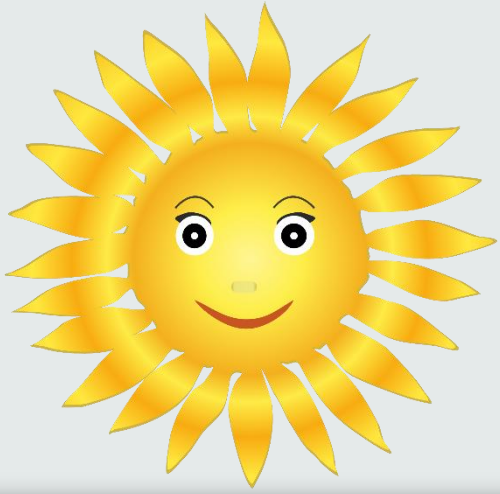




Artificial and natural light



Natural light

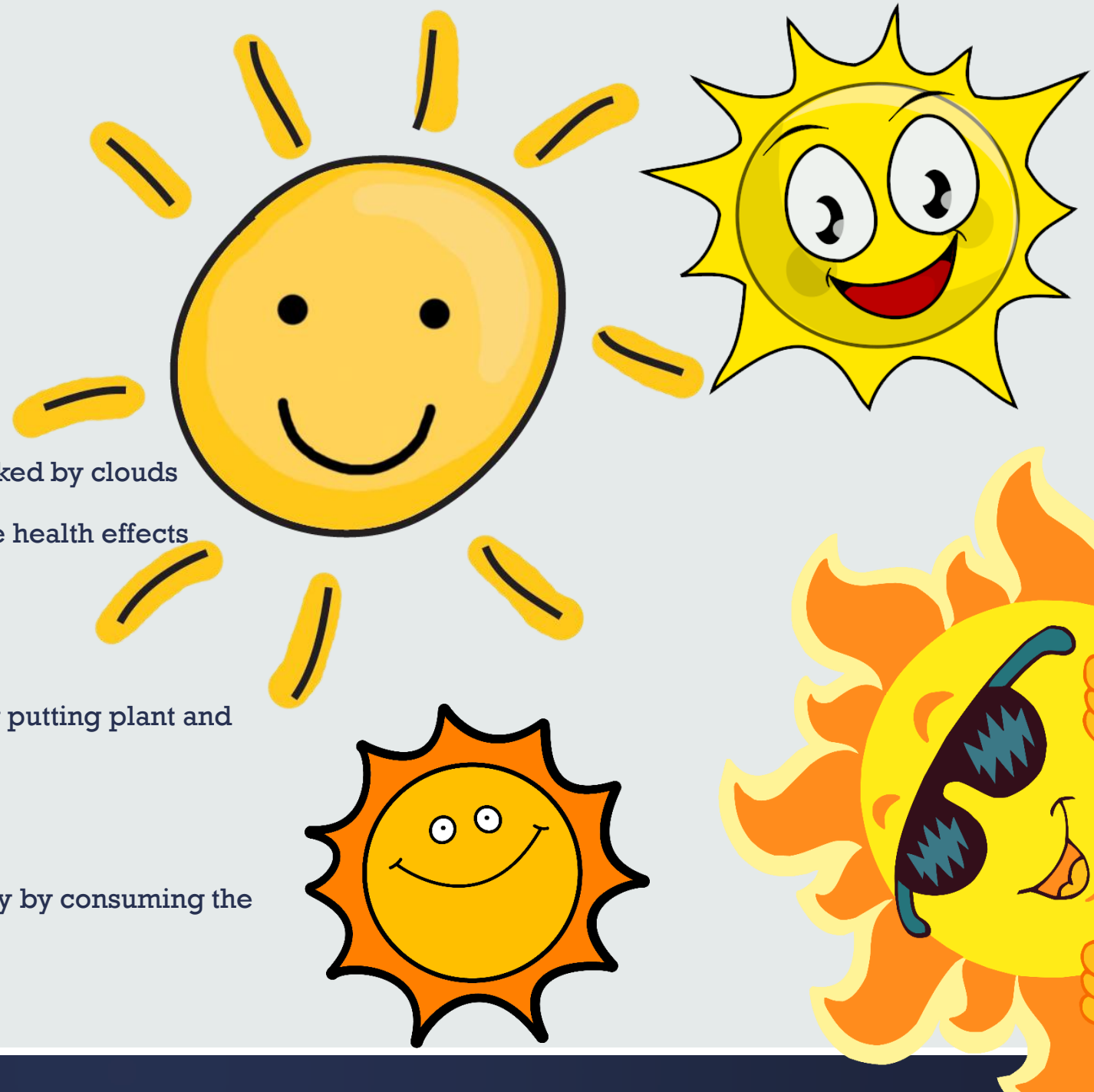
Why is it important?

