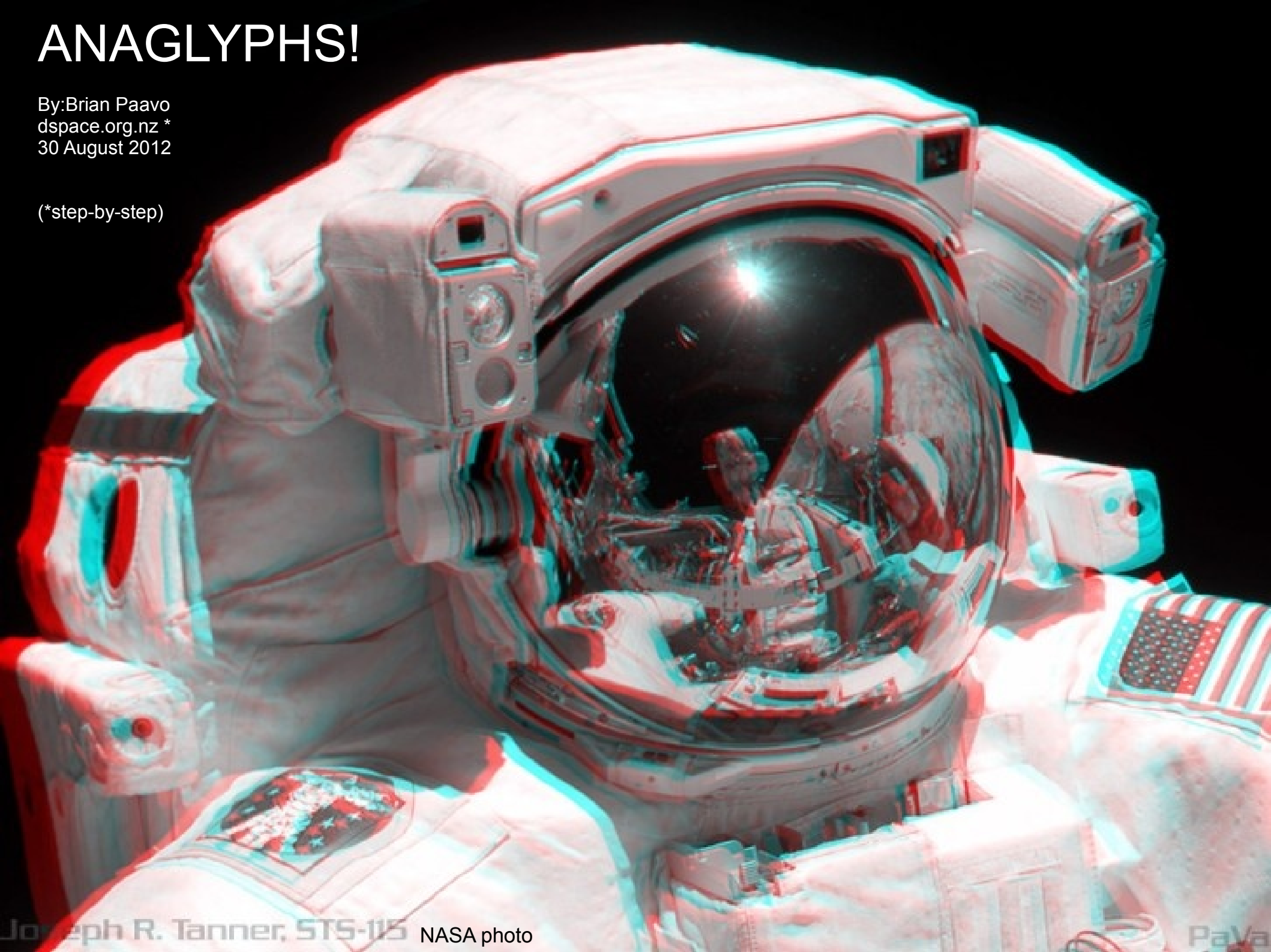


ANAGLYPHS!

By: Brian Paavo
dSPACE.org.nz *
30 August 2012

(*step-by-step)



Joseph R. Tanner, STS-115 NASA photo

PaVa

Anaglyph

Ana = (greek) again

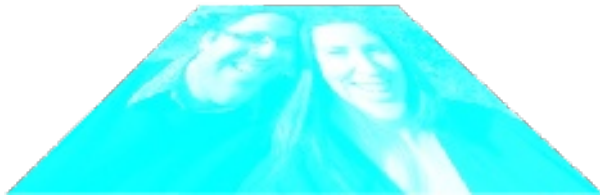
glyph = (greek) pictograph



Anaglyph

Ana = (greek) again *glyph* = (greek) pictograph

Two pictures, a blue (cyan) one on top of a red one.



+



Anaglyph

Ana = (greek) again *glyph* = (greek) pictograph

Two pictures, a cyan one on top of a red one.

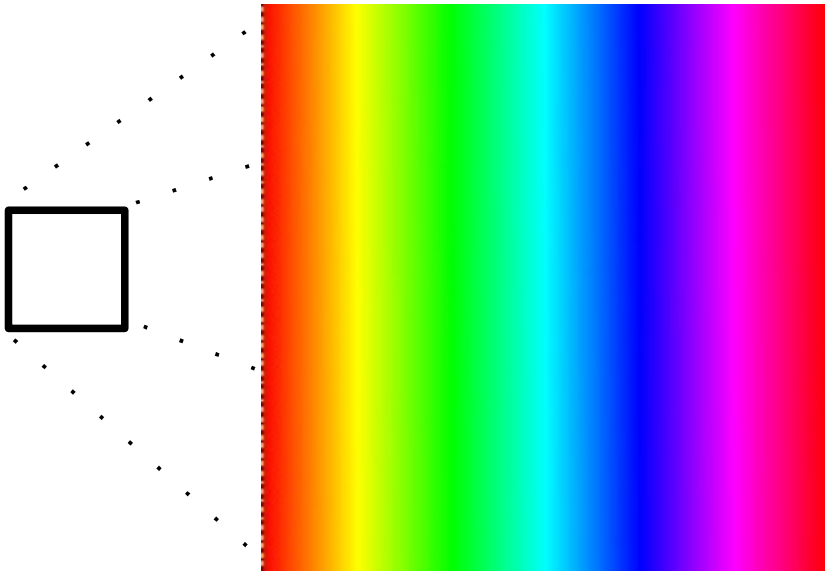


Why do the pictures disappear?



