

# Forest Fire!

## Rules

### A collaborative game of forest fires and firefighting

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## Setting

The setting is a forested community, with 20 scattered houses, 2 schools, and 2 rivers.

## Players

The game can be played by 1 or more players.

## Goals

- The primary goal is to save as many houses (10 points each) and schools (20 points each) as possible.
- A secondary goal is to save as much forest as possible.

## Game ends

The game ends when the card pile is exhausted (team wins) or the acres of fire exceeds 40 (10% burning, team loses).

## Pieces and Parts

- 1 board: a 20x20 grid of hexagons (referred to as 'acres')
- 20 wood houses
- 2 schools
- 52 river tokens
- 40 fire pieces (red crystals)
- 70 burnt acre pieces (black disks)
- 30 rock pieces (white crystals for **fire line** made by bulldozers)
- 28 water barrel tokens
- 14 dry powder explosive fire extinguisher ball tokens
- 2 bulldozers tokens
- 1 helicopter token
- 60 event cards (12 FOREST FIRE cards, 40 WEATHER cards, 2 CATASTROPHE cards, 3 DROUGHT cards, 3 LUCKY BREAK cards)
- 2 20-sided dice: row and column
- 1 6-sided die
- 1 WIND DIRECTION card (large arrow)



## Setup

- Store: All extinguisher materials (water barrels, extinguisher balls) are put in a central store from which they may be drawn to move onto the board.
- Cards: There is one deck of cards. Set up the deck as follows:
  1. Separate out the 12 FOREST FIRE cards and the 3 DROUGHT cards
  2. For the STANDARD game, remove two of the DROUGHT cards leaving 1 in the game.
  3. Shuffle the remaining deck thoroughly and then divide the deck into 3 approximately equal piles.
  4. Shuffle 4 of the FOREST FIRE cards into each of the three piles.
  5. Shuffle 1 DROUGHT card into the bottom pile. [For the CHALLENGE game, shuffle 1 DROUGHT card into the middle pile and 2 into the bottom pile.]
  6. Join the 3 piles into one deck (stack them on top of each other without shuffling) face down, being sure that the pile with the most DROUGHT cards is on the bottom. This is the event pile.
- Board:
  1. Scatter (or not) the houses and schools around the board. This is how you make your own scenario. You can use the dice to get more random varied games. The game plays better if houses are not on the edges of the board.
  2. Place 2 rivers (using the river tokens) anywhere as long as each river is contiguous (each river acre shares at least 1 side with the previous river acre, no gaps) and goes from one edge to a different edge. There should be one river end on each edge of the board. (Bendable rule, just be sure there are 40-50 river pieces on the board.)
  3. Place 2 bulldozers wherever you want them (this is a strategic part of the game).
  4. Roll the row and column dice to determine where the first fire starts (if spot is occupied, or too close to an edge, roll again). Row 10 and column 10 are marked with fire icons on the edges of the board to help locate each acre. The first fire should occupy 4 acres, should not burn any buildings and **should be at least 5 spaces from any edge.**
  5. Roll the 6-sided die to determine the starting direction of the prevailing wind. Place the wind direction indicator at the appropriate compass location on the edge of the board, always pointing toward the center of the board.
    - 1=N, 2=NW, 3=SW, 4=S, 5=SE, 6=NE
    - The top of the board (logo in the lower left and upper right) is should be N or S.
    - Fires spread in the direction the arrow points.



## Play

**EACH TURN, THE PLAYER EITHER STARTS A FIRE (determined by the card drawn), OR SPREADS FIRES AND MOVES EQUIPMENT.**

Be sure to both spread fires AND move equipment on every turn that did not start a new fire.

**WHEN PLAYERS MOVE EQUIPMENT, THEY EITHER MOVE NEW EQUIPMENT ONTO THE BOARD OR MOVE EQUIPMENT TOWARD OR ONTO A FIRE.**

At the start of each turn, player draws an event card. A WEATHER card replaces the previous one.