- The basis of life
- Sunbeams warm the Earth's surface and air
- It influences your mood in a positive way and the Earth's biorhythms (seasons, parts of the day)
- It is necessary for our health (vitamin D) and for plants to make oxygen
- You can save money (solar energy)



What is SUNLIGHT?

- portion of the electromagnetic radiation given off by the Sun
- sunlight is filtered through Earth's atmosphere
- when the direct solar radiation is not blocked by clouds/blocked by clouds
- ultraviolet radiation in sunlight has both positive and negative health effects
- sunlight is a key factor in photosynthesis
- Life on EARTH
- in prehistory, humans began to further extend this process by putting plant and
- animal materials to other uses
- most autotrophs, such as plants, use the energy of sunlight
- heterotrophs, such as animals, use light from the Sun indirectly by consuming the products of autotrophs



Moonlight



- Light that reaches Earth from the Moon

- Consisting mostly of sunlight and starlight

- The intensity of moonlight varies greatly depending on the lunar cycle but even the full Moon typically provides only about 0.05-0.1 lux illumination

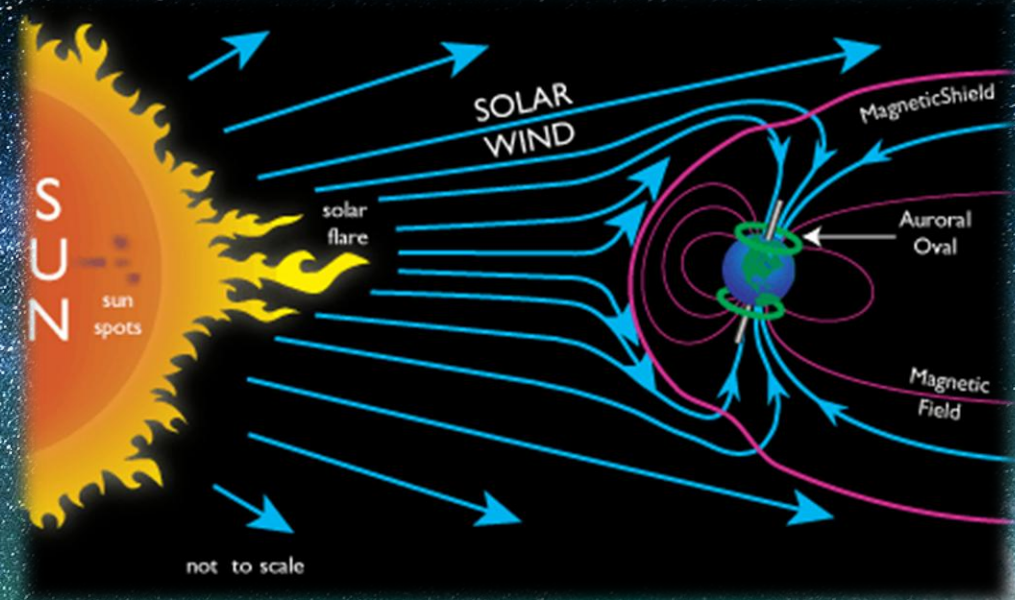
- Moonlight sometimes has a harmful influence

- When the Moon is nearest to Earth and viewed at high altitude at tropical latitudes the illuminance can reach 0.32 lux

- The light of the Moon was thought to worsen the symptoms of lunatics and to sleep in moonlight could make one blind or mad

Aurora

- Aurora=Northern Lights
- It's a natural light in Antarctic and Arctic regions
- It looks like: long, narrow arcs of light
kink, fold, swirl or even ruffle like curtains
- They are caused by the sun, who sends us a lot of energy and particles
- Nitrogen: purple, blue light
Oxygen: green, red light
- Best places to see: Canada, Yukon, Nunavut, Alaska (North America)
Scandinavia, Norway, Russia (Europe)



