information they think they need.

The Art of Teaching and Learning

The art of teaching and learning is often presented as a five-step process for the analysis, design, development, implementation, and evaluation of learning activities. This ADDIE model is a globally-recognized standard for instructional systems design. The ADDIE model is provided in greater detail in Appendix 2 as a reference for those assigned to design and manage curricula as part of formal wildland fire courses. What follows here is a practical framework for ALL firefighters to think about creating opportunities for everyday teaching and learning.

In the philosophy of *Learning in the Wildland Fire Service*, the person managing the learning (the "teacher") is not the focus of the process, ***the student learner is the focus***. While both teacher and student learn together, the learning experience provided to the student is chief concern.

Objectives and Outcomes. The first step is to determine your learning objectives. In formal instructional systems design, this would be analysis, design, and development, but that's a little too scientific for everyday life-long learning. Just think about what it is you want to teach or learn. These objectives may be formal if you are a teacher for a formal course, but more often these are informal objectives that come about because you have observed a deficiency or desire to teach a new skill. If you don't know what needs to be learned, it might not be learned effectively, and you

can't teach it well. Sometimes your initial objectives will have to be modified as you interact with the learners and the environment. Practice expressing the objective carefully, establishing the task, condition, and standard. As you develop objectives, also think holistically about the ***learning outcomes*** you expect. That is, what will be the operational result of achieving the learning objectives. Multiple learning objectives may contribute to a single learning outcome.
For example:
Objective: Winching Operations. Given a 1 ¾ ton truck stuck in the mud and equipped with a 12,000 lb winch, an anchor strap, two clevis rings, a snatch block, a blanket, and an anchor point; rig the winch system and safely extricate the mired truck within 15 minutes.
Outcome: Students are confident in their ability to safely self-recover mired vehicles under all conditions of weather and terrain.

Guided Discovery. Whether you guide yourself or guide others, consciously guiding the discovery of the desire to learn is a critical step in both teaching and learning. In guided discovery, you set up a situation where you yourself or the students you are teaching are posed a problem which involves the skill you want to teach. The teacher guides the students (even if it's you guiding yourself) to realize that they don't know how to do something they need to know. In many cases, the problem may be relatively simple, but may lead to a complex skill. The guided discovery should open the eyes of the learners and motivate them to learn the skills involved. The guided discovery creates conditions and creates or provides opportunity for effective teaching and learning.
For example:
Guided Discovery: Get a truck stuck (or almost stuck) in some mud, then give the students (or yourself) a mission order such as "winch the truck out of the mud, you've got 15 minutes, GO." By setting up this condition you can guide the students to discover that they either know or don't know something useful that they ought to know. All may be surprised by the tasks they discover.

Teaching-Learning. As the guided discovery progresses, the teacher teaches and the students learn. Teaching-Learning begins the implementation phase of formal learning. This works for self-learning too, when you inquisitively test yourself by trying something new and figure it out on your own or with the help of references. The teacher also learns a lot about the students (you learn a lot about yourself too). As you present the guided discovery, watch what is going on in the eyes and actions of the students and adjust your teaching techniques accordingly. You need to make sure your students are engaged and active in the learning process. The key to teaching-learning is dynamic dialog between learners (both teachers and students).
For example:
Teaching-Learning: If the students get right at it and everyone is doing their part flawlessly in winching operations, the teacher can just watch to see how they could improve the efficiency or effectiveness of the process. If they ask questions, the teacher might answer them. If they do something incorrectly, the teacher can correct them...or let the guided discovery go on until they do something wrong, then provide the necessary correction or suggest an idea or technique. If a question or problem comes up that the teacher can't answer, the whole teaching-learning team can do some research or experimentation to figure it out.

Application. This is a method of practice used to reinforce a skill or a task as it relates to firefighting operations. It is a continuation of the implementation phase that transitions to evaluation. After learning of knowledge and attitude has occurred through research, experimentation, and dialog, it's time to develop skill by ***doing*** what you've learned. By so doing, learners build habit and discipline and are able to meet or exceed standards for each task under each condition established in the objective. Students should be supervised and then provided feedback to determine if more practice is needed. This method generally follows a demonstration by the teacher and then replication of the demonstration by learners alone or in groups.

