USING COLORBLIND AWARENESS

Supplement to UF Research Project:
Color, Vision, and Art

INTRODUCTION

Using Colorblind Awareness provides recommendations for art teachers to share with learners of all ages, in schools and other settings. You may find familiar points (unassuming your depth of knowing) and other previously uncharted areas (assuming my lack of knowing). My intent is to share positive and forward-moving connections between art education and colorblind awareness.

A. School-based Logistics

1. My research website **Color, Vision, and Art** (https://www.hoyangfineart.com/uf-research.html) includes
   - **Learn & Share – Recommendations**
   - **Make a Difference – Art & Artists**
   - ***This is Not Red and Other Color Truths*** (my art/project in process)
   - **Capstone research paper:** "Color, Vision, and Art: Teaching, Learning, and Making Art with Colorblind Awareness"
   - **Resources** collected on Scoop.it ® and Pinterest ®.
2. **Communicate** with school administrators, teachers, and staff for support and shared responsibility. Understand the procedures that currently exist for your school/district/state regarding special education needs (SEN) and individual education planning (IEP).
3. **Communicate** with parents/guardians and learners by gathering and providing information.

B. Learning Environment Modifications

Make modifications early by reducing color confusions while providing a positive learning environment.

1. **In the art room:**
   - ✓ Provide good lighting.
   - ✓ Provide color-based materials and supplies with labels.
   - ✓ Provide instructional material in easy-to-read (e.g. black text on white) and alternative (e.g. visual/auditory) formats.
2. **Approaches to teaching, learning, and making art:**
   - ✓ **Broad-based conceptual frameworks** (e.g. NVAS, UDL) provide flexible and multi-modal approaches to art. Allow for multiple outcomes, while maintaining high expectations.
     - **Examples**: *Engaging Visual Culture*, *Studio Thinking 2*, *Including Difference*
   - ✓ **Use technology** such as simulation software and apps to re-think curriculum content: check visuals for color confusions. See **examples of color shifts on my website**.
     - **Examples:** Chromatic Vision Simulator, ColorDeBlind, Visolve.
   - ✓ **Support learners in using technology**. Because it is

impossible for all materials and supplies to have identifying color labels (and labels may not help) using an app like ColorDeBlind may help distinguish colors thus reducing color confusions. See **examples of color identifications on my website.**

- ✓ **Be positive: keep an open mind, support, and encourage.**

3. **About color theory…is it universal?**

I believe art students should have access to and understand how to apply color-based materials. Awareness of color theory (color mixing, models, etc.) is important for artists who wish to develop individualized palettes unique to their color perceptions, preferences, and visions for experimentation.

C. Make a Difference – Art and Artists

Experiences of adult artists with colorblindness illustrate how they have learned and continue to make art in a world where common (typical) color labels dominate. Personal truths accessed on the Internet inherently ask viewers to take a leap of faith in processing information. As with all web-based information, **teachers must review content (including what I've provided) before sharing with learners.**

This is Not Red and Other Color Truths

For as long as I have had a pencil to push on paper, I make art to process how I think, feel, dream, learn, and come to understand life. *This is Not RED and Other Color Truths* documents thoughts and ideas for art/work to follow in the months ahead. I will further explore the notions of color, vision, and art… and how we all see color and make art in different ways.

D. Resources

Hetland, L., Winner, E., Veenema, S., & Sheridan, K. M. (2013). *Studio thinking 2: The real benefits of visual arts education.* New York, NY: Teachers College Press & Reston, VA: National Art Education Association.

Keifer-Boyd, K. & Maitland-Gholson, J. (2007). *Engaging visual culture*. Worcester, MA: Davis Publications.

Kraft, M. & Keifer-Boyd, K. (2013). *Including difference: A communitarian approach to art education in the least restrictive environment.* Reston, VA: NAEA.

National Center on Universal Design for Learning (n.d.). [website] http://www.udlcenter.org/aboutudl.

National Visual Arts Standards/National Core Arts Standards (2014). [website] http://nationalartsstandards.org. See "Inclusion" at bottom of home page.

[G.W.Ho – November 6, 2014]

Quick Facts About Colorblindness
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FACT: 1 of 12 students in a typical classroom may be colorblind, sometimes unrecognized by self, family, peers, teachers, and society at large: the social and learning implications of colorblindness often live in hidden spaces.

- ~8% (1 of 12) boys and ~0.5%[1] (1 of 200) girls in schools & communities.
- **~ 4.3 million boys and 270,000 girls in the formative years of American education** (grades K-12)[2].
- ~27million people in the US (estimate for 2013[2]).
- ~580 million people worldwide[3].

FACT: The complexities of colorblindness exist beyond red-green color vision deficiencies in Caucasian males. Over-simplifications lead to misconceptions.

- Colorblindness affects people of all ages and both genders.
- Colorblindness is global, not restricted to race[4], ethnicity, culture, or socio-economic class.
- Colors visible as color shifts and may present as confusions[5].
- Colorblindness rarely presents as complete loss of color vision (achromatopsia; a.k.a. monochromacy).
- Severe color confusions affect ~25%[5, 6] of individuals with colorblindness.
- Color vision tests[6,7,8] specify type and severity of colorblindness.
- Eye exams for visual acuity detect "visual impairments" linked with special education and disabilities, and lack connection with color vision.

root	**color shifts (-omaly)** mild-moderate confusions **i.e. anomalous trichromacy** (3 colors)	**color absence (-opia)** severe confusions **i.e. dichromacy** (2 colors)
protan (red)	protan*omaly* (shift in red)	protan*opia* (absent red)
deuteran (green)	deuteran*omaly* (shift in green)	deuteran*opia* (absent green)
tritan (blue/yellow)	tritan*omaly* (shift in blue/yellow)	tritan*opia* (absent blue/yellow)

Figure 1. Types of red-green and blue-yellow colorblindness.

