



S-112 Unit 10: Procedural Sizeup

Summary

This unit reviews the procedural sizeup process to determine tree complexity and make a Go/No-Go decision that was covered in the online portion of the S-112 Introduction to Chainsaw Operations training course.

Incident Position Description (IPD) Alignment

This unit aligns with the following Basic Faller (FAL3) IPD-specific duties located at <https://www.nwcg.gov/positions/basic-faller/incident-position-description>:

- Implements saw related objectives, priorities, and work assignments as directed.
- Able to develop and safely execute a cut plan to resolve low complexity saw operations using conventional practices.
- Establish and maintain positive communication and coordination with saw teams, your crew, adjoining resources, and supervisors in the work area.
- Learn to recognize changes in operational complexity and report pertinent changes to the appropriate supervisor.

Unit Objectives

Students will be able to:

- Describe the steps of a procedural sizeup.
- Describe how a procedural sizeup is used to determine assignment complexity.
- Determine the complexity of brushing, limbing, bucking, and felling assignments.
- Make Go/No-Go decisions.

Unit at a Glance

Topics	Method	Duration
Unit Introduction	Lecture	2 minutes
Procedural Sizeup Process	Lecture/Video	25 minutes
Human Factors	Discussion	5 minutes
Leans	Lecture	5 minutes
Binds	Lecture	10 minutes

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Topics	Method	Duration
Wedges	Lecture	5 minutes
Sawyer and Swamper Coordination	Lecture/Video	8 minutes
Procedural Sizeup Demonstration	Demonstration	25 minutes
Complexity Activity	Activity/Discussion	45 minutes
Total Unit Duration		130 minutes (2 hours 10 minutes)

Materials

- *NWCG Incident Response Pocket Guide (IRPG)*, PMS 461, <https://www.nwcg.gov/publications/461>
- *NWCG Incident Position Description for Basic Faller*, <https://www.nwcg.gov/positions/basic-faller/incident-position-description>
- *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212, <https://www.nwcg.gov/publications/212>
- Whiteboard or flipchart paper, if available
- NWCG S-112 Course Activity Packet (Activity Packet)
- NWCG S-112 Course Skill Assessment (Skill Assessment)
- Complexity Fade Chart from Chapter 4 – Risk Management, Sizeup, and Complexity of the *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212
- Complexity Chart Reference Tool (passed out to students at the end of the unit to serve as “answers” after completing activities)

Slide 1



- ☐ Tell students this next unit will allow them to review and apply the procedural sizeup process they learned during online training (OLT).

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Objectives

Students will be able to:

- **Describe the steps of a procedural sizeup.**
- **Describe how a procedural sizeup is used to determine assignment complexity.**
- **Determine the complexity of brushing, limbing, bucking, and tree felling assignments.**
- **Make Go/No-Go decisions.**

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- ☐ Review the unit's objectives.

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Procedural Sizeup Process

- **Identify the objective of the cutting operation.**
- **Identify the known hazards of the operation.**
- **Recognize leans or binds that may be present.**
- **Develop an escape plan.**
- **Develop a cutting plan.**
- **Determine complexity.**
- **Make a Go/No-Go decision.**

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- ☐ Tell students that during the OLT, they learned how to perform a procedural sizeup to determine complexity and make a Go/No-Go decision.
- ☐ Tell students that due to the importance of a procedural sizeup, this unit will go into more detail on how to conduct a procedural sizeup correctly and provide them with opportunities to determine complexity and make Go/No-Go decisions.
- ☐ Review each step of the procedural sizeup process with students using the bullets on the slide. Then, move to the next slide to play a video that details the process.

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Purpose: Review the process for conducting a procedural sizeup.

Materials:

- Procedural Sizeup Video

Time: 20 minutes (16 minutes for video, 4 minutes for class debrief)

- ☐ Tell students that now they will rewatch the video on how to perform a procedural sizeup.
- ☐ Play the video.
- ☐ Pause the video at key points to discuss important concepts or points. This ensures students stay engaged and are prepared for active participation.
- ☐ Perform a debrief of the video by asking questions that confirm students' understanding of the entire procedure.
- ☐ Remind students to perform a procedural sizeup before each cutting operation.
- ☐ Tell students that they will next learn about some factors that can impact a procedural sizeup, including human factors, leans, binds, and wedges.