There is a psychomotor behavioral outcome from most learning related to firefighting. In many cases, the doing part involves effectively communicating what you know or how you feel about a situation to others, in order to effect timely action. In this case the psychomotor activity involves choosing the right words to convey the right meaning so it can be understood and acted on by the receiver of the communication. It may also involve proper use of radios, crafting texts, or hand-written messages.
For example:
Application: Once the students have experienced the guided discovery and the teaching-learning on winching operations, pack up all the gear and drive somewhere else with different geometry for anchors relative to the attitude of the truck. Have them practice the art of winching a few times, then do it in the dark, in the rain, and deep snow until the learning outcome is met.

Evaluation. This is done by both students and teacher. ***The first evaluation*** should be by the students. Are the students satisfied that they have learned the knowledge, skills, and attitudes? In an adult learner, this evaluation is significant and should carry weight, because the experience and maturity of adults usually means that they have a good understanding of how well the learning has settled in. Remember, sometimes people will lack confidence in themselves, and will need encouragement to recognize what they have learned. ***The second evaluation***, is by the teacher, or perhaps the leader, a subject matter expert, an outside consultant, or other person assigned as evaluator. The second evaluator normally just has to ratify what the students think, and agree that the skill has been learned, and the objective (often expressed by a test) has been met. Sometimes, that is a tougher call. The students may be convinced they have passed the test, and the evaluator knows they have not. Then the evaluator must show the students where the objectives have not been met, motivate them to practice some more, and complete the task. In other words, recycle to another guided discovery or new objectives. This last phase drives the first phase in a continual cycle of learning.

For example:
Evaluation: The team learning winching operations conducts an after-action review. The teacher asks each student (starting with the most junior) how they did, what they still need to work on, how they could get better. Lastly the teacher gives their evaluation, affirming or correcting and setting up the next learning adventure!

Tell me and I will forget; show me and I may remember; involve me and I will understand.

Unknown - perhaps Confucius

In summary:

- Determine your objectives. It is better to express them behaviorally if you can.
- Use a guided discovery to motivate your students. When appropriate, make use of unexpected happenings and build on them for motivation. Determine what your students already know, only teach the things they need to learn.
- Use the normal techniques of teaching, but keep the focus on what the student is learning. Try to avoid lecturing, much better is demonstration or the use of visual aids.
- The students have to DO to learn. Hands-on is best.
- The student and the teacher should both agree the objectives have been met. If not, repeat the cycle.

Learning Environment and Climate

The operating environment of the firefighter makes the best learning environment. If possible, get firefighters out in the woods, in the grasslands, in the neighborhoods. Hike the hills, keep them moving and exposed to changing environments to stimulate thought and learning. When possible let the outdoors be

your primary "classroom." That said, there are still times when firefighters will find themselves learning indoors. No matter what or where the classroom, manage the environment and create a good climate in your organization to provide the best possible learning opportunity. A good learning environment is characterized by open communication, mutual trust and respect, freedom to raise issues and engage in debate, clear and obtainable goals, objectives and teamwork. What is the learning climate of your unit and how do you contribute - whatever your position?

- **Learning climate.** The most important learning climate is the daily working environment and a positive climate for learning set by organization leaders.

- **Environmental management** is about setting the environmental conditions and tone for a consistent focus on learning wherever the learning is planned to occur: in a lecture hall, a discussion room, around a sand table, on a staff ride of an old fireground, in the field scouting a new area, in a bus, or out on the fireline. To do so we must consider our tenets of interaction with learners first, engage learners, and react to distractions or interruptions in ways that keep focus on learning and needs of the learner.

- **Environmental layout.** Physically organize the learning environment so that the teacher can reach and see every learner. Tactical Decision Games (TDGs), discussions, after action reviews, etc., should be formed in a horseshoe with the learners oriented away from distractions. During classroom projects or group work, the faculty members should be able to reach every learner by using an interior loop which allows free access to all. When possible, arrange learners so their back is to the sun, even if that means the teacher is facing the sun. Often there is opportunity to use the slope of a hill to position the learners with a good view of the teacher and the terrain being discussed.

