



Lesson 2: Get Ready (Home Preparedness) Defensible Space & Home Hardening

Guiding Question: How can we get our home and property fire-ready?

Goals:

- To give students an introduction to wildfire preparedness.
- To give students agency in wildfire preparedness by building knowledge they can communicate to their families.

Objectives:

Students will be able to:

- 1) Explain defensible space by describing the priorities for each Home Ignition Zone.
- 2) Make recommendations to improve a structure’s likelihood of surviving a wildfire.

Materials and Preparation:

- Print a defensible space worksheet for each student. (Last page of the lesson plan.)
[Full Wildland Fire Junior Ranger Book](#)
- Prepare PowerPoint for *Lesson 2: Get Ready (Home Preparedness)*

Subjects: Writing, Speaking and Listening

Duration: 60 minutes

Setting: Classroom

Vocabulary:
The North Winds, Embers, Ladder Fuel, Defensible Space, Home Hardening, Home Ignition Zones

Standards:		
NGSS	Crosscutting Concepts	Scale, Proportion, and Quantity Structure and Function
	Science and Engineering Practices	Developing and Using Models Engaging in argument from evidence
	Disciplinary Core Ideas	ESS3.B Natural Hazards
Environmental Principles and Concepts		Principle 3: Natural systems change in ways that people can benefit from and can influence.

Lesson Overview:

This lesson is the beginning of the series on wildfire preparedness. These topics may be more difficult for students to discuss, especially students who have experienced a personal loss or community trauma from wildfire. It is recommended to review the class Ground Rules and remind students that discussion will be steered towards actions that can be taken in the future. Reiterate that everyone has a unique experience or feeling about fire, but discussion will be kept more general. Students are encouraged to show a signal if they would like to step outside or take a break and it is okay to choose not to share during discussion.

Students are a key component of the social and cultural shift that is needed to live with fire and drive behavior change. The purpose of this lesson is to give students knowledge about achievable actions they can communicate to their families about defensible space and home hardening. Students may not have the ability to make physical changes at home now, but as future adult community members and potential land or homeowners, they are important concepts to be familiar with. Try to focus the lesson on actions that do not require expensive remodels or major landscaping, which could feel unachievable and overwhelming. Families who live in rentals may be limited on the changes they can make to structures and property. It is recommended to refer to houses as “structures” whenever possible and acknowledge that these structures come in many shapes and sizes, including apartments and mobile homes. In a wildfire recovery area, students may be living in vastly different housing situations. Some may be in a new, rebuilt home with sparse or no vegetation on their property, while others are living in an older, surviving home that is surrounded by thick vegetation.

Students can start discussions at home and help with smaller projects such as removing surface fuels and ladder fuels. They can also be valuable observers, pointing out potential hazards and offering suggestions and encouragement to be more fire-safe. The printable handout is another way to support students in starting wildfire preparedness discussions at home.

Ember Blocker Game Description:

This game is an opportunity to end the lesson on a fun note, review key topics, and shake off the seriousness of the lesson with physical movement. Ideally, split the class into two groups to have two games played at the same time with smaller numbers. The game can also be played as a large group.

Materials:

One or more soft balls such as a dodgeball or rubber ball.

An optional orange safety vest for the Ember Blocker.

Have the group form a big circle. One volunteer comes to stand in the middle of the circle and will represent a structure. That student cannot move their feet once in place; they must be stationary like a building. A second volunteer will be the “Ember Blocker” and can move freely around the structure. The rest of the group must stay in the large circle formation and cannot

move in closer once the game begins. Make sure there is at least 10 feet of distance between the structure in the center and the outside circle. The object of the game is for the students in the large circle to hit the structure with the ball. The ball represents an ember. Students in the circle can try and throw the ember directly at the structure or pass to a student in the circle with an open shot. The Ember Blocker can defend the structure by standing between the thrower and hitting away the ball. To avoid injury, students throwing the ball may not throw above chest-height.

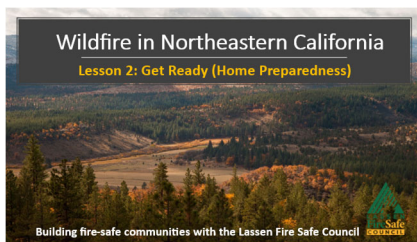
If the structure is hit by an ember, the student who threw the ball must give one way that a structure can be protected from embers either by improving an element of defensible space or home hardening. The thrower then becomes the next Ember Blocker, and the Ember Blocker becomes the structure, creating a rotation of students between the positions. Play until students have sufficiently summarized the lesson's topics or time is up. It is recommended to play for 5-10 minutes.

The activity leader should maintain safety and fair play, while encouraging discussion and appropriate sharing about defensible space and home hardening. Encourage students not to repeat an answer that has already been shared. Ask follow-up questions when appropriate to encourage deeper answers. For extra challenge, multiple embers can be added, and there could be a second Ember Blocker.

At the end of the game, remind students that they can be the Ember Blocker in real life by sharing what they learned with their families and helping by pointing out fire hazards on and around their home.

Procedure:

1. Go through the PowerPoint presentation for *Lesson 2: Get Ready (Home Preparedness)*



The Lassen Fire Safe Council has worked in Lassen County since 2002 in wildfire hazard education, mitigation, and recovery. We are non-profit organization based in Susanville, CA that serves communities across Lassen County. A key part of our community education is working and learning with students and teachers! Thank you for taking the time to participate in this program and bring this important topic into your classroom time. We would like to thank Butte County Fire Safe Council for allowing us to utilize their training material.



Review ground rules. Replace this slide with the picture or new slide of brainstormed expectations or review the paper poster.

"In today's world, there really isn't any one project or agency or landowner that can make a community fire-safe. It takes everyone working towards improving their land and homes for us to truly move towards becoming a fire resilient community."

- Paradise Forest Management Plan (2021)

Ask a student volunteer to read the quote aloud. Class gives a "thumb-o-meter" response to show agreement with the quote. (Thumb up- strongly agree, in the middle-somewhat, thumb down-disagree)

Share thoughts on the statement or reaction.

[The Paradise Forest Management Plan](#) is available as a digital StoryMap on the Butte County Fire Safe Council's website. It contains many topics in the four lessons about forest health, lessons learned, and protecting communities from wildfire. This is a great resource to share with adults.



Students can help at home by educating the rest of the family about today's lesson and contribute to fire-safe projects on their home and property.



Video Length: 2:28

Introductory video from the National Interagency Fire Center about home hardening and ember defense.

Factors that can put structures at risk from a wildfire:

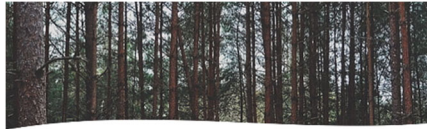
- Windy conditions
- Flying embers
- Dense vegetation and fuels

Today's lesson will look at these factors and what can be done to lessen the risk from wildfire by preparing the space around a structure, and the structure itself.

Wind-driven Fire

- "The North Wind" is a local, seasonal wind that occurs during the late summer and fall months, traveling downslope from the mountains toward the valley.
- Dry wind dries out fuel and increases the air temperature from friction.
- Wind-driven fires produce large amounts of embers.

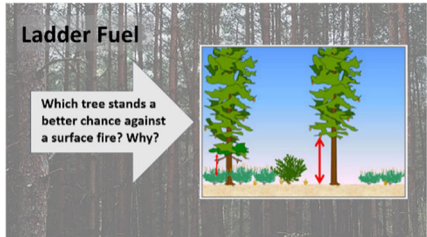
Dry, downslope winds can speed through mountain passes at nearly 100 mph. The North Winds blow from the north and travel down the Sierra Nevada Mountains. Wind is the most critical factor affecting fire behavior.



Fuel-driven Fire

- Supported by dense vegetation.
- Fires can burn as:
 - Surface fires (surface litter and duff)
 - Canopy fires (through the trees)
 - Crown fires (across the tops of trees)
- In urban areas, structures can act as fuel.

Wildfires are much harder to control if they turn into crown fires. Firefighting efforts are focused on keeping fire on the ground where it is easier to defend against and extinguish.



Ladder fuel is fuel that can carry a fire burning in low-growing vegetation up to the taller vegetation. This can move fire up into the canopy and crown where it can quickly spread to surrounding trees. The tree will not survive this fire, whereas it could often survive a surface fire.

The tree on the right does not have ladder fuels around the base. Pruning trees up six to ten feet high and removing brush and ladder fuel are key parts of fire-safe landscaping.

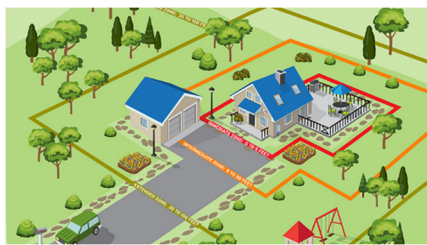


Defensible space addresses the land around your home, while home hardening addresses improving the fire-resistance of the structure itself.



Video Length: 3:30

Join Butte County Fire Safe Council Field Coordinator, Ben TestHart, for a defensible space inspection with one of Butte County's most recognizable residents. Wildfire Ready Raccoon has been working hard to get his property ready, but did he miss anything?



What is defensible space?

Defensible space acts as a buffer between a building and the surrounding vegetation. It is meant to slow or stop the spread of wildfire and protects the structures from direct flame contact and radiant heat. It also reduces the flammable area an ember can land and start a spot fire.

Defensible space is explained through the Home Ignition Zone model that divides a structure's required 100 feet of defensible space into three zones: 0-5, 5-30, and 30-100 or the property line.

Pass out the worksheet about defensible space from the National Park Service Wildland Fire Junior Ranger Activity Book.



Popcorn read aloud the points for each zone from the worksheet.

0-5 feet

- ✓ Make sure gutters, patios, and roofs are clear of dead leaves and pine needles.
- ✓ Remove flammable mulch and vegetation within 5 feet of your home.
- ✓ Use rock mulches or hard surfaces surrounding your home.



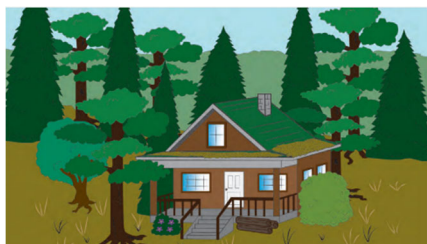
5-30 feet

- ✓ Clear flammable objects (furniture, lawn mowers, wood piles, propane tanks).
- ✓ Remove all dead plants/leaves and weeds.
- ✓ If you have a lawn, keep it watered and mowed to 4 inches or less.
- ✓ Remove tree or shrub branches that overhang within 10 feet of your house, roof, or chimney.



30-100 feet (Or property line. 200 feet if structure is on a steep slope)

- ✓ Remove dead vegetation.
 - ✓ Trim tree limbs 10 feet above the ground.
 - ✓ Create separation between trees and shrubs.
- Trees between 30-60 feet from the home should have at least 12 feet from canopy tops and trees 60-100 feet from the home should have at least 6 feet between canopy tops.



Uh oh, there's a lot of work that needs to be done to make this property fire-safe.

Students write in complete sentences four recommendations to improve the fire safety of the house pictured. Share findings after 5 minutes.

ANSWERS: Clean debris from roof, clear vegetation next to home



Fire-hardened means your home is prepared for wildfire and an ember storm. It does not mean *fireproof*. Home hardening addresses the most vulnerable components of your home with building materials and techniques that increase resistance to heat, flames, and embers that accompany most wildfires.

What parts of a structure should be hardened?

- | | | |
|-----------|-----------------|--------------|
| Roof | Deck/Porch | House Siding |
| Skylights | Patio Furniture | Garage Door |
| Chimney | Flowerbeds | Garbage Cans |
| Windows | Woodpiles | Fencing |
| Vents | Rain Gutters | |

You're the defensible space inspector!

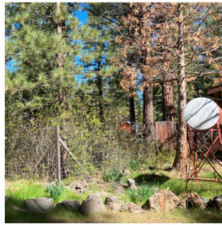
Use your worksheet and learning from the lesson to evaluate the wildfire readiness of the houses on the next 5 slides.



What did they do well?

What needs more work?

Lassen Modoc Unit CAL FIRE, as well as the Lassen Fire Safe Council, can lead voluntary defensible space inspections to make recommendations and help educate people about how to protect their property.



Play "Ember Blocker" outside to review the lesson content. You will need a soft ball like a dodgeball or foam ball. See the lesson plan overview for a game description.

Assessment:

Students write a short paragraph about their thoughts on the importance of creating defensible space and home hardening to prepare for a wildfire. Students can respond to the following questions in their paragraph:

- What are three *home hardening* actions you think are particularly important?
- What are three *defensible space* actions you think are particularly important?
- Is there anything you learned today that you think your family should know about?
- What are some wildfire preparedness actions you think people your age could help with at home?

Evaluation:

	Good	Fair	Poor
Paragraph Response	Students show a strong understanding of wildfire home preparedness topics in their paragraph reflections.	Students show an understanding of wildfire home preparedness topics in their paragraph reflections.	Students do not show an understanding of wildfire home preparedness topics in their paragraph reflections.

Lesson Extension Recommendation:

FireWorks: Northern California Oak Woodlands

M.3.4.A Assessing Your School

<https://www.frames.gov/fireworks/curriculum/norcal-oak-woodlands>