

Dye vs. Pigment vs. Paint vs. Colorant

Various terms related to color,
not always used consistently or
in a purely technical sense

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Natural dyes

Dye definition and sources

A **DYE** is a compound that absorbs into and colors another material, and is generally a complex organic material.

Natural dyes have historically been extracted from:

- **PLANTS**

- Such as alkanet, annatto, archil, brazilwood, buckthorn berries, cudbear, cutch, fustic, madder, indigo, litmus, logwood, morinda, quercitron, safflower, saffron, sassafras, sumac, turmeric, turnsole, walnut, weld, and woad

- **INSECTS**

- Such as kermes, lac dye, cochineal

- **LICHENS** (algae or fungi) and **SHELLFISH**

- Such as archil (lichen) and Tyrian purple (extracted from mollusks)

Synthetic dyes were first derived in 1856 (from coal-tar extracts to create mauve)

DYESTUFFS

The raw organic materials used to create a dye



Types of dyes (by chemical class)

Indigoids

Indigo



Anthraquinones

Cochineal



Flavonoids

Weld



Carotenoids

Turmeric



Neo-flavonoids/homoisoflavonoids

Logwood



Types of dyes (by process)

DIRECT DYES

Colorant forms a direct bond to the textile fiber



Turmeric

<http://www.saniapell.com/homemade/the-colour-of-food-homemade-fabric-dyes/>

MORDANT DYES

Colorant needs to bind to a coordination metal as a bridge between the dye and textile fiber



Cochineal

<http://www.dtcrafts.co.uk/dyesfixers/earthdyes/dv201.html>

VAT DYES

A chemical reaction (reduction) in the dye vat is needed to bind the dye to the textile



Indigo

<http://pinkcrayondyes.wordpress.com/2016/05/28/indigo-in-south-east-asia-quest-blogger-norma-peterson/indigo-dye-vat-recipe-sapa-vietnam/>