FACT: People see color in different ways: one person's view (perception) of red is NOT the same as another person's view of the same color.

References:

[1]Genetics Home Reference http://ghr.nlm.nih.gov/condition/color-vision-deficiency
[2]US Census 2012 Quick Facts: ~17% (53.7 M) people are between 5 and 18 years of age. http://quickfacts.census.gov/qfd/states/00000.html
[3]Worldometers http://www.worldometers.info/world-population/
[4,5] Hansen, E. (2013). *What is Color Blindness? What to Know if You're Diagnosed with Color Blindness.* Originally published in Norwegian as Fargeblindhet, First Edition 2010, Gyldendal Norsk Forlag. CreateSpace Independent Publishing Platform.
[6] Medline Plus: Color Vision Test
http://www.nlm.nih.gov/medlineplus/ency/article/003387.htm
[7] Back to School Eye Exams Can Save Children from a Lifetime of Visual Discomfort
http://www.prnewswire.com/news-releases/back-to-school-eye-exams-can-save-children-from-a-lifetime-of-visual-discomfort-266037301.html
[8] Color Vision Test Made Easy
http://colorvisiontesting.com/color5.htm

[G.W.Ho – November 4, 2014]

Parent-Learner-Teacher Info Sheet - SAMPLE

Welcome to… [your class]
My name is Ms/Mr. Art Teacher…[your short bio]

As we begin our art journey, I'd like to know a bit about you [student/learner]**.**

Student name: Age: Grade:
School: Homeroom teacher:

Parent(s)/guardian:
Parent(s)/guardian phone #:
Parent(s)/guardian email:

Please comment on your/student's
- Strengths (What subjects/activities do you enjoy learning/doing?)
- Challenges (What subjects/activities seem difficult to learn/do?)

Do you/student have medical conditions I should be aware of?
If so, please explain:

Do you/student have a special education need (SEN) and/or individual education plan (IEP) in place?

Do you/student have difficulty seeing certain colors? ___NO ___YES___unsure
If yes, please explain:
If yes, has he/she been tested for colorblindness? ___NO ___YES ___unsure
If yes, please provide type and severity of colorblindness:

Do you/student wear corrective eyeglasses? ___NO ___YES
If yes, what kind? ___ close-up (far-sighted) ___ far-away (near-sighted)
Other:

Please provide additional comments as you wish.

If you have questions, please contact me by…
[e.g. email address, phone #, office hours during school, suggest days for conferences after school, etc.].

I look forward to sharing art with you/student.

Sincerely,
Ms./Mr. Art Teacher

[G.W.Ho – Oct. 20, 2014]

The purpose of this Info Sheet is to initiate communications between teacher and parent(s)/learners. In addition to responses on the Info Sheet, gather more information by **observing and reflecting** on everyday behaviors and **make a difference** as you use colorblind awareness.

Whether a learner is known or not known (i.e. has not been diagnosed) to be colorblind, avoid making quick assumptions about color confusions (choices). Do not presume colorblindness or other "problems" as possible reasons for color choices. Gather more information.

- **Observe** for patterns of color confusions and occurrences in multiple situations:
  - ✓ with multiple color-based mediums…?
  - ✓ with computer-based and printed materials…?
  - ✓ with multiple assignments…?
  - ✓ with other subjects…?
- **Reflect** on responses/conversations provided by others.
  - ✓ Do observations connect with responses on the Info Sheet?
  - ✓ Do other teachers/staff provide similar observations?
  - ✓ Do peers make repeated comments (positive or negative) about the learner's color choices that suggest color confusion?
- **Make a difference** by communicating with awareness. Keep notes and gather samples of art (and other work) that have raised questions.
  - ✓ Communicating with parents/learner with ample privacy and time. Share notes and collected work.
  - ✓ When parents/learner share similar observations and reflections with experiences in and out of school, **the possibility of colorblindness should be considered and discussed.**
  - ✓ Be prepared, know the facts, and share in support and responsibility.
  - ✓ Be supportive without overemphasizing (e.g. singling out the learner as example).
  - ✓ Communicate early with school staff (administrator, school nurse, special needs educator) about steps to take.
  - ✓ Ultimately, formal consultation with an eye doctor will provide clarity about color vision tests and medical diagnosis of color vision deficiency.
  - ✓ **Share stories of artists who are colorblind and continue to make art. Support and encourage learning with multi-modal methods. Aim high.**

When a learner is known to be colorblind (i.e. aware of type and severity), continue to gather information and remain cognizant of needs/interests that may require further assistance. Provide support (e.g. assistive technology) and aim for high expectations:

- ✓ Color confusions may present in subtle ways or not at all, depending on learned coping/adaptations over time.
- ✓ The learner may choose to keep his/her disability hidden for fear of further stigmatization.
- ✓ **Observe, reflect, and make a difference.**

[G.W.Ho – Oct. 20, 2014]