Slide 5

Human Factors Discussion

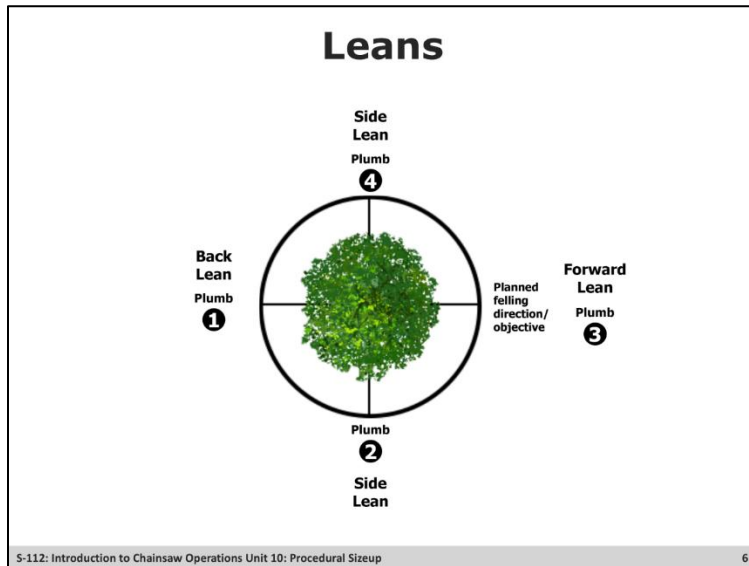
- **How do human factors impact your decision making?**

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- ☐ Tie in the human factors video that students watched in the OLT.
 - For example, now that we've gone through the technical side of a procedural sizeup, let's take a moment to discuss how human factors should be incorporated into the process.
- ☐ Tell students that human factors play a major influence on their decision-making process and need to be considered when conducting a procedural sizeup.
- ☐ Have a facilitated discussion around the question on the slide: "How do human factors impact your decision making?"

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- ☐ Tell students that they will need to consider leans when conducting a procedural sizeup since leans provide critical insight into the forces influencing felling.
- ☐ Tell students that lean is the degree to which the top of the tree deviates from the center. The natural lean is where a tree would land if it fell over on its own. This helps identify the “good side” and “bad side” of the tree.
- ☐ Explain that lean is often expressed in the number of inches or feet away from the hinge of the tree. To calculate the lean of a standing tree:
 - Imagine two lines drawn through a circle around a tree. The first divides the circle in half from the planned undercut (the undercut will be used in place of other terms such as face cut, gunning cut, open-face cut, and Humboldt) through the backcut.
 - Plumbing along the first line will determine side lean. Ideally, trees should be plumbed from a distance of at least half the tree’s height.
 - The second line is through the center of the tree perpendicular to the first line.
 - Plumbing along the second line will determine forward or back lean. Some leans may not be detected until you are at a right angle to them.
 - Simple leans can be determined by plumbing one side of each line, but more complex leans may need to be plumbed from all four sides of the tree.
- ☐ Explain that failure to properly plumb a tree as part of a procedural sizeup has led to numerous unintended outcomes, including accidents and injuries. Slopes, limbs, tree anatomy, and adjacent trees can give false vertical references that a plumb bob will more accurately assess. A plumb bob is simply a weight, such as a sparkplug or two bar nuts, tied to a string.

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- ❑ Explain that other factors influencing lean include:
 - Limb weight, which could favor one side or another.
 - Multiple stems or large hardwood canopies.
 - Tree sweep is when the bole curves and straightens further up the tree.