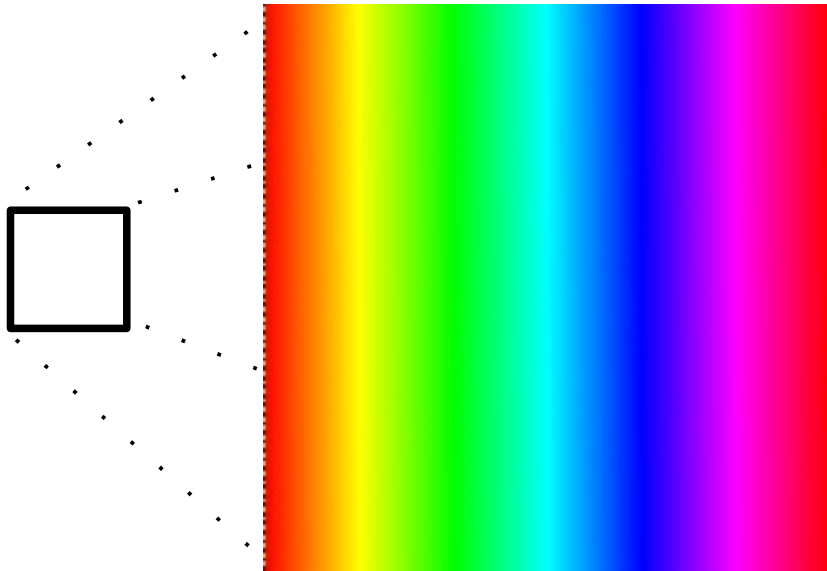
Filtering Light

“White” light is made up of all colours adding together.

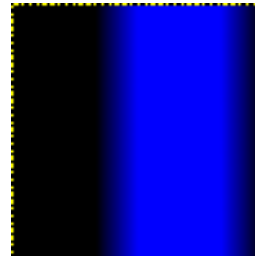


Filtering Light

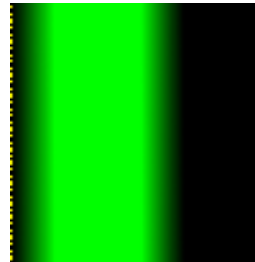
“White” light is made up of all colours adding together.



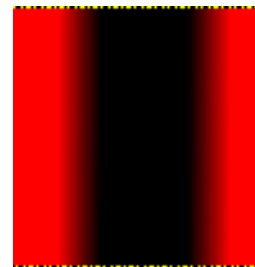
Filters **STOP** most colours



Blue filters stop everything EXCEPT blue.



Green filters stop everything except green.

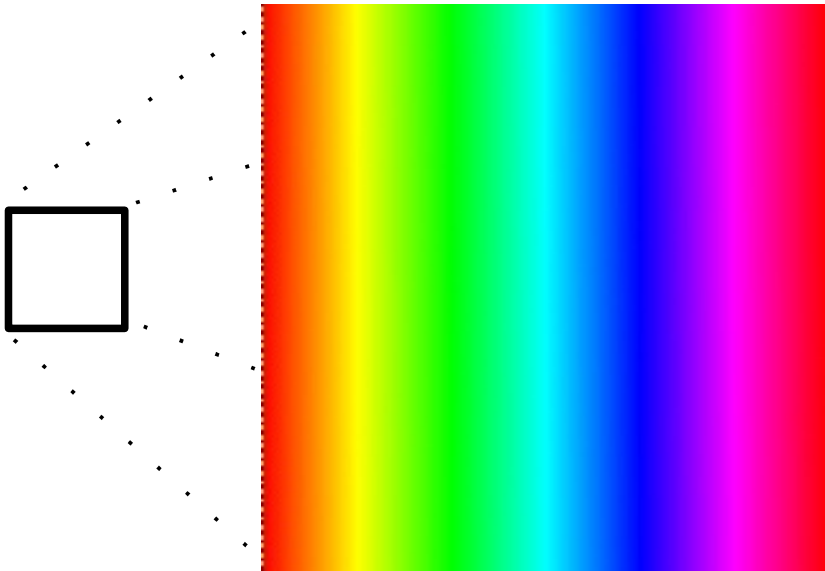


Red everything except red.

