

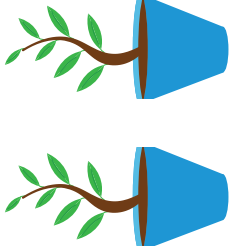


→ INFRARED WEBCAM HACK

Using infrared light to observe the world in a new way

→ Worksheet 2 results

Objects	Describe your observations		Explain your observations
	Visible light	Infrared light	
Remote control 	When pressing a button and looking at the infrared sender, nothing can be seen, (except sometimes a faint light when the wavelength used by the remote control is very close to the visible wavelengths).	Looking at the remote control through the webcam and pressing the buttons, a bright light signal from the infrared sender can be seen. Tip: This is also visible with the camera of some smartphones!	Remote controls are used to control from a distance some devices like televisions. How does the receiver (e.g. the television) know which button on the remote control has been pressed? Each button sends out on-off signals at a certain wavelengths of the infrared light. The pattern of the signal is related to one button on the remote. For this reason, we can see the signal emitted by the remote with the infrared camera.
LED vs. candle 	The LED light and the candle both emit light. The colours look different. The candle has a warmer light, whereas the LED light is whiter.	Looking through the webcam, the candle appears much brighter than the LED light.	The candle not only emits visible light but also heat which can be visible in the infrared, and for this reason the candle appears brighter with the infrared camera. The LED light does not emit a lot of light in the infrared like the candle, but it appears brighter in the visible.
Living vs. fake plants 	Both plants are green when looking at them. Tip: If there are any yellow or brown leaves, they can be compared to the healthy, green leaves.	Looking at both plants with the infrared webcam, the green leaves of the living plant appear much brighter than those of the fake plant. Yellow or brown leaves are much darker than the green leaves.	In visible light both plants look green and real. In the infrared camera the living plant looks much brighter than the fake one. The living plant reflects a lot of radiation in the infrared, as this part of the light is not needed for photosynthesis. High reflectance of infrared light is caused by the spongy mesophyll. This can be related to a healthy plant structure. The plant structure of the yellow or brown leaves is already destroyed, so the reflectance of the infrared light is much lower.