Slide 7

Binds

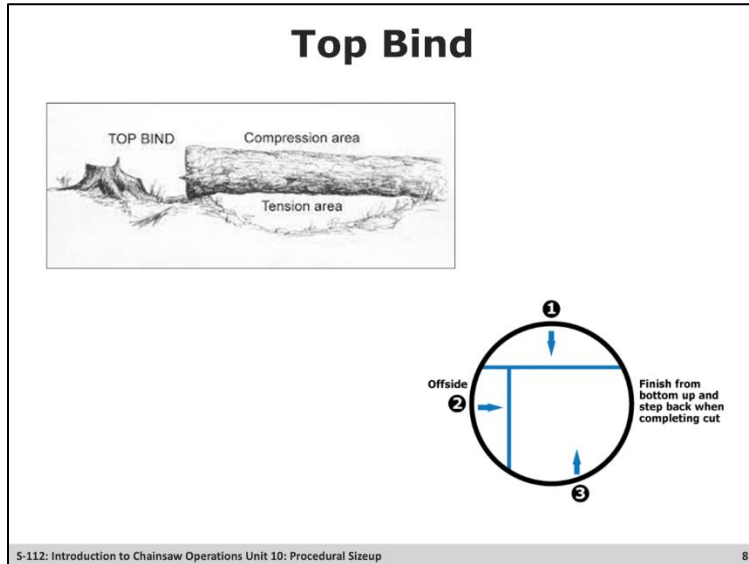


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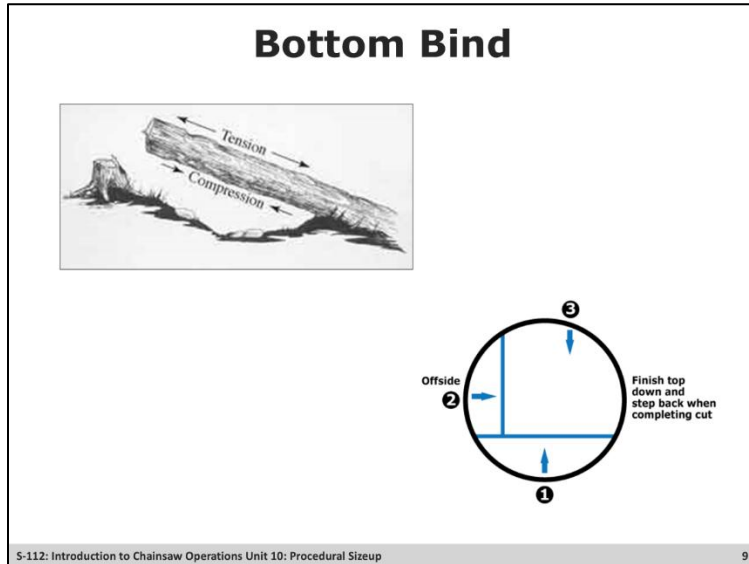
- ☐ Tell students that they will also need to consider binds when conducting a procedural sizeup.
- ☐ Tell students that the bind is the area where the compression is on the log and that understanding directional pressures is important for safe and efficient cutting. Binds can be caused by landforms, stumps, blowdowns, and other obstacles that prevent a log from lying flat.
- ☐ Explain that a log can have different types of binds at different places, including top, bottom, side, and end. Normally, logs have a combination of two or more binds.
- ☐ Inform students that when bucking, they should cut slowly and observe the kerf for movement that will indicate where the bind is. Binds can also change with log movement, so they should always reevaluate for binds after each section of the log is removed.
- ☐ Tell students that the location of the bind will impact where they should position their body when cutting the log. A demonstration of this will be provided during the field day.

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- ☐ Ensure students know that a top bind occurs when the tension area is on the bottom of the log. This creates a compression area on the top of the log.
- ☐ Explain to students that when experiencing a top bind, cut the offside first, then make a partial cut on the compression side (top), finishing from the bottom and cutting upwards.

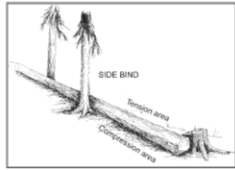
Slide 9



- ☐ Explain to students that a bottom bind occurs when the tension area is on the top of the log. This creates a compression area on the bottom of the log.
- ☐ Tell students that when experiencing a bottom bind, cut the offside first, then make a partial cut on the compression side (bottom), and finish with the release cut on the top of the log.

