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Visual Literacy and Education: Seeing the World Meets Critical Thinking

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Visual Literacy and Education: Seeing the World Meets Critical Thinking

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the requirements for the degree Master of Arts in Education

by

Barbara Lehman

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ABSTRACT OF THE THESIS

Visual Literacy and Education: Seeing the World Meets Critical Thinking

by

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Master of Arts in Education

University of California, Los Angeles, 2015

Professor Douglas Kellner, Chair

The abundance and complexity of information now being delivered visually demands that we become visually literate, as well as verbally literate. We need to understand better a process we have taken for granted. In an age increasingly dominated by images – a media culture, it becomes imperative to develop an understanding of how our visual processing system works; how visual cognition is shaped by social, political, and cultural conditioning; and how visual messages are created to elicit specific responses. One of the chief goals of visual literacy education is to encourage critical analysis of visual communication by developing tools that help us understand and manage this complex activity. "Seeing" needs to become an actively conscious, not a passive activity for us. This thesis illustrates the importance of critical visual literacy, provides an historical overview of the visual literacy movement and suggests a foundational approach to teaching the basics of visual literacy.

The thesis of Barbara Lehman is approved.

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Chapter 1: Introduction

Print [text] is not dead yet, nor will it ever be, but nevertheless, our language-

dominated culture has moved perceptibly toward the iconic. Most of what we

know and learn, what we buy and believe, what we recognize and desire, is

determined by the domination of the human psyche by the photograph. And it will

be more so in the future. (Dondis, 1973, p. 7)

Being able to meld text with images is a key skill and part of the new way we

define literacy. But being a literate communicator does not mean having to invent

a whole new language for yourself. It means mastering a language that already

exists. (Apkon, 2013, p. 135)

Donis Dondis, Professor of Communications and author of *A Primer of Visual Literacy*,

wrote the quote above over forty years ago, even before the dawning of the personal computer.

She was addressing the pervasiveness of images being delivered to us at the time through the

media of television, magazines, and film. Since then and with the advent of the Internet, the

march toward the visual has been relentless and has been occurring at an ever-increasing speed.

We live in an age dominated by visual imagery.

As the second quote, by Stephen Apkon, filmmaker and Executive Director of the Jacob

Burns Film Center, tells us, a visual language already does exist. In short, the visual rules. And,

we must learn its language if we are to be considered literate in the 21st century all-encompassing

media environment. This thesis aims to illustrate the importance of critical visual literacy,

provide an historical overview of the visual literacy movement and suggest a foundational approach to teaching *the basics* of visual literacy.

We open our eyes, and we see. This ability can easily be taken for granted. We live by the adage that "seeing is believing." Yet, seeing is not so simple or direct. "Confucius defined knowledge as to know that we know what we know and that we do not know what we do not know" (Barry, 1997, p. 5). Anne Marie Seward Barry (1997), author of *Visual Intelligence*, maintains that "we still do not know that we do not know" and that we "remain unaware of exactly how and to what extent [our] emotions and attitudes [are] influenced, ...by visual language and logic..." (p. 5).

We are a visual species with much of our brainpower devoted to processing the visual. The abundance of information now being delivered visually and its complexity demands that we become visually literate, as well as verbally literate. Since the early 19th century at the inception of photography, we have experienced technologically-driven shifts that have required bringing more critical analysis to understanding this process of vision that we have taken for granted. Moholy-Nagy, photographer and Bauhaus master, recognized that when in 1935, he said "the illiterate of the future will be ignorant of pen and camera alike" (Dondis, 1973, p. xi). The comprehension that being literate in reading and writing was no longer sufficient accelerated with the introduction into society of the television and the new concern about manipulation that the ubiquity of images related to TV advertising and news reporting wrought. Then the 1990s introduced the Internet, and we are now awash in screens from our desks, to our cell phones, to our car dashboards.

This has wide-ranging implications. Vision happens instantaneously, and often we don't have, or take, the time to reflect on or analyze the information we've received. We need to

develop an awareness about visual impact. That awareness should be ubiquitous, no longer only the domain of designers, filmmakers, and media professionals. In fact, it applies to all of us. We are in dire need of understanding how messages delivered by designers, filmmakers, and media professionals affect us, our lives, and our choices. We also are in need of understanding how to effectively present our thoughts and ideas in a complex world.

Many definitions of visual literacy and other related literacies, such as media literacy, digital literacy, or information literacy, have been proposed based on different approaches and different audiences. Nonetheless, while our discourse will indicate a variance in definition of visual literacy, it does not detract from an overarching purpose – to make visual literacy a core component of education.

As two members of the New London Group, an international group of educators who addressed the challenges of learning in the 21st century, stated, "The dominance of language in education, and Western society generally, has been at the expense of thinking about and teaching and learning about modes of meaning other than the linguistic-textual" (Cope and Kalantzis, 2000, p. 251). In light of that, our discourse will explore the visual literacy landscape, the variety of definitions it has spawned, and how it is situated with what have become known as 21st century literacies. We will also examine the contributions of key figures who have influenced this movement. In addition, we will review, briefly, the process of visual perception and the role of cultural and socio-political influences in that perception in order to show why "literacy" has to be applied to the "visual." We will look at the importance of "visual thinking" in both communication and problem-solving. Finally, I will suggest an entry point for beginning to teach visual literacy – an approach that would lay a foundation for further exploration of this vital competence.

Attention is what drives the media environment in which we are engulfed. Attention influences what we see, how we are impacted, and how we then interpret and act on the information we have gleaned. Visual literacy is about recognizing and understanding the immediacy of vision and the corresponding results. "Literacy" will enable us to bring attention to the act of seeing and prepare us to understand more fully what seeing entails. Visual literacy is about attention (what we attend to) and awareness (reflecting on what we attend to).

Chapter 2: Visual Literacy and Why It Needs to Be Taught

What is Visual Perception – How Do We See?

In an age increasingly dominated by images, it becomes imperative to develop an understanding of how our visual processing system works, how our visual cognition is shaped by cultural and socio-political influences, and how visual messages can be, and are, shaped to elicit specific responses.

Referencing our earlier quote from Confucius, what we *still do not know* is that visual literacy must be learned. Seeing is a complicated cognitive process. Contrary to popular opinion, seeing is not simply a physiological development. It is a combination of physical and mental components. Current cognitive research has determined that our information-processing system consists of three main memory structures - sensory memory, working memory, and long-term memory (Malamed, 2009, p. 22). Light bounces off an object or emanates from a screen, lands on our retina and creates an image that is briefly held in short-term *sensory memory*. The image then enters our *working memory* where it becomes part of our awareness and is combined with our existing knowledge to be encoded. At this stage the brain determines whether the image is something we've seen before, whether it can be compared to something we already know, and

whether it can be recognized and categorized. This is the point at which we have perception. The part of the image that has been our focus – what we have perceived and encoded – is then sent to our *long-term memory* from which we can later retrieve the information.

"Seeing" is a process of understanding and imparting meaning to the external stimuli we've received. Cognitive researchers refer to these activities of seeing as "top-down" and "bottom-up" processing. Visual awareness is driven by external stimuli, the bottom-up processing. Our perception of what we see, top-down processing, is driven by our "memories, expectations, and intentions. Our visual perception is a result of the combination of the two processes" (Malamed, 2009, p. 23). The information we receive from bottom-up processing drives pattern building, while top-down processing involves our attentional refocus, reinforcing relevant information. In essence, we see with our minds.

It is a foundational aspect of visually literacy to be aware that seeing is a complex activity that encompasses social, political, and cultural conditioning. As Susan Metros, Associate Vice Provost and Associate CIO for Technology Enhanced Learning at the University of Southern California, states in her advocacy for teaching visual literacy at the university level, "Institutions must provide a stage, real and virtual, where the academic community, in tandem with the global community, can freely debate the ethical issues inherent in a visually dominated world" (Metros, 2006, p. 81). She asserts that students need to be taught to look critically at images and representations, to investigate their sources, and to interrogate their truth-telling.

One of the chief goals of visual literacy education is to encourage critical analysis of visual communication by developing tools that help us understand and manage this complex activity.

What is Visual Literacy?

> To be literate…is to be conversant in the dominant expressive language and form of the age. (Apkon, 2013, p. 38)

That dominant expressive form and language of our age is the visual. That dominant language is being expressed through image alone, or in multimodal texts – ones that combine text and image as in the case of printed artifacts, or ones that include sound and/or text in the case of film, video, or the Internet.

The field of visual literacy is truly multidisciplinary and interdisciplinary. For example, it is embedded within and draws on art history, semiotics, photography, media and cultural studies, advertising, communication studies, graphic design, visual studies, and typography, among others. Hence, "visual literacy" itself is a term that elicits multiple nuances of definition.

The term "visual literacy" was coined in 1969 by John Debes, an employee of the Kodak Company and a founding member of the International Visual Literacy Association. He stated that,

> Visual Literacy refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies he is able to communicate with others. Through the appreciative use

of these competencies, he is able to comprehend and enjoy the masterworks of

visual communication. (Debes, 1969, p. 27).

Since then, the term has been variously defined, revised, and redefined depending on the

particular approach of the practitioner. Following are a few examples:

Paul Messaris (1994), in his book *Visual literacy: Image, Mind, & Reality*, defines visual

literacy as "the gaining of knowledge and experience about the workings of the visual media

coupled with a heightened conscious awareness of those workings" (pg. 2).

Gunther Kress and Theo van Leeuwen in their seminal book *Reading Images: A

Grammar of Visual Design,* first published in 1997, make a distinction between what they call

the "old literacy" versus the "new literacy" (p. 17). They posit that what we commonly think of

as *literacy* – the ability to read and write – is based on a visual recognition of abstract symbols,

an alphabet, combined into longer strings of symbols that are interpreted to form meanings. It is

an abstract visual language. Hence, they do not define "visual literacy" as something new and

distinct so much as contend that it is an extension of a previous understanding of literacy.

Literacy, thus, has always been visual. But new phenomena require new approaches, hence, a

"new literacy."

In a 2005 White Paper commissioned by Adobe Systems, Dr. Anne Bamford defines the

term as follows:

Visual literacy involves developing the set of skills needed to be able to interpret

the content of visual images, examine social impact of those images and to

discuss purpose, audience, and ownership. It includes the ability to visualize

internally, communicate visually, and read and interpret visual images…. Visual

literacy also involves making judgments of the accuracy, validity and worth of

images. (p. 1)

As to the results of visual literacy, Bamford (1997) has this to say: "A visually literate person is able to discriminate and make sense of visual objects and images, create visuals, comprehend and appreciate the visuals created by others, and visualize objects in their mind's eye." (p. 1) Bamford emphasizes the importance of visual literacy when she concludes that "to be an effective communicator in today's world, a person needs to be able to interpret, create, and select images to convey a range of meanings" (p. 1).

James Elkins, arts educator, historian, and critic, builds a case for an undergraduate curriculum in visual learning in his 2008 book, *Visual Literacy*. He gives reasons for choosing the term, noting that the very combination of words is a seeming contradiction meant to imply "reading" images. His final reason for choosing the term is "that it is convenient in the absence of anything better. It might be possible to speak of visual competence...but that sounds awkward…. Visual skills is too narrow, because much of what matters here is politics, ideology, and history…. It is best to acknowledge the inbuilt awkwardness that language and usage impose on the subject at hand." (p. 1) Elkins insistence on the role of "politics, ideology and history" is especially important in highlighting the broader cultural aspects of visual literacy.

A similar message is offered by Brian Kennedy, President and Director of the Toledo Museum of Art. In a TEDxDartmouth presentation, "Visual Literacy: Why We Need It" (2010), he defines visual literacy as "the ability to construct meaning from images. It's not a skill, but uses skills as a toolbox. It is a form of critical thinking that enhances your intellectual capacity."