- If the card is a WEATHER card, then that becomes the prevailing wind — **before spreading the fires.**
  - If the card is a CATASTROPHE or LUCKY BREAK card or DROUGHT card, the player performs the action directed by the card, then continues with their turn. **If the LUCKY BREAK is a new bulldozer you may add a bulldozer (if you don't have 2) or move a bulldozer to any acre on the board.**
  - If the card does not cause a new fire, then the player spreads the fires indicated on the latest WEATHER card (see 'Spread of a FOREST FIRE').
  - If the card is a FOREST FIRE card or the helicopter crash:
    - The card will indicate how many acres to cover with fire.
    - If the fire is from the helicopter crash, then the fire starts where the helicopter was. Otherwise, roll the two 20-sided dice to determine where the fire starts.
    - If the board location is forest or a building (not burnt from a previous fire, not rock, not river), the fire starts there and covers adjacent (sharing at least one side) acres to the number shown on the FOREST FIRE card. (Roll again if needed to get an available starting acre.)
    - Player determines which surrounding acres get the fire, but all have to be contiguous (sharing at least one side with one of the other fire acres), not burnt, not river, and not rock. For example, a straight line in the same column is ok, but no gaps are allowed. Buildings in the way of the fire are removed. Played strictly, all the acres after the first go with the wind.
    - Place red crystals on each acre with fire.
    - Player's turn is over if they started a fire.
  - If the card did not start a fire, the player has 2 choices:
    1. Get new equipment (place on the board):
      - 1 helicopter, or 1 bulldozer, or 6 water barrels, or 3 extinguisher balls, or 2 water barrels + 2 extinguisher balls, or 4 water barrels + 1 extinguisher ball
      - Each piece of new equipment is placed on any acre at the edge of the board and then moved up to 2 spaces.
      - The team (the board) cannot have more than 1 helicopter and not more than 2 bulldozers at any one time.
    2. Move pieces (must be already on the board)
      1. Move extinguishers up to 10 total acres
      2. Move a bulldozer up to 10 acres
      3. Move the helicopter up to 10 acres
- (for more on moving pieces, see 'Fighting a FOREST FIRE')



## Fighting a FOREST FIRE (choose one of the 3 moves)

1. Move any combination of extinguishers up to 10 acres **total** toward or onto the fire
  - Each water barrel extinguishes 1 acre when it is **deployed** (lands on a fire acre).
  - Each foam extinguisher ball extinguishes up to 2 adjacent acres when it is **deployed** (lands on a fire acre).
  - Objects deploy (are activated) to extinguish as soon as they land on a fire acre.
2. Dig a **fire line** with a bulldozer (if a bulldozer is on the board).
3. Drop firefighting material from the helicopter (if the helicopter is on the board).

Extinguisher balls extinguish the space they are on plus one other adjacent fire space. Deployed (used) extinguisher tokens are returned to the store for reuse.

When fire at an acre has been put out, remove the red fire marker and place a black marker on that acre. No fires can start or spread to that acre for the rest of the game, but equipment can be moved into those spaces. If one of the extinguisher spots falls on rock, water, or building, its effect is ignored (no black marker is applied to that acre).

### Bulldozer movement

- Bulldozer moves up to 10 acres in a turn.
- Up to 5 of the acres can be bulldozed (create a **fire line**) — this can include the starting acre. They do not have to be contiguous.
- Replace each bulldozed acre with rock (white crystal).
- Bulldozer can remove houses (go through them) but not schools.
- Bulldozer remains where it ends its movement.
- Bulldozer can move fewer than 10 acres, and dig fewer than 5 acres.
- Bulldozer cannot cross or stop in burning acres or rivers.