Slide 10

Side Bind



- **Remove a pie-shaped section from the compression area, then make the release cut in the tension area.**

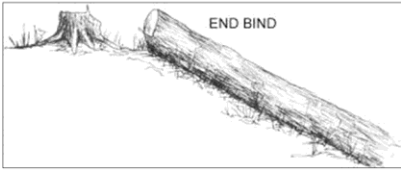
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- ☐ Explain to students that a side bind occurs when pressure is exerted sideways on the log. When experiencing a side bind, do not cut if you are not certain the job is safe. Normally, the offside is the side with tension; the tension side is usually bowed out (convex). Look for solid trees with no overhead hazards and objects you can stand behind for protection while cutting.
- ☐ Tell students that when experiencing a side bind, remove a pie-shaped section from the compression area, then make the release cut in the tension area.

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End Bind



- **Cut from the top down and insert a wedge as soon as possible. Finish by cutting down from the top.**

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- ☐ Explain to students that an end bind occurs when weight compresses the log's entire cross-section.
- ☐ Tell students that when experiencing an end bind, cut from the top down and insert a wedge as soon as possible. Finish by cutting down from the top. Watch the wood chips to ensure the chain is not cutting into the dirt (look for dark-colored or bark-colored chips).

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Wedges



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- ☐ Tell students that since a wedge is important, especially in felling trees, they need to be considered when conducting a procedural sizeup since they will impact their escape plan and tree complexity.
- ☐ Explain that sawyers use wedges during bucking operations to manage compression and prevent the saw from becoming pinched or stuck in the kerf.
- ☐ Explain that sawyers also use wedges during felling operations to lift the back of the tree and redistribute the center weight into the undercut. Sawyers can also use wedges to support the hinge on trees with heavy side leans.
- ☐ Explain that when properly placed, wedges help keep the tree from pinching the chainsaw bar and help the tree fall in the intended direction.
- ☐ Explain to students that deciding which wedges to bring is based on the fuel type and size of the trees.
- ☐ Inform students that the *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212, contains more information on wedges. Students should have a chance to practice using wedges in the field exercises.

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Sawyer and Swamper Coordination



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- ☐ Tell students that saw teams usually consist of a sawyer and swamper working together.
- ☐ Explain the responsibilities of the sawyer (from the *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212):
 - Discuss the brushing, limbing, and bucking plan with the swamper.
 - Maintain awareness of the location and proximity of the swamper.
 - Develop a process with the swamper to safely remove cut material.
 - Cut material to facilitate safe and efficient removal.
 - Maintain cutting area control.
 - Develop a process to maintain situational awareness.
- ☐ Emphasize that the sawyer is in charge of the work area and stress the importance of communication, especially after a hazard has been identified.
- ☐ Discuss hand signals:
 - Stop (fist in the air), turn off saw (cut across throat motion), look (two fingers from eyes to where they want someone to look), all good (thumbs up), come around (finger in a circle like a lasso), overhead hazard (tap top of helmet), loose chain (hold arm out and pull sleeve down or draw arc with other arm), and swamper tapping sawyer on the shoulder to get attention.
 - Remember: when someone taps you, turn your head, not your saw.

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- ☐ Explain the responsibilities of the swamper (from the *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212):
 - Discuss the brushing, limbing, and bucking plan with the sawyer.
 - Ensure the sawyer is aware of the swamper's presence when working in the cutting area within reach of the sawyer.
 - Do not approach unless the sawyer indicates that you can.
 - Never push or pull on material while the sawyer is cutting it.
 - Help to identify hazards and maintain situational awareness.
 - Ensure other crew members do not directly approach the sawyer but rather approach the swamper, which will get the sawyer's attention.
- ☐ Remind students that it is easy to become mission-focused when operating a chainsaw and lose sight of the "big picture."
- ☐ Play the Sawyer and Swamper video for students.
 - Depending on the audience and time, you may show all or a portion of the video.
 - Tell students that some of the terminology from this video may no longer be relevant (e.g., blood bubble), but the information is still relevant.
- ☐ After the video plays, ask the students if they have any questions.

Slide 14

Procedural Sizeup Demonstration

- **Identify the objective of the cutting operation.**
- **Identify the known hazards of the operation.**
- **Recognize leans or binds that may be present.**
- **Develop an escape plan.**
- **Develop a cutting plan.**
- **Determine complexity.**
- **Make a Go/No-Go decision.**

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Purpose: View a demonstration of the procedural sizeup process.