Frank Serafini (2014), in his book *Reading the Visual: An Introduction to Teaching Multimodal Literacy*, highlights additional elements. He defines visual literacy as "the process of

generating meanings in transaction with multimodal ensembles, including written text, visual images, and design elements, from a variety of perspectives to meet the requirements of particular social contexts" (p. 25).

These various definitions illustrate different dimensions and concepts associated with visual literacy. They show how the term has been appropriated for a variety of interpretations. No single or simple definition suffices. For this reason, I would tend to agree with the assessment of Donis Dondis in her book *A Primer of Visual Literacy*. At the early stages of the defined movement, Dondis (1973) argued that "the major pitfall in developing an approach to visual literacy is trying to overdefine it" (p. 9).

With that in mind, it is, perhaps, most useful to turn to points of convergence that Maria Avgerinou, a leading scholar and researcher in visual literacy, identified in a 2009 publication. Avgerinou gathered the ideas of a wide range of visual practitioners in a research project to define visual literacy, which came to be known as the *Delphi Study*. She compiled several concepts upon which there was significant agreement. Among these are that visual literacy: "1) is a cognitive ability, but also draws on the affective domain; 2) is described as an ability, skill, and competency; 3) includes the ability to write (encode) and read (decode) visual communication; 4) is comprised of skills that are learnable and teachable; 5) is not isolated from other sensory skills; and 6) incorporates theories from a variety of fields of inquiry" (Serafini, 2014, p. 23).

I would include one more feature of being visually literate that, although not explicitly mentioned, is related to encoding. Termed "visual thinking," it extends into expressive and cognitive benefits not afforded by digital proficiency. It addresses the issues of "whole brain" thinking and why digital proficiency needs to be integrated with manual dexterity.

Visual Thinking – What Is It and Why Is It an Important Component of Visual Literacy?

What we perceive in sensory memory lasts only a second or two. Hence, visual thinking often must rely on visual aids. (Ware, 2008, p. 11)

Drawing to extend one's thinking is frequently confused with drawing to communicate a well-formed idea. *Graphic ideation precedes graphic communication*; graphic ideation helps to develop visual ideas worth communicating…. Education that stresses graphic communication and fails to consider graphic ideation can unwittingly hamper visual thinking. (McKim, 1972, p. 12)

We have seen the two components of visual literacy most often discussed: 1) the ability to interpret messages delivered visually as images or multimodal texts (decoding) and 2) the knowledge and skills needed to present ideas in an effective manner (encoding). The latter calls on our knowledge of basic design and presentation principles and requires an understanding of human perception and cultural differences. There is yet a third aspect to visual literacy that we can term "visual thinking." It is about utilizing "whole-brain thinking" and exercising the ability to express ideas visually with pencil/pen and paper. Doodles and simple sketches, used to "show" others one's thoughts, often can be grasped more easily and rapidly in pictures (e.g., the "back of the napkin" sketch) than in verbal explanation alone. Visual thinking is also about concretely capturing one's own thoughts externally for purposes of comparison and further development.

Combining the thought process with the physical act of sketching has been shown to focus thinking, imprint ideas, and aid in problem solving. From our beginnings, as evidenced by early cave drawings, we have been "mark-makers." What does cognitive research tell us about visual thinking – about mark-making – as an aspect of visual literacy?

We have moved from the Industrial Age (1840-1950), to the Information Age (1950 - present). We are beginning to recognize another cultural shift and are entering what many are calling the Conceptual Age (Pacione, 2010, p. 8). This new age is being heralded as one of creativity and innovation. Neurological and cognitive research, involving how the brain functions, is helping to define the Conceptual Age. This research is showing that we process different kinds of information in different regions of the brain, and various regions work in collaboration depending on the requirements of a given activity. This dawning age is characterized by what Daniel Pink (2005) has called a "whole new mind" quoting Samuel Taylor Coleridge's belief that "a great mind must be androgynous" (p. 136).

In the 1970s, cognitive research done by Dr. Roger Sperry, working with neurosurgery colleagues, uncovered what is deemed the left-brain, right-brain dichotomy. The findings of that research indicate that specific regions of the brain are activated by different activities. Later research has determined that this is not a strict left-brain vs. right-brain dichotomy, but more related to specialization within areas of the brain and how we use this understanding to engage and integrate our thinking. The left brain is more linear, logical, and adept at working with the symbolic language of words. The right brain is more intuitive, emotional, and adept at dealing with images. A synthesis of the two sides of the brain allows for thinking in new ways, for patterning information, for figuratively and literally, "seeing the big picture." Thus, visual thinking is applying the skills of the right side of the brain in combination with the left side to

create meaning, convey information, and solve problems more efficiently and more effectively. It is to be in possession of Coleridge's great androgynous mind.

In1984 Terry Childers and Michael Houston published a paper on the *Picture Superiority Effect*. Their research determined that "visual imagery is a rich mnemonic device that enhances learning and retention of material over such techniques as sentence elaboration or rote rehearsal" due, in part, to the concept of "redundant cues" (p. 643). The "redundant cue" theory argues that "imagery involves a form of elaboration that yields stored semantic information beyond that contained in the original stimulus" (Childers and Houston, 1984, p. 644). Therefore, they assert that utilizing only verbal input offers a less effective pathway to memory. The kind of data that Childers and Houston amassed provides one of the many reasons why visual literacy matters in education. But there is more to consider.

Research is also revealing that information can be retrieved more easily when the original coding has commanded more than one channel of input, and thus is stored in different regions in the brain. Information is proving to be retained longer and retrieved more easily if it is presented as image juxtaposed with text, if it combines an image and/or text with music, or if it is associated with a heightened emotional state. We recognize that we suffer from "information overload." But, we now understand more about how to combine channels of input and about the importance of accessing both parts of our brain, adding our intuitive and visual abilities, in order to turn that overload of data into something meaningful and useful.

Through her study of cognitive research on drawing practices, Andrea Kantrowitz (2012), artist and educator, concludes that engaging the mind, eye, and hand in the physical act of drawing is "to learn to be open to surprise, to perceive underlying structures and make unexpected connections…. [In] developing metacognitive skills like constructive perception, it is

possible for those who draw to become deeper and more creative thinkers who are better equipped to solve problems across disciplines..." (p. 12).

Don Norman, cognitive scientist and Director of the Design Lab at the University of California San Diego, succinctly makes the case for applying the products of visual thinking. He observes that "the power of the unaided mind is highly overrated. Without external aids memory, thought and reasoning are all constrained. ...real powers come from devising external aids that enhance cognitive activities" (Ware, 2008, 20). M. Verstijnen and C. van Leeuwen, in a 1998 study of design drawing practices, concluded that, "sketches are not just about lightening cognitive load, or even making new combinations. Sketches support radical restructuring of percepts and concepts, stimulating new analogies and leading the way to innovation and invention" (Kantrowitz, 2012, p. 10).

As we see, visual thinking is taking advantage of external aids that take shape as rough sketches intended to capture concepts in our mind's eye – an informal activity. Rough sketches allow us to share our conceptual imaginings with others. This kind of rapid, concrete visualization is doing spontaneous critical thinking and problem solving with images, an activity Colin Ware calls "creative meta-seeing"

We can also use a more formal approach – McKim's concept of "graphic communication" – to convey messages that draw on our "whole mind" as we create, and the "whole mind" of the viewer as the message is received. This is *visual design*, using cognitive design principles in shaping information to convey a message, a topic we will discuss later in the paper.

How is Visual Literacy Situated with Other Literacies?

Foundational to understanding visual literacy is situating it amongst what are being called the "21st century literacies." As Renee Hobbs notes,

> New types of texts and new types of literacies have been emerging over a period
>
> of more than 50 years. ….[these literacies use terms like] information literacy,
>
> media literacy, media education, visual literacy, news literacy, health media
>
> literacy, and digital literacy, among others. Each term is associated with a
>
> particular body of scholarship, practice and intellectual heritage, …. These terms
>
> reflect both the disciplinary backgrounds of the stakeholders and the wide scope
>
> of the knowledge and skills involved. (2010, p. 17)

Among the myriad of new essential literacies, for our purposes specifically, we must situate visual literacy in relation to two other literacies – media literacy and digital literacy – with which it is inextricably intertwined.

The concept of *media literacy* has evolved from its beginnings with the advent of each new technology that has appeared, and the growing awareness of the societal impact that occurred with each of these. Media literacy, in large part, involves visual interpretation and understanding. The technologies that relate specifically to the visual include photography, film, television, and most recently, digital technologies and the Internet. What began as a need to understand the cultural influences of television and advertising in shaping our perceptions and behaviors, eventually, with the advent of the Internet and Web 2.0, became a need to respond to additional demands of an interactive communication environment. As with the evolving definition of visual literacy, the definition of media literacy, and thus media literacy education, has changed along with evolving technological shifts.

The National Association for Media Literacy Education (NAMLE), which began as the Partnership for Media Education (PME), was formed in 1996. It now defines media literacy as "the ability to access, analyze, evaluate, and communicate information in a variety of forms…individuals need to develop expertise with the increasingly sophisticated information and entertainment media that address us on a multi-sensory level, affecting the way we think, feel, and behave" ("A Broader Definition," n.d., para. 3). The Center for Media Literacy (CML) lists five core concepts of media literacy: "1) all media messages are constructed; 2) media messages are constructed using a creative language with its own rules; 3) different people experience the same message differently; 4) media have embedded values and points of view; and 5) most media messages are organized to gain profit and/or power" (MediaLit Kit, 2005, p. 1).

The *Aspen Institute Task Force on Learning and the Internet*, in a 2014 joint project with the *John D. and Catherine T. MacArthur Foundation*, defines media literacy as,

> the ability to understand, interpret and use different forms of media: books,
> hypertext, videos, podcasts and much more…[which] employ different grammars
> and vocabularies and require different skills for searching and producing as well
> as consuming…. Media literacy training started in the era of one-way mass media
> but has evolved to embrace today's multidirectional new media as well. (p. 68)

This definition overlaps with what is called "information literacy" in its reference to search skills and sourcing artifacts.

Both NAMLE and the Aspen Institute Task Force recognize that now we are all consumers in a vast "media-industrial complex" (a term attributed to journalist Ben Bagdikian), and also participants in an interactive media culture that demands we be able to create and deliver messages.

"Words and pictures mean something only because 'we' are placed in a historical, social, and epistemological relationship to them" (Moore & Dwyer, 1994, p. 296). As we previously mentioned, visual literacy, like verbal literacy, is contingent upon cultural and socio-political influences. This understanding takes us into the discipline of *semiotics* and the theory of *critical media literacy*. The first, semiotics, is the study of signs, symbols, and signification. It is a study about the tools, processes, and contexts that human being use for creating, interpreting, and understanding meaning in multiple ways. Suffice it to say here that visual literacy draws extensively on this field of study. The second, critical media literacy, has evolved as a part of cultural studies and the realization that media touches and influences every part of our lives, and shapes our understanding and behavior. Critical media literacy demands that we be conscious of those influences.

Critical media literacy has developed to expand upon media literacy, asserting the urgent need for critical media analysis to cultivate and sustain a democratic and participatory society. As Douglas Kellner, a leader in the field of critical media literacy and George Kneller Chair in Philosophy of Education at UCLA, points out along with Jeff Share, UCLA Teacher Education Program Faculty Advisor, "critical media literacy is an educational response that expands the notion of literacy to include different forms of mass communication, popular culture, and new technologies. It deepens the potential of literacy education to critically analyze relationships between media and audiences, information, and power" (Kellner & Share, 2007b, p. 62).

Kellner and Share assert that it's essential in a democratic society to teach a *critical* media literacy that "focuses on ideology critique and analyzing the politics of representation of crucial dimensions of gender, race, class, and sexuality; …expanding textual analysis to include issues of social context, control, resistance, and pleasure" (Kellner & Share, 2007b, p. 62).

Media literacy acknowledges that media is created with an agenda. *Critical media literacy* argues the need to extend that recognition into the realm of the politics of representation, giving heed to an analysis of the role of media in establishing and sustaining power structures. As the progressive educator Paulo Freire suggested, people need to read the world as well as read the word if they are to be successful citizens (Freire, 1970). A large part of "reading the world" is interrogating the images presented in media.

In our current media environment, we also now require a group of skills deemed "digital literacy." *The Aspen Institute Task Force* report of 2014 states that this "refers to fluency in the use and security of interactive digital tools and searchable networks. This literacy includes the ability to use them safely and effectively for learning, collaborating and producing…." (p. 68). In addition, knowledge of digital tools facilitates the creation and delivery of messages.

Visual literacy is integral to the concepts of media literacy and digital literacy. To be *media literate* is to understand how images and multimodal texts that make up much of that media are constructed to elicit a particular response from us; this also allows us to create/construct our own media messages. To be *digitally literate* is to have the knowledge and ability to interact with the digital landscape for that two-way communication. Whereas once we were all consumers, we now are all designers (to a degree), as well. Visual literacy is a pre-requisite for both of these capabilities if we are to use them well.

Visual Literacy Pedagogy - Why Does Visual Literacy Need to Be Taught?

How do we find ourselves in an educational climate that fails to understand and thus resists widespread visual literacy education? There are isolated and targeted educational programs that address visual literacy, yet there is no widespread recognition of the critical

importance of visual literacy training for everyone. Emphasis now is placed on STEM education. While we do have a strong need for a populous trained in science, technology, engineering and math, we are impeding innovation if we do not include training in the visual, which brings a crucial dimension into STEM education. A movement to turn STEM into STEAM to include the arts in the educational agenda is just beginning to emerge, but faces either resistance or apathy. What do we not yet understand? The following assertions address these questions.

A common misperception has been fostered resulting from a paper Marc Prensky authored in 2001 called *Digital Natives, Digital Immigrants*. The intended audience of the paper is educators. In that paper, Prensky is making a fervent case for teachers to find and incorporate "digital native" methodologies in their teaching practices if they are to successfully engage students that have grown up in front of the screen. The popular conception that has evolved from that paper is that there is a dividing line between those who have grown up with technology and those who are "immigrants," who experienced the world before technology brought us the Internet, social media, and other ever evolving, life-altering technologies. That much is true. However, this has been extrapolated to imply that since the "natives" have a greater facility and ability to navigate within it, they have a more granular understanding of this new landscape. While it may be true that "natives" have less fear of technology and, thus, can explore and adapt themselves more quickly to learning and using these technologies, it does not follow necessarily that they reflect upon the social and cultural implications of them. Critical analysis of what we see and are shaped by is not a given – neither for "natives" nor for "immigrants." It requires training.

Scholars and visual theorists contend that visual literacy is critical for illuminating how our society and we as individuals are being shaped in our image-rich media environment.

Professor Douglas Kellner does so as he argues that media culture has become a primary source of public education. Kellner (1995) states that, "In a contemporary media culture, the dominant media of information and entertainment are a profound and often misperceived source of cultural pedagogy: they contribute to educating us how to behave and what to think, feel, believe, fear, and desire – and what not to" (p. 2). Notably, he asserts that "media culture is a culture of the image" (p. 1). Kellner succinctly states the powerful influence that media images exert in shaping each of our lives and thus the kind of society in which we live. In a similar vein, reflecting on one of the pieces included in his book *Visual Literacy*, James Elkins (2008) affirms the contention of one of the authors that "without confronting the way in which visual texts are produced and consumed,…one cannot understand the practices of modern social life" (p. 199).

In their seminal book on visual literacy, Gunther Kress, professor of semiotics and education, and Theo van Leeuwen, film and television producer turned professor, make a compelling case for the need to teach visual literacy in their book, *Reading Images: The Grammar of Visual Design*. They discuss how the situation has come about and examine the socio-political implications. Most significantly for the present thesis, they also show why we should have a sense of urgency. In the book, first published in 1997, and released in a revised edition in 2006, Kress and van Leeuwen contend that young children naturally express themselves visually, producing images and illustrating their work. They assert that children are progressively introduced to written texts until a point in their school experience when the use of the visual gives way to a more technical function of producing things such as maps and diagrams and less expressive art. Writing becomes the expected and dominant mode. Writing is a form of "visual literacy" but one that relies on a high level of abstraction. Given that understanding, they

refer to deciphering written texts as the "old visual literacy" (Kress & van Leeuwen, 2006, p. 23).

Kress and van Leeuwen (2006) point out that much of contemporary communication is delivered as sophisticated multimodal texts, yet the ability to analyze and to create these kinds of "texts" is not taught in school. It is notable that their book was written even before computer screens had become so ubiquitous. Yet they state, "in terms of this essential new communication ability, this new 'visual literacy,' institutional education, under the pressure of often reactionary political demands, produces illiterates" (p.17). They argue that there is an underlying opposition to the "emergence of the visual as a full representation." (p. 17). They also foresee that visual communication is becoming less and less the domain of specialists, believing that "not being 'visually literate' will begin to attract social sanctions. 'Visual literacy' will begin to be a matter of survival, especially in the workplace" (p. 3).

In light of all this, Kress and van Leeuwen (2006) contend that we are in a transition from the "old literacy," in which images have been made subservient to language to the "new literacy," in which images exist side-by-side with written text, but often as independent entities (p. 23).

Kress and van Leeuwen question whether information has become so complex and vast that language by itself is no longer sufficient to address our situation – that multi-modality must exist. Hence, a vocabulary to analyze visual representation and thus be able to interpret and to teach this literacy is needed. Kress and van Leeuwen also elucidate the relationship between communication or interpretation and socio-political power that makes such visual literacy urgent. They cogently express this need as follows:

Analysing visual communication is, or should be an important part of the 'critical' disciplines. …we see images…as means – always – for the articulation of ideological positions. The plain fact of the matter is that neither power nor its use has disappeared. It has only become more difficult to locate and to trace. In that context there is an absolute need in democratic terms for making available the means of understanding the articulations of power anywhere, in any form. (Kress & van Leeuwen, 2006, p. 14)

Visual literacy is a crucial response for a culture where democratic principles are to be preserved. Recognizing the broad cultural implications, Kress and van Leeuwen echo the calls from Douglas Kellner and others for the teaching of critical media literacy. Kress and van Leeuwen continue:

The still growing enterprise of 'critical discourse analysis' seeks to show how language is used to convey power and status in contemporary social interaction, and how the apparently neutral, purely informative (linguistic) texts which emerge in newspaper reporting, government publications, social science reports, and so on, realize, articulate and disseminate 'discourses' as ideological positions just as much as do texts which more explicitly editorialize or propagandize. To do so we need to be able to 'read between the lines,' in order to get a sense of what discursive/ideological position, what 'interest,' may have given rise to a particular text, and maybe to glimpse at least the possibility of an alternative view. It is this kind of reading for which critical discourse analysis seeks to provide the ways and means. (Kress & van Leeuwen, 2006, p. 14)

Having demonstrated the multi-layered significance of critical discourse analysis, Kress and Leeuwen continue by observing that: "So far, however, critical discourse analysis has mostly been confined to language, realized as verbal texts, or to verbal parts of text which also use other semiotic modes to realize meaning" (2006, p. 14). This last conclusion prompted Kress and van Leeuwen to embark on their mission to open a conversation about developing a visual language to facilitate discourse about "reading" images, as a way they see to "broaden critical discourse analysis…" (2006, p. 14).

In a later essay on multiliteracies, Gunther Kress reflects on how art as an everyday communications tool throughout history gave way to the textual. He suggests that in the 18th and 19th century the elites in Western Europe severed the earlier continuous chain of art and music as a part of life in the so-called public sphere. These modes became "leisure time" luxury activities of the elite rather than an integrated part of communal life. The visual became associated with personal expression rather than with broadly based communication. Kress posits consequences of this as hindering our ability to educate people in multimodal learning. As he states,

> The general effect of this, … [on art and music] has been to leave the two modes
> of the visual and of music outside a general theory of communication, to leave
> them untheorised, or at least under-theorised, and certainly to take them out of the
> school curricula, except as specialist activities. As a consequence we, in the
> 'West', find ourselves singularly ill-equipped in the new landscape of
> communication, whether that is generally speaking, or institutional and non-
> institutional education. (Cope and Kalantzis, 2000, p. 183)

Scholar James Paul Gee is explicit in making the case for developing a facility with analyzing images as well as other meaning-making modes as a means to assure that we can

successfully navigate the demands of the media environment. In his Forward to *Reading the Visual*, Gee asserts that,

> This new world is a multimodal world. Language is one mode; images, actions, sounds, and physical manipulation are other modes…. In the 21st century anyone who cannot handle multimodality is illiterate. They must be able to handle it critically, since without critical and analytic skills a multimodal world of games, ads, news, and other media is a world where it is easier than ever to lie, scam, dupe, and manipulate people. (Serafini, 2013, p. xi)

Gee's admonition, expressed in a book directed to K-12 teachers, applies to people of all ages.

As Gee notes, we now live in a multimodal world. We need to challenge the anxiety of some that use of visuals will overtake or replace the written word. Championing the teaching of visual literacy is not antithetical to teaching the literacy of reading and writing. The major proponents of visual literacy pedagogy are explicit in asserting that advocating visual literacy is not about supplanting literacy – the ability to read and write – as we have come to know the term. The "word" is not losing its potency for delivering meaning. Rather, proponents demonstrate that the ability to understand written language is no longer enough in a world in which so much meaning is conveyed through imagery. Kellner expresses this in a 1998 paper, "…the concept of multiple literacy and the postmodern pedagogy that I envisage would argue that it is not a question of *either/or*, that is, either print literacy or multimedia literacy, either the classical curriculum or a new curriculum, but it is rather a question of *both/and* that preserves the best from classical education, that enhances an emphasis on print literacy, but that also develops new literacies to engage the new technologies" (p. 122). Words and images complement one

another in ways that can result in deeper meanings, and therefore, require greater sophistication in critically assessing them.

Chapter 3: Historical Perspective

Visual Theorists' Influence on Visual Literacy

Visual literacy draws on many fields of study, including art, art history, linguistics, semiotics, design, cognitive psychology, and philosophy. While there is a vast literature and numerous scholars and visual theorists from whom visual literacy has drawn, among the most historically influential are Rudolf Arnheim and Roland Barthes.

Rudolf Arnheim (1904 – 2007) was a German-born art and film theorist, perceptual psychologist, and professor of the psychology of art. A member of the Berlin School of experimental psychology, he authored two particularly influential books, *Art and Visual Perception* and *Visual Thinking*. He made a significant contribution to the visual arts by applying his knowledge of gestalt psychology to art, enlarging our understanding of the laws of perception. He advocates for a general visual literacy that is a product of visual thinking exercised in all areas of life. For Arnheim, *visual thinking*, the ability to process information visually as well as verbally, is essential. Among other things, Arnheim explained the activities of a science student tasked with drawing what he sees in a microscope, Arnheim (1969) describes how the student must use an active intelligence to understand what he sees and make determinations of relevant shapes and what else is to be represented. He concludes, "the discipline of intelligent vision cannot be confined to the art studio; it can succeed only if the visual sense is not blunted and confused in other areas of the curriculum. To try to establish an island of visual literacy in an ocean of blindness is ultimately self-defeating. Visual thinking is

indivisible" (p. 307).

