- Color Mixing


## Color Theory

Intro
(ch. 7 pp. 77ff)

- Liquitex Color Map
- Value Staff
- Intrinsic Value Staff

- Munsell color notation (HVC)
- HC color mapping
- HV color mapping
- Strait Line Mixing (2clr/3clr "Y")
- 1st Mix Set
- Acrylic Cleanup





REEN LIGHT, PERMANENT
(Mixture)
VERT PERMANENT CLAIR VERDE CLARO PERMANENTE

## Munsell color notation system

- 5 Primaries (R, Y, G, B, P)
- 5 Secondaries (YR, YG, BG, BP, RP)


## LIGHTFASTNESS:I OPAQUE MUNSELL HUE: 1.2G VALUE:4.9 CHROMA:10



LIGHTFASTNESS:I OPAQUE MUNSELL HUE: 1.2G VaLUE:4.9 CHROMA: 10


QEEN LIGHT, PERMANENT


## Munsell color

wheel
10 hues

## Either

$45=5 \mathrm{G}$
78=PB8
$100=0=10 \mathrm{RP}$


Munsell color

- Notice the outer numbers - hues are wheel:
2 different huespecification specified from 0-100
options

$$
\begin{aligned}
& 95=\mathrm{RP} \\
& 5=\mathrm{R}
\end{aligned}
$$

- $15=\mathrm{YR}$ (orange)


Munsell color wheel:
2 different hue-

- The inner numbers range from 0-10.
- There are 10 Hue Sections. Each section is a sort of neighborhood of very similar hues. specification • R, YR, Y, YG, G, BG, B, BP, P, RP options



## Munsell color

 wheel: 1 R is a RRP -- a slightly purple red.2 different hue-• 5 R is "ideal", primary red specification • 10 R is a RO (and is the same as 0 YR ) options

- We will only use the 0-10 Hue specifications - they are more intuitive.


Which is which?

2 G
8 G
5 BP
2.5 Y




## High Viscosity / Heavy Body

 Haute Viscosité - Cuerpo Espeso Hohe Viskosität • Alta Viscosità
## CMCR

## HEAVYBODV

## YELLOW ORANGE AZO

JAUNE D'OR
AMARILLO NARANJA AZO
GIALLO ARANCIO AZO
GELBORANGE AZO
Tronsporen ta Lightrostmess: 1 -Excellent
Vehicle: Acrylic Polymer Emulsion Pigment: Diorylide Yellow (PY 83 HR 70)

High Viscosity / Heavy Body Haute Viscosité • Cuerpo Espeso Hohe Viskosität • Alta Viscosità

## Relative Hue <br> Ton RelatiffMunsell Hue Ton Munsell 0.39 Y <br> Vehicle: Acrylic Pointness: I-Excellent

Series 1 :
Lightfastness I

Hone Viskosität • Alta Viscosità


Munsell Hue Ton Munsell

Value Valeur 7.12

## HEAVY BODY

# High Viscosity / Heavy Body Haute Viscosité • Cuerpo Espeso Hohe Viskosităt • Alta Viscosità 

## Relative Hue Ton Relatif

\section*{Munsell Hue ${ }_{4.22 \mathrm{YR}}$ Value ${ }_{2.63}$ Chroma 0.92 <br> Saturation Ton Munsell} | R | YR |
| :--- | :--- |

# HEAVY BODK 

## BURNT UMBER

## TERRE D'OMBRE BRUULÉE

TIERRA DE SOMBRA TOSTADA
TERRA D'OMBRA BRUCIATA UMBRA GEBRANN $\mathrm{F}^{4}$
Polymer Emulsion Pigment: Calcined Naturol Iron Oxide Contoining Mongonese (PBr 7 )
Opoque I Tenue lumière : 1-Excellente Liont: Emulsion

Rone Viskosităt • Alta Viscosità

| Relative Hue <br> Ton Relatif | $\mathbf{R}$ | YR | $\mathbf{Y}$ |
| :--- | :--- | :--- | :--- |
| Munsell Hue |  |  |  |