Materials:

- *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212, <https://www.nwcg.gov/publications/212>

Time: 25 minutes (20 minutes for demonstration, 5 minutes for class debrief)

Instructions:

- ☐ Tell students that everyone will go outside to view a demonstration (by the instructor) on how to conduct a procedural sizeup.
- ☐ Bring the class outside and identify an object that can be used to conduct a procedural sizeup. This can be a tree or any other structure like a tree (e.g., lamp post, utility pole, support column).
- ☐ Ensure all students have a clear view of your demonstration.
- ☐ Walk students through each step as you perform a procedural sizeup.
- ☐ Ask students if they have any questions after you complete the procedural sizeup.
- ☐ After returning to the classroom, do a quick recall activity by having a different student describe each step of the procedural sizeup.

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Complexity Activity Overview

- Evaluate your group's assigned illustrations.
- Prepare to report out the following:
 - What are the considerations of the procedural sizeup?
 - What is the assignment's complexity?
 - What are considerations for work area and cutting area control?

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Purpose: Provide students with an opportunity to perform a procedural sizeup, determine complexity, make a Go/No-Go decision, and develop a plan for establishing and maintaining control of brushing, limbing, and bucking assignments.

Materials:

- NWCG Standards for Wildland Fire Chainsaw Operations, PMS 212, <https://www.nwcg.gov/publications/212>
- Complexity Fade Chart from Chapter 4 – Risk Management, Sizeup, and Complexity of the NWCG Standards for Wildland Fire Chainsaw Operations, PMS 212
- Complexity illustrations (printed on 8.5 x 11" paper in full color and laminated)
- Unit 10 Instructions in Activity Packet
- Whiteboard or flipchart paper, if available
- Complexity Chart Reference Tool (passed out to students at the end of the unit to serve as "answers" after completing activities)

Time: 45 minutes (Prepare: 5 minutes, Group Work: 20 minutes, Debrief: 20 minutes)

Instructor Directions:

- ☐ Divide the class into three or four groups.
- ☐ Distribute the complexity illustrations among the groups.
- ☐ Give each table group two to three illustrations to evaluate.
- ☐ If the complexity illustrations are not printed, have students refer to the illustrations in the Activity Packet and assign each group the illustrations to evaluate.
- ☐ Tell students they will have 20 minutes to complete the group activity.
- ☐ Send students to their breakout areas.

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- ☐ Remind students to refer to the Complexity Fade Chart in the *NWCG Standards for Wildland Fire Chainsaw Operations*, PMS 212.

Coach Directions:

- ☐ Once in the breakout room or area, select a volunteer to be the spokesperson for the group.
- ☐ Tell students to review their assigned illustrations in their Activity Packet.
- ☐ Tell students to answer the following questions for each assigned illustration and be prepared to provide a 2-minute brief out the following:
 - What are the considerations of the procedural sizeup?
 - What is the assignment's complexity?
 - What are considerations for work area and cutting area control?
- ☐ Tell students to capture their answers on a whiteboard or flipchart, if available.
- ☐ Observe where students get stuck and assist them where needed.
- ☐ After students complete the steps for one illustration, tell them to repeat those steps for the remaining illustrations.
- ☐ After students complete all illustrations, ask them to describe the steps they should take to troubleshoot when the chain is thrown off the guide bar.
- ☐ At the end of 20 minutes, have students return to the primary classroom to provide their answers to the whole class.

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Complexity Activity Debrief

- **Report out the following:**
 - **What are the considerations of the procedural sizeup?**
 - **What is the assignment's complexity?**
 - **What are considerations for work area and cutting area control?**