- **Preparation time** is crucial to creating an effective learning

environment. Preparation for a scheduled class begins weeks or months prior to presenting the class. Don't think you can just show up at 0700 for a 0700 class. Teachers must arrive early and allocate time for personal reflection and preparation. Ensure you have all the tools you need to teach: perhaps a stick to point with, some rope and objects to make a terrain model with, a map large enough for all to see, a compass to verify direction, markers that work for the dry-erase board. Is the lighting just right so students can see what you show? Is there a generator running or is the AC too noisy? Is there an HDMI cable available to the projector from your computer? Are your PowerPoint slides formatted for 3:4 or 16:9 projection? Do the speakers work for playing your DVD? Most importantly, what will you say when you begin, and where will you say it from as you start teaching? Once all that is done, greet the students as they arrive and remember as many names as you can.

- **Distractions and interruptions** can interfere with learning. Often such interferences result from teacher or learner behavior that either through intent or thoughtlessness interferes with instruction or learning, threatens or intimidates others, or oversteps standards of civil conduct. *For example: the well-intentioned bus driver on a staff ride or field trip who keeps the bus running while the group is discussing something on the side of the road. While trying to maintain a comfortable environment inside; the driver thoughtlessly causes disruptive noise and fumes that interfere with learning outside the bus.* Some distractions or interruptions will be unavoidable and will have to be mitigated to the best of the teachers ability. A good command presence, speaking with a clear and projecting voice will help, but the amount of time in a noisy distracting environment should be kept to a minimum.

- **Learners who are not engaged** actively in learning during instruction can interfere with learning in the environment

and climate. Learners must become actively involved and must not lapse into the role of a passive spectator. Faculty may inadvertently support distraction or interruption by allowing a shift or loss of focus on the learning or topic. Often this happens because of poor professional example by the teacher, lack of prevention skills, ineffective reaction to interference as it occurs during instruction, or poor time management skills. If there is an isolated individual not engaged, there can be numerous reasons including, choice, distracted by a personal manner or even a disability such as poor hearing. The teacher will need to determine how to re-engage the individual. This applies especially to self-directed learning when you find yourself not engaged and actively applying the pillars of learning. Take corrective action to reverse your own lack of engagement in learning.

For those assigned to teach formal courses, there are a number of teaching models for crafting lesson plans and learning activities. The ARCS model (Attention, Relevance, Confidence, Satisfaction) captures the essential components of gaining learner attention, showing topic relevance, instilling confidence in the learner, and allowing for satisfaction of accomplishment. The ARCS model is provided in greater detail in Appendix 3 for those tasked with delivering learning activities.

Tips for Unit Leaders

Both formal and informal learning occurs at the small-unit or team level. Leaders first must shape their thinking about how they interact with their people as learners, then consider the goals of all learning (learning outcomes, not just content or objective specific learning), and finally consider standards of instructional morals, ethics, and professionalism. At our disposal are specific skills or best practices which enable us to tend to all the learners within the environment and climate we create, in ways that keep them engaged

on the task and focused on the learning. When adult learners are engaged and focused, they are less likely to be distracted or interrupt the learning of others. Here is a checklist of best practices:

- ❑ **Serve as a Good Role Model.** A leader has considerable influence on the student's motivation, thru the example given. Show them the proper way to complete a task, wear a uniform, or treat learners in order to PRACTICE WHAT YOU PREACH.

- ❑ **First Impressions and Command Presence.** As a leader you have one opportunity to give a first impression to the learner. This can be completed by being early, organized, prepared, focused, presentable, and engaging to the learners as they arrive. The leader's command presence sets the tone for the class environment and demonstrates leading from the front. As a leader, it is okay to not know an answer to a learners question, and needs to be properly addressed and followed up on. *For example: "That is a great question, I don't know the answer and I will find out and get back to you".* It is imperative that this is followed up on. Demonstrate confidence without arrogance and remember, when in charge, be in charge.

