How do hurricanes form?

KS2 KS3 Ages 7-14 ⏰ 3 min read

A hurricane (called a typhoon or cyclone in other parts of the world) is among the most powerful weather events on Earth. Some generate as much energy in a single day as the entire world's electrical production. They can destroy cities. They're also genuinely beautiful from space — perfect spirals hundreds of kilometres wide. So how does one start from nothing?

Warm water is the fuel

Hurricanes need three things to form: warm ocean water (at least 26°C to a depth of 50 metres), warm moist air, and a process called the **Coriolis effect** to get the whole system spinning. They almost always form in tropical regions, typically late summer, when the ocean has had months to warm up.

Warm water heats the air above it. That warm, moist air rises rapidly, creating an area of low pressure at the surface. Surrounding air rushes in to fill the gap, picking up heat and moisture from the ocean as it does.

Think of the ocean surface as an enormous pan of water on a hob. When it heats up, steam rises. If you have a really powerful fan above the pan, that rising steam gets organised into a spinning column. The hurricane is the steam — the warm ocean is the hob, and the Coriolis effect is the fan giving the whole thing its spin.

The Coriolis effect

The Earth's rotation causes air flowing toward a low-pressure system to be deflected sideways — to the right in the Northern Hemisphere, to the left in the Southern Hemisphere. This deflection is what turns a simple inflow of air into a rotating system. In the Northern Hemisphere, hurricanes spin anticlockwise. In the Southern Hemisphere, the opposite.

The eye

As the storm intensifies, a calm region forms at its centre: the **eye**. Inside the eye, the sky is clear and winds are light — sometimes eerily calm. This is because the rotating

winds are moving so fast around the centre that centrifugal force keeps air from spiralling all the way in. Surrounding the eye is the **eyewall** — the most destructive part of the storm, with the fastest winds and heaviest rainfall.

What makes them stop?

Hurricanes weaken when they move over cooler water (cutting off their fuel supply), when they travel over land (also cutting off the warm ocean moisture), or when wind shear in the upper atmosphere disrupts their structure. But a powerful hurricane over warm, open ocean can sustain itself for days or even weeks — and travel thousands of kilometres.

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