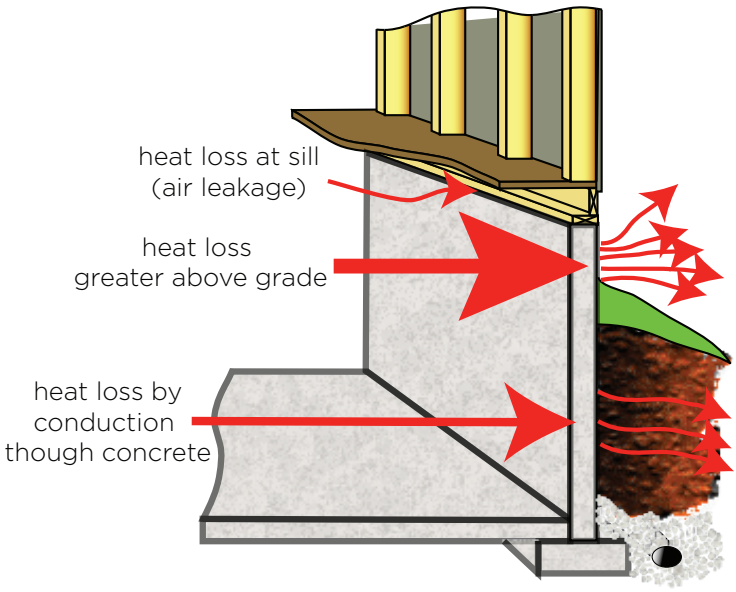
Insulating the Basement

The basement is usually the last place people think to insulate, yet it can account for up to 1/3 of heat loss in a home. Upgrading basement insulation can significantly cut down on energy use. It also creates a comfortable space — a boon to people who wish to extend their recreation and living space into the basement. The perfect time to consider insulating the basement is during a renovation.



Where Should the Insulation Go?

From a building-science point-of-view, it is better to insulate the outside of the foundation. From a practicality point-of-view, however, insulation is easier to apply from the inside, especially if done while renovating.

Here are the pros and cons of exterior versus interior insulation:

Exterior Pros

- You can address any foundation water issues at the same time.
- Insulation will not take up interior basement space.
- The foundation itself will be warm (at the interior temperature), reducing condensation issues.
- The foundation stays dry inside, reducing or eliminating mold and mildew.

Exterior Cons

- Disruptive and expensive: you have to dig soil to get at the foundation.
- The above-grade portion of the foundation insulation is difficult to finish and protect. Rigid-foam insulation is the most common exterior insulation material, most often finished with stucco, a fragile finish that gets damaged from impact of lawn tools, etc.

Interior Pros

- Much easier to install and less expensive than exterior insulation.
- Does not disrupt landscaping.
- Can be done while renovating the basement.

Interior Cons

- Foundation wall will be at exterior temperature (cold), making it prone to condensation.
- Possible migration of moisture into the finished wall due to seepage from outside and from capillary action that draws moisture up from the ground through the footing.
- Any moisture that gets into the wall system from the two mechanisms above does not dry readily.

Problems with Traditional Interior Techniques

Since interior insulation is by far the most common approach, a great deal of research and debate exists around proper installation. Traditionally, a moisture barrier is applied to the foundation. Fiber-glass batts sit against this barrier and then a vapor barrier is applied to the batts on the interior. Today's conventional wisdom recognizes that with traditional methods, the wall cavity gets damp and has little drying potential.

Other interior insulation strategies work much better, such as foam-based insulation that is more tolerant to moisture. If you are planning to insulate your basement, make sure the contractor is up to date on the most effective strategy for your climate.

A Few Tips

Deal with dampness first – Most experts agree that you should deal with any dampness issues before insulating the basement from the interior.

Seek out knowledgeable contractors – Don't just follow traditional conventions. Significant advances in the best techniques for insulating basements mean better results.

Fix basement windows – One of the most effective strategies for improving the thermal efficiency of your home is to seal air leaks. Seal and weather strip basement windows, which are often neglected.