- ❑ **Time Management.** Manage the time available against the time needed for various learning tasks. Mismanagement of time is critical for the impact it leaves on the learners and possibly the teacher to follow. Start on time and end a few minutes early.

- ❑ **Smoothness.** Keeping lesson presentation or execution moving smoothly and seamlessly through well-orchestrated transitions so that learners are not abruptly directed from one element or activity to the next. This minimizes distracting or disturbing incidents and keeps learners engaged and focused. For example, smoothness encompasses transitions between slides in a presentation,

concepts in a lecture, and movement from one stand to the next during a staff ride.

- ❑ **Classroom Structure.** Avoid time-wasting through well planned classroom structures that prompt learners to action with minimum required time or communication. These structures may be opening routines in lessons, or field routines such as the conduct of operations briefs. *For example: The leader may give the order "Conference Group Leaders, take charge of your group, see you all at Stand 3 at 1300."*

- ❑ **Group Alerting.** Using effective systems for gaining attention and clarifying expectations without unnecessary and time consuming direction and explanation.

  Example #1: Show an instructions slide on screen in a lecture classroom that prompts learners to begin work on a warm-up problem while they are taking their seats.

  Example #2: On a staff ride, gather the whole class into large-group sessions in the field before breaking into small groups for discussion, then reform occasionally as a large group by alerting the group to established times and locations for large-group sessions.

- ❑ **Momentum.** A lesson should gain and maintain momentum to help keep learners on track. Move at the right pace for learners without wearing them down. Plan for sustained learning throughout the day or night, but sense when it's time to take a break.

- ❑ **Satiation Avoidance.** See to it that learners are not overexposed to a particular subject as they will eventually become "full" and need to move onto another topic or activity. A good rule of thumb is about 20 minutes to a topic after which a break is in order or a smooth transition to a new topic.

- ❑ **Audience Awareness.** Leaders of learning need to know what is going on in all parts of the learning environment at all times. This situational awareness is essential to detecting learners with questions, unmet needs, or those slipping from engagement in the task or slipping in focus on the learning. Reading the audience helps feed this awareness, knowing which learners are engaged or when the group is approaching satiation. Eye contact, body language, and tone of voice from learner responses all provide input beyond just what teachers see across the whole of the classroom. For example:
  The "aware" leader notices that several learners are puzzled by the last example used; or some learners in the back have tuned out and are staring into space; or one is always on their cell phone. The leader then takes action to get learners back on track, such as changing location or position of the classroom in order to focus on a map or a terrain model.

- ❑ **Overlapping.** Leaders that manage their learning environments effectively are able to attend to two or more events simultaneously. Prevention and reaction to misbehavior takes constant focus on the learners, the learning environment and the curriculum to be instructed all while facilitating the lesson so as to keep learners engaged and focused. A leader presenting a concept is capable of answering a learner's question while moving through the classroom to non-verbally prompt others to reengage in the lesson is using the overlapping technique.

- ❑ **Attention.** Keeping learners engaged means holding them accountable (being in the moment, alerting them to the exam, and to the operational fireline connection), indicating and making the relevance meaningful to them, and providing them prompts and means to actively take notes. The relevance in particular is essential -- do not underestimate the power of purpose. Tie all instruction back

to the fireline with the life-and-death decisions they will face in the realm of chaos.

- ❑ **Challenge.** Effective leaders challenge their learners with manageable difficulties. Start the lesson with a question, problem, or puzzle that challenges prior knowledge and experience and engages learners immediately. Guided discovery!

- ❑ **Provide Efficient Help.** Give learners a visual alert with any instructions and then when helping individuals; be positive, be brief, and be gone. For example, for a TDG the map graphic and instructions are written on the dry erase board and then read to learners with the scenario. Questions from learners about what is required are directed to the visual alert on the board. Questions from learners on their ideas are given brief positive comments with rapid identified areas for improvement and the teacher quickly moves on— these force learners to engage and not rely on the teacher for extensive assistance.