Munsell Hue Ton Munsell
8.58YR Value
Valeun
7.12 Chroma ${ }_{13.04}$ Saturation

YELLOW ORANGE AZO

## Rela. ve Hue <br> RO <br> $\begin{array}{lll}\begin{array}{lll}\text { Munsell Hue } \\ \text { lon Munsell }\end{array} \\ & \text { V.9YR } & \text { Value } \\ \text { Valeur }\end{array}{ }^{7.0} \begin{aligned} & \text { Chroma } \\ & \text { Saturation }\end{aligned}$

Relative Hue Ton Relatif Munsell Hue Ton Munsell

### 8.58YR Value 7.12 Chroma $_{13.04}$ Saturation



## MEAVY BODY

YELLOW ORANGE AZO
JAUNE D'OR
AMARILLO NARANJA AZO
GIAIIO ADARAN

YELLOW OXIDE JAUNE DE<br>AMARILIO E MARS<br>GIALLO DE MARTE MLLO DI MARTE MARSGELB

BURNT UMBER TERRE D'OMBRE BRÛLÉE TIERRA DE SOMBRA TOSTADA TERRA D'OMBRA BRUCIATA UMBRA GEBRANNF ${ }^{\text {² }}$

## Rel. be Hue

Relative Hue
Ton Relatif

| R | YR |
| :--- | :--- | Mussel Hue Ion Munsell

8.58YR Value 7.12 Chroma ${ }_{13.04}$
Saturation

Relative Hue Ton Relatif Mussel Hue Ton Munsell $\mathbf{0 . 3 9} \mathbf{y}$ Value Valour 6.18

Chroma
Saturation 7.5

## Relative Hue Ton Relatif

Mussel Hue ${ }_{4.22 \mathrm{YR}}$ Ton Mussel

Value 2.63 Valour ${ }^{2.63}$ Saturation



## Munsell

## color

 wheelHue $=1.2 \mathrm{G}$
$\mathrm{G}=\mathrm{Green}$ section

$$
\begin{aligned}
& 1.2=\text { very close } \\
& \text { to YG }
\end{aligned}
$$

## Liquitex Color \& Pigment Chart

- This chart organizes many of the colors available in the Liquitex product line of acrylic paints.
- Hue-Chroma position.
- Pigment: transparent, translucent, opaque
- Pigment: single-pigment, 2, 3+
- Pigment permanency



## Pigment

 Transparency- In general,
- Transparent colors offer richer mixes
(thus higher chroma can be maintained).
- Glazes and washes are possible.

Pigment
Traits
(higher chroma can be maintained).

- Most artists pigments are expected to offer excellent lightfastness - that is, the color should not fade over time under normal viewing conditions.
- Sunlight (ultra-violet light, particularly) breaks down pigment molecules and so alters color over time. Some pigments/chemicals are more resilient to UV light.


All pigments test as "excellent lightfastness" except:
-• "good lightfastness"
\& "not for permanent work"

## Three dimensions of color Munsell's color model



## Personal

 Palette Map- Identify the colors that you have in your set-your personal palette.
- 1) List name, hue, value and chroma of each tube.
- 2) Graphically locate huechroma positions.
- 3) Graphically locate huevalue positions.



For each color/paint you
have:
List name, hue, value \& chroma.

High Viscosity / Heavy Body Haute Viscosité • Cuerpo Espeso Hohe Viskosität • Alta Viscosità

| Relative Hue <br> IIon Relatif | $Y$ | YG | G |
| :--- | :--- | :--- | :--- |

 Ton Munsell ${ }^{9.4961}$ Valeur ${ }^{4.19}$ Saturation ${ }^{4}$ Opzque I Llightiosmess: --Excollent Vehicle: Acylic Polymer Emulision Pigment: Anhydrous Chmomium

## 1. Chromium Oxide Green

## H 9.49GY V 4.19 C 4.25

# Rela. ve Hue Ton Relatif 

\section*{| $\begin{array}{l}\text { Munsell Hue 3.9Y } \\ \text { lon Munsell }\end{array}$ | $\begin{array}{l}\text { Value } \\ \text { Valeur }\end{array}$ | $\begin{array}{l}\text { Chroma } \\ \text { Saturation }\end{array}$ |
| :--- | :--- | :--- |}


| Relative Hue <br> Ton Relatif$\| \mathbf{R}$ | YR | $\mathbf{Y}$ |
| :--- | :---: | :---: | :---: |
| Munsell Hue <br> Ton Munsell |  |  |
| 8.58 YR <br> Value <br> Valeur |  |  |

$$
\begin{aligned}
& \text { Relative Hue } \\
& \text { Ton Relatif }
\end{aligned}
$$