Roland Barthes (1915-1980), French semiotician, philosopher, and critic has influenced a number of fields in regard to the representation of information, among them photography, computers, music, and literature. One of the most pertinent ideas he introduced in the realm of visual literacy relates to the interplay of text and image. Acknowledging that every image is polysemous, his work introduces the concepts of *anchorage* and *relay* in relation to images. The term "anchorage" refers to text associated with an image that "anchors" or constrains the meaning of that image. The viewer essentially is guided in interpreting the image. "Relay," a concept Barthes applies primarily to sequential art such as comic strips or film, refers to a combination of image and text in which each component fills in the gaps of understanding that would occur if either were absent. In this case, text and image complement one another in supplying information about the meaning of a narrative.

Among other visual theorists who have produced work that contributes to the visual literacy discourse are: Walter Benjamin (1936), Guy Debord (1967), John Berger (1972), Susan Sontag (1977), Jean Baudrillard (1981), and W.J.T. Mitchell (2006). It is the work of Arnheim and Barthes, however, that more directly and consistently has found its way to the visual literacy movement.

Key Figures in the Visual Literacy Movement

As with our mention of visual theorists, any attempt to do a historical summary of key figures in the visual literacy movement becomes highly selective. The following highlights some of these key figures. Each reference is to an exemplar of a particular aspect of visual literacy, such as visual thinking, visual design, semiotics, visual theory, presentation and information

design, or visual communication.

Visual literacy as a movement can be traced back to **John Debes**, who worked for the Eastman Kodak Company in Rochester, New York, and who (as noted earlier) coined the term "visual literacy" in the late 1960s. Debes, along with Clarence Williams, and Colin Murray Turbayne, Professor of Philosophy at the University of Rochester (the group became known as "The Rochester School"), laid the foundation for the visual literacy movement. Following a 1969 conference on the subject, the *International Visual Literacy Association* (IVLA) was born.

In 1972 **Robert McKim** drawing on the early work of Rudolf Arnheim among others, published his 2nd edition of *Experiences in Visual Thinking*. McKim, a professor at Stanford University, theorized that there are several components involved in sketching an idea. From what began as a small picture book project on "idea-sketches," became a treatise on combining research on "seeing" (visual perception), imagining, and producing idea-sketches – in essence, "visual thinking."

A year later, in 1973, **Donis Dondis**, a designer, professor, and pioneer in visual literacy education, published *A Primer of Visual Literacy*. Dondis noted that, with the growing use of imagery, everyone needs to become visually literate. She asserted that developing a visual sense is akin to learning a language. Her book elaborates on the basic elements that comprise visuals as a starting point for people to begin to learn visual language. Forty-two years ago she noted, "If the invention of moveable type created a mandate for universal verbal literacy, surely the invention of the camera and all its collateral and continually developing forms makes the achievement of universal visual literacy as an educational necessity long overdue" (p. ix).

Over a 40-year career, **Elliot Eisner,** professor of Art and Education at the Stanford Graduate School of Education, advocated for the importance of arts education across the

curriculum. Dr. Eisner's academic research focused on the development of aesthetic intelligence and on improving educational practice across the curriculum by applying the critical methods used in teaching in the arts. Eisner (1998) premised his arguments on several ideas. Among them, that "there are multiple ways in which the world can be known" (p. 7). Moreover, these multiple ways have specific consequences: "the forms through which humans represent their conception of the world have a major influence on what they are able to say about it" (p. 7). What is perhaps most pertinent, Eisner posits, "which particular forms of representation become acceptable in the educational research community is as much a political matter as an epistemological one. New forms of representation…will require new competencies" (p. 8).

Gunther Kress and **Theo van Leeuwen** are academics with teaching and research interests in semiotics, linguistics and visual communication, and one (Kress) a member of the New London Group. They have written extensively on the intersection of visual literacy and new media. *Reading Images: A Visual Design Grammar*, a seminal text in visual literacy mentioned previously, is their comprehensive exploration to begin developing a vocabulary to discuss visual imagery.

In the 1990s **Maria Avgerinou**, as a doctoral student in education, collaborated on an influential paper on the topic, *A Review of the Concept of Visual Literacy* in the *British Journal of Educational Technology*. Since then, she has served in several capacities with the *International Association of Visual Literacy* and has contributed in teaching and research to advance the concept of visual literacy.

James Elkins, art historian and critic, and professor at the School of the Art Institute of Chicago, has researched and written extensively on visual matters. He directly addresses the concept of visual literacy in his 2008 book *Visual Literacy,* an edited volume which was an

outgrowth of a 2005 conference about visual literacy, visual cultures, and visual practices at the university level. His primary interest in compiling the essays in the book was to explore, along with several colleagues, how expanding the use of visual practices could enhance a university education. As a whole, this edited collection speaks to the social and cultural significance of visual literacy. Elkins (2008) proposes that,

> visual literacy is not a solitary, individual act, but part of a wider set of social practices. To find meaning is to negotiate with the visual text, to engage with it on any number of levels, and to be involved in discovering how that act of negotiation itself is constructed. (p. 196)

In reflecting on one of the essays included in this volume, Elkins (2008) affirms the contention of its authors that "without confronting the way in which visual texts are produced and consumed,…one cannot understand the practices of modern social life" (p. 199).

Edward Tufte is a Yale University professor emeritus, statistician, and artist. Tufte embarked on a personal mission to educate others in critically analyzing and presenting information through visual display. In doing so, he has authored four influential books on information design and visualization, and teaches workshops on information design, visualization, and presentation techniques. He notes that science and art are both about "intense seeing." In each of his books he explores the intersection of visual presentation of information and analytical thinking, describing universal principles of analytical thinking. As Tufte (2006) notes In *Beautiful Evidence,* "the principles of analytical design are universal – like mathematics, the laws of Nature, the deep structure of language – and are not tied to any particular language, culture, style, century, gender, or technology of information display" (p. 10). Tufte's work addresses the critical issue of how both to interpret the vast amounts of information that we now

are receiving in visuals, and to understand how most effectively to present information in visual form, often in multimodal texts combining image and written text.

Paul Messaris, professor at The Annenberg School for Communication at the University of Pennsylvania, researches visual communication and digital media. In his 1994 book *Visual Literacy: Image, Mind, & Reality*, Messaris – exploring the representation and interpretation of images in film and television and the cognitive consequences of visual literacy – brings a critical eye to the field of visual literacy itself. At that time, in contrast to most of his colleagues, Messaris expressed some skepticism about the value of teaching visual literacy as a means to comprehend visual media; he did assert, nevertheless, the need to teach it to make viewers more aware of how meaning is created visually, thus, less susceptible to manipulation and misinformation. Messaris is an ardent proponent of the valuable experience gained by engaging in media production to bring viewer's "awareness of intent" to the foreground in order to critically assess what is being presented to them (p. 183).

A recent contribution to the field is the work of **Nick Sousanis**, who is expanding understanding of the role of the visual in academia by bridging the worlds of academic study and popular visual culture. Drawing on his work as a comics artist and the groundbreaking comics theory of Scott McCloud, Sousanis completed a dissertation in interdisciplinary studies at Columbia University's Teachers College drawn in comic book form. His dissertation, *Unflattening*, in comic book format and published in 2015 by MIT Press, is a discourse – about visuals expressed through a visual mode – on the way humans construct knowledge.

Many other scholars are making significant contributions to the concept of visual literacy though not through that specific lens. Among the academic disciplines in which they are leading the discourse are critical media literacy, linguistics, literacy education/multiliteracies, media, and

visual theory.

The **New London Group** is a group that came together in New London, New Hampshire, in 1994 to consider the state of future literacy teaching and to outline an agenda for a pedagogy of multiliteracies – to reconceptualize the meaning of literacy (Serafini, 2013, p. 26). This group included ten academics and literacy professionals, among them Bill Cope, James Paul Gee, Mary Kalantzis, and Gunther Kress. In *Multiliteracies: Literacy Learning and the Design of Social Futures,* a book that expanded on their ideas first published as a paper in a 1996 edition of the *Harvard Educational Review,* they recognize the need to educate students to effectively navigate the multimodality of the current communications landscape:

> If it were possible to define generally the mission of education, it could be said
> that its fundamental purpose is to ensure that all students benefit from learning in
> ways that allow them to participate fully in public, community and economic life.
> …we argue that literacy pedagogy now must account for the burgeoning variety
> of text forms associated with information and multimedia technologies. This
> includes understanding and competent control of representational forms that are
> becoming increasingly significant in the overall communications environment,
> such as visual images and their relationship to the written word – for instance,
> visual design in desktop publishing or the interface of visual and linguistic
> meaning in multimedia. (Cope & Kalantzis, 2000, p. 9)

Douglas Kellner, critical theorist and George Kneller Chair of Philosophy of Education at UCLA, has researched and written extensively on critical media literacy. As we saw earlier, Kellner (1995) posits that media culture is "a culture of the image" (p. 1). Kellner (1988) notes that "it is precisely the images which are the vehicles of the subject positions and that therefore

critical literacy in a postmodern image culture requires learning how to read images critically and to unpack the relations between images, texts, social trends, and products in commercial culture" (pg. 43).

Henry Jenkins, a media scholar who was previously Director of the MIT Comparative Media Studies Program and now is at the University of Southern California, advocates for media literacy education for young people and adults alike to build a meaningful relationship with media – producing as well as consuming it. In a 2014 interview he expresses his concern about technology being brought into classrooms yet without a comprehensive approach to media literacy. Jenkins contends that "…the focus on technology turns media education into something that can be sold — like getting whole school districts to buy iPads — and can be purchased from the school budget, rather than something which…should require a fundamental paradigm shift in the ways we teach all school subjects." Jenkins succinctly points out that media education is not about simply learning to use hardware or software. Being media literate, visually literate, and digitally literate is, in large part, about understanding the ramifications of evolving technologies. What new opportunities does technology create? How can we best integrate and benefit from those? What new problems does it present? How can we mitigate those? As we learn the technical aspects of using the new technologies, it is crucial that we interrogate how they shape and influence our behavior, and how they affect our learning. It is crucial that we understand these things and have a concomitant shift reflected in our pedagogy to acknowledge and respond to the changing landscape.

The necessity of a paradigm shift in thought is reflected in the book *Graphesis: Visual Forms of Knowledge Production* by **Johanna Drucker**, Breslauer Professor of Bibliographical Studies in the Department of Information Studies at UCLA, visual theorist, book artist, and

cultural critic. In her book, she addresses the visualization of information design, noting that visualization and visual representation have long been part of scientific research and exposition, but lacking in the humanities. With this book, Drucker (2014) seeks to open a dialog about "[engaging] the full potential of visuality to produce and encode knowledge as interpretation" (p.11). In this treatise, Drucker is interested in visual systems of thinking, how the interface design of technology impacts understanding, and the progress that could be made in bringing this to awareness and developing a language to enable critical analysis of what is possible in a networked environment. Drucker affirms that though widely used, visual representation is still suspect as a form of knowledge. She explains the reasons for that, and then challenges assumptions. Drucker, along with Kress and van Leeuwen, are making significant contributions to the development of languages of visual representation that allow critical thought and analysis to be brought to bear on this subject.

On a broader collaborative scale, advocates have come together as a number of key groups to promote the concept of visual literacy. The primary organization is the *International Visual Literacy Associate* (IVLA), which was founded in 1969 at the time that John Debes coined the term for this new literacy. The IVLA, whose members come from a wide range of disciplines, is the one organization specifically dedicated to promoting visual literacy, exploring how we interact with our visual environment and how we make meaning of what we see. Among the other organizations that address visual literacy, doing so within the scope of media literacy, teaching, technology, and/or information seeking are: the *National Association of Media Literacy* (NAMLE), the *Center for Media Literacy* (CML), the *Association of College and Research Libraries* (ACRL), and EDUCAUSE which states as its mission "transforming higher education through the use of information technology."

We have explored the concept of visual literacy, the science of sight, visual thinking, the historical importance of visual theorists, and primary figures and groups of the visual literacy movement. Having established the nature and importance of visual literacy, we now turn to what I suggest as a foundational approach to begin teaching visual literacy.