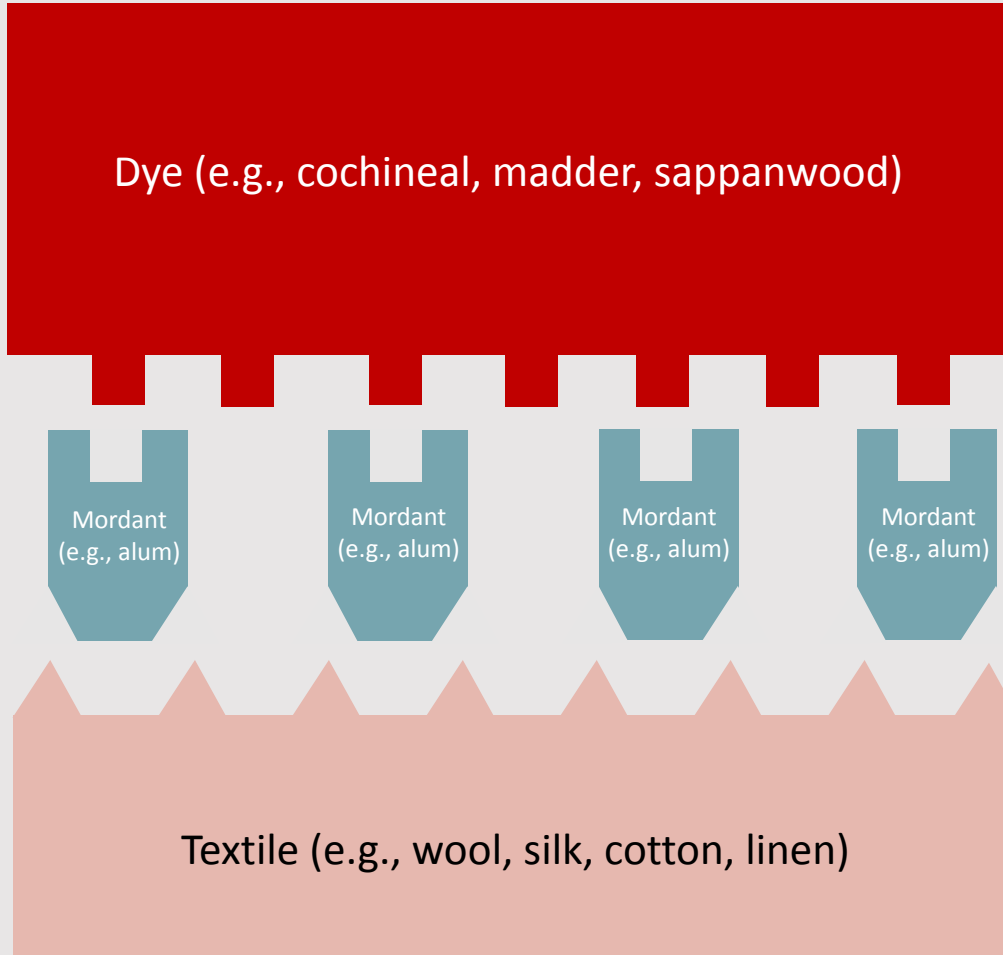


Dye (e.g., cochineal, madder, sappanwood)

Dyes are a **CHEMICAL
INTERACTION**

A dye is bound to a textile through chemical bonds. Dye molecules and textile molecules do not always readily bind to each other, so often a mordant is used to facilitate this process

Textile (e.g., wool, silk, cotton, linen)



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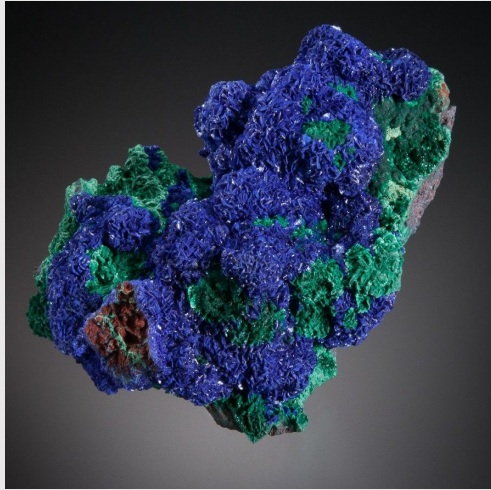


Natural Pigments and Paints

Natural Pigments

Inorganic

“Mineral”



Azurite (copper carbonate)

Earth



Venetian Red (ochre)

Organic
Plant or Animal



Weld (*Reseda luteola*)