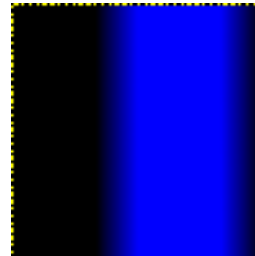


Filtering Light

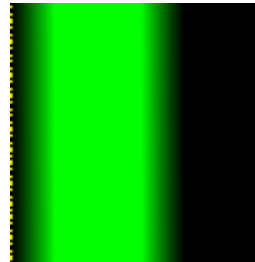
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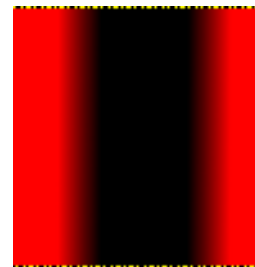
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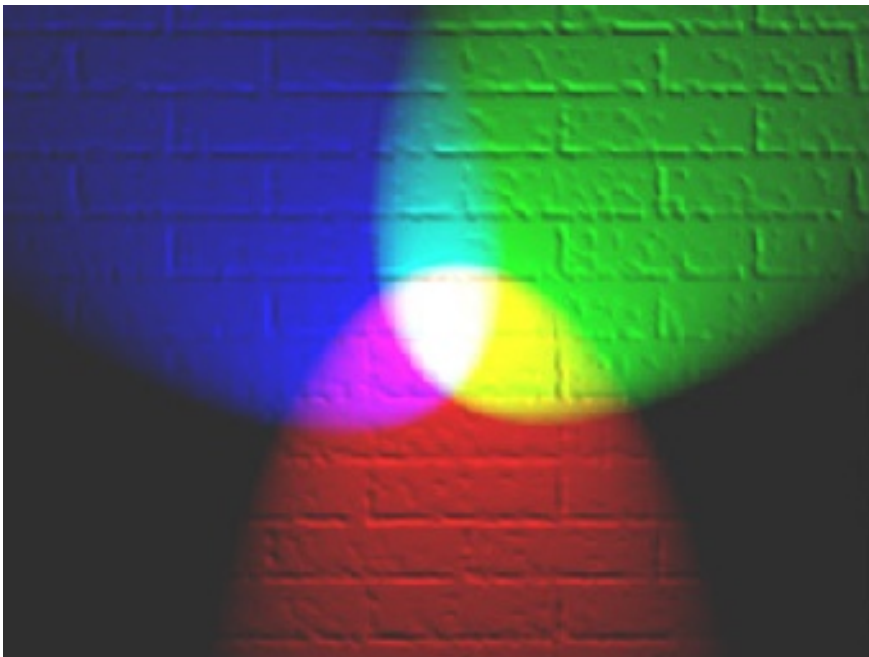
So filters **SUBTRACT** colour



Filtering Light

So filters subtract colour, but you can add light up again.

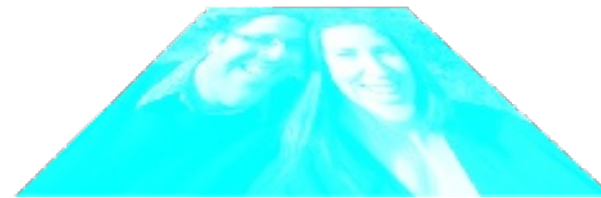
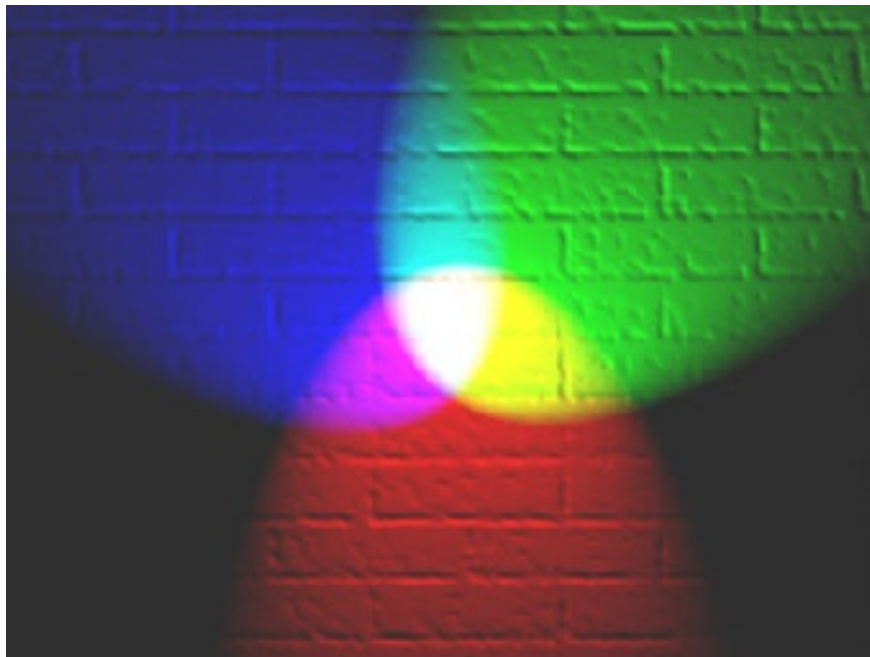
Each white light has a colour filter, but they all add up to white again



Filtering Light

So filters subtract colour, but you can add light up again.

Each white light has a colour filter, but they all add up to white again



visible
left

Filters in your glasses subtract everything but cyan from one eye and everything but red from the other.



visible
right



But how does it make things look 3D?

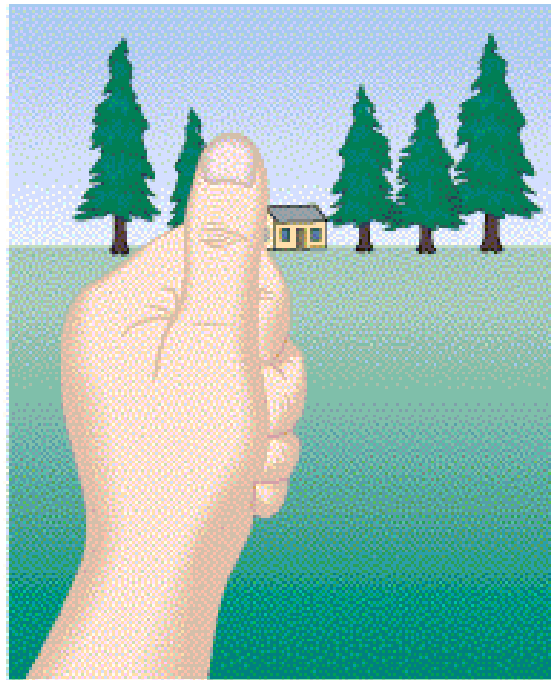
Parallax

Parallax = (greek, παράλλαξις) alteration, your view is altered

Each eye sees the world from a different place.