Chapter 4: Teaching Visual Literacy – A Foundational Approach

While sight comes to us naturally, understanding what we see is a complex process. Just as learning a language to become verbally literate takes considerable practice, becoming visually literate involves mastery of a vocabulary of principles of perception, and analysis and application of graphic elements and composition. Whether a visual message is delivered in the categories of graphic design, fine art, film, or visual communication, visual language is built on a foundation of basic elements and cognitive understandings.

Below I describe the kind of basic information that can readily be conveyed to educators and students. It is, in many ways, a mini-course in the basic grammar of visual literacy that can help alert teachers to the process of visual literacy and its potential.

This section presents foundational design principles within five categories that I believe can and should be taught across the curriculum (noting overlap and cross-referencing) to facilitate analyzing, interpreting, and creating visual messages. While not the standard manner of grouping elements found in most art and design instruction, I find this particular categorization a most useful way to think about visual literacy. These categories are drawn from my 30 years of study and experience as a graphic designer and my knowledge of design literature. I have worked as principal of a design firm, and as a design director in corporate, non-profit, and higher education settings. My graphic design expertise for both print and web has expanded, as well,

into work in information architecture and user experience design. Through my academic work for my Masters degree, my thinking also now builds upon the ideas of seminal figures in the visual literacy and critical media literacy movements.

Understanding how graphic elements are used is critical in both decoding and encoding visual messages. In *Essentials of Teaching and integrating Visual and Media Literacy,* Kristina Lamour Sansone points out the importance of basic graphic design education across the curriculum. She notes that it "strengthens critical thinking within picture and word processing, providing scaffolding for how students can think about and steer picture–word integrated language for their own learning and for the learning of those who interpret their constructed images" (Baylen & D'Alba, 2015, p. 14). Sansone goes on to note that exposing teachers to graphic design processes gives them confidence to include multimodal projects into their curriculum and to be able to facilitate their effective completion (Baylen & D'Alba, 2015, p. 14). The elements that I discuss below are an introduction to such processes.

The foundational framework for visual literacy that I will be presenting includes: 1) basic design elements – the basic forms that combine to constitute vision, 2) gestalt principles of visual relationship – how visual elements interact, 3) gestalt principles of visual hierarchy – how attention is directed, 4) structure - how elements come together in forming a whole to deliver a message, and 5) the special role of color – how color plays a role in image interpretation and creation.

Dondis provides an overview of the basic elements:

The tool box of all visual communications is the basic elements, the

compositional source, for all kinds of visual materials and messages and objects

and experiences: the dot, the minimal visual unit…; the line, the fluid, restless

articulator of form…; shape, the basic shapes, circle, square, triangle…; direction, the thrust of movement …; tone, the presence or absence of light, by which we see; color, …the most emotional and expressive visual element; scale or proportion, the relative size and measurement; dimension and motion. (Dondis, 1973, p. 15)

These are the building blocks of visual expression. Learning the visual language requires that we go step by step to understand how these building blocks can be put together to convey meaning. As Colin Ware, a leader in the field of data visualization has said, "Visual expression is based on a hierarchy of skills. Sophisticated cognitive skills build on simpler ones. We cannot begin to play chess until we can identify the pieces. We will not become [adept at visual expression] until we have learned patterns involving whole configurations relating to strategic advantage..." (Ware, 2008, p. 171).

Howard Gardner, in the research and theory set forth in his book "Frames of Mind," has extended our thinking to an understanding that there is not only one measure of intelligence, but that there are seven "multiple intelligences," to which he eventually added an eighth one, patterning. Perceptual psychologist Richard Gregory has described this eighth intelligence as "the 'inner logic' of perception in visual problem-solving. Our ability to see pattern in things, that is to pull together parts into a meaningful whole, …is the key to perception and to abstract thinking – both of which represent the complex feat of deriving meaning out of essentially separate and disparate elements" (Barry, 1997, p. 8).

Cognitive research has identified several principles regarding how we perceive the light, patterns, and images that enter our awareness. I will discuss a few of the most foundational ones, grouping them into categories despite the overlap and cross-referencing. These principles hold

information we need to begin to understand, both to help us design effective messages and to create awareness of how and what we are responding to in messages we receive.

Basic Elements – Dot, Line, Shape

The simplest element of communication is the dot. A dot has no area, but can be identified by its position on a surface. As mentioned, humans are pattern seekers. The Pointillist painters used their knowledge of visual perception in creating paintings comprised of small dots of color, which when viewed at a distance collectively merged into a recognizable image. Our perception extends to the same technique used in the printing process, creating images with *halftone screens* that deposit dots of ink. A black and white image is formed by a series of black dots placed in different proximities to one another. Color images are created by depositing tiny drops of four different colors into patterns that we then perceive as representing full-color images. Our "mind's eye" merges the colors into what we "normally" see.

Two dots connected form a line. A line can be thought of as dots in motion. The shortest distance between two points is a line. A line, whether tightly penned in a technical drawing or loose and fluid in a sketch, makes our imagination visible. The line not only defines shapes but also has tremendous expressive potential created through application such as variance in thickness or in use as a flowing versus a jagged representation. It is the tool for writing and notation systems.

Three or more dots connected form a surface. The most basic shapes are the square, the circle (a continuous series of dots), and the triangle. Even at this most basic level, visual associations have been established and they generate a number of implicit assumptions. "The square has associated to it dullness, honesty, straightness, and workmanlike meaning; the

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triangle, action, conflict, tension; the circle, endlessness, warmth, protection" (Dondis, 1973, p. 44). When these two-dimensional surfaces connect or through addition of tone gain depth, they become three-dimensional shapes with volume, creating things such as boxes, spheres, cylinders and tetrahedrons.

From these basic elements in myriad combination, all visible forms are created. How these elements relate helps create our visual perception of the world.
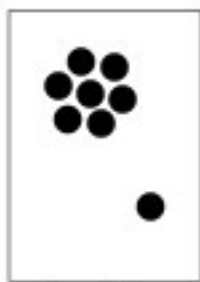

Visual Relationship

The first category describing how these elements interact is visual relationship, broadly speaking. I will elaborate on principles concerning effective use of proximity, similarity, depth perception, grouping, cue theory, and figure/ground gestalt.

Earlier we looked at Gardner's eighth intelligence, patterning or pattern seeking. This is a concept that has grown out of gestalt psychology, a discipline founded by Max Wertheimer in the early 20th century. *Gestalt*, a German word that means "shape" or "form," refers to how visual input is perceived by humans. Gestalt psychology furthers our understanding about how "sensory imagery [is drawn] together into holistic patterns, or "gestalten." … every perceptual image consists of more than the sum of its parts; it also possesses a "gestalt," a patterning force that holds the parts together" (McKim, 1980, p. 61). "All visual thinking is skilled, and depends on pattern learning. The map reader, the art critic, the geologist, the restaurant chef….have all developed particular pattern perception capabilities encoded…in their brains" (Ware, 2008, p. 55). They have engaged with thinking visually in their areas of interest until the respective patterns have come to serve them instantaneously. One of the ways this pattern seeking is evidenced is in the concept of *closure*, in which our minds fill in missing pieces to create a

whole. An example is "seeing" a box when shown a drawing in which the four corners of the box are missing. While in reality we only see four lines, two vertically parallel and two horizontally parallel, our proclivity for pattern seeking compels us to see these different elements as part of a similar whole, as something we recognize.

Pattern seeking is manifest in another way, as well. "According to gestalt theory, perception obeys an innate urge toward simplification by assembling complex stimuli into simpler groups" (McKim, 1980, p. 62). From this we draw insight about grouping through techniques such as *proximity*, *similarity*, or *line of direction*. The theory of proximity tells us that we perceive elements that are close together to be a unit, to have similar concepts or related information. We also perceive objects with similar visual characteristics, such as shape or color, to be a unit. Pattern seeking is also expressed in *repetition* of elements that can establish directionality for the eye to follow. An example is a series of dots that create visual rhythm, a line that moves across a visual space.

Research is continuing to define additional principles, such as the concept of boundary or framing. This principal states that objects enclosed within a boundary, such as a circle or a square, are perceived to be a group even though without the boundary their characteristics would not imply association (Malamed, 2009, p. 66). All these forms of grouping help with organization, rapid processing, and comprehension of a message.
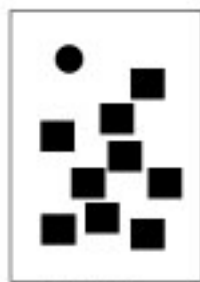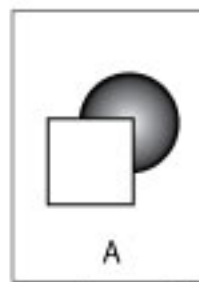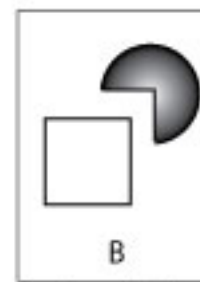
Proximity   Similarity   Cue theory - We perceive sphere in Ex. A
                                        to be behind the box, not adjacent as in Ex. B

Further, we understand spatial relationships manifest in depth perception and cue theory, illuminating the way we judge distance. While many variants of cue theory have been identified, one example is *occlusion*. When one object visually occludes, or blocks, another object, we perceive that the blocked object is farther away (Ware, 2008, p. 90).

We also benefit from explicit spatial relationships, such as when "a line connects related elements in a diagram, related bars are placed in proximity in a bar graph, and a road connects cities on a map. This explicit depiction of relationships helps viewers process information simultaneously rather than sequentially – as when reading text" (Malamed, 2009, p. 134).

Understanding the gestalt concept of figure-ground is a major aspect of visual relationship. The element in focus, or perceived to be in the foreground or object of focus, is the "figure." The rest of the perceptual field, the background, or area upon which the foreground image rests – is the "ground." When foreground and background are clearly delineated, this is described as being a stable figure-ground relationship. An unstable figure-ground relationship is one that is reversible. An often used example of this relationship is a black and white image that can be perceived as an urn or vase in the center of a rectangle, or conversely, as two mirror-image face profiles looking at one another from opposite sides of a rectangle. Conscious perception can bring either the urn or the faces to the foreground of the image, but not at the same time. Yet they have equal pull on the viewer. This kind of image in which the figure and the ground attract equal attention creates tension which, when consciously used, can lead to a dynamic design.

Figure-ground relationship helps to set context for everything else in a composition. Figure-ground perception is closely related to the concept of "white space." As Jan Tschichold (1902-1974), influential typographer, book designer, and writer, has said, "White space is to be

regarded as an active element, not a passive background." White space allows for elements in a design to breath and for a viewer's eyes to rest, can improve readability and legibility, and can direct a viewer's eye from one element to another in a visual text. It is a key component in grouping and providing directionality in leading the eye of the viewer. White space is a major design component that is misunderstood, hence, often not well incorporated into the design of a message.

Visual Hierarchy

The next category is visual hierarchy or visual prominence. While images often bypass our conscious awareness, an understanding of visual hierarchy can illuminate the way in which our attention is directed. Some of the key principles governing this are contrast, variation, scale, color, depth, and positioning.

Subconsciously, visual hierarchy helps establish a focal point and first impression, which is supported as we are led to subsequent levels of information to be processed. Visual hierarchy establishes a pathway for the eye to travel. This is accomplished through contrast and variation – effective use of size, color, spacing or depth, positioning, and motion to name a few.