- ❑ **Adaptive Execution.** Effective leaders are adaptive in their ability to adjust instruction to best support the learners. If learners are approaching satiation on a topic the leader adapts the plan to transition to a new topic while being sure to follow up on the part missed later in the lesson. Adaptive execution is not about changing the curriculum for the needs of the learner, it is about changing the instruction to meet the needs of the learner. Such changes are departures from the norm and may take the form of additional questions to the learners, analogies, examples, in the moment sequencing changes, etc.

- ❑ **Positive Reinforcement.** When learners perform or behave as we expect or desire, provide positive reinforcement such as incentives or appreciative praise. This makes learners more interested in doing the right thing. In essence, we need to "catch" adult learners "being good."

- ❑ **Give Recognition.** When students do something worthy of recognition, leaders need to give positive feedback to the student. Such recognition makes the student feel alive, important, and significant.

- ❑ **Stimulate Cooperation Among Students.** Modern society places a lot of emphasis on competition. While competition with the self can lead to improved performance as students strive to do their best, competition against others can result in negative perceptions of the self especially if it isolates a person. With cooperation, everyone can experience the success of the group, and no one is viewed as the winner or loser.

- ❑ **Consider Mastery Learning.** Mastery is defined in terms of a specific set of major objectives that students are expected to exhibit by subject completion. Using this approach, a learner's performance is measured against objectives rather than against the performance of other students. Students learn at different rates, therefore the teacher sets expectations for each individual. This allows time for learning to vary, so all or almost all students achieve the desired level of mastery.

- ❑ **Have High but Reasonable Expectations for Learners.** There is a considerable amount of research that suggests that learners perform up to the expectations that leaders have for them. Learners grow, flourish, and develop better in a relationship with someone who projects an inherent trust and belief in their capacity to become what they have the potential to become.

- ❑ **Recognize Potential in Students.** Behavioral scientists have concluded that human's function at 10 percent or less of their potential. Negative views of self certainly stand in the way of releasing the potential of learners.

- ❑ **Provide Examples and Analogies.** Providing a variety of

examples and analogies when teaching concepts or skills will help solidify the key elements of the material and can further motivate students to learn. *"The strength of the pack is the wolf, and the strength of the wolf is the pack."* Metaphors matter because they are memorable. Alliteration helps too.

- ❑ **Recognize Individual Differences.** Some people learn at a slower pace than others, and some require different stimuli to become motivated to learn. The leader must establish an effective student-teacher trust relationship. It is important that the teacher does not create barriers, but builds a rapport with the students, and shows empathy and genuine concern for their learning.

- ❑ **Provide Feedback through Active Listening.** Learner performance improves when the leader provides meaningful feedback on performance. Provide written comments on student assignments about the strengths and weaknesses of the ideas and concepts. But be cautious with praise for if it is used too often, or inappropriately, it can have a negative effect on the motivation of adult learners. Timely and constructive comments about performance provide recognition of their efforts and help to correct errors. Used appropriately, feedback should specify clearly the action being reinforced and should be believable.
  Examples:

  "Good point!" "Outstanding!"

  "So based on that direction from you Mary, this is what I would do… What would you do Joe?"

  "Bill, that's a good idea! Let's discuss what might happen if you implemented that concept."

  "Thanks Jim, that reminds me that we should always think about second and third order effects. Can anyone think of

any unintended consequences that might occur after that decision."

"Tell me more about that."

"I like that, thank you! What are the risks?"

Framework for Learning Summary

Despite our attempts to reduce learning into a predictable process, the entire framework for learning is a chaotic environment which is difficult to predict. The smallest changes or actions can have the most profound consequences. As a leader in wildland fire, you are well-prepared to thrive in this environment, YOU make a difference.

Within the core values and principles for the wildland fire service, the integrity to know yourself and seek self improvement, seek responsibility and take responsibility for your actions, and set the example, all seem so easy to understand that many don't give it enough thought. Start thinking about that. ***Inquire*** about that. Integrity has everything to do with establishing a framework for learning within yourself and within your organization.

