

Materials Decathlon - Challenge n°4 - 40'

CHROMADEPHT

Enjoying the pictures using ChromaDepht glasses

- Put on the glasses that you have been given and have a look at the exhibition. Don't run from one picture to the other and take your time to stare at each one: it may take a while to get the full effect! Answer the questions you find under some of the pictures. Write down what you see and everything else which maybe of importance.
- Then join your team to discuss and merge your observations to answer the following questions.

Q1. What's the effect of looking at the pictures through the glasses?

Q2. Which is the perceived order of the colours from nearest to farthest? Is it random?

Q3. Describe what you see when you follow the instructions on picture n° 25 in the exhibition and you alternatively close one eye at a time. With coloured pencils make a picture of what you see:

 - when you close the left eye;
 - when you close the right eye;

Q4. In picture n°7 close one of the eyes and look at the magenta square through the glasses. Then close the other eye. Describe what you see. What happens with the yellow square? What do you think would happen with a cyan square? Why?

How are the ChromaDepht glasses working?

The following questions/activity may help in your research/comparison

- Look at the light sources around you. What do you see when you have ChromaDepht glasses on?
- Which optical devices do you know that transform incident white light in a rainbow of colours made of the full spectrum?
- Revise how a prism works and how a diffraction grating works. Make a sketch of both devices and highlight the difference in result.
- In the picture on the answer sheet draw both a red and a blue ray coming from the light source (circle) and reaching the eyes after they have gone through the two prisms. Is it exactly like in a diffraction grating ?

One of you has a **diffraction grating** in its badge: now use it to explore comparing and contrasting the two devices (ChromaDepht and usual diffraction grating).

- Looking at light sources:** how does the spectra appear through the two devices?
- One pair of ChromaDepht glasses has been cut into two. On the lenses you have L and R to remind which was originally the left and the right lens. Now shift the lenses (put L-lens on right eye and vice versa): what do you notice? What about a couple of diffraction gratings? Is it the same?
- Using a laser:** compare the pattern obtained shining the laser through the diffraction grating and the ChromaDepht glasses first one lens and then the other one. Write down your observations.
- Just go with your **finger nail** along one of the faces of the lens: on one side it will appear perfectly smooth, on the other one it will produce the typical noise of something on grooves,
- Under a USB microscope:** can you see anything? Take a snapshot!

At the end of all these investigations write down on the answer sheet a **Table** evidencing the different behaviour between Diffraction Grating and ChromaDepht glasses in the observations you made.

Building your own ChromaDepht picture

Now that you understand how ChromaDepht glasses work, design your own ChromaDepht composition! On the desk you have black and coloured cardboard and scissors. Best one will get extra-points!



OUTPUT WANTED :

Answer to Q1-Q4 + Final Table + 1 photo with the USB microscope + your own ChromaDepht composition

Answer sheet

GROUP N° _____

Ch.4 --- CHROMADEPTH

Q1

Q2

Q3

Q4

Complete the picture [See point 4 in the student sheet

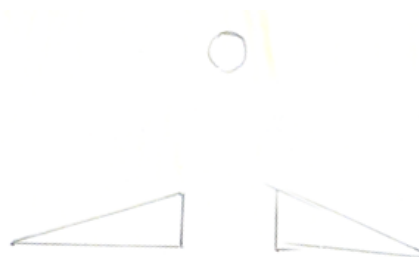


Table: [You can also use the back of the sheet]

<u>Observation:</u>	<u>Diffraction grating</u>	<u>Cromadepth</u>

PICTURES [Sent by Whatsapp to your group – See general instruction to share pictures or files]

- **Picture1 description:**



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