The first two images below are an example of visual hierarchy, indicating how this principle would apply to the viewing pattern for a layout. The eye would first be drawn to the image (1) in the upper left corner due to its location, its size, and prominence or *visual weight*. The eye would then be drawn to the headline (2) to the right of the image due to its size. The eye would rest next on the large section of body copy as the pathway for the eye moves downward (3), and then drawn to the image (4) at lower right due to its visual weight, before finally resting

on the small segment of text (5) to the left of the bottom image – the smallest element at the bottom of the page with the least visual weight.
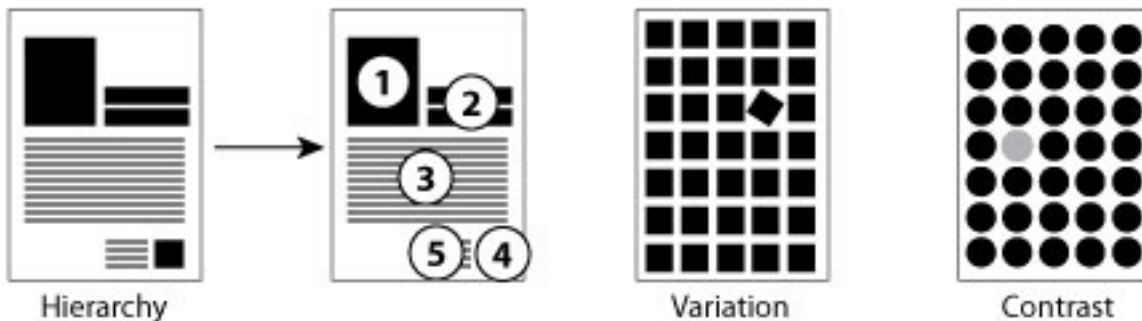
The two images on the right side above are simple examples of the use of *variation* and *contrast*. We search for visual distinctness in our need to discriminate between objects being presented. Our eye is drawn to that which stands out, such as a color that deviates from its surroundings, or an object that deviates from the shape or positioning of all other objects surrounding it. "It is the degree of feature-level contrast between an object and its surroundings that makes it distinct" (Ware, 2008, p. 29).

That contrast is also evident through the use of *scale*. Scale is relative, based on context. Two equal-sized squares, one placed into a slightly larger square, and one into a much larger square, will be perceived differently based on the comparative difference in each context. In the same way, a large circle next to a small circle shows an obvious difference in scale. If these are shapes on a flat background, we perceive one being larger than the other. However, placed in another context with a horizon line, we could now encounter the concept of *depth perception* and perspective. Depth is the perception of advancing or receding space. The large circle next to the small circle that indicated scale in the previous example, could now become same-sized circles, yet "appearing" different if positioned in a context with a depth cue such as a horizon line, which would indicate receding space and one circle being further back than the other. The concept of

foreground and background in now operational. "Learning to relate size to purpose and meaning is essential in the structuring of visual messages" (Dondis, 1973, p. 58).

Visual hierarchy can be thought of as a series of levels. On the first level is the dominant element, the most important element in the composition. The next level contains secondary focal points that should draw attention as the next most important elements to notice. On the third level is the remainder of the information through which the eye will navigate. A simple method to discern visual hierarchy is the "squint test." By squinting, the viewer is able to determine which elements come immediately to the foreground, which elements may have secondary focus, and finally, which elements recede into the background. Without a visual hierarchy, the eye darts from object to object, unable to process the input, determine what is important, or create a meaningful whole.

Structure

A third broad category is structure, how elements come together in forming a whole to deliver a message. Within this category we will discuss the concepts of balance, directionality and movement, grid systems and alignment, and framing. These all serve to create messages that are of a harmonious whole greater than its parts.

Structure, again, relates to our innate pattern seeking – our desire to organize and to make sense of what we see, and pattern recognition – satisfying that desire and identifying and categorizing the image. Findings in cognitive science tell us that structure of information affects what we remember. In a paper published in the *Handbook of Research on Educational Communications and Technology*, William Winn writes that, "Memory for content improves whenever information is organized. The theory behind this is that spatial and physical features of

the visual structure may be encoded along with the semantic structure of the information. Consequently, when information in memory is well organized, it is thought to be easier to retrieve and to integrate with new information" (Malamed, 2009, p. 196).

Theories of structure involve visual balance, whether a design is symmetrical – equal on both sides of an imaginary, central vertical axis, or asymmetrical – using varying elements on each side of that imaginary axis to achieve overall balance. This also applies to balance along a central horizontal axis. Visual balance establishes a sense of order, creating an environment for information to be more easily processed. Balancing is seeking equal optical equilibrium. Symmetrical balance is associated with formality and directness. It is generally less dynamic than an asymmetrical composition.

Directionality and *movement* are the terms used to describe the energetic force that moves the viewer's eye through a composition. "Rudolf Arnheim suggests that the direction of visual forces in a picture is determined by three factors; the attraction exerted from the visual weight of surrounding elements, the shape of objects along their axes, and the visual direction and action of the subject" (Malamed, 2009, p. 86). When an element, such as a dot, a line, a shape, or a color, is repeated in relatively close proximity, our perception recognizes this as a pattern that creates a path for our eye to follow. Curved lines and organic shapes create a smooth flowing movement, while jagged lines create tension. Elements placed on a diagonal serve to attract the eye and point to where to look.

To harness the powers of balance and directionality/movement, grid systems were developed. Viewers can process information more quickly when a structure, such as a *grid system*, is present. Grid systems are evident across media. In printed media, such as newspapers or magazines, a grid creates columns and picture placement which establishes a pathway for the

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eye. In web interface design, an established structure provides the viewer with organizational "security." A site with navigation buttons and other elements that randomly change place from page to page would be extremely disorienting and difficult to navigate.

Symmetrical Balance   Asymmetrical Balance   Grid System

A grid system also provides for *alignment*. Aligning elements to one another creates a sense of unity and cohesion and contributes to the flow and movement of the eye through a design. Note in the grid system example that the edges of pictorial elements line up with the edges of text columns in both the vertical and horizontal modes. Without alignment, visual flow and perception are disrupted. Working outside the confines of a grid system only should be done if the intention is to create a certain level of visual chaos.

Framing is a key concept in visual literacy on multiple levels. At the level of encoding messages, framing serves to set specific information apart by the use of boundaries, whether visibly with the use of a line or other design element, or invisibly separating through the use of white space and grouping of elements. Grouping text and/or images in this way, called *chunking,* organizes information to facilitate understanding. At another level, framing is a technique used to manipulate the way information is presented. For example, in viewing a photograph it's important to consider the perspective of the photographer. What is shown within the frame and what may be occurring outside the frame? Framing in this sense is about critical analysis of

perspective. It is understanding the use of words, images, and context to manipulate a message and influence behavior.

The elements of visual relationship, visual hierarchy, and composition/structure we have illustrated come together in a framework cogently explained by Kress and van Leeuwen in *Reading Images*. Their framework demonstrates the application of principles as it relates to the larger dynamics of visual literacy. They describe composition through the lens of three interrelated systems – *information value*, *salience*, and *framing*. In their formulation, these three principles of composition apply not only to single images but also to composite visuals. Kress and van Leeuwen assert that we must be able to look at a multimodal representation, a whole page, as an integrated text. They contend that,

> If we are to understand the way in which vital text-producing institutions like the
>
> media or education…make sense of the world and participate in the development
>
> of new forms of social stratification, a theory of language is no longer sufficient
>
> and must be complemented by theories which can make the principles of the new
>
> visual literacy explicit, and describe, for instance, the role of layout in the process
>
> of social semiosis [signifying what is important] that takes place on the pages of
>
> texts…. (Kress & van Leeuwen, 2007, p. 179)

Kress and van Leeuwen's first lens is *information value.* This refers to the placement of elements on a page/screen, how they relate to one another and to the viewer, and the particular value of the zones of placement.

The second, *salience,* pertains to how elements attract the viewer's attention manifested through such things as placement (whether foreground or background), relative size, contrast in color or tonal value, or difference in sharpness. This integration coding relies on visual clues and

results from complex interactions. Rhythm, balance, and visual weight, made apparent by manipulation of these elements, all play a part in how a text is "read" (Kress & van Leeuwen, 2006, p. 202).

Their third lens is *framing*. As previously noted, this involves whether explicit or implicit boundaries are present which connect elements and present them as belonging together, or disconnect elements from one another, signifying that they do not. This function, too, has significant impact to what a viewer's eye is drawn and the subsequent reading path (Kress & van Leeuwen, 2006, p. 203).

Modes of information delivery have changed significantly over time. In discussing linear and non-linear compositions, Kress and van Leeuwen emphasize the shift that has taken place since the 19th century when densely printed pages of text, in which reading was linear and strictly coded, began to give way to more complex layouts including visual imagery. Much of what we now view in print and online can be read in many different ways. Thus, effective use of compositional elements to direct that reading has become more and more critical.

The Role of Color in Visual Perception

In the previous categories, we have seen color mentioned briefly in regard to visual hierarchy and visual relationship. We see how color can be used to identify difference, to attract attention, and to group elements, and how it can play an important part in creating visual hierarchy and in improving the overall balance of a visual message. Nevertheless, due to the complex interplay of color with visual perception, awareness of the impact of color requires that it be introduced as a separate unit to understand, more fully, its foundational elements and its role in image interpretation and creation – its ability to evoke emotion and convey meaning. Color is

a complex subject, but gaining an understanding of color theory and basic principles of the application of color can illuminate how it impacts decoding and encoding visual messages.

Color has three dimensions: hue, saturation, and brightness. *Hue* refers to the pure color itself. *Saturation* indicates the relative purity of color as it moves from pure color to gray. Brightness refers to the lightness or darkness of a color – tint to shade.

Early in our education, many of us are introduced to the *color wheel,* a system of understanding color divided into 12 colors arranged in a circle. This system shows how colors are related and is designed to explain how to mix them, as in painting, and perceptually, how to create harmonious combinations, or *color schemes*. Several basic color schemes derive from the color wheel. A *monochrome* scheme uses different values of the same color. An *analogous* scheme uses a color with two colors directly adjacent to it. A *complementary* scheme pairs colors that are opposites on the color wheel. A *split-complementary* is created using a color with the two adjacent colors of its complementary color. Finally, a triadic scheme is comprised of colors located at the points of a triangle within the color wheel.

In the digital age, we all now are exposed to color from different sources. It's useful to understand the way color perception differs in these various modes. Color is light, or rather a manifestation of light waves. Our perception of color is created differently depending on application – whether as paint on canvas, as lithographic print on paper, or as digital image on screen. In print or on canvas – in the physical world – color is created by a *subtractive* process. That is, we see what light waves are *not* absorbed by an object and remain to be viewed as reflected light. An apple is red because it absorbs all the wavelengths of light except the red one. The color wheel we described above is the system used in the physical world for painting or printmaking. Another system is the 4-color printing process for printing on paper or textiles. This

process uses what is termed the CMYK process. The acronym stands for Cyan, Magenta, Yellow, and Black. This process relies on visual perception discussed earlier that uses dots of colors printed closely together in a halftone screen to create a color image.

In the physical world, when all color wavelengths are reflected, or absent, we perceive white. When all color wavelengths are absorbed, we perceive black. There is yet another system. In the world of digital screens, our perception of color operates in a different manner. It is created instead through an *additive* process since light is not reflected off objects but comes from inside the screen. In our perception in this process, the *absence* of light is black and *presence* of all light is white. We perceive color differently in this mode from what we understand about color in the physical world. Hence, color here is referred to as an RGB (Red, Green Blue) system. In this system, the primary color yellow is replaced with green to accommodate the perceptual difference. When using software to create digital color images, we are presented with an *RGB color wheel* from which to make our color choice, rather than the color wheel we are familiar with when putting paintbrush to paper.