Seen by left eye



Seen by right eye

©Brooks/Cole Publishing Company/ITP

Our brains use the differences to give us the illusion of depth.



(Psssst: This is one way to measure how far it is to nearby stars. Can you figure out how?)

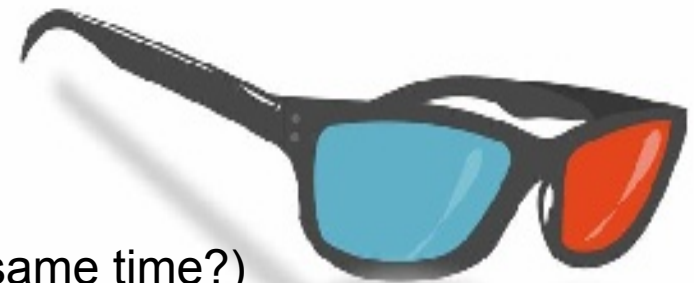
To make anaglyphs you have to show two different pictures to your brain at the same time.



People have been doing this for fun since 1838.



We've been making 3D movies since 1915.



(Are there other ways to show two pictures to your brain at the same time?)

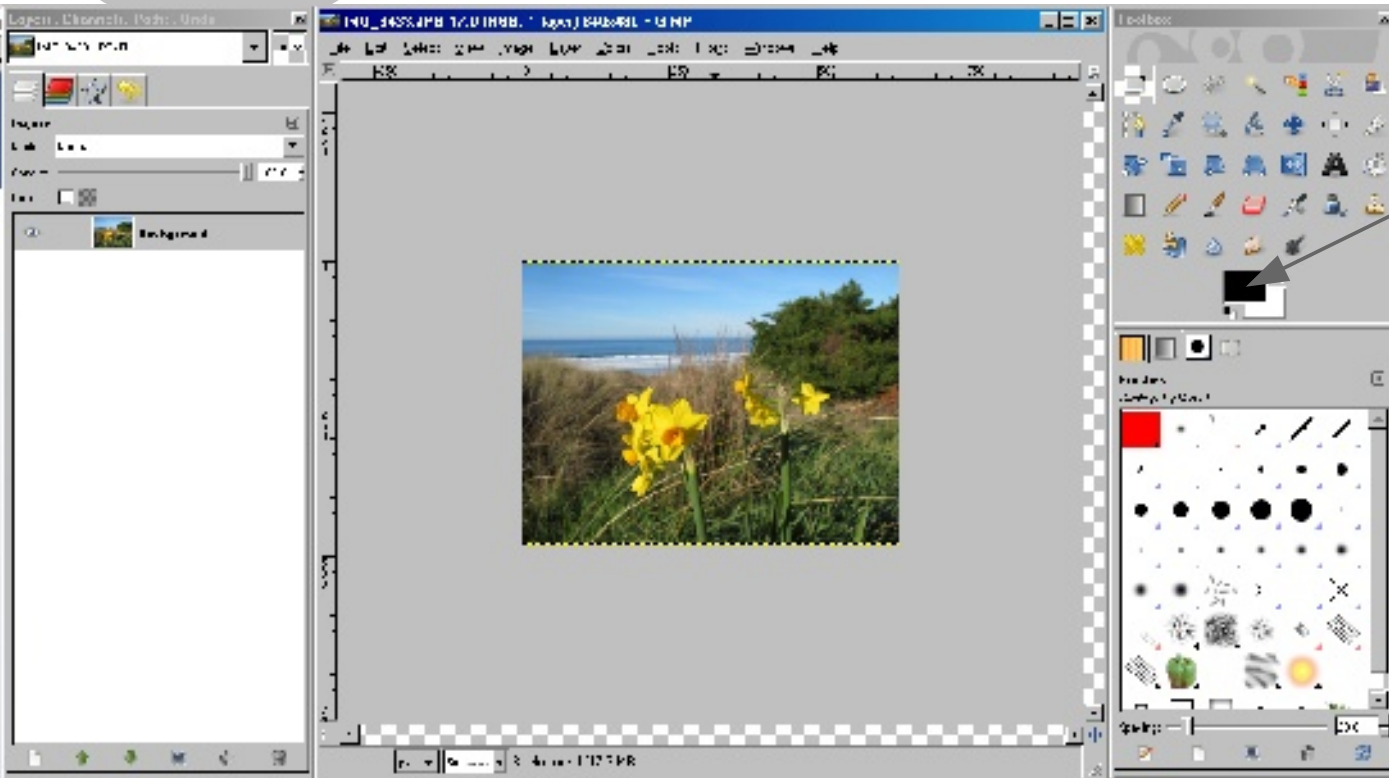
STEP 1

Tell people to keep still! Take one picture, move your camera a few centimetres to the left, take another. You may want to turn autofocus off.



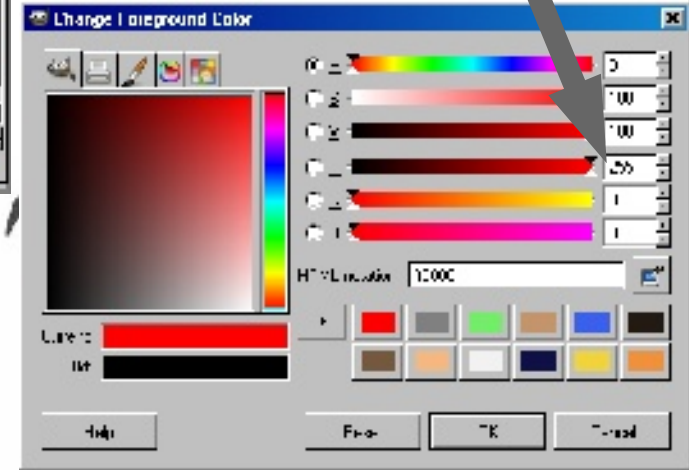
STEP 2

Open up your first photo in GIMP*. Change the foreground colour to red.