As a leader and a lifelong learner, you have a ***duty*** to ***respect*** yourself and your sisters and brothers in the wildland fire service by working together to build up your individual and collective ***integrity.*** This publication may help you find ***opportunities*** to ***dialog*** and employ this framework to build a learning organization that does just that.

If you are assigned to teach a formal course, or just have an interest in more details about how people learn and some of the theory behind it, the Appendixes provide some in-depth background information to stimulate your inquiry.

Notes

Appendixes

Appendix 1 - Learning Domains

Appendix 2 - Instructional Systems Design

Appendix 3 - ARCS Model

Appendix 1 - Learning Domains

Learning objectives are categorized into three domains or general areas: cognitive, affective, and psychomotor. The domains and levels of learning are extremely useful in designing education and training experiences.

Cognitive Domain

Cognitive learning is demonstrated by recall of knowledge and other intellectual skills such as applying knowledge in a new situation, displaying comprehension of information, problem solving, organizing information, analyzing, synthesizing, and evaluating ideas or actions. The lower levels of this domain require a student to recall, comprehend, or apply knowledge. In the higher levels, students must analyze, synthesize or evaluate. The table below provides definitions and examples of the behavior for each level of the cognitive domain.

COGNITIVE DOMAIN		
Level	**Type of Learning**	**Definitions and Examples of Behavior**
6	**Evaluation**	Making judgments about the value of ideas, works, solutions, methods, materials, etc. Judgments may be either quantitative or qualitative. **Examples:** To argue, to decide, to compare, to consider, to contrast.
5	**Synthesis**	Putting together elements and parts to form a new whole. **Examples:** To write, to produce, to plan, to design, to derive, to combine.
4	**Analysis**	Breaking down material or ideas into their constituent parts and detecting the relationship of the parts and the way they are arranged. **Examples:** To distinguish, to detect, to employ, to restructure, to classify.
3	**Application**	Knowing an abstraction well enough to apply it without being prompted or without having been shown how to use it. **Examples:** To generalize, to develop, to employ, to transfer.
2	**Comprehension**	Understanding the literal message contained in a communication. **Examples:** To transform, to paraphrase, to interpret, to reorder, to infer, to conclude.
1	**Knowledge**	Remembering an idea, material, or phenomenon in a form very close to that in which it was originally encountered. **Examples:** To recall, to recognize, to acquire, to identify.

Adapted from Taxonomy of Education Objectives: Handbook I: Cognitive Domain (pp. 201-207), by B.S. Bloom (Ed.), M.D. Englehart, E.J. Furst, and D.R. Krathwohl, 1956, New York: David McKay Co.

Affective Domain

Objectives written in this domain are intended to change attitudes that affect behavior. The affective domain of learning deals with learning objectives on an emotional level, to include feelings, appreciation, enthusiasm, attitudes, and motivation. This table provides definitions and examples of the behavior for each level of the affective domain:

AFFECTIVE DOMAIN		
Level	**Type of Learning**	**Definitions and Examples of Behavior**
5	**Characterization by Value or Value Set**	Acts consistently in accordance with the values he or she has internalized. **Examples:** To revise, to require, to be rated high in the value, to avoid, to resist, to manage, to resolve.
4	**Organization**	Relates the value to those already held and brings it into a harmonious and internally consistent philosophy. **Examples:** To discuss, to theorize, to formulate, to balance, to examine.
3	**Valuing**	Willing to be perceived by others as valuing certain ideas, materials, or phenomena. **Examples:** To increase measured proficiency in, to relinquish, to subsidize, to support, to debate.
2	**Responding**	Committed in some small measure to the ideas, materials, or phenomena involved by actively responding to them. **Examples:** To comply with, to follow, to commend, to volunteer, to spend leisure time in, to acclaim.
1	**Receiving**	Being aware of or sensitive to the existence of certain ideas, material, or phenomena and being willing to tolerate them. **Examples:** To differentiate, to accept, to listen (for), to respond to.