### Helicopter movement

- The helicopter can fly as far as 10 acres in a turn and carry several items at a time.
- The helicopter path can enter any space that has water barrels or extinguisher balls to pick them up at any time, and can carry several items at a time.
- The helicopter path can enter a river to pick up water equivalent to a water barrel. (A water barrel is not needed.)
- To drop water barrels or extinguisher balls in the right place, the helicopter path must enter that acre and the player deploys the extinguisher if they wish, replacing fire acres with burnt markers.
- The helicopter cannot land (cannot end its 10 spaces) on rivers, houses, schools, or within 2 acres of fires (must have 1 space between). If it does, it is removed from the game until replaced. It can land on blank, burnt, or rock acres.



## Spread of a FOREST FIRE

- Fire spreads every turn except when a new fire is started.
- If a WEATHER card is drawn, it replaces the current WEATHER card before the fires are spread.
- Each weather card indicates how many fires spread. Fires that spread are selected randomly.
  1. Assign a number to each discrete fire (if two fires have touched, they become one fire; if a fire has jumped and is separated into two parts, then it is 2 fires).
  2. Repeat the next step for the number of fires to spread.
  3. Roll the 6-sided die and spread that fire. If a duplicate or no fire for that number, roll again.
- For each fire that spreads, each acre with fire spreads to the next acre in the direction of the prevailing wind arrow.
  - If that acre already has fire, river, rock (**fire line**), or burnt space, nothing happens.  
**Note:** The result is that only the 'edge' of the fire away from the prevailing wind actually spreads, because the other acres just spread to acres already on fire.
  - If that acre is empty or has a building on it, fire spreads (place a red crystal there) and any building is removed.
  - If the 'spread' acre has an extinguisher (water or ball) on it, then it sets off the extinguisher which extinguishes the fire on that acre. If the extinguisher is a foam extinguisher ball, then it also extinguishes the fire from the spot the fire spread from.
  - If the 'spread' acre has a helicopter or bulldozer on it, and is not also a rock or burnt acre, the fire spreads and the equipment is lost, removed from the board and that acre becomes a fire acre. Helicopters and bulldozers on rock and burnt acres are protected unless the fire jumps over that space (in which case they are lost).
  - If the card indicates 2 acres (arrow with 2 under it), then the fire spreads two acres in the same direction. Similarly with a spread of 3 acres. If the fire **jumps**, the jumped acres count in the spread for those that spread 2 or 3 acres.
- Place a red crystal on each acre with fire.
- Player spreads the selected fire(s) according to the prevailing wind (in the direction of the wind arrow — ie, 'with the wind').
- Rock acres (dug by bulldozer), burnt acres, and river acres are '**fire line**' acres, because they keep the fire from spreading unless the fire '**jumps**' (indicated on a few weather cards).
- Fire cannot cross a **fire line** acre unless it '**jumps**'. It can never cross two adjacent **fire line** acres except with 22 mph winds.
- Jump follows the prevailing wind.

Spreading a fire is inexact, because the wind directions (8) do not line up with the board directions (6). To correct for this, in the newest game version, we have removed E and W winds on the cards. If you have old cards, you can change W to SW and E to SE. Or, here are my fire spread examples with the old cards:

<https://www.phosphorlearn.com/forest-fire-playing-notes/>

# Forest Fire!



## Drought — doubles the size of the largest fire

- If two or more fires are the largest (same size) then select the one closest to the wind arrow or flip a coin.
- Doubling roughly follows the prevailing wind (be very loose about this) with the exceptions below.
- Doubling a fire does not jump unless the prevailing wind is at 12 MPH or greater.
- If a doubling fire is blocked by rock, river, or burnt acre but can go around the block with 1 acre side-step, it will. If completely blocked, do not place those pieces on the board.

## General rules and notes

- Players are one team. All equipment belongs to the team, and can be used by any player.
- After extinguisher equipment is used, it is recycled into the store. If all of an extinguisher type is on the board, no more can be added until some are deployed (used on a fire) and returned to the store.
- When a bulldozer or helicopter is removed from the board, it has to be added again during a turn. There is never an automatic return.
- When a lucky break card adds firefighting equipment, that must follow the rules in 'Get new equipment' (page 3).