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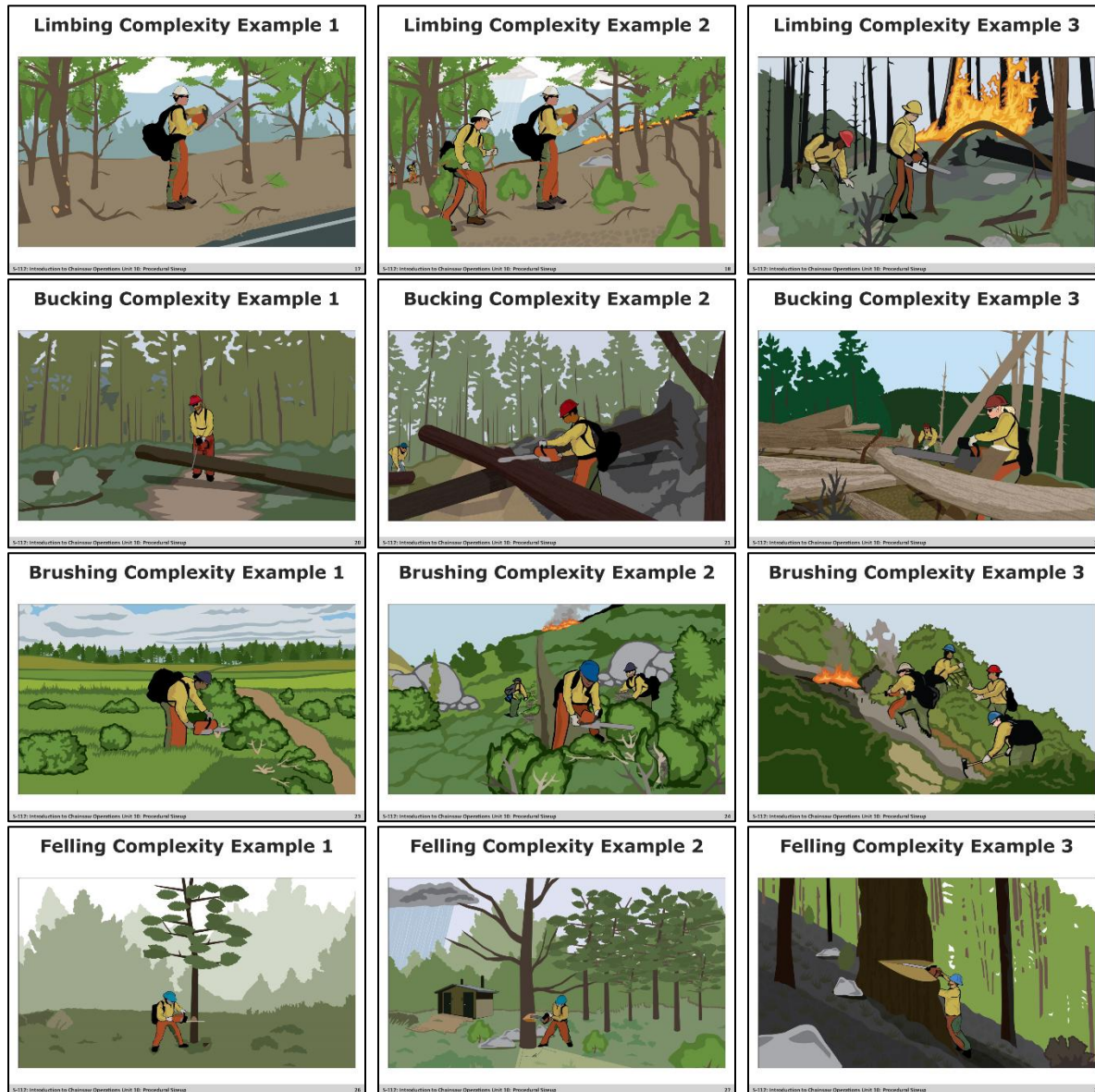
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Instructor Directions:

- ☐ During the debrief, show an illustration that was evaluated on the projection screen.
- ☐ Have the group assigned to that particular illustration report out (about 2 minutes per illustration).
- ☐ Have the spokesperson present answers for the assigned illustration.
- ☐ When appropriate, integrate additional questions during the debriefs to allow students to apply other concepts discussed in this unit. For example, ask each group one of the following questions:
 - Where would you position your swamper(s) during the operation?
 - What communication methods or hand signals would you use?
 - What would you do in the event of a medical incident?
- ☐ Summarize the positives and share opportunities for improvement.
- ☐ After the first group reports, show the next illustration that was distributed and have the next group do the same.

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- ☐ These illustrations, which can be found in the Complexity Analysis Tool, may be displayed while students are debriefing.

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- ☐ Answer any final questions students may have regarding this unit.