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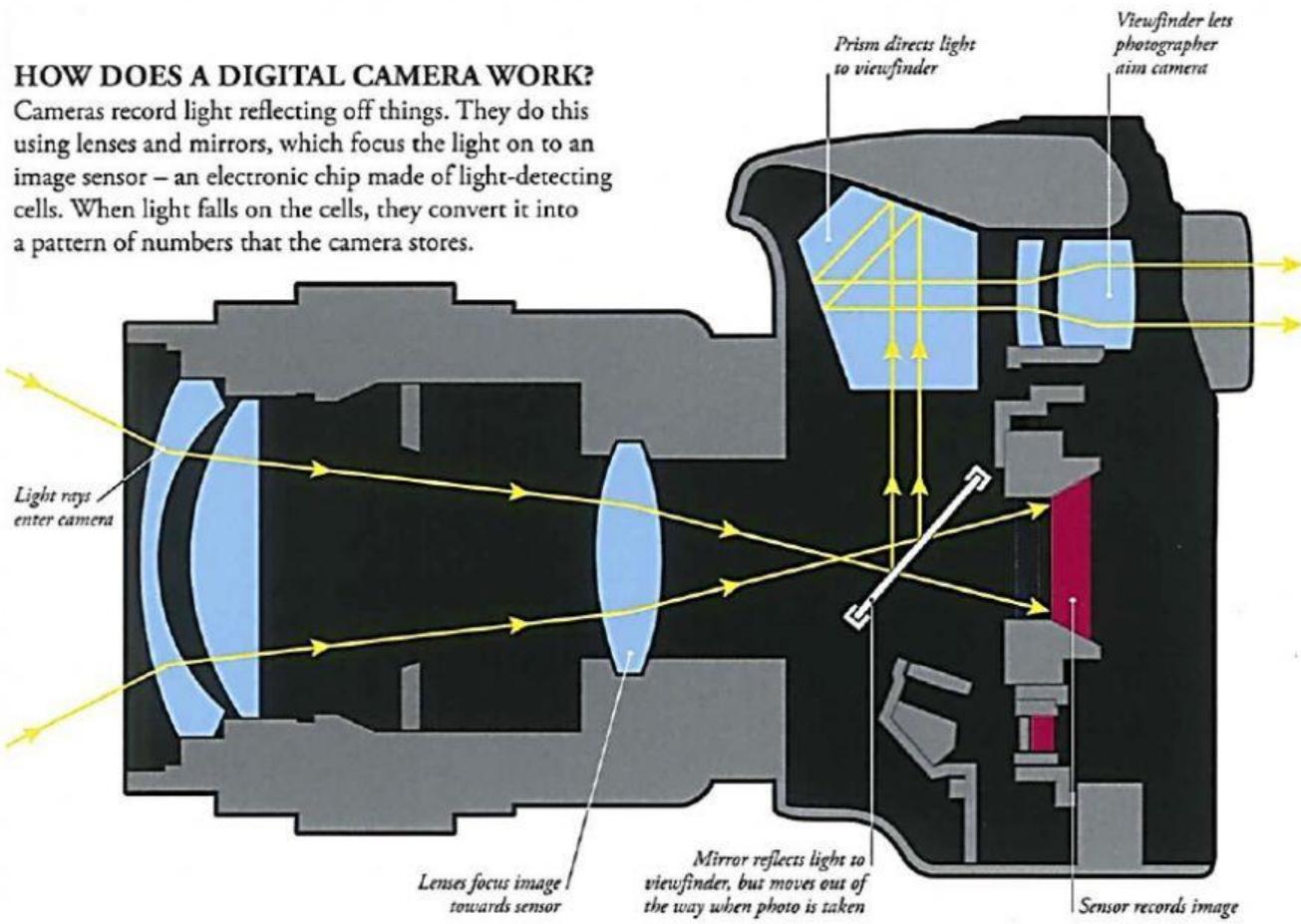
Science

Cameras

We see things because light bounces off them and into our eyes, where our brains recognize them. Cameras are like artificial eyes. They can record patterns of light as images and store them for us to look at later. They use lenses to take in light from a wide area and focus it on a small recorder.