## Scoring

- Your starting score is 400 if you finish all the cards, or 200 if the game ended with 40 acres on fire.
- Add to your starting score 10 points for each remaining house and 20 points for each remaining school.
- Subtract from your score
  - 1 point for each acre that is on fire
  - 1 point for each acre that is burnt
  - 1 point for every 2 acres that are rock (**fire lines**) — thus **bulldozing is better for your score than extinguishing**

## Variants

- Alternative end (and win) condition: extinguish 6 fires (or pick a number), or allow 50 burning acres.
- Players can take turns placing pieces on the board for the setup, designing the board. Experiment with different arrangements of houses, this is part of the fun.
- As designed using all the cards (CHALLENGE game), this game is difficult to win. For the EASIER game, remove the 6 cards with the little flame indicator in the upper right (all 3 DROUGHT and 3 FOREST FIRE cards), or anything in between for your preferred game. **[IF YOU LIKE TO WIN, REMOVE ALL THE DROUGHT CARDS.]**
- For a more realistic game, replace the windward side (the side facing the wind, not the side where the fire spreads) of spreading fires with blackened acres after every two times it has spread. This makes the game easier to win, but more complicated and with a lower end score.
- The rules are a bit loose (especially how a fire spreads) to allow you to make your own house rules. We encourage you to set (and to discuss) the precise rules for how fires spread. Make it your game.



## The game vs reality

This game contains the typical tools and procedures for fighting forest fires: digging trenches called control lines, and dousing with water either from hoses or from small planes and helicopters. Sometimes fire retardant is dropped from small planes and helicopters.

We have used explosive fire extinguisher balls that are not realistic in fighting large fires (firefighters generally use fire retardant chemicals or water), but are more interesting to younger players. There is increasing research in chemicals dropped from helicopters or small planes, and some promising substances that might directly put out large fires as is done in our game. But these substances are still mostly in research.

No barrel of water can put out an acre of fire and no retardant can put out two acres. These are game mechanics to make the game fun.

Wind changes are a serious problem in fighting real forest fires and wildfires, though of course the wind does not change direction as frequently as in the game. But prevailing wind and wind change are factors any young firefighter should be well aware of and plan for.

Drought is a serious problem for forest fires and other wildfires, and the effect of drought is much more severe and longer-lasting in the real world than in this game. We have designed the game so that drought becomes more common toward the end of the game as a reminder that climate change is making drought more frequently a factor in real world wild fires.

Creating a 'control line' ('scratch line' if a quick cut; '**fire line**' if down to bare rock; 'wet line' if soaked after the cut) is much more complicated than taking a bulldozer to the forest. It is extremely hard work, usually involves cutting down large trees with chainsaws as fast as possible in miserable and dangerous working conditions, if possible wetting the ground (making a 'wet line') or covering it with fire retardant. The critical importance of control lines is the reason we have encouraged the use of the bulldozer in this game (bulldozed acres are better than burnt acres in the scoring).

Forest management teams create control lines in critical places before there are any fires, and these are called fire-breaks. Most fires in large managed forests are not actively fought, but let to burn until or unless the fire comes close to human habitation.



To learn more about fighting forest fires, bush fires, or wildfires:

- [https://en.wikipedia.org/wiki/Wildfire\\_suppression](https://en.wikipedia.org/wiki/Wildfire_suppression)
- <https://www.mentalfloss.com/article/57094/10-strategies-fighting-wildfires>
- <http://www.pbs.org/wgbh/americanexperience/features/burn-fighting-wildfires/>
- <https://www.livescience.com/39367-how-to-fight-wildfires.html>

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Long-Suffering Wife of the creator of *Forest Fire*

30% of profits from the sale of this game in the year 2020 will go to  
The Wildland Firefighter Foundation  
(<https://www.wffoundation.org>)

# **Forest Fire!**