

# HOW DO TREES SURVIVE THE WINTER?



Trees can't make their own heat, and they can't migrate to escape the cold (what a sight that would be!). So how do they survive our winters, with below freezing temperatures? They use a combination of internal and external adaptations to make it through.

## 1. They Have Bark –

Bark prevents water loss during winter when liquid water is more scarce. It also provides protection against the elements such as wind and sun, reflecting light and dispersing heat.



## 2. They Drop Their Leaves, or Have Needle Leaves –

Desiccation, rather than cold, is the biggest threat to trees in winter when liquid water is scarce. Deciduous leaves are a big source of water loss, so trees drop their leaves to avoid this problem. Needle leaves retain water more effectively because of their smaller surface area and waxy coating.

### 3. Slowly Increase Cold Tolerance in Their Cells –

The real danger from cold temperature is when the water inside cells freezes, killing the cells. This is called frostbite in humans. Through a combination of cellular changes that involve shrinkage, dehydration, and sugar concentration, the cells harden and become glasslike. This helps prevent freezing and damage to living cells.



Above: not really what happens (ha ha).  
Below: a real exploded tree.



### 4. What if They Can't Handle the Cold? –

Sometimes it can get so cold the tree will explode! It takes time to acclimate to the cold. In cases when the temperature quickly drops suddenly and the tree hasn't had time to adapt, the sap inside the tree (which contains water) expands and puts pressure on the bark – sometimes more than it can handle.