Pigment



Pigments are insoluble, dry solid particles

- most often found in powder form

Paint = pigment + binding media

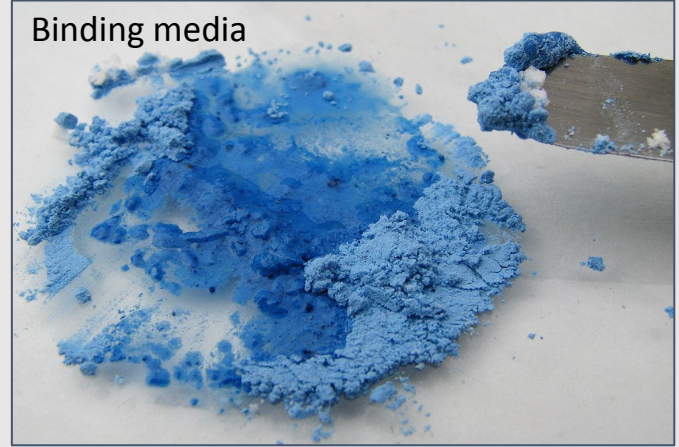
Pigment



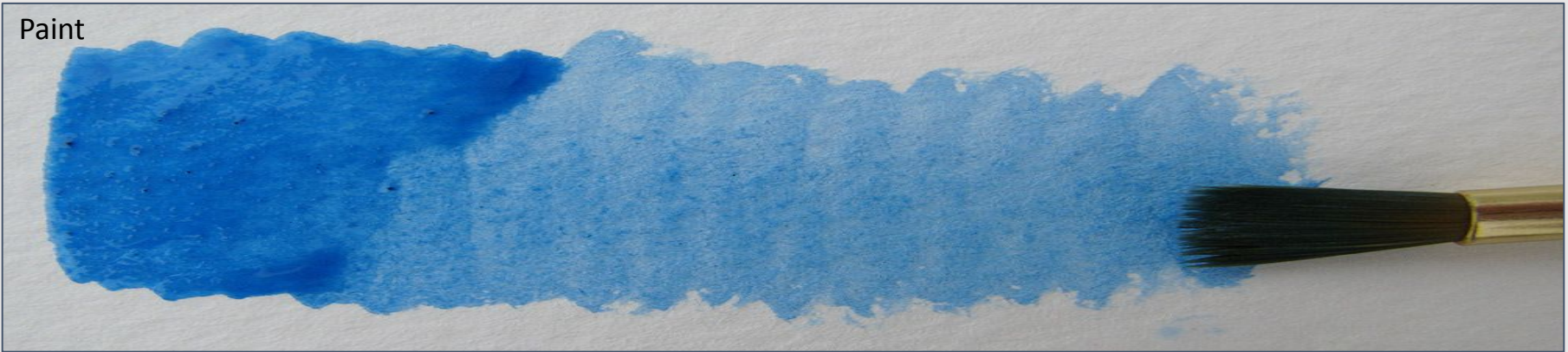
e.g., oils, gums, glues
→ act as adhesive



