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| Procedure    **Procedure Overview:**  A survey will be given to a sample of both males and females from ten classes located on the Amador Valley High School Campus.  We will restrict our survey to teenagers between the ages of 15 and 18 years to avoid lurking variables, including the possibility of changes in color perception and preference which arise due to aging.  Comparing the color preference of a sixty year old to that of a teenager would not be logical since color vision may worsen over time.  The survey will consist of two parts, the first of which will compare the color preference of distinctly different colors between genders.  This will show if a certain gender favors a particular color over another, or prefers a specific group of colors, such as warm colors or cool colors.  The second part of the survey will give the subject two colors from which they will choose the one they prefer, yet the colors will be very similar and almost indistinguishable to the human eye.  Each color will, however, be different and quantified using CIE (Commission Internationale de I Eclairage, translated as the Commission on Illumination)  L\*a\*b Color System scale for measuring color.  The instrument used will be a Minolta CR300 Chromameter with a D65 Illuminant. It has a built in xenon source (or illuminant), which is very stable and is capable of measuring colors very accurately and reproducibly.  Like our eyes, the instrument to measure color also needs a light source, an object, and an observer or processor.  Color is received by the instrument in much of the same way our eyes receive color information; it gathers and filters wavelengths of light reflected from the object.  These reflected light wavelengths are then perceived by the instrument as numeric values and recorded as points across the visible spectrum, creating the spectral data.  Mathematics is then used to convert the color into a color space.  The illuminant, which in our case is D65, is necessary to know and control because this light source has a spectral distribution that affects what color is seen.  CIE L\*a\*b color scale is based on the opponent colors theory of color vision which states that a color cannot be red and green at the same time or blue and yellow at the same time.  Single values are used to describe the red/green and yellow/blue characteristics unique to the measured color.  When a color is measured in CIE L\*a\*b\*, L\* defines lightness; a\* denotes the red/green value with a color measurement movement in the +a direction depicting a shift toward red; and b\* denoting the yellow/blue value with a color measurement movement in the +b direction depicting a shift towards yellow (X-Rite).  Using this color system we can choose two colors that look very similar, but are measurably different in order to determine whether color preference and perception differ between genders.    **Materials:**  - computer and paint program to create survey and colors  - Minolta CR300 chromameter (2æ observer) using a D65 Iluminant: instrument using the CIE L\*a\*b\* uniform color scale  - 35 color copies of our survey  - 35 clear plastic protective sheets to prevent subjects from writing directly on the color survey  - about 350 answer sheets for subjects to record their answers on      **Procedure:**    1.Create the survey containing:  - the initial question of what is your gender?  - twenty one questions in which the subject is given two colors or two sets of colors from which they must choose that which they prefer best  - the first thirteen questions will involve two distinct colors or color sets from which they will choose their favorite  - questions 1-4 list two distinct colors in words  - questions 5 and 7 both display a bright color set and a soft (pastel) color set; the colors in each question are the same except bright or soft  - questions 6 and 8 display a color set of warm colors (red, orange, and yellow) and a color set of cool colors (blue, green, and purple) to choose from  - question 11 lists in words a set of warm colors in words and a set of cool colors  - question 9 and 10 display the color teal (blue-green) with either the color green or the color blue  - questions 11 and 13 list, in words, the color teal (blue-green) with either the color green or the color blue  - the last 8 questions will each display two colors that are very similar in  appearance to the human eye, but have been quantified and measured to be  different colors using the D65 illuminant using the CIE L\*a\*b\* color system.    2. Identify ten classes willing to take part in our project and distribute the survey. Although ten classes is not an extremely large sample size, it was very important to have the subjects take the survey in a consistent environment. Therefore, to eliminate some variables, we gave the survey only to students inside classrooms with fairly consistent light sources (five of the classes surveyed were actually held in the exact same classroom).  - we first told the students that the survey they were about to take deals with  color perception and color preference which will help us in our APBiology research project  - as we hand out the survey and answer sheets, we ask the students not to  discuss their color choices with their neighbors and to pick the color which  they truly prefer, not worrying about what their peers will think because  their name will not be linked with their answer sheet; all we will know is  their gender  - finally, before they begin, we warn them that the colors on the second page of the survey are very similar in color,  but are in fact different, so they must use their best judgment in deciding which they think they prefer  - we collect the surveys and answer sheets immediately following each student s completion of the survey  - finally we thank the teacher students for their assistance, and exit the class room   [[**Survey**](http://docs.google.com/survey.html)] [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [2002 Projects][2001 Projects][2000 Projects][1999 Projects][1998 Projects] |