

The Secret Science of Popcorn



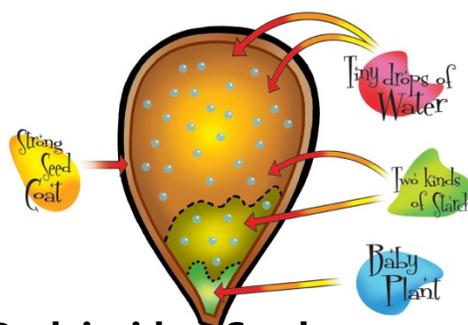
Start with a Seed

A popcorn kernel is a seed with the perfect combination of starch and water inside it. A strong outer layer holds everything together until the moment it explodes into a piece of popcorn.



Water Makes the Wow!

A popcorn kernel must contain just the right amount of water inside it: Too much or too little water will prevent the kernel from popping. When you open a bag of freshly popped popcorn, you may see some of the water from inside the kernels. The water escapes into the air as a puff of steam.



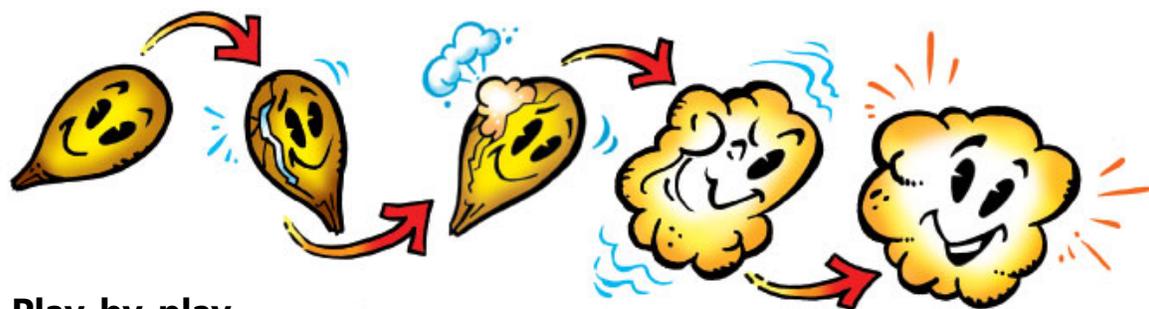
Peek inside a Seed

Like all seeds, a popcorn kernel contains the start to a baby plant. Also inside the seed is food for the plant as it begins to grow. When a kernel pops, this plant food known as starch, becomes the fluffy and tasty part we recognize as popcorn.



Bring the Heat!

When a popcorn kernel gets hot enough, the starch inside the seed melts. The water molecules in the starch move faster and faster, changing from liquid water to water vapor. The faster the water molecules move, the harder they push. Eventually the seed coat can't take the pressure anymore and the kernel bursts.



Pop Play-by-play

Water molecules push on the seed coat so hard that a tiny crack forms. As they rush out of the crack, they push a little bit of starch out and make the “pop” sound. The kernel flips as the rest of the water and starch break out of the kernel and expand. Almost instantly, the starch hardens into the crisp solid we love to munch!



Snack on Science

Making popcorn is fun. Eating it is even better. Science makes it happen!

More Cool Chemistry

Can any corn become popcorn?

Not all corn pops! Popcorn is a special type of corn. Some other grains, such as quinoa and sorghum, can pop too; but popcorn is the biggest and best popper!



How big does popcorn get?

This picture shows 200 kernels of popcorn in a 1000 mL graduated cylinder and 200 pieces of popped popcorn in another. Popped popcorn typically fills about 40 times the space it did when it was just a pile of kernels.

Why is some popped popcorn rounder-looking than other popcorn?

Popcorn comes in two basic shapes—butterfly and mushroom. Butterfly popcorn has a very irregular shape with large bumps. It has a light crispy texture but can break easily. The mushroom-shaped popcorn is round with a rough surface. This shape makes it sturdy enough to stir and as you add tasty flavorings such as powdered cheese or sugar for sweet-tasting kettle corn.



Why does steam come out when you first open a container of hot popcorn?

Be extra careful when opening a bag, foil dome, or even removing the lid off a pot of freshly made popcorn! Why? The water vapor, which burst out of each kernel, is in the container and is very hot. You might see the water as it condenses into swirls of smoky steam. Here you can see it over a pot of popping kettle corn.