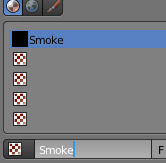
Using Blender 2.7 for Animation - **Advanced 7 Bonus page 1of2** - Outdoor Cloud and Smoke Scene: **Animated Smoke** (bonus is to do these steps instead of smoke steps for 3dv7)

GOAL 1: make a moving object that emits smoke—something that would emit smoke in real life.

* Create a cube for a domain around whole area where smoke can exist (**s** once on keyboard scales in all directions)
  + Make sure you scale it in object mode, otherwise the smoke will be duplicated instead of scaled
  + With that selected, click “Physics”, “Smoke”, “Domain”
  + You can increase the **Divisions**–about 64 (for accuracy) and **Temp. Diff** (heat). **Dissolve** makes smoke disappear over time.
  + *For more realistic smoke, check “Smoke High Resolution” click the arrow beside it to show or hide it’s options, then under “Smoke High Resolution” set Divisions:2 or so, Noise Method:FFT* 
    - *64x2 is over 6GB, but you will need about 4 to 8 divisions for sharp realistic smoke (~160GB).*
  + You may want to name the object something like “1.Smoke Domain” (use Object button menu, click name, type new name, press enter)
* Select an object that will emit smoke (a flaming arrow, invisible circle inside a jet engine, etc) somewhere inside the domain cube
  + Click “Physics”, “Smoke”, “Flow” (you can set the temperature here too)

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| TIP: To change the behavior, select your Smoke Flow object then click the Particles  button window   * You probably want to increase the Number to a few tens of thousands * You can also reduce the Normal under velocity to create a regular fire (around 0.5) * Now you can hide the emitter if you want: Still under the Particles Buttons, scroll down to the “Render” section, then uncheck “Emitter” to make the smoke flow object invisible if you want (Particles can be left at “None” since all you need is the smoke, not the particles used for calculating smoke). * Particle Lifetime can stay at 1. In the case of smoke, particles create smoke, disappear, but smoke remains. |

* For wind, you can click Add, Force Field, Wind and put it inside the smoke domain.
* To BAKE:
  + Select the Smoke Domain object. *Click Physics  button then click “Smoke Cache” to show or hide the smoke cache settings (make sure you can see Bake under it).*
  + **Name the bake file:** For “File Name” under Smoke Cache type a name that will remind you that the files are for this project.
  + Click “Bake” (if it is disabled, Save, exit blender, then re-open blender & reopen the file)
    - Button says “Free Bake” if there was a previous bake. If so you can push that to delete it.
* Create a smoke **Volume Material** for the cube:
  + Select your smoke domain object
  + Click “Material” , and if there is no material click “New”, then click **Volume**.
    - **Density** to 0 (start at zero, then only smoke will be visible not cube)
    - **Density Scale** about 8 (this is better to simulate bigger scenes to make the smoke appear more dense),
    - **Scattering**: about 6 (this makes more light bounce off of the smoke, making it cast more shadow, be more visible, and be darker on the inside)
    - There are also color settings. You can hover over each white rectangle to see what it affects.
    - Set Transparency to **Raytrace** to eliminate jagged edges (a volumetric side effect).
    - Set under Integration set **Step Size** to about 0.02 to increase detail & reduce noise
    - If smoke gets in front of a cloud & it glitches, you’ll have to turn off Volume for cloud
  + Click the “Texture”  button
    - If there is no texture, click “New”. Now would be a good time to name the texture:



* + - Set type to “**Voxel Data**”
    - For Domain, choose your Smoke Domain object



* + - Under “Influence” make sure **only** “Density” is checked

Using Blender 2.7 for Animation - **Advanced 7 Bonus page 2of2** - Outdoor Cloud and Smoke Scene: **Animated Fire**

GOAL 2: Make a manual fire texture using the existing smoke simulation’s voxels.

Add a Fire Texture to the Existing Smoke Material:

* Select your Smoke Domain object & click the Texture  button

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| TIP: You can optionally make it a separate texture, but without the sharp Color Ramp we’ll make affecting the smoke Density (see “smoke Volume Material”) the edge of the smoke may not be sharp. Skip this box if you don’t want to adjust Density separately. Click **an empty slot** so you don’t erase your smoke texture,  then New, Set type to “Voxel Data,”  For Domain, make sure you choose your Smoke Domain object again.    Under Influence uncheck everything, then follow steps below using this texture slot (instead of first slot). |

* Under “Influence” make sure “Emission” & “Emission Color” are checked:

Make Emission high to make the fire bright enough, so type it in manually—about 5.000



*NOTE: It may say “Emission” not “Emission Color” if the pane isn’t wide enough. Hover over a button for tooltip (see pic)*

* If you can’t see the “Colors” settings, expand it by clicking:



* Under “Color”, choose Ramp, and make most of it transparent (alpha 0) and add some bands of color:

(Clicking “Add” will add a band of color before the selected line which is dotted)



In this one only the 2nd band is red and it also has 0 alpha,

so the fire would approach red only as it becomes transparent.

This is more realistic since heat is infrared. Also, the 0 alpha stop being close to the 1 alpha stop makes the edge sharp.

* For all **objects inside smoke domain**: Go to Materials button tab, then under Shadows click “Receive Transparent” (this avoids shadows of the cube—instead the transparency will be used)

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| TIPS:   * If smoke domain becomes black, it’s ok. It should render fine as long as you follow the steps for smoke texture. * If you rename file & want to keep bake (& save space) rename smoke bake folder too—then re-open blender. |

See also:

Simple Fire

<http://wiki.blender.org/index.php/Doc:2.5/Manual/Physics/Smoke>

Very realistic fire

<http://cg.tutsplus.com/tutorials/blender/introduction-to-smoke-simulation-in-blender-2-5-day-1/>

**Advanced 7 Bonus Requirements**

Manual Smoke with Animated Source

* Animated Smoke used as: a smoketrail for a fire or a moving object
* Manual smoke (not using the Quick Smoke feature)