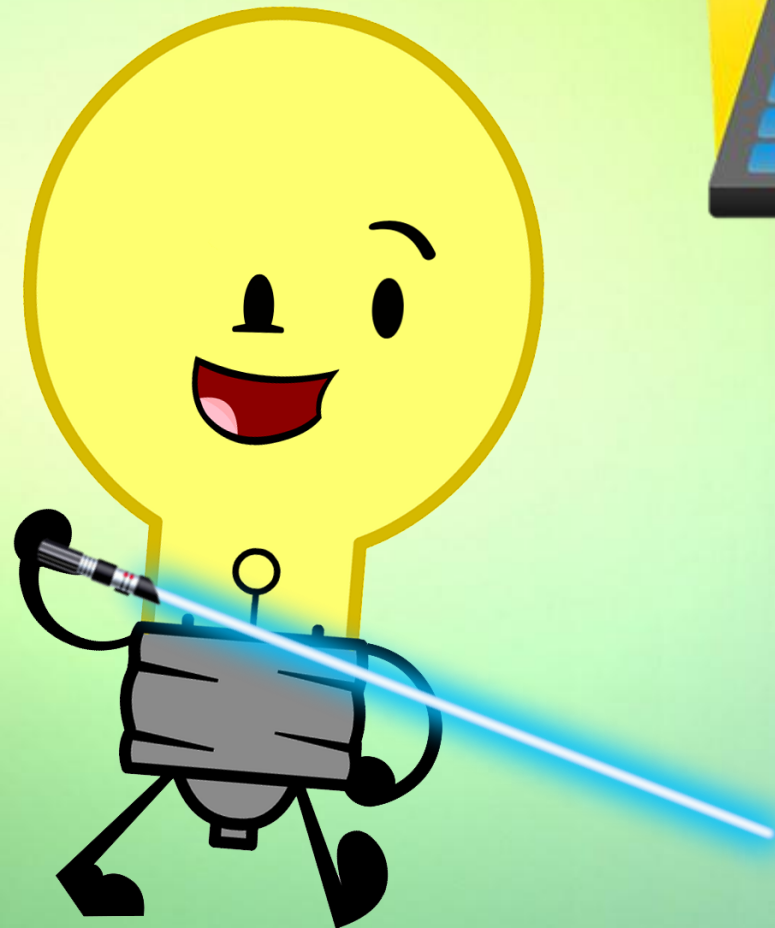
Light and rainbows

- We can define rainbow as an optical event composed by a lot of tiny prisms. When the sunlight crosses over the drops in the sky, after or during a storm, drops shape a light spectrum in the sky. The rainbow development is characterized by 3 optical effects:
 - Refraction
 - Dispersion
 - Reflection



Artificial light

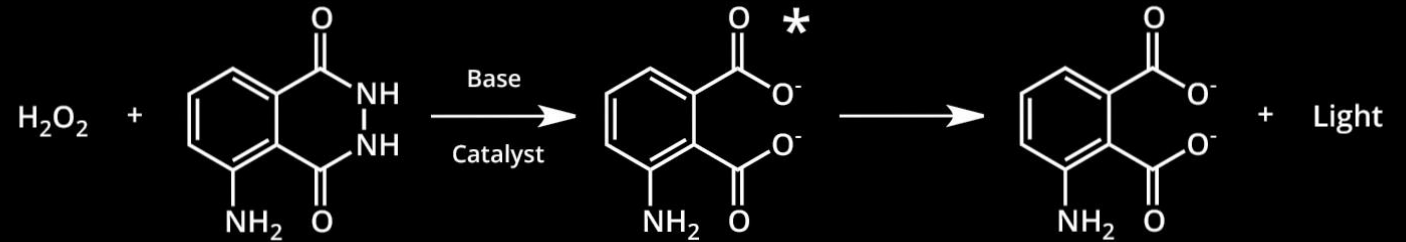
- Non-natural light
- Light produced by electric lamps
- Several types:
 - **Incandescent Bulb**
 - **Halogen Lamp**
 - **Gaseous Discharge**
 - **LED** (red, blue, green, white)



