

Why do marshmallows catch fire so easily?

From the sweeties.net wiki

Toasting marshmallows over a campfire is a long standing treat in Britain, the United States and elsewhere, and a newspaper in New Jersey was already reporting marshmallow roasts as a new craze in 1892. Hold one too close to the flames, though, and it can catch fire very quickly.

Sugar is a fuel

A marshmallow is mostly sugar. Like other carbohydrates, sucrose, ordinary sugar, burns in air to carbon dioxide and water, giving out energy. When it is heated strongly, it first breaks down into carbon and water, and the carbon then burns.

Sugar is such a good fuel that, mixed with the oxidiser potassium nitrate, it makes rocket candy, a fuel used to power amateur rockets.

Air helps it burn

Fire needs air as well as fuel, and a marshmallow brings its own. It is a foam, about 50% air, with the sugar held in the walls around countless tiny bubbles.

How finely sugar is spread out makes a big difference to how fast it burns. In the most extreme case, clouds of fine sugar dust can explode. On 7 February 2008, a dust explosion at an Imperial Sugar refinery in Port Wentworth, Georgia, killed fourteen people and injured thirty six, after accumulations of sugar dust were thrown into the air.

Toasting without flames

The aim of toasting is a caramelised outer skin with a liquid, molten layer underneath, where sugar browning creates the flavour and colour: see [how is caramel made?](#). That needs gentle heat. Hold the marshmallow above the heat rather than in the flames, turn it slowly, and be patient.

Stay safe

A flaming marshmallow is hot enough to burn skin and lips. If one catches, blow it out and let it cool before eating, and always supervise children around a fire. For what happens to marshmallows in the gentler heat of a microwave, see [why do marshmallows expand in the microwave?](#)

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