

;;THS203 Final Code

globals [

initial-woodcells

burned-woodcells

burn-rate

]

breed [fires fire]

breed [embers ember]

breed [waves wave]

to setup ;; Assigns the point of the initial burn point

clear-all

set burn-rate Fire-Strength

ask patches

[set pcolor brown]

ask patches with [(distancexy -375 125) < 50];;starts initial burn point in corner of wall

[ignite]

set initial-woodcells count patches with [pcolor = brown]

set burned-woodcells 0

reset-ticks

end

to create-frequency ;; creates individual cycles of the waves to point in the general direction of the fire

```

create-waves 35
[
  set size 100
  set shape "wave"
  setxy 370 0
  set color green
  set heading 235
  set heading heading + random 65]

end

to go ;;

  if not any? turtles ;; either fires or embers
    [ stop ]
  ask fires
    [ ask neighbors4 with [pcolor = brown];; This lights the unburned materials near the fire to catch on
      fire
        [ ignite ]
        set breed embers ]
  fade-embers
  supress-fire

tick

end

;; creates the fire turtles
to ignite ;; patch procedure
  if not any? waves-on neighbors

```

```

[
  if not any? waves-on self
  [
    sprout-fires random burn-rate
  ]
  if any? waves-on neighbors
  [
    ask fires [die] ;; kills fire if a wave is on a neighboring patch

  ]
  ask fires ;; Ignites fire and turns brown patches to red
  [
    set color red
  ]
]
set pcolor black
set burned-woodcells burned-woodcells + 1 ;;for percent burn monitor
end

```

;; achieve fading color effect for the fire as it burns

to fade-embers

ask embers

[set color color - 0.3 ;; make red darker

if color < red - 3.5 ;; makes the older burned materials look black

[set pcolor color

die]]

end

to emit-frequency

ask waves

```

[
  if xcor < -350 [die]
  if ycor > 120 [die] ;; this optimized the code by killing the waves that already acted on the fire
  if ycor < -120 [die]

  fd 10 ;; this makes the frequency of the waves.
]
create-frequency

end

to suppress-fire

ask patches
[
  if pcolor = black
  [
    if any? waves-on neighbors ;; If waves are on neighboring patches of fire, it decreases the burn rate

    [
      repeat 100
      [set burn-rate burn-rate - .00000025]
    ]
  ]
]

end

```