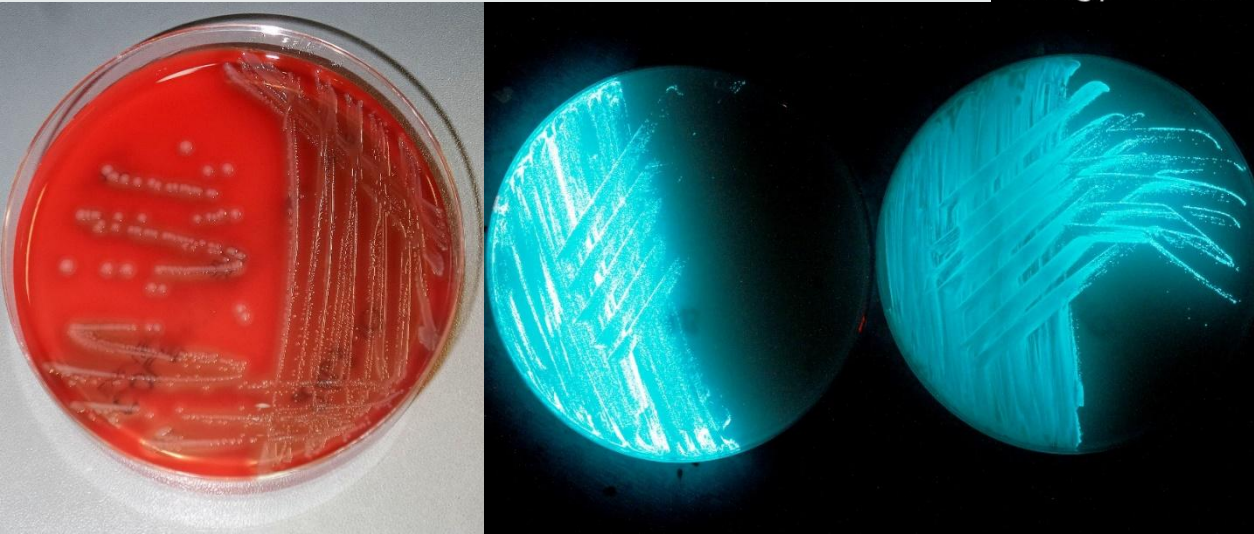
Chemical light

- Bioluminescence is the ability of biological beings to emit light
- In fireflies and bacteria it works thanks to enzyme luciferase
- It oxidises an aldehyde saturated long-chain following the reaction

- In 1937 a German forensic scientist discovered the use of luminol in the presence of blood.
- Luminol is used in forensic research.

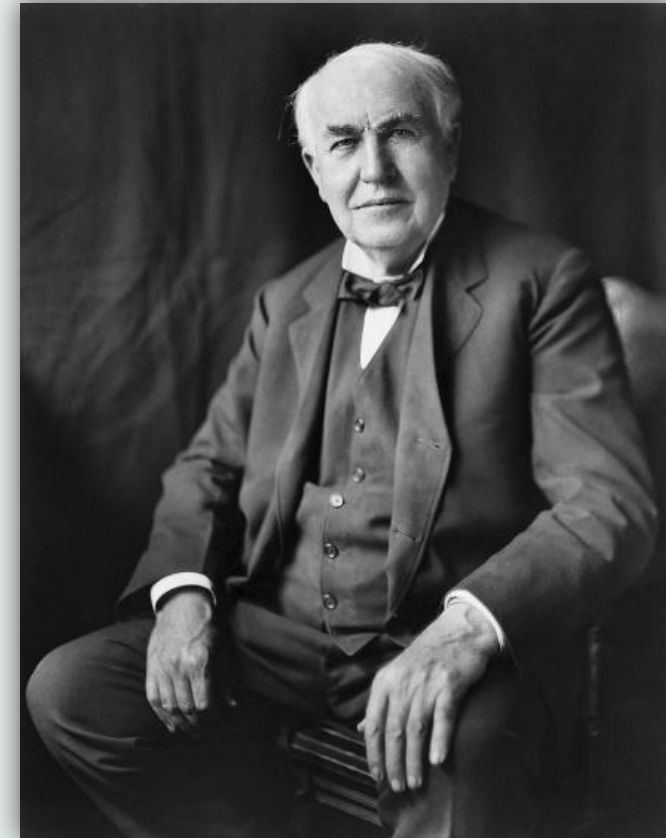


Luminol solution also contains an oxidising agent, such as hydrogen peroxide, and a base. In the presence of a catalyst, the reaction produces energy, promoting electrons in the product to higher energy levels, before they fall back down and release their excess energy as light.



THOMAS EDISON

- Was an American inventor and businessman
- In 1878 he began working on a system of electrical illumination
- He wanted to create a long – lasting incandescent lamp, something that would be needed for indoor use
- Early bulbs had flaws as an extremely short life, high expense to produce, and high electric current drawn
- The first successful test was on October 22, 1879 (it lasted 13.5 hours)
- By November 4, 1879 was filed for U.S. patent 223 898 for an electric lamp using „a carbon filament or strip coiled and connected to platinum contact wires”
- This was the first commercially practical incandescent light



Artificial light and agriculture



- light is an essential factor for plant germination
- LED lighting
- great effect on the plant's growth cycle
- extreme climatic changes
- to replace the natural sunlight

Thank you for your attention!