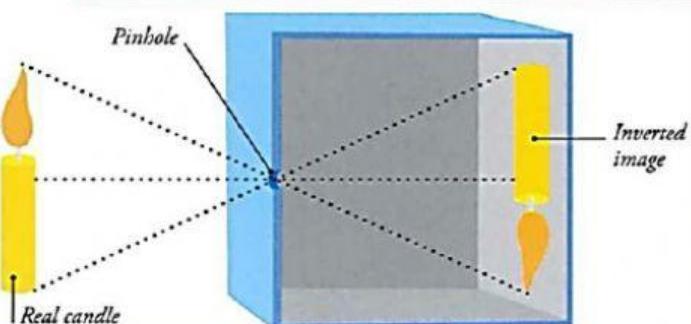
HOW DOES A DIGITAL CAMERA WORK?

Cameras record light reflecting off things. They do this using lenses and mirrors, which focus the light on to an image sensor – an electronic chip made of light-detecting cells. When light falls on the cells, they convert it into a pattern of numbers that the camera stores.



PINHOLE CAMERAS

Modern cameras are based on an older invention called the pinhole camera. It is a sealed box with a tiny hole on one side. As light streams through, it makes an upside-down image on the back wall of the box. You can even project an image on the wall of a room by making a tiny hole in the blinds. Pinhole cameras were invented in Ancient China, but the first person to understand how they worked was Islamic scientist Alhazen, around 1,000 years ago.



EXTREME PHOTOGRAPHY

Ordinary snapshots capture the world as we see it, but our eyes cannot see everything. They are not fast enough to catch things that happen very quickly, or sharp enough to notice very tiny changes. Special photography techniques can take astonishing pictures that our eyes alone could never see.



▲ **SLOW-MOTION** Cameras can slow things that happen too fast for our eyes to see. This photo shows what really happens when a balloon full of water bursts.



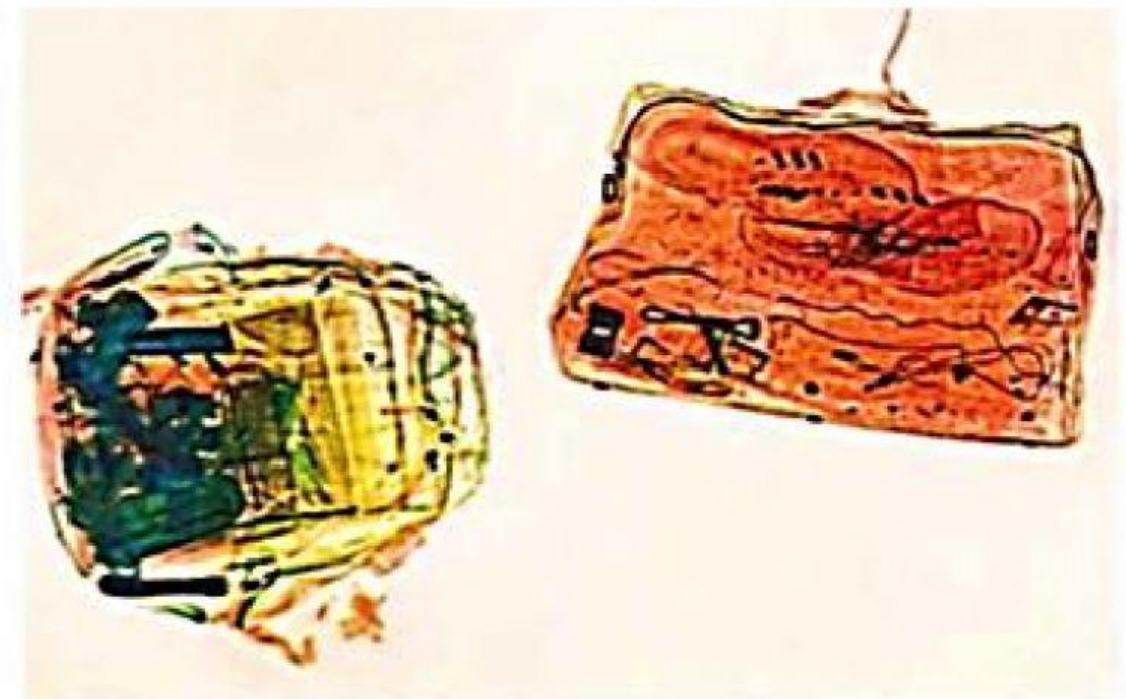
▲ **SCHLIEREN** *Schlieren photos use coloured lines to reveal invisible air moving around things. They are used to design more efficient shapes for aeroplanes and spacecraft.*