Adapted from Taxonomy of Education Objectives: Handbook II: Affective Domain (pp. 176- 185), by D.R. Krathwohl, B.S. Bloom, and B.B. Masia, 1964, New York: David McKay Co.

Understanding domains can help instructors and curriculum developers in writing learning objectives, selecting test questions, developing lesson materials, choosing instructional methods, and most importantly understanding how people learn.

Psychomotor Domain

The psychomotor domain includes physical movement, coordination, and mental skills such as speaking. This is the domain in which most firefighting training objectives occur. Objectives in this domain require physical action. Some psychomotor skills are inherently more complex than others. An example is conducting firing operations, a skill that requires more thought and planning for success than digging line with a shovel. The table below provides definitions and examples of the behavior for each level of the psychomotor domain.

PSYCHOMOTOR DOMAIN		
Level	**Type of Learning**	**Definitions and Examples of Behavior**
7	**Origination**	The ability to develop an original skill that replaces the skill as initially learned. **Examples:** Create, design, originate, arrange, compose, construct.
6	**Adaptation**	Can modify motor skills to fit a new situation. **Examples:** Adapt, change, modify, revise, alter, rearrange.
5	**Complex Overt Response**	The ability to perform the complete psychomotor skill correctly. **Examples:** Carry out, operate, perform.
4	**Mechanism**	The ability to perform a complex motor skill; the intermediate stage of learning a complex skill **Examples:** Attempt, imitate, try, assemble, build, construct, dismantle, disassemble, display, fasten, fix, mend, organize, work.
3	**Guided Response**	The early stage of learning a complex skill: includes imitation; can complete the steps involved in the skill as directed. **Examples:** Attempt, imitate, try, assemble, build, construct, dismantle, disassemble, display, fasten, fix, mend, organize, work.
2	**Set**	The readiness to act; requires the learner to demonstrate an awareness or knowledge of the behaviors needed to carry out the skill. **Examples:** Assume a position, demonstrate, show, display, move, respond, start.
1	**Perception**	The ability to use sensory cues to guide physical activity. **Examples:** Distinguish, identify, select, choose, describe, detect, isolate.

Adapted from The Classification of Educational Objectives in the Psychomotor Domain: The Psychomotor Domain. Vol. 3. Washington, DC: Gryphon House.

People learn in different ways. The term "learning styles" refers to an individual's preferred way of gathering, interpreting, organizing, and thinking about information. Some students need to see the information on a chart, screen, or paper; others may need to hear it

explained or discussed; and many need to perform tasks themselves in order to learn.

Three common learning preferences or styles:

1. Visual Learners. Visual learners tend to learn better when they see the subject matter to be learned. They like to learn with photos, diagrams, charts, physical objects, or demonstrations. To teach a visual learner how to swim, do a demonstration or use a video.

2. Auditory Learners. Auditory learners tend to learn best when they hear the subject matter to be learned. To teach an auditory learner how to swim, give verbal instructions prior to getting in the pool.

3. Kinesthetic Learners. Kinesthetic learners tend to learn better by performing the new task. Although they may benefit from other methods, they learn best when they perform a task. When teaching a kinesthetic.

Learning experiences that provide opportunities for all three styles are most effective.

Appendix 2 - Instructional Systems Design

The Instructional Systems Design process is made up of five distinct phases, each serving a specific purpose. The five phases are Analyze, Design, Develop, Implement, and Evaluate (ADDIE). Each of these phases involves inputs, a process, and outputs. The successive phases of the process build upon the outcomes of the previous phases. Evaluation is continuous throughout all processes, gathering assessment and making necessary corrections.

This process is for implementation by the developers of formal courses throughout the wildland fire community. The process elements described here are guidance which require judgment in application. Do not let the process become the focus of learning; focus on the learning done by the students. If parts of the process are helpful to you, that's why they're here.

Analyze

The purpose of the Analyze Phase is to accurately determine what the firefighter must know and do on-the-job. Job Analysis is done through a systematic research process called the Front-End Analysis (FEA) to collect, collate, and report job performance data. Task analysis is accomplished by convening a Subject Matter Expert (SME) conference. This conference, attended by representatives from the National Interagency Fire Center, Wildland Fire Lessons Learned Center, and the Geographic Area Training Representatives (GATR), reviews the results of the FEA and produces a description of learning objectives and training standards. SMEs then determine the instructional setting for each task and finally produce the draft Target Population Description (TPD).

