

# Changes in RGB of Transmitted Light by the Concentration of Colloidal Particles in a fluid

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### Purpose

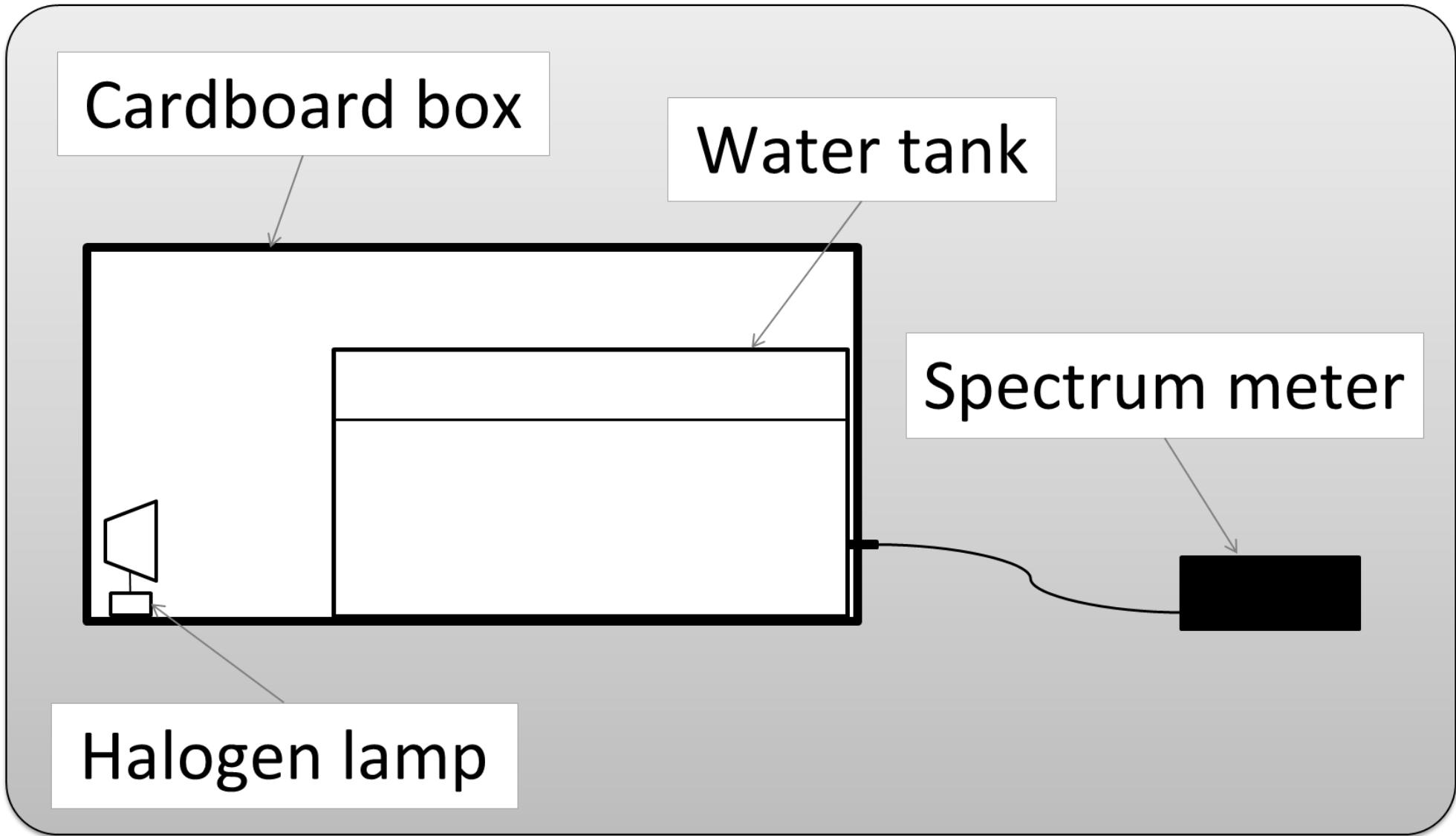
Consideration there is a relationship between the change of sky color and the atmosphere, so we examined the glow of the sunset. (the sunset glow is easy to examine) Through previous research we understood the changing color of the sunset has a relation with the amount of dust in the atmosphere and we carried out a model experiment to replicate the effect.