Click

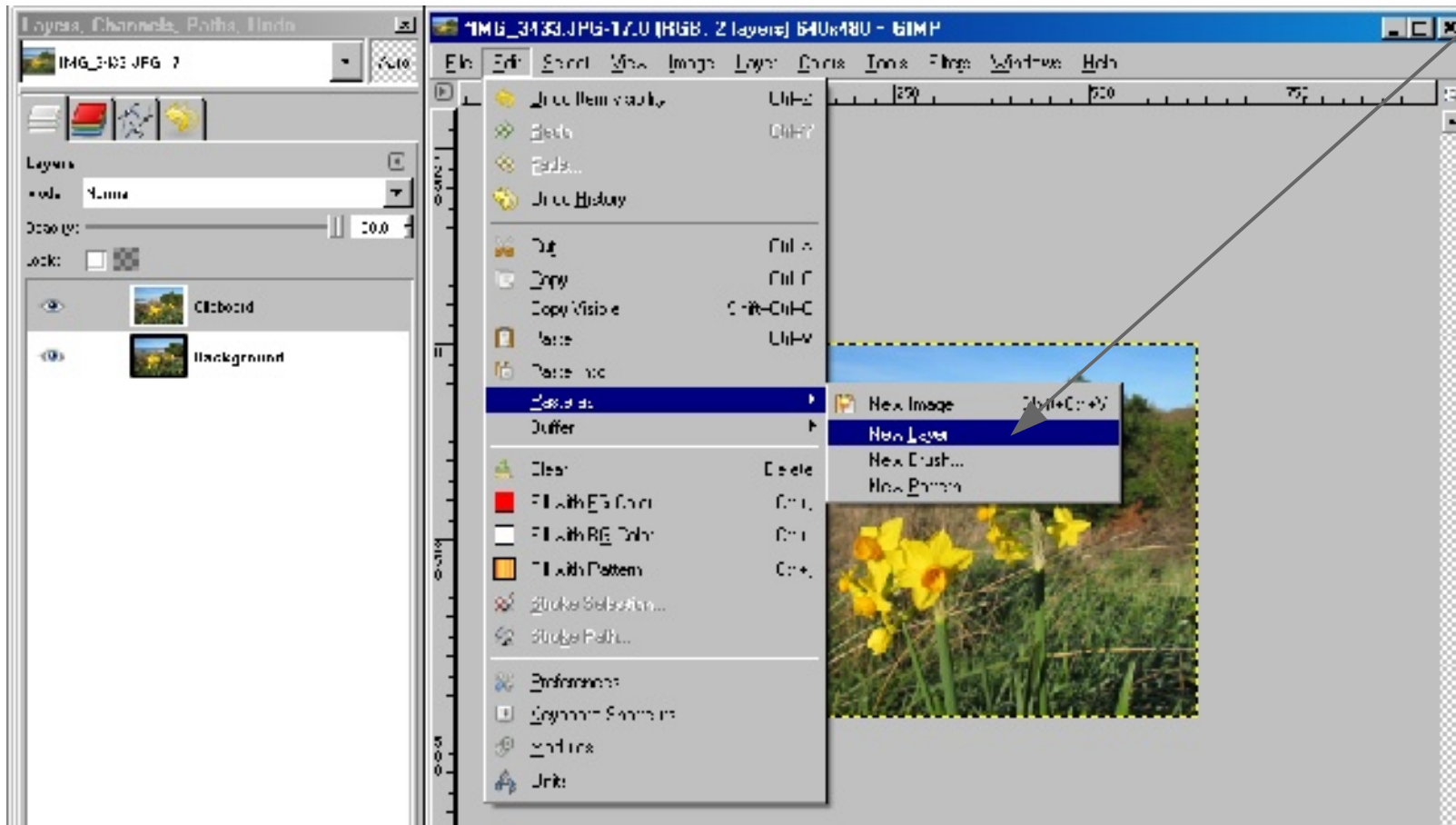
Change to 255



* You can use different software, just follow the logic of each step.