How we should think about using color is influenced by perception, cultural difference, and emotional response. Warm colors (reds, oranges, and yellows) tend to advance while cool colors (blues, greens, violets) tend to recede. This informs our emotional response. Warm colors create feelings of dynamism, activity, and cheerfulness while cool colors have a low-key, calming effect. There is a semantics of color. Color can be used symbolically but those meanings are not universal. In western culture, red represents danger, heat, or stop. It is an assertive color. Green represents go, safety, renewal, or the environment. Blue represents cold, calm, or serenity. Black is both the color of mourning and the color of luxury and high-style. White represents purity. Yet, in Asia, white is the color for mourning, and in China red is used to symbolize good

fortune and renewal (Ware, 2008, p. 84). Awareness of these cultural variances in meaning is becoming more important in the globalization of imagery.

Our discussion of color opened with mention of its impact on decoding and encoding messages. A key element of that is the issue of representation and the perceived truth or factuality of a message. Kress and van Leeuwen address this question using a term they borrow from linguistics, *modality*. They discuss modality cues as those that have developed out of the central values, beliefs and social needs of a given group. They argue that modality does not express absolute truth, but rather what a particular group considers to be true. Using photographic images as an example, they indicate that "pictures which have the perspective, the degree of detail, the kind of colour rendition, etc. of the standard technology of colour photography have the highest modality, and are seen as 'naturalistic.' As detail, sharpness, colour, etc. are reduced or amplified, as the perspective flattens or deepens, so modality decreases" (Kress & van Leeuwen, 2006, p. 159). Kress and van Leeuwen also introduce the concept of "modulation markers," which cue us to the validity of an image. These include the amount of color saturation, along with elements such as differentiation; contextualization (whether a background is present); representation of detail; perspectival depth; and the qualities of illumination and brightness. All these details, subject to the photographer's choices, often render even a photograph something other than an objective representation, an unvarnished truth. Color is a key element in modality, our tendency to believe the validity of an image.

Yet, as before, we see that perception is not necessarily a straightforward proposition; there are exceptions to the modality principle. One example is the concept of "coding orientation." Coding orientation is defined as sets of abstract principles through which texts are coded by social groups or in specific contexts. Once again, we see that "visual modality rests on

culturally and historically determined standards of what is real and what is not, and not [necessarily] on the objective correspondence of the visual image to a reality defined in some ways independently of it" (Kress & van Leeuwen, 2006, p. 163). For example, in a *sensory coding* orientation, the authors point to food photography, in which response to things such as hyper-saturated color plays to the emotions and certain sensations, which makes the image seem more real than one that has not been manipulated.

When decoding messages, understanding how color is being used to create a particular effect allows us to bring a more critical eye to the impact of the message. Using the same knowledge, we can more effectively use color when encoding our own messages.

Summary

While we have seen that visual perception is complex, it can be introduced with a basic set of principles that establish a firm foundation for further exploration and study. I have delineated the elements that serve as the "alphabet" of such visual literacy and can work as a starting point. Understanding these fundamentals of how visual perception functions and how to use and interpret basic design principles makes us more effective communicators and more critical consumers of visual information. Introducing them across the curriculum is a first step towards enhancing visual literacy.

At its core, effective visual communication is about capturing attention, establishing a pathway for the eye to travel, and providing a structure and visual cues to help us make sense of what we see. Bringing this knowledge to a conscious level is imperative for functioning well in our media environment.

Chapter 5: Conclusion - Meeting the Challenge

In discussing what he has termed "the pictorial turn," J.W.T. Mitchell contends that our attention to visuals is not new. What is new is the ubiquity of images we now encounter due to evolving technologies and digitization. This creates an urgency to understand the visual more fully. In our opening quote Stephen Apkon (2013) said, "…being a literate communicator does not mean having to invent a whole new language for yourself. It means mastering a language that already exists" (p. 135) A visual language exists, and we must learn it and teach it if we are all to function effectively in the 21st century.

While developing visual literacy is not about replacing verbal literacy, it has gained increasing importance as we confront the need to contend with an overabundance of information. We neglect it to our peril, rendering students illiterate precisely in an era when globalization encompasses the expansion of visual communication. Visual perception allows for conveying and receiving information at an amazing speed. Whole professions are arising that highlight this. We now have professional graphic facilitators who stand at white boards and record meeting discussions not with written notes, but with elaborate, multi-colored conceptual drawings that become the "minutes" of the meeting. We now have a cadre of information designers to help distill, organize, and present the massive amounts of information available to us. The complexity of information demands we be able to display concepts in ways that facilitate cognition of relationships and patterns so that we may create meaning. We see a growing use of mind-mapping to commit to paper the far-ranging thoughts in our minds; thus, providing coherence to those thoughts and a basis for action. In addition, we have a growing collection of, and respect for, the graphic novel, a medium that draws upon theories of sequential narrative and the marriage of word and picture.

Media is now a primary driver of culture. Media literacy is fundamental as we are all now both consumers and creators of that media. And visual literacy is integral to our understanding of both sides of the media equation. As consumers of media, image analysis is central to decoding the messages we receive. Avgerinou (1997) identifies four phases in the process of decoding: "a) description of the graphic elements composing the image, b) analysis of the ways those elements have been arranged, c) interpretation of the messages being communicated, and d) aesthetic appreciation of the image" (p. 286). We need to be cognizant of the elements of design in order to understand what is being delivered to us *and* to effectively present ourselves and our ideas.

It is evident that many of the skills that are being identified as critical to navigating this new landscape are developed through engagement with visual processing. Speaking about human development, Howard Gardner offers the following reasons for integrating visual forms of processing across the curriculum:

> In the arts, there are levels of development [that] should form a backdrop for any educational regimen. ...my belief that artistic forms of knowledge and expression are less sequential, more holistic and organic, than other forms of knowing.... From [these] encounters, one gains a sense of the nature of the enterprise of creating and reflecting.... Consistent with the developmental perspective, growth involves a deepening of this knowledge, and an attainment of higher levels of understanding,...attainment of qualitatively different forms of knowing. We must be careful not to sacrifice this special nature of the arts – indeed, we might do well to allow this form of understanding to infiltrate other areas of the curriculum. (Eisner 1985; Gardner,1973; Polanyi, 1958). (Gardner, 1990, p. 43)

A recent contribution to the subject is the book, *STEM to STEAM: Using Brain Compatible Strategies to Integrate the Arts,* by David A. Sousa and Tom Pilecki. The authors, one an educator and the other a consultant on educational neuroscience, elaborate on eight cognitive competencies that Stanford professor Elliott Eisner identifies in *The Arts and the Creation of Mind.* Training in visual literacy fosters all these competencies. They are: 1) the perception of relationships, 2) an attention to nuance, 3) the perspective that problems can have multiple solutions, and questions can have multiple answers, 4) the ability to shift goals in process, 5) the permission to make decisions in the absence of a rule (i.e., exercising judgment), 6) the use of imagination as the source of content, 7) the acceptance of operating within constraints, and 8) the ability to see the world from an aesthetic perspective (Sousa and Pilecki, 2013, p. 17). As this list amply shows, the consequences resulting from visual literacy extend well beyond the comprehension of basic messages. These competencies embody the potential for a deep and broad impact on how we collectively attend to the large-scale challenges we face as a society, as well as how we navigate the world individually.

Why Teach the Fundamentals?

Howard Gardner identifies visual intelligence as one among his theory of multiple intelligences. According to Gardener (1983), visual intelligence ''is the capacities to perceive the visual world accurately, to perform transformations and modifications upon one's initial perceptions, and to be able to re-create aspects of one's visual experience…. " (p. 173). "Visual intelligence includes the sensitivity to color, line, shape, space, form, and the relationships that exist among those elements. Gardener asserts that with appropriate instruction, encouragement,

and enrichment, visual intelligences could be developed to a reasonably high level of performance" (Yeh and Cheng, 2010, p. 246).

As the necessary foundation for visual literacy, I am proposing teaching a skill set, the building blocks needed to facilitate incorporating a variety of visual literacy lessons – both interpretation and creation of visual messages – across the curriculum. I have described the basic elements that belong in such a foundation. More can be done even with limited resources once the value of such capacities is more adequately grasped. Understanding the elements of art and basic design principles drawn from gestalt psychology and cognitive science research in visual perception provides a toolbox to navigate our complex world. Acquiring this knowledge is tantamount, as noted earlier, to learning the alphabet and basic grammar of verbal literacy. Knowledge of these tools is fundamental whether we propose to engage in critical media literacy, analyze news reporting, watch a film, scrutinize advertising, interpret complex data presented in visual form, interact with social media, create a website, or develop a presentation.

Kress and van Leeuwen (2006) began developing their visual grammar in hopes that "a broad range of people will begin to see images for more than their aesthetic and expressive qualities, but also in their structured social, political and communicative dimensions" (p. 20). Those dimensions are accessed through knowledge of how the elements of images interact with our perception. Teaching the principles I have outlined in Chapter 4 of this paper is the first step in enabling teachers to feel confident in their ability to incorporate visual literacy activities in their curriculum. These principles can be taught as part of teacher education to pre-service teachers, in professional development workshops for experienced teachers, as well as in non-formal settings.

As part of this training, we also need to recognize the benefits researchers are finding in the power of combining the mental and physical activity involved in sketching. Despite the cultural turn to typing and away from handwriting, we need to engage in critical visual thinking and make our imaginings concrete if we are to capture our thoughts, revise and refine them, and share them with others. We all use our imaginations. …but, as McKim (1980) quotes from a book by three cognitive psychologists, "imaginings are ephemeral and must be put to paper. Unless you can use your image to do something, you are like a man who collects maps but never takes a trip" (p. 131).

Although proponents have been advocating for visual literacy training for over 40 years, it still has not been widely adopted as a necessity. In a 2010 report on digital and media literacy, Hobbs, acknowledging the situation, points out the need for teacher training in digital and media literacy in which visual literacy is situated:

Digital and media literacy education cannot come into the classroom without teachers who have the knowledge and skills to teach it. At the present time, many K–12 educators are not familiar with the instructional practices of digital and media literacy education, creating a leadership gap in schools. A parallel gap exists at most colleges and universities because the silos between disciplines mean there is little interface between faculty in the schools of education and communication. Most schools of education lag behind in bringing innovative digital and media literacy education to their students because faculty do not make active use of digital media themselves. Most faculty in schools of communication specialize in professional digital media training but have little expertise in developing non-specialist programs that address the needs of children, youth and

other underserved populations. Teacher education programs must give their

students rich digital and media literacy learning experiences if they hope to

inspire them to include this pedagogy in their own teaching. (Hobbs, 2010, p. 41)

Serafini (2013) echoes this, asserting that "calls for expanding the literacy curriculum to

include strategies for comprehending visual images and multimodal ensembles need to be

supported by ongoing professional development to help teachers develop the skills and strategies

necessary for ensuring that students are able to navigate, analyze, and interpret complex

multimodal ensembles" (p. 4). Avgerinou (1997) also reports from results of the Delphi study on

visual literacy, that not only do we need teacher training in visual literacy but that "there is a

need for leadership in bridging the concerns of various individuals and groups involved with

visual literacy: … creating support for the concept of visual literacy within public education;

involving teachers, administrators and media specialists with visual literacy in education; …" (p.

284).

Educating for Visual Literacy

While the disciplines of visual communication/design or visual expression/fine arts can

be life-long pursuits, training in basic visual literacy is another matter. Acquiring this basic

knowledge and these applicable skills is something that can occur across a broad population in a

number of different venues and in multiple ways. A curriculum for visual literacy education that

encompasses this basic toolbox can be adapted to be age appropriate, from the use of picture

books for young children through more sophisticated methodologies In adult education.

Within a K-12 school setting, it should not be seen as a drain on resources, or as a

required separate course, but rather as skill acquisition that fits within the time demands of

scheduled curriculum – visualizing data in science projects, creating maps in studying historical events, or critiquing the impact of the visual component in news reporting of current events. One way to incorporate this teaching is to analyze the product of a project-based learning exercise to bring design principles to conscious awareness. For example, students can be assigned a project to develop a simple website for a report on a particular research project or for simple content curation. A final stage of the assignment would be a review of the finished products/sites to identify what design principles have been effectively, if subconsciously, used and what changes based on specific design criteria could make the delivery of the information more effective. (See sample lesson plan in Appendix A.)

