



STEEC Program – WOWEE

Program Name: Defensible Space Mapping

Grade Level(s): 6th grade

Length of Program: 30 – 35 minutes

Program Overview:

By mapping out the different defensible space zones, students will be able to visualize the zones' distances, map them out at their own houses, and understand the requirements within each zone.

Next Generation Science Standards:

- [MS-ESS3-2](#) - Analyze and interpret data to natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
- [MS-ESS3-3](#) – Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Objectives:

Upon completion of this program:

- Students will be able to understand the local concerns and effects of catastrophic events, such as wildfire, in the Lake Tahoe area.
- Students will understand that it is our human responsibility due to urbanization, to minimize our impact on the environment.
- Students will be able to test a developed scientific mitigation, called defensible space, in an activity to help reduce catastrophic wildfire in our community.

Materials:

- Blue flags (4 per house): mark the structure footprint
- 80 red flags (8 flags per group; will not mark Zone 2)
- Defensible space poster - taped onto whiteboard/other display mechanism
- Clipboard (10)
- Pencil (10)
- Worksheet - PDF version (10)

Vocabulary:

- **Land management:** the process of managing the use and development of land resources
- **Fuels:** live or dead vegetation that allows for a fire to grow (shrubs, branches, plants, trees, pinecones, grasses and more)
- **Defensible space:** a fire protection organization term that represents the surrounding area that helps to improve structures' and homes' chance of surviving catastrophic wildfire.
- **Spot fire:** a fire ignited outside of a wildfire area/burn unit as a result of a windborne ember



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Preparation:

- Prior to WOWEE day: visit the site and survey the best location that provides ample space AND some shrubs/small trees that would be removed when placed in Zone 0
- Set up 10 different house set ups for students (adjust count of houses depending on location area and class size)
- Prepare clipboards with pencil and paper, one prepared clipboard per house foundation

Procedure:

1. **Introduction:** (0-0:05)

Introduce yourself, your organization, and the topic of the station: Defensible Space. To build background, ask students if fire is good or bad? “What are examples of each? Fire is a natural cause occurring from more than 200 hundred years ago and would happen in Lake Tahoe every 5-15 years, helping the ecosystem bring the forest back to a natural healthier state.”

Ask students “what occurs now that we live here in the urban setting of Lake Tahoe? When do natural fires occur when we live here? In order to protect our homes, we need to mimic the natural fire regime, while also protecting our community. Foresters help us understand how urban fire can be prevented while also discussing how the forest resources are managed to provide various products and other benefits.”

“Fuels reduction in the forest is an important aspect of land management, as it is a technique used to reduce fuels, allowing for a healthy forest all around. Forests provide timber for various purposes, but also provide habitat for wildlife, produce oxygen, reduce soil erosion, and offer recreation areas. One thing that forestland owners might be interested in doing is managing their land better, more sustainably, and considering all resources on the land when they’re doing so (wood, wildlife, water, and recreation).”

2. **Set-up:** (0:05-0:15)

Show poster of the defensible space zones. Discuss defensible space with students. “One thing we can all do to our own homes and properties is improve our defensible space. Who here knows what defensible space is? Who wants to define it? Defensible space is the buffer zone or designated area between a building, like your house, and the surrounding areas full of trees, shrubs, or other vegetation. Maintaining your defensible space is a proven way to decrease the risk of wildfire to your house and gives firefighters a safer space to fight fires when or if they’re nearby.”

“In the event of a wildfire, embers can travel miles ahead of the flames on strong winds. Why are these embers dangerous? Why would defensible space be important during ember storms? These embers can land on dead vegetation and ignite smaller spot fires. These spot fires may be right next to peoples’ houses if they’ve let debris like pine



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needles, leaves, and pine cones collect on the ground around their house or if they have flammable vegetation surrounding their house. However, if you maintain proper defensible space, this risk decreases because there's less flammable vegetation or combustible fuel around your house."

"Looking at this poster here, we can see the three different zones highlighted. The zone closest to the structure is called Zone 0 and it's 0-5ft away from the structure. It's nicknamed the Ember Resistant Zone, why do you think that is? We want this zone to be as ember resistant as possible so that means no dead and dying vegetation, using hardscaping like rocks and cement rather than mulch, and removing all bushes/shrubs/small trees that would be easy fuel for embers."

"The next zone is Zone 1 which extends 5-30ft away from the structure. Its nickname is the Lean, Clean, and Green name, any ideas why? We want to keep vegetation in this zone spaced apart both horizontally and vertically. In this zone, ladder fuels become a very important topic. Has anyone heard of ladder fuels or know what they are? They are vegetation that enables the fire to climb from the bottom/the ground up to the tree tops, like you're climbing a ladder. So, we want to reduce this possibility by removing ladder fuels like shrubs tucked up under trees and separating vegetation so that flames have a harder time traveling from one fuel to the next."

"The other zone is Zone 2 which extends 30-100ft away from the structure. In this zone, the most important thing is to continue maintaining separation between your vegetation, giving your shrubs and trees space to grow both horizontally and vertically."

3. **Activity: Defensible Space** (0:15-0:25)

"Now that we all know what defensible space is, we're going to become defensible space mappers and survey our own defensible space lots. For this activity, you will form groups of 3 – not yet, once I finish explaining –, go to one of the house foundations around us, and mark out Zone 0 and Zone 1 using the provided flags. One big step is about 3 feet so use that measurement to figure out how many steps it'll take to reach the perimeter of Zone 0 and Zone 1. Once you've flagged the four corners (so 8 corners in total) of the zones, you'll use the clipboard to take inventory of how many things you need to remove in each zone. Count shrubs, small trees, pine cones, and any other vegetative debris you can quantify. We'll be walking around ready to assist if y'all need help! Before we break, Zone 0 is how many feet away from the structure? 0-5! Zone 1 is how many feet away from the structure? 5-30! Perfect, any questions? Lets get into groups of 3 and find an unclaimed house foundation to measure from."

Walk around while students complete the activity, checking to make sure their Zone 0 and Zone 1 flagging makes sense.



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4. **Conclusion:** (0:30-0:35)

Bring students back together after marking.

“Who wants to share how many shrubs/trees/other vegetative debris they tallied for removal in their lot? How would you describe the current conditions of your zones – do they look trimmed and cleaned up or overgrown and in need of attention? We can do this same work at our own houses. You now know how to measure out the different zones and what needs to be done in each zone. Take a minute to think about what you can do at your own house and share with the person sitting next to you.”

“We all live in a fire-prone forested area. So, it’s our responsibility to be land stewards, or people who care and manage the land we live on. Defensible space is a proven way to reduce the risk of wildfires to your property like we saw in that video. Maintaining your defensible space helps your house, your neighborhood, the city, the forest, the firefighters...you name it!

Resources & References:

- [Cal Fire Defensible Space](#)
- [IBHS video 1](#) and [IBHS video 2](#)

Background Information:

Creating defensible space is essential to improve your home’s chance of surviving a wildfire. It’s the buffer you create between a building on your property and the grass, trees, shrubs, or any wildland area that surrounds it. This space is needed to slow or stop the spread of wildfire and it protects your home from catching fire—either from direct flame contact or radiant heat.

Defensible space is also important for the protection of the firefighters defending your home.