Munsell Hue Ton Munsell $\mathbf{0 . 3 9 y}$

## Relative Hue Ton Relatif

Munsell Hue ${ }_{4.22 \mathrm{YR}}$ Value 2.63 Value 2.63 Chroma 0.92 Ton Munsell

RO

Red (R)
5



## Paint/Colors On Hand:

1. DEEP VIOLET H 7.9RPV2.5 c 2.1
2. Cad.Red Med. H, H $6.4 R \mathrm{~V} 4.1 \mathrm{c} 14$
3. RED OXIDE H $9.5 R v 3.9 \mathbf{c} 7$
4. Cad. Drange $H$. $\quad$ 33.9YRV 7 c 14
5. BURNT UMOER H5.3MRVZ.4C I
6. Raw 7. Cad. Yellow thed.1.H 2.54 V c 13 8. UVIDLUME GREEN H $7.64 \% \mathrm{~F}$ ㄱ 10 9. Chrome OX. Green $\mathbf{~} 9.346 \mathrm{v} 4.1 \mathrm{c} 4$

7. Thrlo Grean (Yel) H 3 BG v $2.6 \mathrm{c} \underline{2.1}$ 12. ЂRULANT BLLE H8B V 5 c 9
8. Ultram. Blue

H 8.2 PB V 2.4 C 13.6
14. Dhox. Purple H5.6PV 1.5 c 1
15. Mars Black
$\mathbf{H ( N )}(N) \vee \frac{1.5}{9.6} c \frac{0.1}{}$

Blue-Green (BG)

Paint/Colors On Hand:

1. DEEP VIOLET
2. Cad.RedMed. H.

H 7.9RPv 2.5 C 3.1
3. RED OXIDE $\qquad$ R. R V 4.1 C 14
4. Cad Orange $H$. H 9.5 R $\cup 3.9$ c 7
3.9YRV 7 C 14
5. 马UMNT UMEER HS.3MRVz.4c 1
6. RAN SIENNA H5.94Rv4.2c 5 7. Cad. Yellow Medil. $\mathbf{H} 2.54 \mathrm{~V} 8 \mathrm{C} 13$ 8. Viviplume Gradn h $7.6 \% \mathrm{v} 7 \mathrm{Z}$ c 10 9. Chrome Ox. Green $\mathbf{n} 9.34 \mathrm{gv} 4.1$ c 4 10. Pram.Gran_
11. Thalo Green $\left(y_{01}\right)$ H 3 BG $v 2.6 \mathrm{c} 2.1$ 12. BRLLANT BLUE H8B v5c9 13. Ultram. Blue H 8.2 PBV 2.4 C 13.6 14. Drox. Purple H5.6P V .5 c 1 15. Mars Black $\mathbf{H}(\mathrm{N}) \vee \frac{1.5}{9.6} \mathbf{c} \frac{0.1}{}$ Itan. White


## Straight-Line Mixing Method

- A simple and reliable strategy for mixing colors involves finding two colors/paints that are "on a line" with the color you are trying to mix.
- The rule: you can mix any color on the line between any two colors. *
- *However, there are situations in which this doesn' t quite work as expected.


See p. 76

## Color Map \& Mixing Guide

- Shows Hue and Value (chroma only partially represented) (10-step value scale, 12 hues)
- Imagine a flattened cylinder - a 3D model of color.


## LIQUITEX ACRYLIC COLOR MAP'\& MIXING EUIDE



## Mix samples located on the color map.

- Pick the "target" colors (your choice)
- Use "straight line" method to mix your targets
- Select your best source colors.
- Mix \& paint samples.



## Straight-Line Mixing Guide



Diagonal


Horizontal


Diagonal


Vertical

## Straight-Line Mixing Guide



- Target Color the color you are aiming to mix.
- Source Colors the particular paints/colors that you have available. The colors that you mix with.