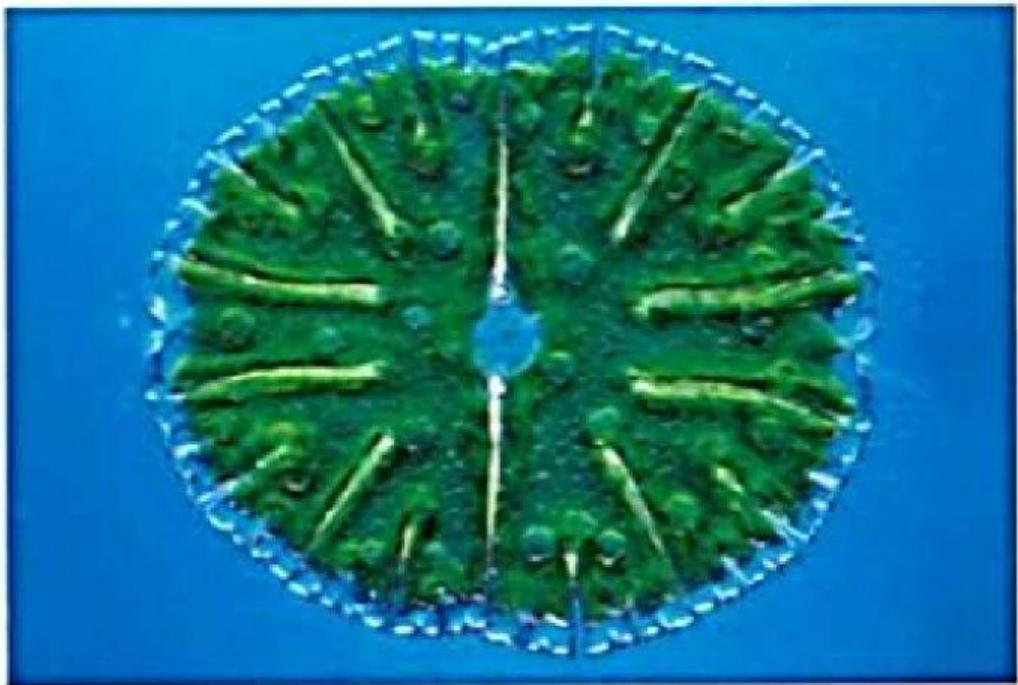
▲ **LONG EXPOSURE** *Photos taken over a long time show moving lights as lines. These circles are trails made by stars circling the sky.*



▲ **MACRO** Powerful lenses can zoom in on the details of microscopic things. Macro lenses make large, detailed close-ups of very small objects, such as these seeds.



▲ **X-RAY** X-rays pass straight through soft materials such as fabric and skin, so they can show up the ghostly details inside things, like the contents of these bags.



▲ **MICROGRAPH** A photograph taken under a microscope is called a micrograph. With an electron microscope, we can make lifelike 3D micrographs, such as this photo of an alga.

How do camera's work?

Click here:

