



Sky ! Why your colors change ?

Sandrine Larrieu-Lacoste

19 July 2016



1- Sky ! Why do your
colors change ?

2- Interactive book

1 - Sky ! Why do your colors change ?



<https://vimeo.com/172331891>

2 - The Interactive book

Sky, why your colors change ?

Score 0 / 42 - 0%

1 / 28

Cover

Cover ✓

Sky ! Why do your colors change ?

Table of contents


1- The colors of the rainbows

1-1 Let's make a rainbow !

1-2 The rainbow experience

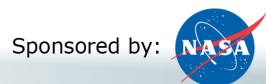
1- 3 Try the experience !

1-4 The Newton experience





<http://www.epubeditor.it/ebook/?static=37837>

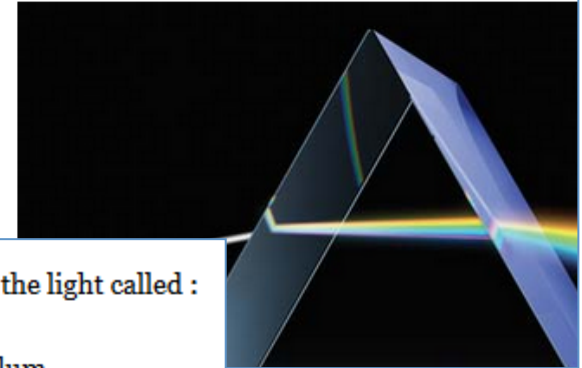


Implemented by:  **UCAR**

QUIZZES

What is the name of this phenomenon ?

1. ☐ Reflexion
2. ☐ Refraction



All colours of the light called :

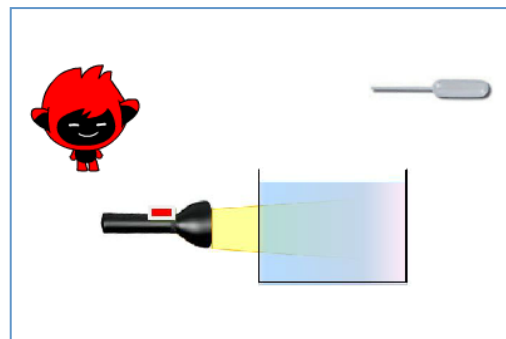
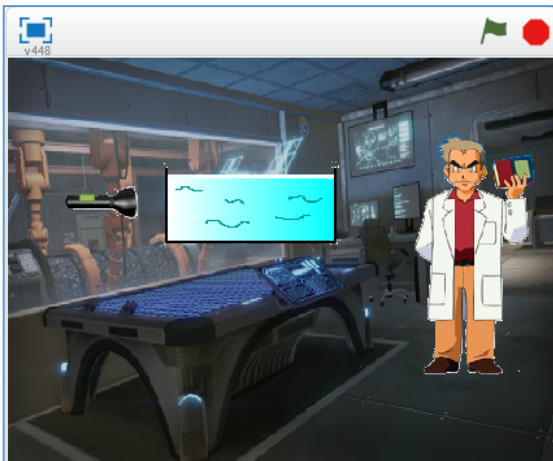
1. ☐ speculum
2. ☐ spectograph
3. ☐ spectrum

Arrange the colors of the rainbow, from the top to the bottom

blue yellow purple orange red green



Games's programming with Scratch



Mathématique modeling

For the red beam of light

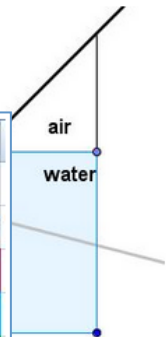
$$1 \cdot \sin(75^\circ) = 1,33 \cdot \sin(i_2)$$

$$\text{So } \sin(i_2) = \sin(75^\circ) / 1,33 \text{ so } 0,72626$$

Thanks to calculator, the value of the

$$i_1 = 75^\circ$$

	A	B	C	D	E	F
1	Value of i	Value of λ				
2	100	380		colors	Wavelength	Scattered light intensity
3	80,85	450		Purple	380 nm at 450 nm	100 et 51
4	34,73	495		Blue	450 nm at 495 nm	51 at 35
5	19,75	570		Green	495 nm at 570 nm	35 at 20



Mathematical modeling:

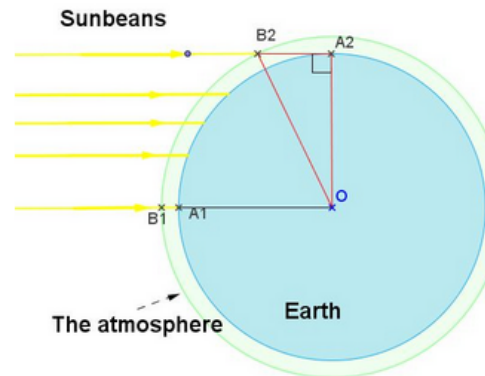
We suppose the observer is on the equator. When the sun is at the zenith, the observer is on the location A_1 , the distance A_1B_1 is equivalent to the thickness (around 30 km).

On evening the observer is on the location A_2 , the distance A_2B_2 is higher than the distance A_1B_1 .

We will calculate the maximum value.

We know the earth's radius $OA = 6\,370$ km and $OB = \text{earth's radius} + \text{thickness atmospheric}$


$$OB = 6\,370 + 30 = 6\,400 \text{ km.}$$



20 at 17
17 at 14
14 at 6



Thanks for your attention

Sponsored by:  **NASA**



Supported by:  **NOAA**



Implemented by:  **UCAR**