

ACCIDENTS

Happen

BUT SOMETIMES THEY RESULT IN AMAZING DISCOVERIES!



Accidents can be *really* embarrassing. But from time to time these oopsies lead to something awesome. Check out these three *fortunate* mishaps...



THE INVENTION: MICROWAVE OVEN

THE "OOPS!" MOMENT: Accidentally melting a chocolate bar in a pocket

THE DETAILS: Percy Spencer wasn't trying to find a quick way to cook food. It was the 1940s, and he was experimenting with radar — radio waves used to detect objects. But as he walked around the lab, he stepped in front of a 'magnetron' — a device in radar sets that makes short electromagnetic waves called 'microwaves'. Spencer didn't think much of it... until he reached into his pocket and pulled out a chocolate bar that had turned into a gooey mess!

STICKY SURPRISE

We now know why that happened — microwaves excite water molecules in food, which causes the molecules to vibrate and give off heat generated by internal friction. But Spencer had to find that out for himself... first, he aimed a beam of microwaves at some kernels of popping corn. The kernels burst and popcorn flew everywhere. He then zapped a raw egg, which exploded in his lab partner's face!

Spencer's discovery that microwaves could heat food superfast, from the inside, led to the first **microwave oven** — a ginormous 340kg gadget about the size of a fridge! Imagine trying to put that on your kitchen worktop!

THE INVENTION: DURABLE RUBBER

THE "OOPS!" MOMENT:

A temper tantrum

THE DETAILS: America was hit by 'rubber fever' in the early 1800s — lots of items, including clothes and footwear, were made out of the material. Trouble was, these objects either melted into a sticky pile of goo in heat, or cracked in the cold.

But hardware merchant **Charles Goodyear** was determined to figure out how to turn natural rubber into a material that could stand up to extreme heat and cold.

TEMPER, TEMPER

In 1839, after years of experiments, Goodyear had a new plan — he'd add sulphur to the rubber to change its properties. Armed with a sample of his new rubber formula, he went down to the local general store, but people there just laughed at what they thought was another silly idea about rubber.

Angered, Goodyear waved his hands about as he shouted. The mixture flew out of his hand and landed on a hot stove. And when he went to prise it off, he found a substance that was hard, like leather, but still elastic — a substance later called **vulcanized rubber** that's similar to what we use today to make everything from wellies to bicycle tyres. By adding heat to his new mixture of rubber and sulphur, he created rubber that was elastic, strong and stable. Goodyear's temper had accidentally found the key to a great discovery!



LEARNING FROM

mistakes

If these inventions show us anything, it's that we all make mistakes — and that's not always bad.

Mistakes often take us in new directions — and help us learn new things.

People who say something is impossible aren't always right. A lot of things were 'impossible' — before someone worked out how to do them.

If you don't succeed straight away, don't be afraid to try again and again, and again — and again!

THE INVENTION: ARTIFICIAL SWEETENER

THE "OOPS!" MOMENT: Dirty hands

THE DETAILS: We all like a sweet treat from time to time. But sugar can be too much of a good thing. That's why a lot of foods — from fizzy drinks to cereal — contain artificial sweeteners. And the first one was actually a tasty surprise.

In the late 1870s, German scientist **Constantin Fahlberg** was hard at work in his lab when a beaker of chemicals accidentally tipped over. He cleared away the mess but the harmless chemicals were still on his hands.

SWEET SPLASH

Without pausing to wash, Fahlberg carried on with his work and then went home to eat. Sitting down at the table he began his meal, picking the food up with his dirty hands. But he noticed his bread tasted strangely sweet — something on his hands had transferred onto the bread. What was it?

The chemist rushed back to work. He licked and tasted everything in sight (not exactly the smartest idea in a lab!), and found what he was looking for — the substance in the beaker that had spilled was sweet, much sweeter than sugar.

Fahlberg eventually named his discovery **saccharin**, the world's first artificial sweetener. Dirty hands? Delicious!