## Y- Mix alt

- When you plan a color mix, there are usually several ways to think about it - different routes to the same destination.
- Here we mix the hue before getting the value right - which is generally good practice.
- Use 1 \& 4 to mix 3
- Use 3 \& 2 to mix 5 (target color)

See p. 76

## General Mixing Rule:

## use colors closest to "target" color.



If your target color is " T " and you have colors 1, 2 \& 3, do you mix with \#1 or \#2?
\#2 is closer to the target color. It will usually offer
a) a richer (higher chroma) potential mix and
b) will have less critical mixing proportions.
(its easier to mix)

## Breaking the rules: primaries from secondaries.

- Can it be done?
- Can you mix a red from a violet and orange?
- A Blue from a green and violet?
- A yellow?



## Liquitex Color Map

Note differences between CMYK (textbook) and Paint versions.


## Mix 15 samples of assigned hues and values.

- identify the "target" colors.

See p. 96

- Target colors: RP7, R6, RO7, O3, YO6, Y7, YG8, G9, BG5, B8, BP7, P7 - B2, R3, Y4 (without primaries)



## Next:

- By 12:30: mix 3 of the assigned colors
- By next class:

Mix the first 7 of 15 assigned colors from the Liquitex color mixing chart.

- Mix B2, R3, Y4 (primaries) *without* using primaries.
- Fill out color map with your paints.
- Paint samples on card-stock plates (up to 4 mixes per plate).
(target/final color sample should be at least 1 ")
- Show source colors in approximate proportions needed to mix target color.
- Label/identify source colors

Hue/Val: G-3
(Permanant Green Deep)

- Munsell color notation (HVC)
- HC color mapping
- HV color mapping
- Strait Line Mixing (2clr/3clr "Y")
- 1st Mix Set
- Acrylic Cleanup


## LIQUITEX ACRYLIC COLOR MAP\& MIXING GUIDE






## Mix 12 samples of varied hues and values.

- identify the "target" colors.

See p. 96

- Target colors:

RP3, R6, RO7, O5, YO8, Y4, YG8, G9, BG5, B2, BP8, P7


## Personal

## Palette Map

- Identify the colors that you have in your set-your personal palette.
- List name, hue, value and chroma.
- Graphically locate huechroma positions.
- Graphically locate huevalue positions.



## Straight-Line Mixing Method

- The rule: you can mix any color on the line between any two colors. *
- *However, there are situations in which this doesn' t quite work as expected.


Horizontal



Vertical


See p. 97

## Straight-Line Mixing Guide



Diagonal


Horizontal


Diagonal


Vertical

## Glaze and Tints

- Glaze and Tint samples at bottom of Liquitex Color Map



## Glaze and Tints

- Glaze: a thin, transparent layer of paint/color.
- Usually used to modify the color underneath. The undercoat and the glaze colors are mixed because of the transparency of the glaze.
- In acrylic: easy glaze: use water to thin paint to water-color-like consistency. Better glaze: add acrylic medium to paint. (acrylic medium is basically paint withOUT any pigment)


## Glaze and Tints

- Tint:
a) a high-value color, particularly, a color that is higher than the intrinsic value of that color' s hue.
-B) paint mix that has had white paint mixed in.



## Glaze and Tints

- Both glazes and tints offer means of raising the value of a (painted) color.
- Glazes rely on a light underpainting.
- Tints rely on white mixed into the paint.
- Effects vary according to the opacity/transparency of the particular pigment.

| colgit |
| :--- |
| nity |
| numanin a |



See p. 76-77

## Glaze and Tint Samples




## Medium Magenta 5-RP 1 0



(c)

0


Cadrnum Orange Section
GLAZE COLOR TINT
(c)


Brilliant Orange 70 I (1)

Cadmium Red Medium 4-R 1



Cadrium Red Light Section
GLAZE COLOR TINT


Yellow Orange Azo 7.YO 1 TP

©
Vivid Red Orange 6-RO I

Cadmum Yellow Medum Sectc GLAZE COIOR (6)

Briliant Yeliow or I (1)

## Cadmium Yellow Medium sy



Yetlow Medium Azo ay I
Cadmum Yellow Light Section
GLAZE COLOR
(1)

Cadmium Yellaw Light 9Y 1

| 8 |
| :--- |
| 3 |
| 3 |

Yellow Light Hansa gy II

# "Strait Line Mixing"technique. 

- Identify "target" color. This is the color you want to mix.
- Assess the hue, value, and chroma of the target color.
- Assess the "source" colors you have available. These are the colors that you can mix with - the tubs/jars of color you own.
- Identify the colors nearest your target color.
- Find the source color nearest your target color.