### Experimental method

In this experiment, we supposed the atmosphere as water and the dust as milk. (colloidal particles)

#### Instrument

- Water 1L
- Milk
- Halogen lamp
- Water tank (5cm × 30cm × 15cm)
- Spectrum meter
- Cardboard box



#### Procedure

- 1.Put water into a water tank.  
Turn on a halogen lamp.  
Cover the device with a cardboard box.  
Measure the wavelength of red, green and blue (RGB) using a spectrum meter.
- 2.Add a drop of milk into the water tank.  
Measure the wavelength of RGB.
- 3.Repeat this operation 10 times.

### The mechanism of the sunset glow

As the sun goes down to the horizon, it comes nearer and nearer to the ground. The sun light comes into the earth at a shallow angle rather than an obtuse angle. So it shines for longer in the air. Red light, which has a longer wavelength, hits the dust in the air and the dust reflect the sun light. This is why the sky looks red.

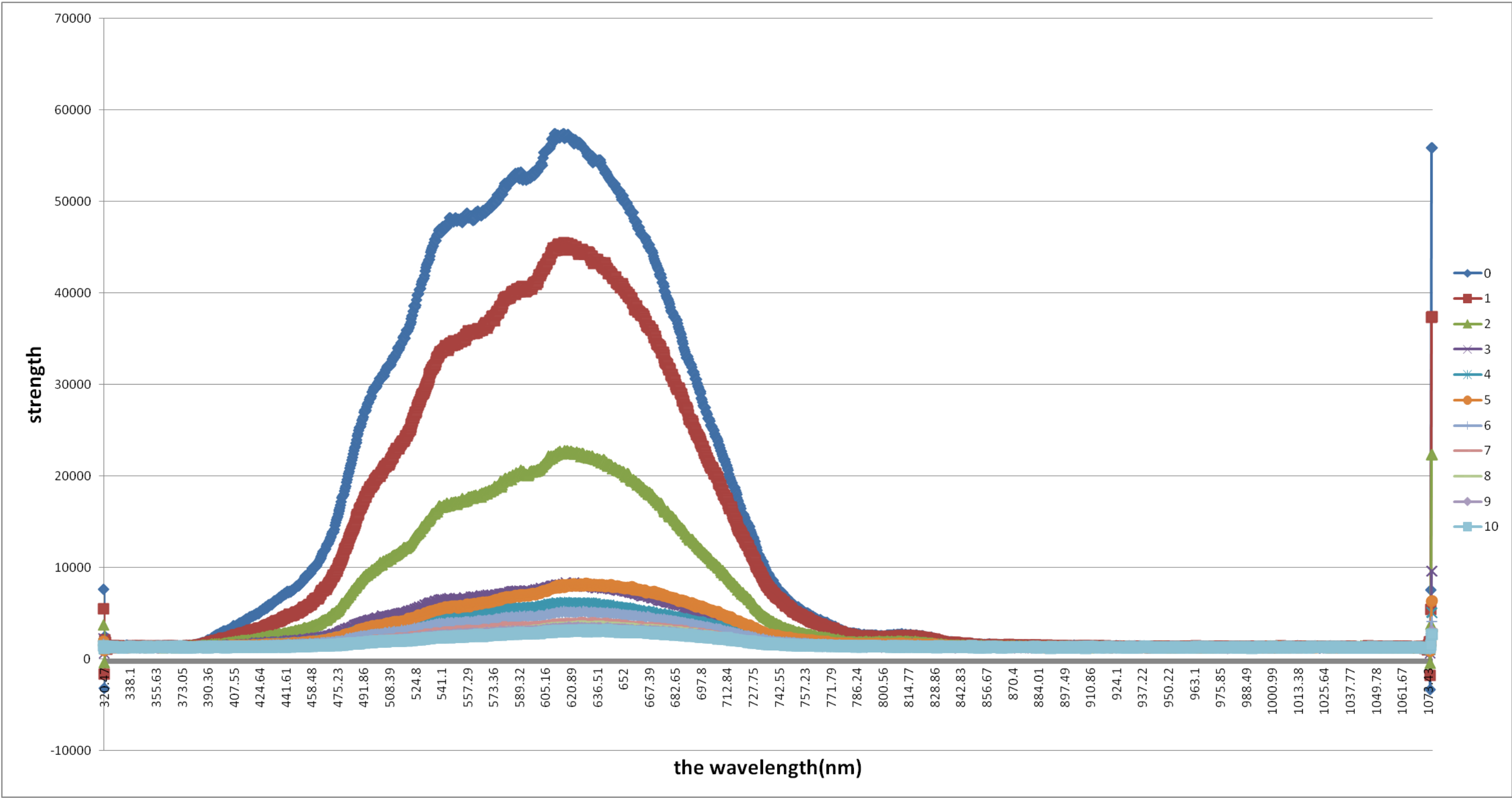
### Consideration

According to the graphs, they show that **one drop of milk weakens short wavelength**. From the color of the light in these photos, you can find the ratio of red light increases. In these graphs, after putting 6 or 7 drops, they show no big changes. However, in these photos, **the color of the red looks deeper**. We consider that the reason is all wavelengths decrease.