Binding media



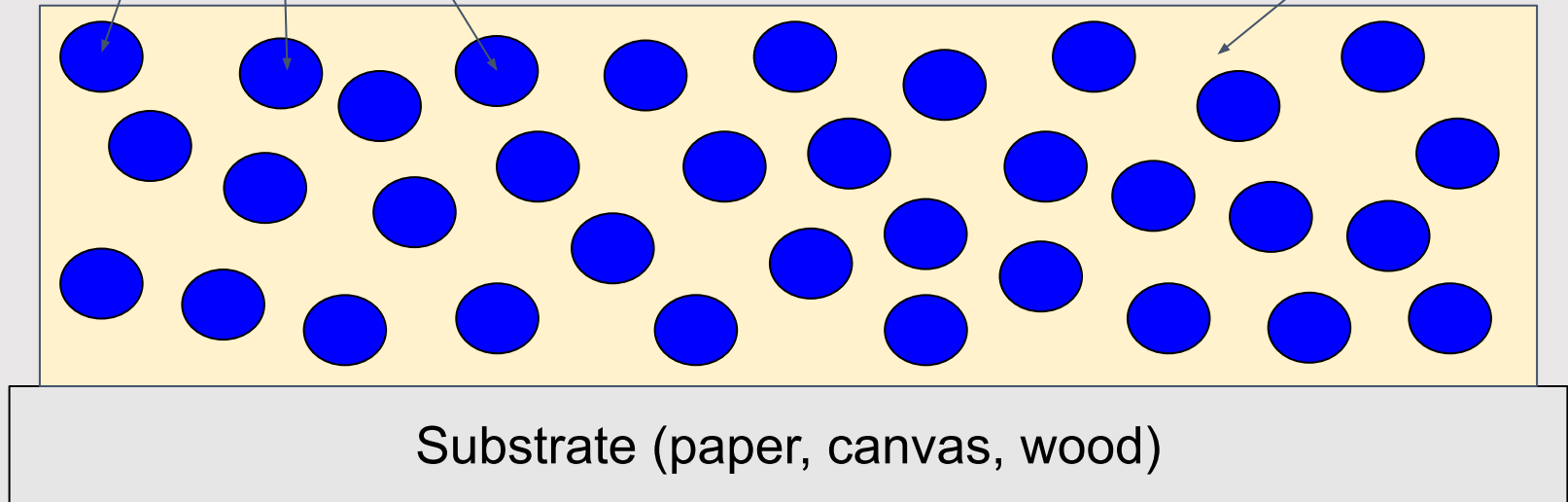
Paint



Paints are a PHYSICAL
INTERACTION

Pigment particles

Binding medium

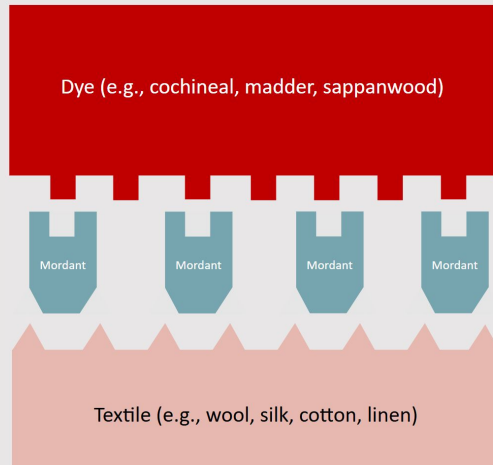




