



STEEC Program – MS Dixie II Cruise

Program Name: Ember Resistant Vents

Grade Level(s): 7th grade

Length of Program: 10 minutes

Program Overview:

Students will use models of vents and embers to determine how different mesh screen sizes impact the travel of embers into structures.

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.

Objectives:

Upon completion of this program:

- Students will be able to understand how home hardening reduces the threat of wildfires to structures
- Students will be able to determine how proper vents deter embers from entering into a structure

Materials:

- Ember rain sticks (10)
 - Two different mesh sizes
- Example of ember-resistant vent/mesh (optional)

Vocabulary:

- **Home hardening:** the process of minimizing a home's vulnerability to wildfires by using noncombustible building materials and implementing measures to prevent embers from entering the home
- **Ember storm:** burning fragments that are carried by the wind during wildfires; can travel miles ahead of the blaze, igniting new fires far from the original wildfires

Preparation:

- Check each ember stick to make sure everything is in place

Procedure:

1. **Introduction:** (0-0:03)

Introduce yourself, your organization, and the topic of your station: Home Hardening.

“Has anyone heard of home hardening before? Does anyone know what it means?”

Home hardening is the process of minimizing a home's vulnerability to wildfires by using noncombustible building materials and implementing measures to prevent embers from entering the home.”



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“There are many things you can do to harden your home but today we’re going to focus on your vents. What do vents do for your house? They provide air ventilation and circulation, which means air particles can move in and out of your house.”

“So, if there’s a wildfire nearby and winds are blowing, an ember storm is likely to happen. What do you think an ember storm is? It’s when embers or those burning fragments travel on the wind miles ahead of the original wildfire, igniting smaller fires. How do you think those smaller fires ignite? What are the embers catching on? Dead vegetation like pine needles, dead leaves, wood, etc. Embers are also traveling through vents with large mesh screens and setting fires inside peoples’ houses. So, using these ember vent sticks as examples, we’re going to see how that actually works.”

2. **Activity: Ember Vent Sticks** (0:03-0:08)

Pass out the different ember vent sticks to the students and allow them time to observe and explore the way the inside matter does/does not travel through the mesh screen.

“Why do some of the mesh screens allow for the embers to travel through and others don’t? The size of the holes in the mesh screen. If you were replacing your vents, which one would you want? The ember vent sticks with the smaller holes.”

3. **Conclusion:** (0:08-0:10)

“Having proper vents on your house is one of the easiest ways to harden your home against embers. We recommend vents with a mesh that’s $\frac{1}{8}$ - $\frac{1}{16}$ of an inch big which will still allow for airflow but will decrease the change of embers entering into your house.” *If you have a vent example, hold it up/pass it around for students to see.*

“Thank you so much for listening!” *Provide directions on the next rotation.*

Resources & References:

- [CALFIRE Home Hardening](#)
- [Make a rain stick](#) (if one happens to break)

Background Information:

Home hardening and defensible space go hand in hand in reducing the threat of wildfires to one’s home. During defensible space inspections, SLTFR inspectors take note of a home’s vent and the vent conditions and determine whether or not they need replacement.