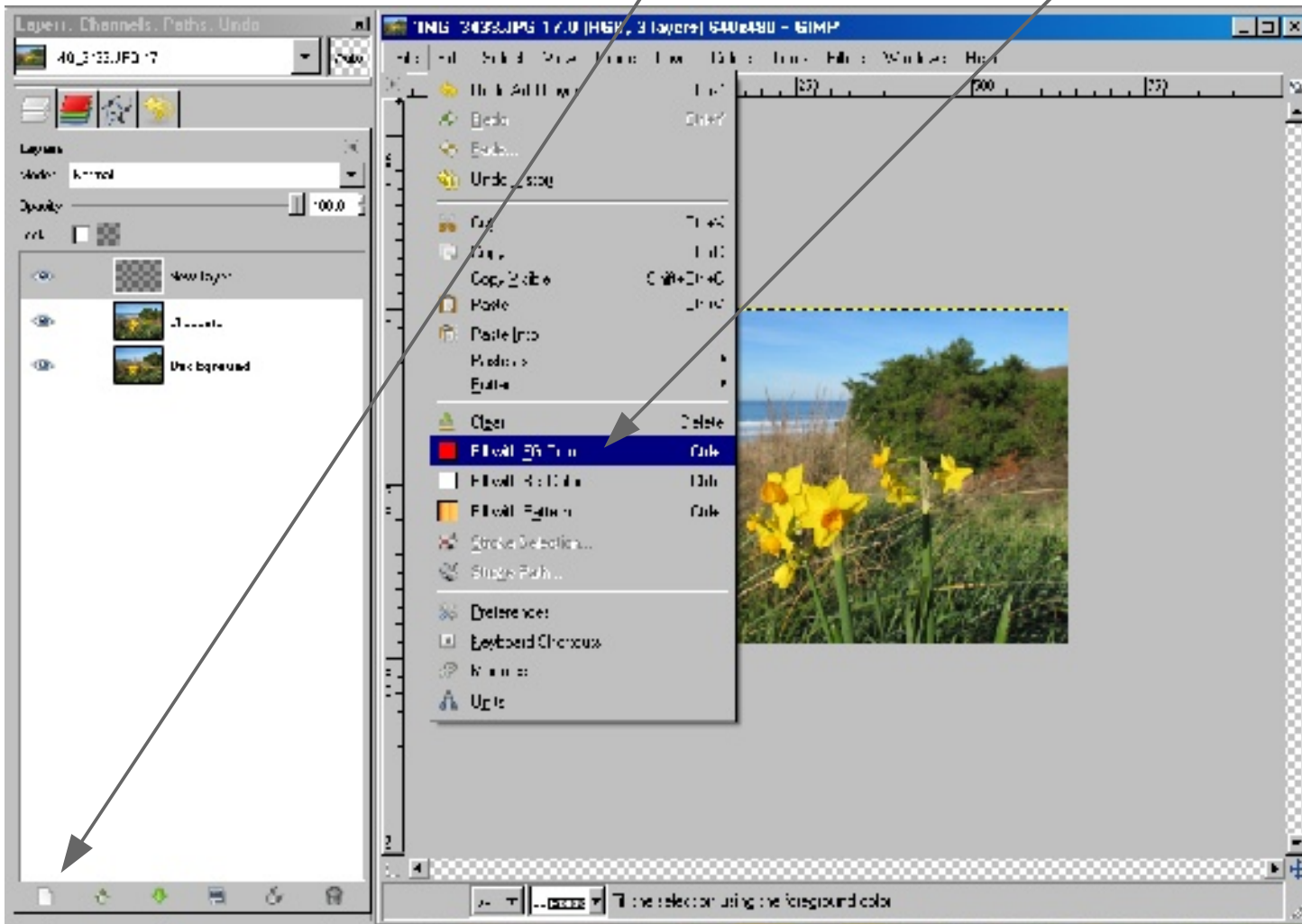
STEP 3

Open your second picture and paste as new layer.



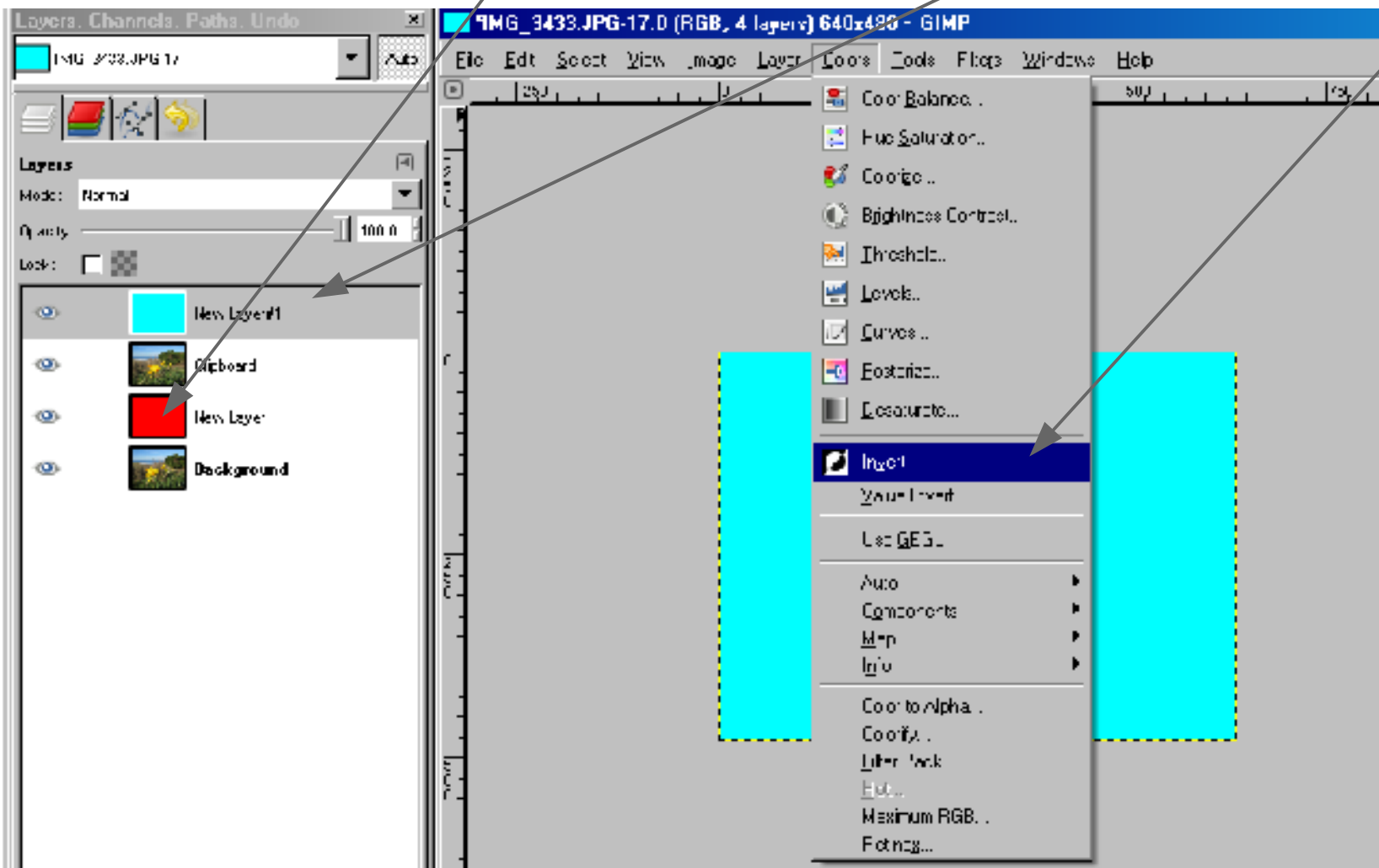
STEP 4

Create new layer and fill it with red.



