

# LESSONS #3-5: INTRODUCTION TO FIRE BEHAVIOR BASICS

**GRADES:**  
3-5

**TIME REQUIREMENT:**  
Will vary according to each lesson

**STANDARDS:**  
Will vary according to each lesson

**LESSON #3: Fire Behavior—Basics**

**LESSON #4: Fire Behavior—Firefighters, fuel loads, prescribed burns**

**LESSON #5: Fire Behavior—Chance and occurrence**

## OVERVIEW:

These three lessons are all developments or variations on the different factors that affect the spread of wildfires. They all use the same basic set of materials. Each lesson has its own variations, but they are designed to build one upon the other in number order.

## BACKGROUND INFORMATION

*Fire behavior* is the term used to describe a forest fire. It includes the many different characteristics a fire can have. Many factors influence fire behavior. Weather, climate, tree density, landscape, and human structures (like roads and houses) all affect the way a fire spreads through an area. Rivers and roads can make firebreaks, and people create margins of safety around houses and other buildings. Wind fans flames, and fires burn faster uphill. In a forest, the density of trees and fuel can determine the rate at which a fire burns-- things that are closer together burn quicker.

Fire scientists have to take all of these factors into account when making decisions about managing healthy forests and handling forest fires. These lessons will help students think about the system of a forest fire with its many moving parts and changing conditions.

## CONSIDERATIONS:

This work is best done in small groups of 2-4 students. Each student will need a Forest Fire Scenario kit (see below).

## MATERIALS NEEDED

### Forest Fire Scenario kit

- Forest Fire grid: fabric gameboards labeled along the edges with letter and number coordinates
- Tree / fire tokens: 100
- Water / Dead fuel squares: 35
- House tokens: 20
- Firefighter tokens: 15
- Protection chips: 60
- 10-sided die
- 8-sided die
- 6-sided die

## OVERALL LEARNING OBJECTIVES

These lessons use models to show the effects of different conditions on wildfires. Ecological systems are central to these lessons, and students learn how one part of the system can have effects on other parts of the system.

## ASSESSMENT

Will vary with each lesson, but in general,

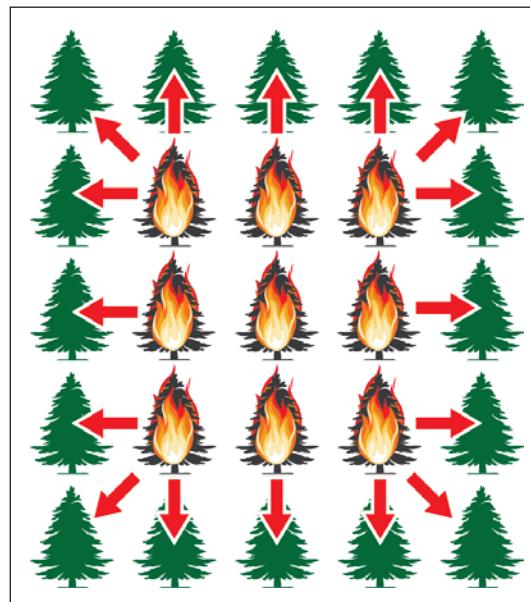
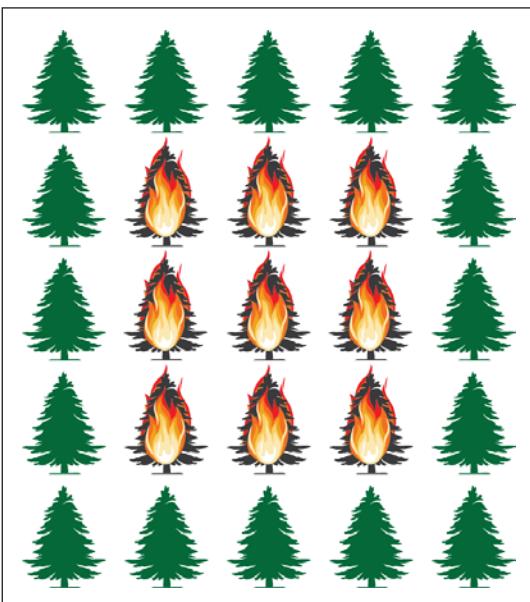
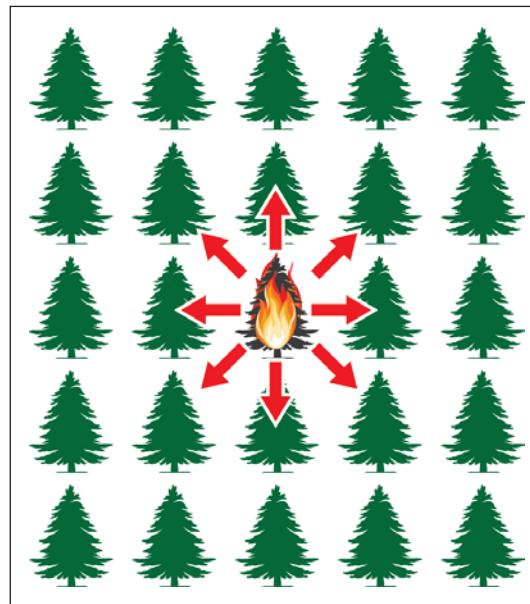
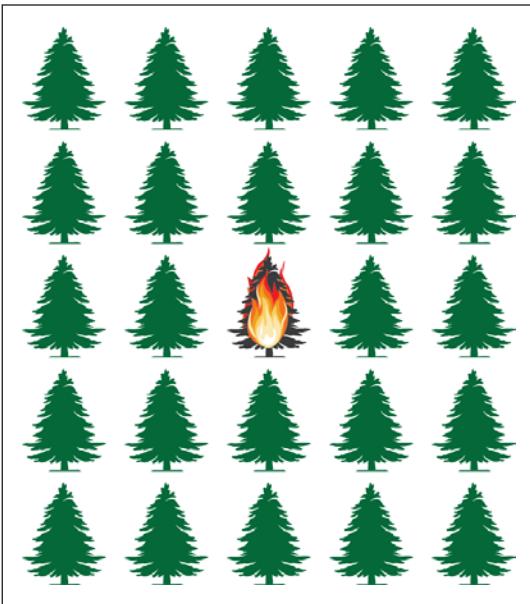
students should be getting an idea of how ecosystems work and the different aspects of a forest fire.

## GENERAL ACTIVITY FOR LESSONS

Each lesson uses the forest fire scenario materials to model the movement of fire through a forest. The following step is needed for all the lessons.

### Introducing the Forest Model and Fire Simulation

1. Have students open their game board grids and inspect the pieces.
2. Describe each board as a forest. The board lines up with the cardinal directions on a compass, so that Row 1 is the southern edge and Row 10 is the northern edge. Each square is a space for a tree. Trees are represented by the “tree” side of the tree/fire tokens. Trees represent the fuel in a forest fire. When a tree catches on fire, every tree in a space next to it catches on fire, horizontally, vertically, and diagonally. Fire is indicated by flipping over a tree/fire token to fire side, representing burning/burnt trees. The process repeats in stages.
3. Demonstrate the movement of a fire from one corner of the board to another on a 4x4 section of a board, like the illustrations below. Between stages, ask students to predict what they think will happen next.



Icons courtesy dcdm-studio, freepik.com and pch.vector

Each lesson goes into its own variation after this stage.



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