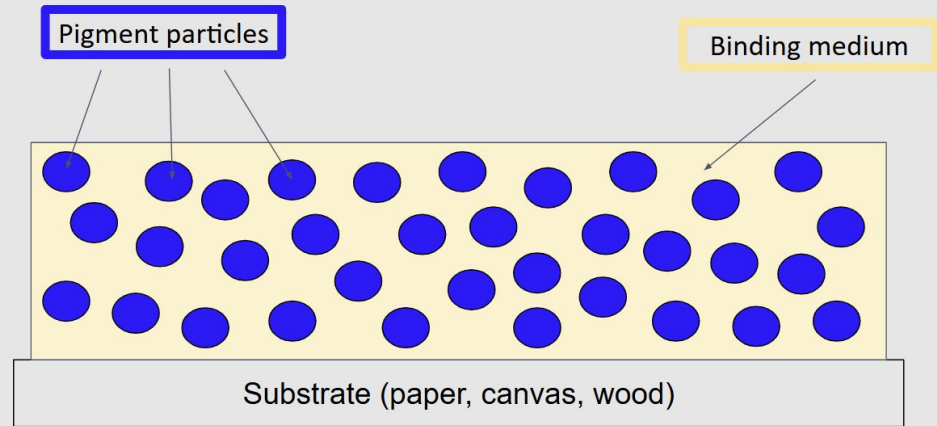
Terminology

Dye vs. Pigment vs. Paint vs. Colorant

Chemical interaction

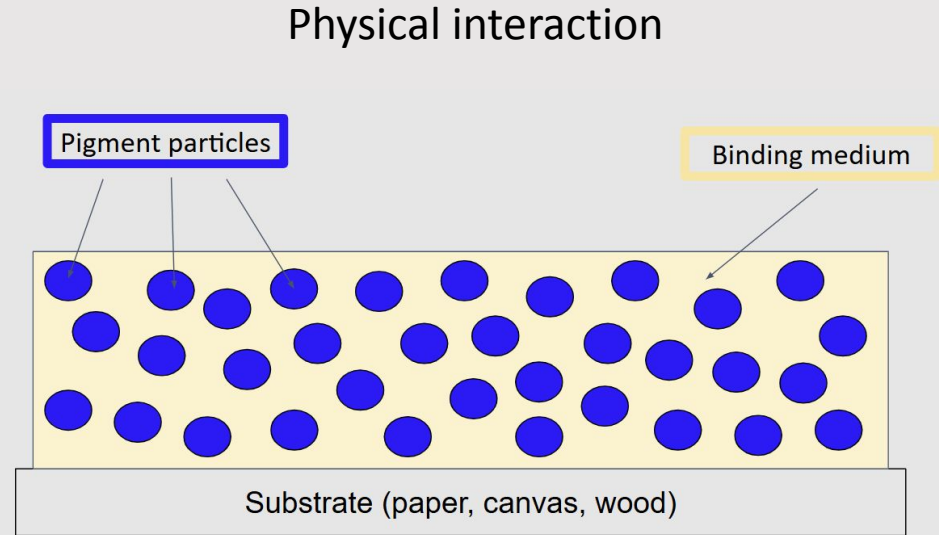
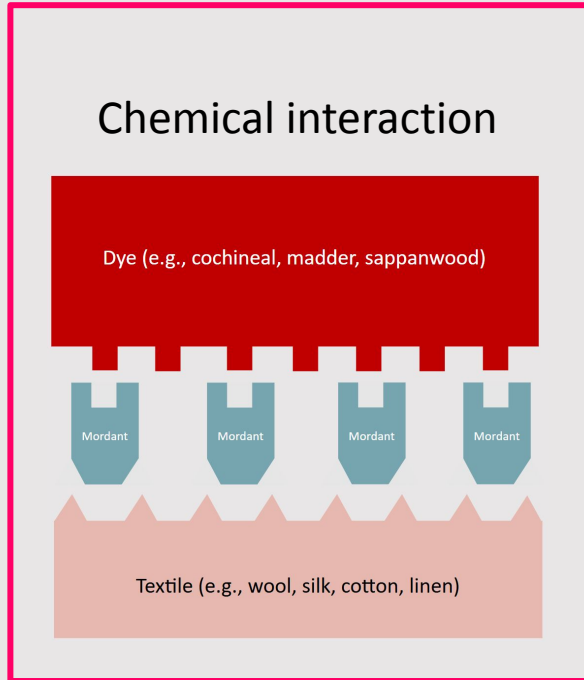