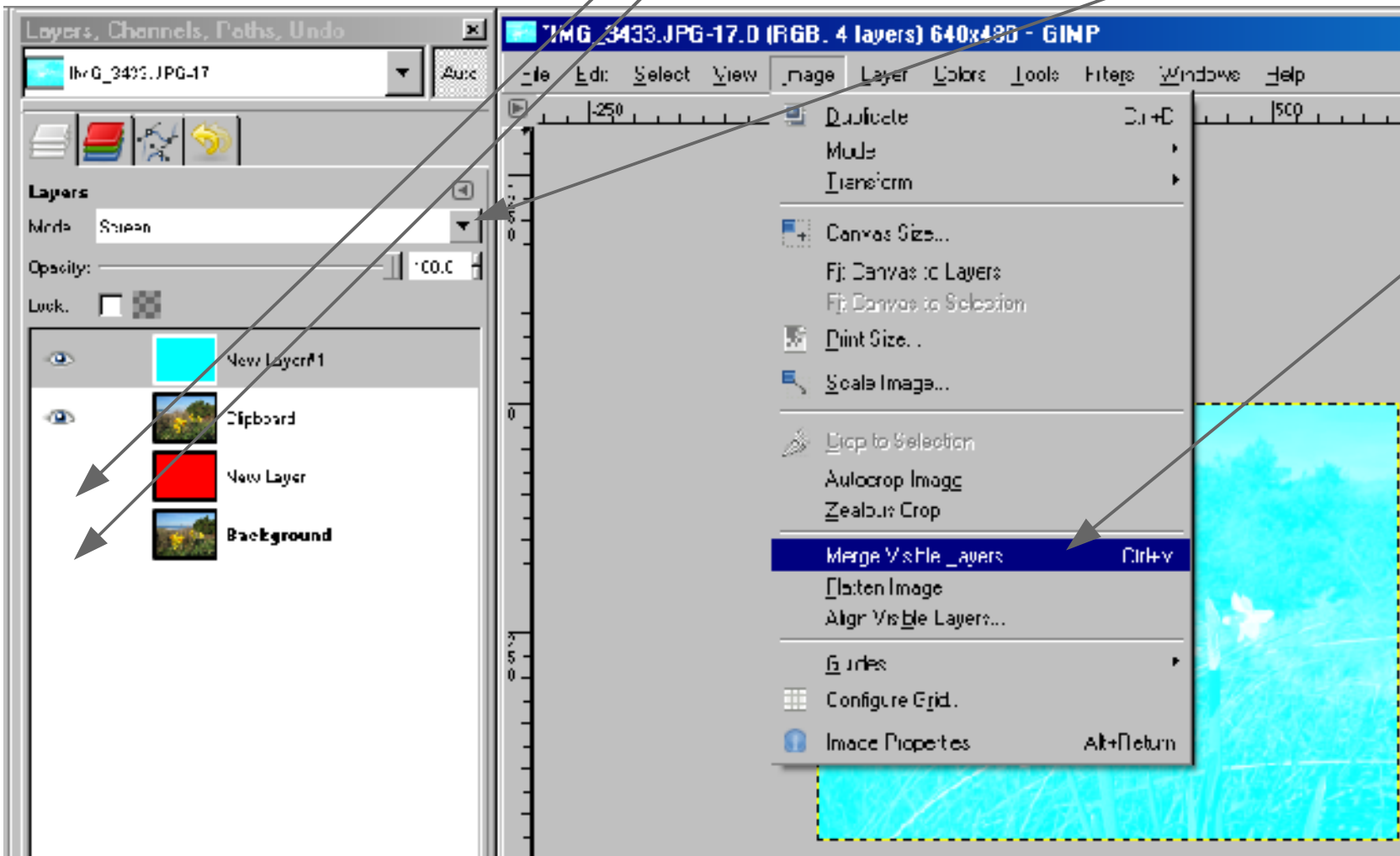
STEP 5

Copy the red screen. Paste as a new layer. Invert it.