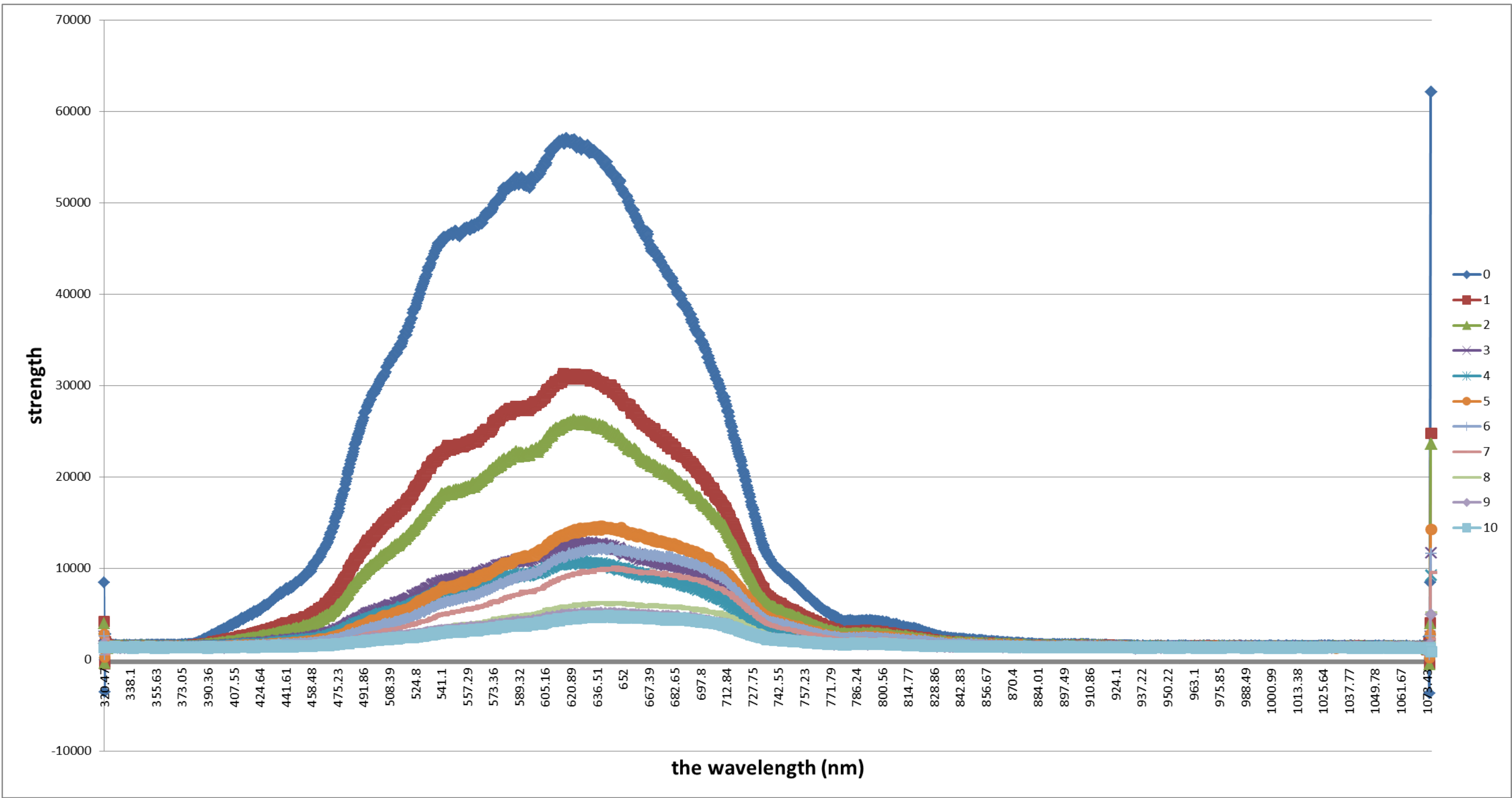
### Result

✂We did this experiment 5 times. These graphs show Experiment 2 and 4.  
Vertical axes show the light strength. Horizontal axes show the wavelength of the light.

- As we put some milk,
1. The strength of the light get lower. (in these graphs)
  2. The red wavelength get stronger. (in these photos)



Experiment 2



Experiment 4

### Future work

We would like to study more about sunset in order to compare the result of this experiment and real sunset.