

# HOME ENERGY GUIDE

## FANS: THE FIRST LINE OF COOLING

Often misused, fans are one of the most economical ways to cool the most important thing in your house: **you**. Just as with windchill in the winter, moving air will quickly reduce our skin temperature, especially when the evaporation of perspiration is included. Even homes that use air conditioning can benefit from the use of fans. Cooling our bodies with a fan means we can turn up the temperature for the air conditioner, and save energy overall.

### Portable fans

Small portable fans can be a very good option for cooling people. Available with either floor stands or table stands, most have several speeds and the ability to oscillate. Some newer designs include fans with concealed blades, which provide high velocity air streams.

### Old fans can be dangerous

Many older fans have metal blades and limited shrouds (the screens that keep things from being hit by the turning blades). These can be very dangerous for children and pets; they can also cause problems if they tip. In addition, most older fans are usually very energy inefficient.

### Box or window fans

Designed to rest in the opening of a double-hung window, box or window fans can also can serve as portable fans with a supporting base. They can be an efficient way move cooler air into a house from the outside.

### Risks with box fans

If a box fan tips and lies flat on the floor, the airflow can be restricted, which can lead to overheating of the electric motor and become

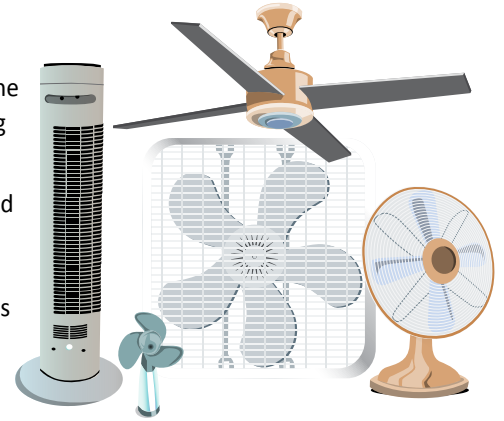
a potential fire risk. Likewise, drapes, curtains, or other things that might obstruct the airflow might contribute to the overheating of the motor.

Box fans placed in a window opening should *only blow in!* Although it might make some sense to have a fan blowing out a window on a higher floor to “suck out the heat,” this can depressurize a house, leading to dangerous backdrafting. As air is pushed out of a house, it is replaced through any available opening—which could be the chimney for the water heater or exhaust fans. In certain conditions this can lead to carbon monoxide or other flue gasses building up in the house.

### Ceiling fans

A ceiling fan is quieter than a portable fan and is safely out of the reach of children. As with other fans, ceiling fans serve to cool our bodies—not the room. Designed to replace an existing ceiling light fixture, some fans include a light. Ceiling fans should have multiple speed settings and be reversible, to provide the right amount of cooling for the conditions and occupants. Many also have remote controls.

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### When a fan spins and nobody is there, is it cooling?

Fans cool people. Fans don't significantly cool rooms, furniture, or walls.

Moving air cools us by removing our body heat from our skin (think windchill). This process is enhanced through the evaporation of sweat from our skin.

There are only two times that fans can actually cool a room:

- Removing excess heat and moisture through bathroom or kitchen fans.
- Moving cooler air into a room, either through an air conditioning system or by moving cooler outside air into the house.

The bottom line: A turning fan in an unoccupied space is doing only one thing—using electricity.

### *Sizing of ceiling fans*

Proper sizing of a ceiling fan will provide the most efficient cooling for the occupants of a given room. Use these guidelines when purchasing (and don't forget to look for the ENERGY STAR® label):

Room Size	Fan Diameter
100 ft <sup>2</sup>	36"
150 ft <sup>2</sup>	42"
225 ft <sup>2</sup>	48"
375 ft <sup>2</sup>	52"
400+ ft <sup>2</sup>	2 or more fans

### *Whole-house fans*

These are *not recommended* in our climate. Cutting a large hole in the ceiling to install a whole house fan creates potential air leaks and a source of heat loss in the winter, since it is very hard to seal and insulate around the fan. Whole-house fans may also depressurize your house, leading to dangerous backdrafting of combustion appliances like water heaters.

### *Attic fans*

Attic fans move air into and through the space in your attic above the insulation. *Using an attic fan to cool your house has limited value.* A properly sealed and insulated attic will prevent the transfer of heat between the attic and the house, regardless of the temperature in the attic. Building components such as rafters and sheathing can easily withstand attic temperatures of 150 degrees or higher.

### *What about “destratification” of air layers?*

Many claims have been made about the benefit of operating fans to move cooled or heated air from either the floor or ceiling—destratifying the different temperature layers.

Although there might be some layering in larger buildings, the difference between floor and ceiling in most homes is usually only a degree or two. Regardless, the operation of heating and air conditioning blower fans will be adequate to keep the air well mixed in most residential situations.

Again, the primary effect of moving air from portable and ceiling fans is to cool our bodies. There is no benefit to operating fans in unoccupied rooms to “mix the air” for cooling, and there is a negative impact for operating fans in the winter—because they actually cool our bodies.