STEP 6

Turn the bottom layers off. Change mode to SCREEN



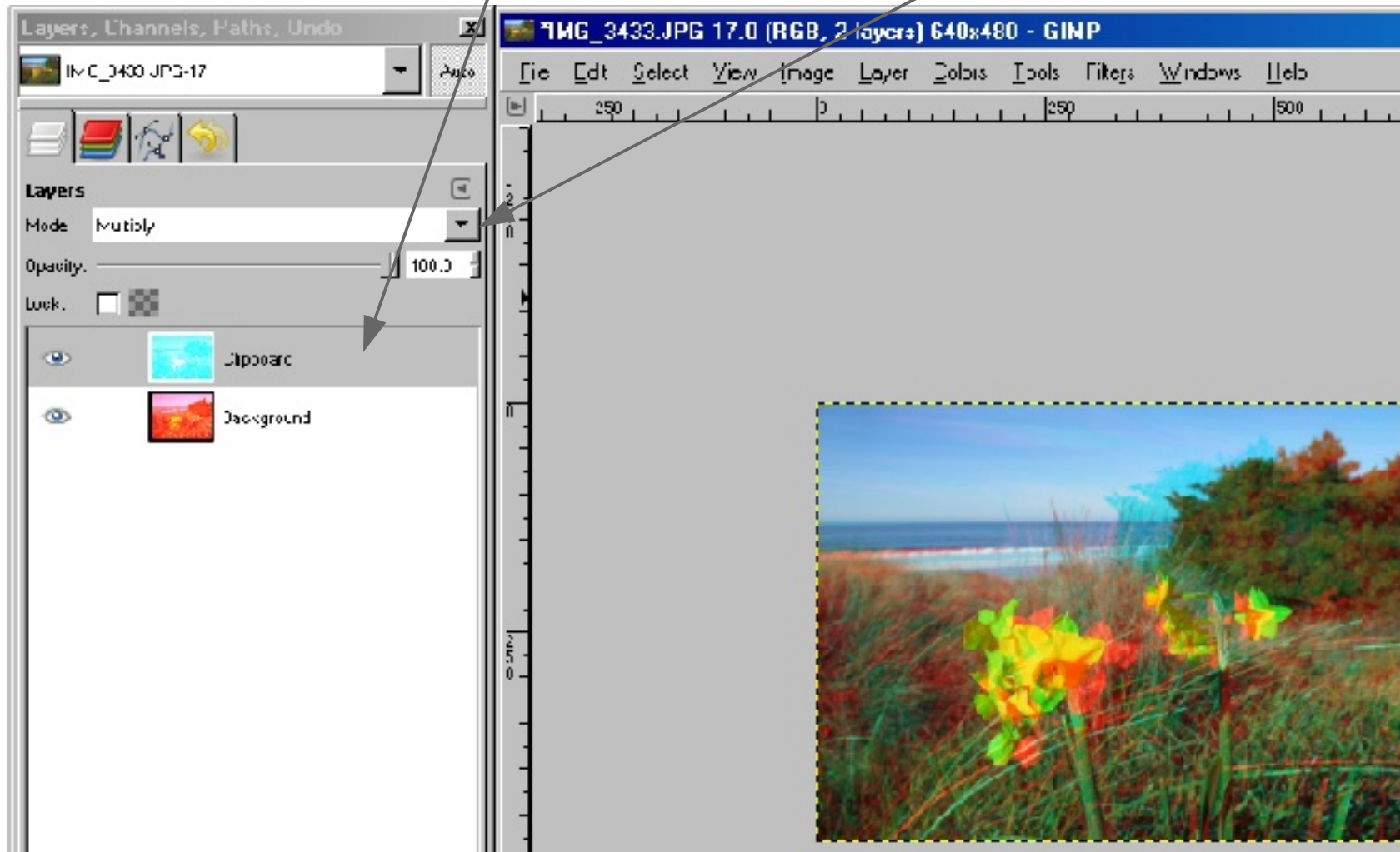
Merge visible layers

then

DO SAME THING FOR RED

STEP 7

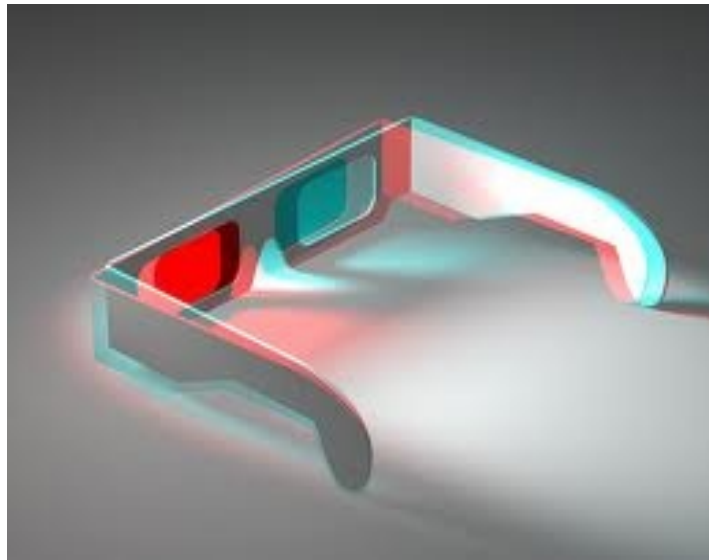
Select top layer. Change mode to MULTIPLY.



(You can merge visible layers again and save as 3Daffodils.jpg)

STEP 8 (done!)

Make funky 3D glasses!



Right eye
cyan

Left eye
red

If you have access to theatrical lighting gels, the right filters are bright red (Lee 026) and special steel blue (Lee 354)



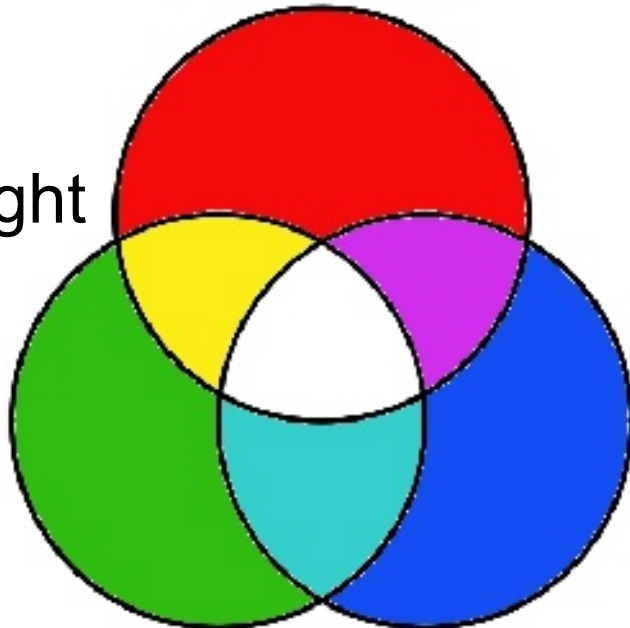
Like filters, paints REFLECT some colours and ABSORB all others.



The primary colours are different for reflected or emitted light.

ADDITIVE

Emitted light



SUBTRACTIVE

Reflected light