Design

During the Design Phase, the framework for instructional and assessment strategies is created by using the service-level learning outcomes developed during the Analyze Phase to guide the creation

of course and subordinate learning outcomes in addition to the conduct of a systematic process called a Learning Analysis. The output is the documentation of the learning institution competencies within an initial course framework. The main processes of the Design Phase are:

- Write a Target Population Description (TPD)
- Determine Course Learning Outcome
- Conduct a Learning Analysis
- Sequence Learning Objectives (LO)
- Determine Subordinate Learning Outcomes
- Determine Assessment Instruments for Learning Outcomes

Target audience: Curriculum developers and Academic faculty.

Develop

During the Develop Phase, developers complete the structure for the course, capture resource requirements, document the instructional system, and prepare materials necessary to conduct instruction. The output is the Program of Instruction (POI) and associated Master Lesson Files (MLFs). The main processes of the Develop Phase are:

- Develop a course structure and schedule
- Develop a concept card
- Develop a POI
- Conduct a Risk Assessment
- Develop lesson materials
- Construct assessments
- Construct Tests
- Conduct Validation
- Assemble a MLF

Target audience: Curriculum developers and Academic faculty.

Implement

During the Implement Phase, academic faculty prepare the learning environment, facilitate and evaluate learning, and conduct after lesson management. The output is learner mastery of behaviors and progress towards mental associations, graduates better prepared for

operational demands, and course data. The main processes of the Implement Phase are:

- Prepare for facilitation
- Establish a learning environment
- Deliver instruction
- Instructional Strategies, Tactics, and Techniques
- Assess effectiveness of instruction
- After lesson management

Target audience: Teaching faculty (instructors).

Evaluate

During the Evaluate Phase, evaluation is used to ensure that instructional systems are current, relevant, effective, and efficient to meet the demands of training readiness. The Evaluation Phase is integrated with ongoing revisions throughout each element of the Instructional System Design process and continues throughout the lifecycle of the instructional system. The output is a summary of findings and change recommendations to any aspect of the instructional system (such as learning structures, faculty development, resourcing, and Standing Operating Procedures (SOP)). The main processes of the Evaluate Phase are:

- Plan evaluation
- Conduct evaluation
- Analyze, Interpret, and Summarize data
- Manage data
- Course Content Review Board (CCRB)
- Course Evaluation Plan.

Target audience: Curriculum developers and Academic faculty.

Appendix 3 - ARCS

Attention, Relevance, Confidence, Satisfaction

John Keller's ARCS Model of motivation can be perceived as a learner centric approach to designing learning activities at any level. The components are Attention, Relevance, Confidence, and Satisfaction

Attention can be obtained either by perceptual arousal or by inquiry arousal. In the case of perceptual arousal, the learners' attention would be gained by surprise, doubt or disbelief. For inquiry arousal, the learners' curiosity would be stimulated by challenging problems that needed to be solved. In order to grab and hold learners' attention, a variety of methods could be employed, including active participation, humor, conflict, or emotional reaction to real world examples.

Relevance is the key to having motivated learners. Learning activities should establish connections between the new information presented and what they already know. To accomplish this use analogies or stories to which the learner can relate such as previous experience, future usefulness, or models of success.

Confidence can be instilled in learners by helping them to believe that they can succeed. If learners feel as though they won't be able to accomplish their goals, then this will reduce their motivation. Ways to support the learners' level of confidence include communicating objectives and prerequisites, providing feedback, and giving learners some degree of control over the learning process.

Satisfaction is the last component of Keller's ARCS Model. There is a direct link between satisfaction and level of motivation, either intrinsic or extrinsic…learners should be recognized and have a sense of achievement at the completion of the learning activity, as well as be aware of ways to apply their newly acquired knowledge or skill immediately in their environment.