# Strait Line, "Y", \& Adjustments 

- Try the strait line method to find what colors are on the either "side" of the target color.
- If you have two colors that make a strait line through the target color, you can begin to mix.
- You may have to do a "Y" mix using three colors, rather than two.


## Think about...

- Consider how you will adjust the hue. (strait line, " $Y$ "?)
- Consider how you will adjust the value (tube colors of higherlower value, B/W/neutrals)
- Consider how you will adjust the chroma. (complements, near-complements, neutrals)
- How far "apart"are source colors? - likely to shift?


## Counter-intuitive Color Mix

 factors- Note hue shift with mixtures
(blacks tend to blue-green; white has some hint of blue; browns are red, org, yellow)
- Note value drop with mixtures (see p. 76)
- Note chroma loss with mixtures (the more distant the source hues, the lower the chroma of the mixed color, the more pigments means less chroma)
- Note weber-fechner law - increasing proportions for consistent change in effect. (p. 78)
- In general, add dark colors to lighter colors.


## Mediums vs. Additives

- Both alter properties of paint (thinner...thicker...slow down drying...speed up drying...enhance gloss surface...provide matt surface.)
- However, mediums do not diminish the reliability of the paint - mediums are either the same as or similar to the binder of the paint-the glue that holds the paint together. Thus, you can add as much medium to your paint as you Iike, and the paint will still work. It will still stick to surfaces well, it will not crack, etc.
- But, if you add too much of an "additive" to a paint, it will weaken the essential characteristics of the paint. Water, for instance, may be added to acrylic paint, but if you add too much, the paint becomes too weak to bond...it either gets a bit powdery or it peels away from the ground.


## Gloss Medium

- We use gloss medium
- To mix transparent glazes
- To seal or protect
- To glue surfaces together (collage).
- To transfer newspaper, magazine or laserprinted images.
- NOTE: if you bring a small sealable container, you can have some gloss medium for class use. (baby food jar, 35mm film canister...)
- Mix colors.
- Paint samples of target color as well as source colors.
- Show source colors in approximate proportions to amount used.
- Label hue and value using column/row from liquitex color map.
- Mix colors.
- Paint samples of target color as well as source colors.
- Show source colors in approximate proportions to amount used.
- Label hue and value using column/row from liquitex color map.


# (Permanant Light Blue) 

Hue/Val: BG-3

Hue/Val: BP-3
(CRhnlt Dlun)

Value Staff

## Value Scale Chart

- Goals: mix accurate range of values in even steps.
- Learn to recognize and assess fine distinctions in value
- Main challenge: even/consistent steps throughout the scale.

Value Staff


## Value Scale Chart

- Use 1 " squares, evenly spaced.
- Mount at Rt. edge of page.
- Hole-punch all the way through for viewing.
- Label values.

Value Staff

## Value Scale Chart

- Recommended sequence: 1 (black), 9 (white), (midvalue)
- 7 (Mid-high)
- 8, 6
- 3 (mid low)
- 4,2
- NOTE: you will mix a total of 4 value scales for this and later assignments.


## Value Staff details

- Use pre-cut squares
- Paint squares before mounting.
- Position squares evenly and aligned.
- Hole-punch squares so value staff is easier to use when studying values later.


## "Strait Line Mixing" technique.

- Identify "target"color. This is the color you want to mix.
- Assess the hue, value, and chroma of the target color.
- Assess the "source" colors you have available. These are the colors that you can mix with - the tubs/jars of color you own.
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- Find the source color nearest your target color.


# Strait Line, "Y", \& Adjustments 

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## Constant Hue Charts

MUNSELL 5.0 GREEN HUE CHART


MUNSELL 5.0 PURPLE HUE CHART


