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| One of the critical factors of an enriched environment is one which is mostly taken for granted, the visual climate. How does our brain recognize and work in this visual climate? Beginning around 1970, researchers began to seriously study the visual brain. Among the chief discoveries was the discovery of the V1 system. VI, in brief, acts much like a post office, distributing different signals to different destinations; it is an essential stage in an elaborate machine designed to extract the important information from the visual world. Our eyes are capable of registering 36,000 visual messages per hour�a huge number when you stop to think about it. Imagine 36,000 words laid out on the floor and your brain has the capacity to register each one. "Between 80 and 90 percent of all information that is absorbed by our brain is visual" (Walker, Morton). In fact, the retina accounts for 40 percent of all nerve fibers connected to the brain. With this enormous capacity, "it is important to be aware of the environmental factors that influence how we see and process information. The essential elements enabling our eyes to actually compose meaning from our visual field are contrast, tilt, curvature, line ends, color, and size" (Walker, Morton). These elements, are perceived even before the learner consciously understands what they�ve seen; they can inform teaching practice and provide a framework for attracting learner attention. While optimal learning involves far more than getting and keeping students� attention, the principles of brain-based attention-getting are useful. How does color come into this? Color is a truly powerful medium; and one that is generally underestimated. Color originates in light. Sunlight, as we perceive it, is colorless. In reality, a rainbow proves that all the colors of the spectrum are present in white light. As illustrated in the diagram below by Jill Morton, the light goes from the source (the sun) to the object (the apple), and finally to the detector (the eye and brain).  1. All the invisible colors of sunlight shine on the apple.  2. The surface of a red apple absorbs all the colored light rays, except for those corresponding to red, and reflects this color to the human eye.  3. The eye receives the reflected red light and sends a message to the brain.  Color is a property of objects that our minds create -- an interpretation -- and this property is unique to humans and higher primates. How is color determined? The signal from the retina is analyzed by nerve cells (retinal ganglion cells) which compare the stimulation of neighboring cones, and calculate whether the light reaching an area of the cones is more blue-or-yellow, and reddish-or-greenish. Next, the signal travels to the brain where it is divided into several pathways -- like fiber optics branching throughout the cortex. For example, visual signals from the photo receptors pass to retinal ganglion cells which code color information, to the parvocellular cell layers of the dorsal lateral geniculate nucleus (LGN) in the thalamus, onwards to the retinotopic mapped layers of the LGN.    ([Intro1](http://docs.google.com/introduction.html))([Intro2](http://docs.google.com/intro2.html))([Intro3](http://docs.google.com/intro3.html))([Intro4](http://docs.google.com/intro4.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](http://docs.google.com/AP2002/index.html)][[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |