

Sequence 6: digital cameras



Fiches de synthèse mobilisée (collection en français) :

- Fiche n°6 : modélisation de l'appareil photographique



Sommaire des activités ETLV :

- ACTIVITY 1: what is a digital camera?
- ACTIVITY 2: digital camera resolution
- ACTIVITY 3: controlling light

ACTIVITY 1: what is a digital camera?

■ Understanding:

DOCUMENT 1: digital camera

A digital camera is a camera that captures photographs in digital memory. Most cameras produced today are digital, largely replacing those that capture images on photographic film. While there are still dedicated digital cameras, many more cameras are now incorporated into mobile devices like smartphones, which can, among many other purposes, use their cameras to initiate live video-telephony and directly edit and upload images to others. High-end, high-definition dedicated cameras are still commonly used by professionals and those who desire to take higher-quality photographs.

Digital and digital movie cameras share an optical system, typically using a **lens** with a variable **diaphragm** to focus light onto an **image pickup device**. The **diaphragm** and **shutter** admit the correct amount of light to the image, just as with film but the image pickup device is electronic rather than chemical. A computer then breaks this electronic information down into digital data.

Source: wikipedia

DOCUMENT 2: Professional digital camera



Source: wikipedia

Hasselblad 503CW with Ixpress V96C digital back, an example of a professional digital camera system

■ **Vocabulary:**

List the main components of a digital camera:

ACTIVITY 2: digital camera resolution

DOCUMENT 3: resolution

The amount of detail that the camera can capture is called the resolution, and it is measured in pixels. The more pixels a camera has, the more detail it can capture and the larger pictures can be without becoming blurry or "grainy."



Source: How stuff Works

■ **Understanding:**

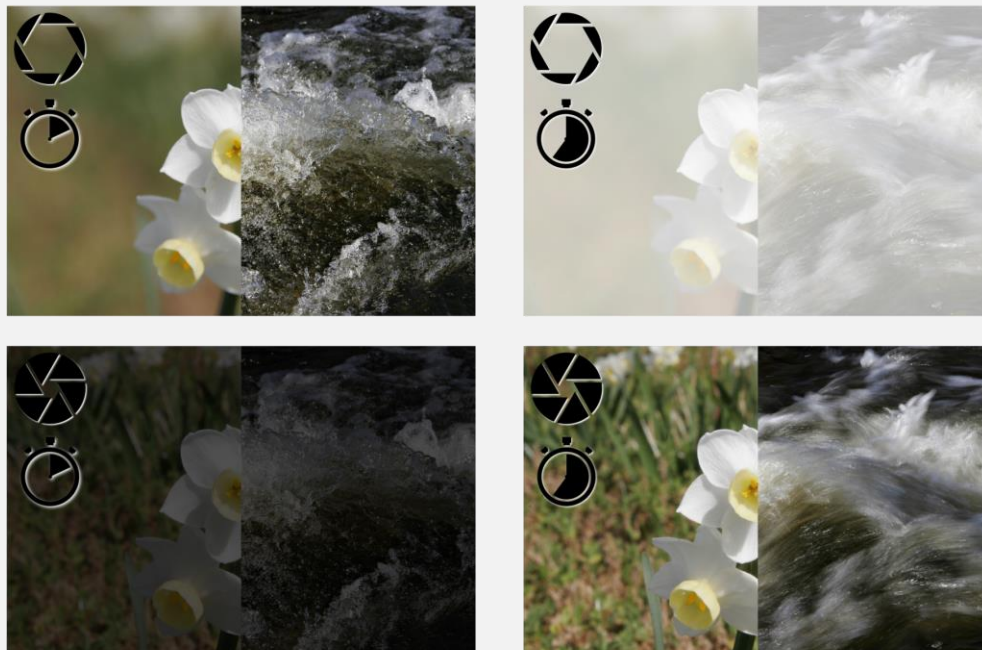
What is the advantage of having more pixels in a picture?

ACTIVITY 3: controlling light

DOCUMENT 4: aperture and shutter speed

Just as with film, a digital camera has to control the amount of light that reaches the sensor. The two components it uses to do this, the aperture and shutter speed, are also present on conventional cameras.

Aperture: The size of the opening in the camera. The aperture is automatic in most digital cameras, but some allow manual adjustment to give professionals and hobbyists more control over the final image.



Upper right: with large aperture and slow shutter too much light passes to the film/sensor and the photo is overexposed. Lower left: with small aperture and fast shutter not enough light passes to the film/sensor and the photo is underexposed. Lower right: small aperture and slow shutter gives a correct exposed photo but shows motion blur.

Source: [wikimedia commons](#)

Shutter speed: The amount of time that light can pass through the aperture. Shutter speed is a common term used to discuss exposure time, the effective length of time a camera's shutter is open. Slower shutter speeds are often selected to suggest movement in a still photograph of a moving subject. Fast shutter speeds freeze a moving subject on photograph.

Source: [How stuff Works](#)

■ **Understanding:**

Explain in your own words the notion of aperture:

Explain in your own words the notion of shutter speed:

■ **True or False:**



1) The picture above, on the left, was taken at a high shutter speed: **True – False**



2) The picture above was taken at a high shutter speed: **True – False**



- 3) The picture above, on the lower left, was taken at small aperture: **True – False**
- 4) The picture above, on the lower right, was taken at small aperture: **True – False**

Connaissances et capacités à maîtriser

Ce qu'il faut savoir faire :

Compétences	Capacités à maîtriser	Où dans cette séquence ?
APP	Utiliser du vocabulaire spécifique	Activités 1 à 3
	Lire et comprendre des documents scientifiques	Activités 1 à 3
ANA	Mettre en lien des documents pour émettre des hypothèses en réponse à une question scientifique	Activité 3
COM	S'exprimer à l'écrit en utilisant le vocabulaire adapté	Activité 1 et 2