Physical interaction



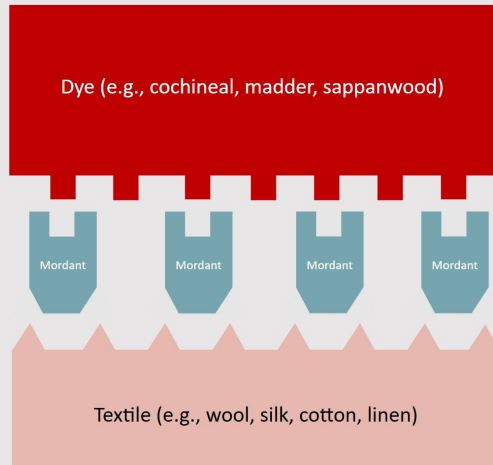
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Dye



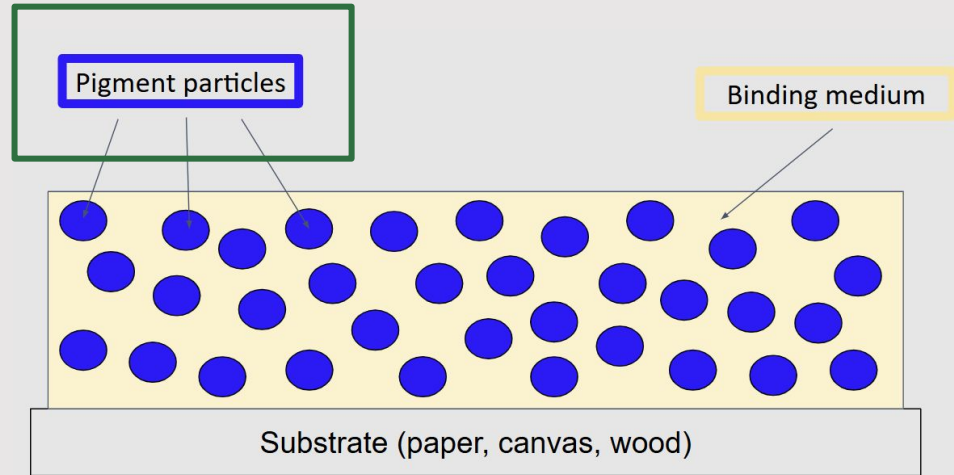
Dye vs. Pigment vs. Paint vs. Colorant

Chemical interaction



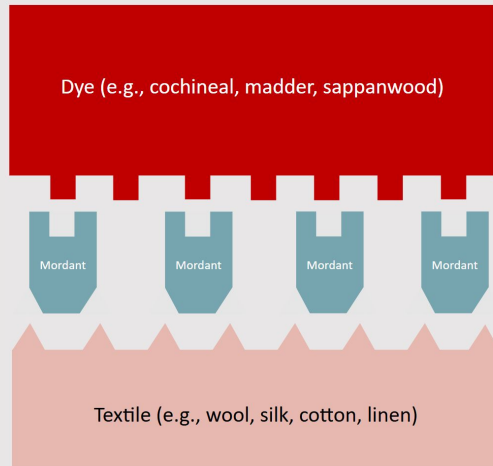
Pigment

Physical interaction



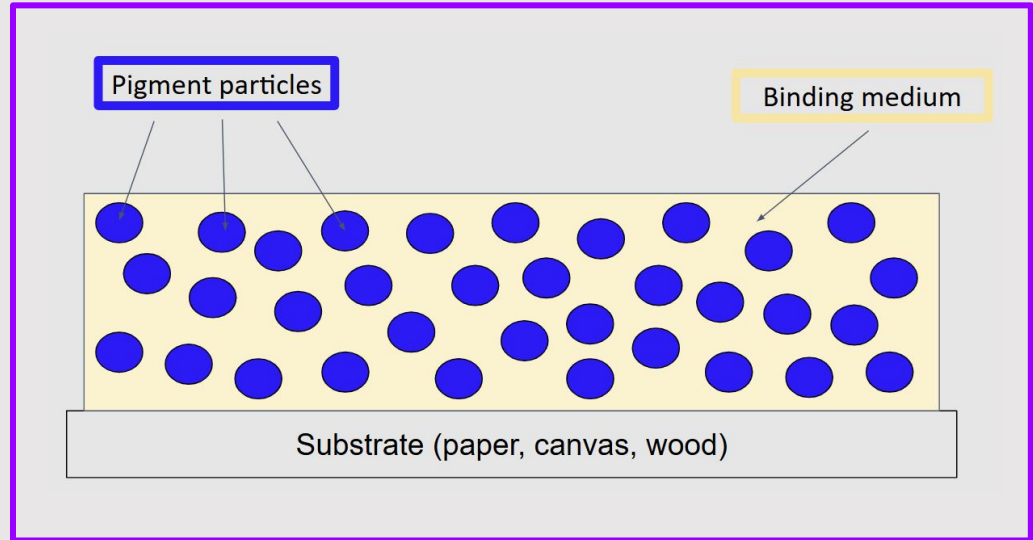
Dye vs. Pigment vs. Paint vs. Colorant

Chemical interaction



Paint

Physical interaction



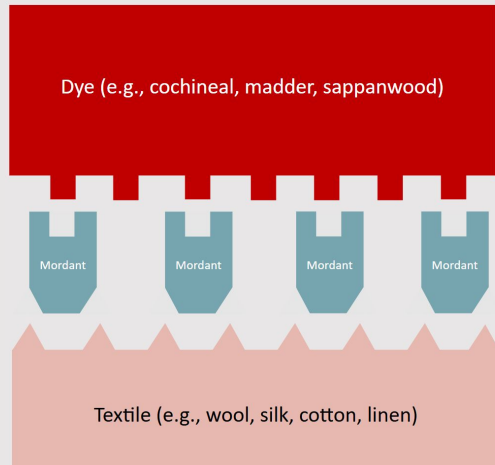
Dye vs. Pigment vs. Paint vs. Colorant

Colorant

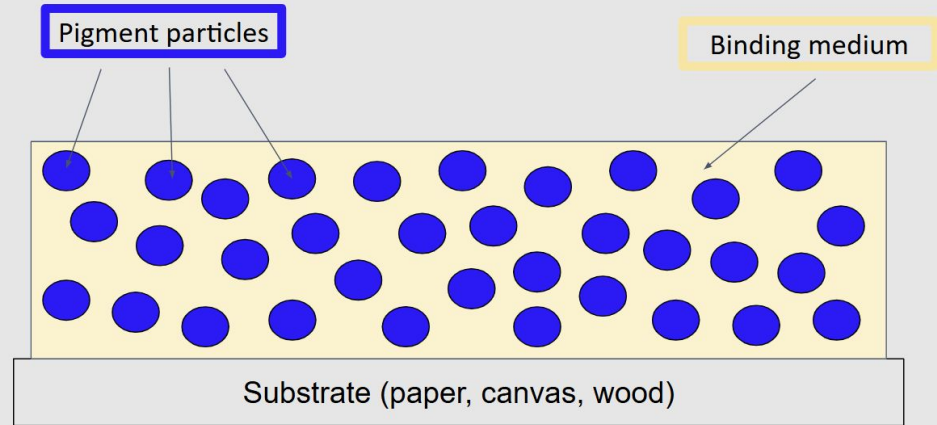
Used inconsistently. Most often it is used to mean either:

- 1) a general catch-all term for a thing that colors, or
- 2) the component of a dye or pigment that is providing the source of color, e.g., the element or compound

Chemical interaction



Physical interaction



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Colorant: Used inconsistently

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Dye: Chemical interaction



Pigment and Paint: Physical interaction