Using such a framework in a professional development setting for teachers both would be a learning experience for teachers of the elements of the toolbox, and an experiential model of how the teaching process for this particular lesson could work in the classroom. This process would work equally well as a paper-based assignment without using technology. Paper layouts would be created and then explored in two or three iterations to discern how use of design elements helps shape and/or clarify the delivery of information.

Role of Cultural Institutions – Museums and Libraries

The accomplishment of this educational need extends beyond the classroom into a collaboration with cultural institutions – non-formal educational environments – that also bring awareness to the concept of visual literacy and create opportunities for learning. Museums have educational programs that address various aspects of visual literacy. Generally speaking, this programming may offer teacher resources, teacher workshops, museum field trips, and lesson plans. A specific structured approach has been developed by Philip Yenawine, past Director of

Education at the Museum of Modern Art (MOMA) in New York City, and Abigail Housen, arts educator and researcher. In 1995 they cofounded a non-profit, Visual Understanding in Education, which developed and oversees a program called *Visual Thinking Strategies* (VTS). VTS encourages the use of discussion about art to enhance student engagement. This approach addresses questions such as "what do you see in this picture," and "what evidence do you have for that interpretation" ("Method & Curriculum," [n.d.], para. 2). In most of these programs, students develop an appreciation for the uses of art and learn some design principles indirectly. This is one element of visual literacy. However, this is not systematic training in developing a visual vocabulary or learning the basic tools of design.

Libraries can contribute to this kind of education, as well. To advocate for broader visual literacy training, the *Association of College and Research Librarians* (ACRL), a branch of the *American Library Association,* has developed *Visual Literacy Competency Standards for Higher Education* in conjunction with their *Information Literacy Competency Standards*. The *Visual Literacy Standards* identify six competencies that are needed to be visually literate. Most of the standards address the library's role in "the process of selecting and providing quality image resources, developing research and subject guides for images, teaching image research strategies, and raising awareness of the ethical use of visual media…[as well as] working with students to develop the critical thinking and evaluation skills essential to participation in visual culture." ("Implementation and Use of the Standards," 2011, para. 3). One of the standards, however, is the ability to *create visual media*. In order to meet what is defined by this standard, librarians need to partner with visual communications faculty to provide this teaching, or need to have professional development training for library staff in visual design basics. Nonetheless, the ACRL Standards of Visual Literacy are a comprehensive set of directives for what constitutes

visual literacy needs in higher education.

Summary

In this thesis I am advocating for the universal need to become more cognizant of our perceptions. It follows that we need to develop a 21st century literacy by understanding the language of the visual. I am proposing that training in the basic elements of design and visual perception is the springboard from which a visually literate society will emerge. Dondis summarized what is required to enhance our active engagement with the world around us,

> Visual literacy implies understanding, the means for seeing and sharing meaning
>
> with some level of *predictable universality*. To accomplish this requires reaching
>
> beyond the innate visual powers of the human organism, reaching beyond the
>
> intuitive capabilities programmed into us for making visual decisions on a more
>
> or less common basis, and reaching beyond personal preference and individual
>
> taste. (Dondis, 1973, p. 182)

We do *not* all need to become experts in design. However, in an age so reliant on the visual, we *do* all need 1) to bring awareness to what we are seeing, 2) to acquire the basic knowledge of how humans perceive, and 3) to learn and apply basic principles of design to deliver messages in the most effective way possible. "Seeing" needs to become an active, not a passive activity for us. Imparting the knowledge to do so is an educational imperative.

APPENDIX A

SAMPLE LESSON PLAN

Sample Lesson Plan

This sample lesson plan is part of a unit that covers design principles of visual organization. This sample is a framework of a lesson to be taught in grades 6-12. To be fully formed, the lesson plan would be customized to reflect appropriate vocabulary and grade level, and to include visual samples, links to examples of strong vs. weak website layouts, supplemental material elaborating on terminology that may be new to the teacher as well as the students, and a comprehensive set of learning activities and timeframe. The primary intention here is to demonstrate how design/presentation principles can be introduced into regular classroom activities. Critical thinking about visual communication thus becomes an integrated activity. The building blocks of visual literacy being taught and/or reinforced, thereby, form the basis for teaching more sophisticated aspects of visual and media literacy.

The beginning lesson plan for the unit introduces the idea of pattern-seeking as part of visual perception, and gestalt concepts from which several universal design principles have evolved. (Pattern-seeking is the human tendency to facilitate understanding by seeking patterns in random information.) Thus, a foundation is established for students to integrate each new design/presentation principle to be taught.

Each subsequent lesson plan in the unit delineates a specific principle, or small group of closely related principles. Each reinforces the idea of pattern-seeking and builds student understanding of how the principles overlap and interrelate. Incorporating these lessons into student work across the curriculum strengthens students' abilities to present their ideas more effectively throughout their coursework.

Unit: Design Principles of Visual Organization

Brief Summary of Unit:
Students now are involved in presenting their ideas in a variety of media formats. While they may have internalized some essential design principles and concepts by exposure to the many visual messages they encounter day-to-day, most have no conscious awareness of these design elements and principles or training in using these in the presentation process. By providing students with an assignment to design a basic website to present information they've researched or an idea they want to promote, they first have an opportunity to work through a design problem themselves.

Examples, drawn from outside the class, can then be shown. These would exemplify both websites that make good use of principles, as well as websites where principles are not followed. A group critique of student's websites would follow. This would begin to develop within the students a sense of connoisseurship and knowledge of how to apply a discriminating eye for excellence in communication.

As students critique their work, they begin to explore their thought processes in creating their websites. They are called on to recognize and elaborate on specific principles and/or design elements they have employed in their final product, and identify other design principles that could be applied to create more effective presentations. Students acquire a visual literacy awareness in both learning by doing, and then learning by critiquing their project outcomes in terms of adherence to specific established design principles.

The following lesson will be one in a series, each presenting a specific design principle with one or two closely related concepts. The student project will be consistently refined in iterations through a series of lessons, as design principles introduced in each subsequent lesson are applied to their projects.

This lesson can be integrated into courses across the curriculum, such as history, life and physical science, social studies, and language arts.

Lesson Plan: Visual Organization – Principles of Grouping (Grade: 6-12)

Desired Results

Established Goals:
- To teach the importance of visual presentation by facilitating understanding of concepts and ideas.
- To teach how to apply design principles to communicate one's ideas in a clear and compelling manner.
- To teach how the concepts of grids, grouping, and white space relate to the organization of information.

• To teach the application of the specific design principle of "grouping".	

Essential Questions:	**Understandings:** Students will understand that:
• Why does design matter for non-professional presentations? • Is it important always to use a grid in layout? • Is using "white space" as a design element wasting space? • How do I describe what makes the presentation of information on a website more or less appealing to me? • How can we critique other website designs if everyone processes information a little differently?	• Information presented visually must be organized for maximum understanding, lest the message not be successfully delivered. If visual cues are not used to group information appropriately, the target audience will fail to understand the intended message or not be able to grasp the message quickly. • Design grids are the foundation for organizing visual information. • Design grids provide boundaries and site lines for alignment, which creates order and a path for the eye to follow. • Information is more readily understood when related elements are grouped. This can be achieved through application of concepts such as proximity, similarity, and repetition. • "White space" is an important design element. If "white space" is not used effectively, the result is visual chaos. "White space," the "negative" space in a layout, helps to organize the layout, direct the eye, and/or provide the eye with a resting place within a design.

Knowledge and Skills Acquired:	

| Students will know…
• Three design principles of grouping: proximity, similarity, and repetition.
• How to use a grid to facilitate layout of information.
• How visual alignment contributes to clarity.
• Why "white space" is a key design element. | Students will be able to…
• Identify grid patterns and design one appropriate for their project.
• Use one or a combination of design grouping principles to organize information being presented.
• Use the structure of a grid to align the elements in their layout.
• Effectively incorporate "white space" to direct the eye, to act as a separator for groups of information, and to avoid clutter in a message.
• Transfer and apply their new knowledge to the presentation of their ideas in |

	other subject areas in both print and digital mediums.

Assessment Evidence

Performance Tasks (students):
- Create a simple website to present research information.
- Identify in writing the layout and organization process used to arrive at the finished website.
- After introduction to specific design principles of grouping, identify which ones have been used.
- Identify design principles not followed in the design project.
- Revise layout of website to apply and incorporate new understandings of the principles.

Other Evidence:
- Creation by students of three pencil sketches showing alternate layouts.
- Use of design principles vocabulary to explain layout process of iterative layouts both verbally and in written reflection.
- Having learned the principles of grouping, have students research and present two examples each of what the students believe are good and bad uses of grouping in a website.

Content and Key Vocabulary

1. Concepts of grouping: proximity, similarity, and repetition.
    - Proximity - the theory tells us that we perceive elements that are close together to be a unit, to have similar concepts or related information.
    - Similarity - the theory tells us that we perceive objects with similar visual characteristics, such as shape or color, to be a unit.
    - Repetition – the concept in which pattern seeking is expressed in repetition of elements that can establish directionality for the eye to follow.

2. Concept of alignment through use of design grid.
    - Design Grid:
      A structure using a series of intersecting lines that establishes a foundation for positioning graphic elements, whether on page or screen.
    - Alignment:
      Creating a cohesive and coherent visual structure by positioning graphic elements to create a site line and establish a clear pathway for the eye to travel.

3. Concept and importance of "white space."
    - White space is the "negative" space in a design layout.
    - White space can help to organize a layout.

- White space can direct the eye.
- White space can provide the eye with a resting place within a design.

Key words: pattern-seeking, grid, alignment, proximity, similarity, repetition, "white space"

Learning Plan

Learning Activities:

1. As part of a class project, students research a topic pertinent to the course and compile information to be presented to the class.

2. Student's create a simple website to present their findings. Depending on the target age group and technical expertise of the students, the websites may be created on a free, proprietary site such as Weebly, or in a WYSIWYG ("what you see is what you get") software program such as Adobe Dreamweaver, or coded in HTML. The final product demonstrates a baseline of skills and instinctual understanding of each student from which the lesson proceeds.

3. Students participate in teacher-led review of the basics of how humans perceive visual information. The concept of pattern-seeking learned in the introductory lesson of the unit is reinforced. It establishes the reasoning for, and importance of, visually grouping information in order for the information to be effectively delivered to the target audience.

4. Introduce the concept of alignment, a visual technique that helps to avoid visual chaos. Discuss how the use of layout grids creates a template for alignment.

5. Introduce concepts of grouping – proximity, similarity, and repetition – demonstrated with simple design layouts (e.g., an image of a tightly grouped set of squares amidst a few randomly placed circles).

6. Introduce concept of white space as a design element.

7. Show website examples of good information organization compared to examples that do not apply the design principles of grouping in order to demonstrate how visual understanding is facilitated by applying the principles, or hindered if they are not. Have students verbally identify how grouping principles have or have not been incorporated into each example.

8. Have students constructively critique the class projects as a group, noting if they understand and can easily grasp the material being presented in each one. They are encouraged, for example, to talk about how "white space" is used to group material, and if they think there is too much or too little.

9. Based on the group critiques, have students use paper and pencil to do revised sketches of their websites as evidence of their learning, following the group critique.

10. Have students revise their website layouts incorporating the principles that have been brought into their awareness and that they have seen applied.

APPENDIX B

VISUAL LITERACY IN COMMON CORE STATE STANDARDS

Visual Literacy in Common Core State Standards

Visual literacy is a critical competency that can be taught in multiple environments, structured and informal. The most structured is within the framework of the Common Core State Standards (CCSS). There is some controversy and debate regarding aspects of CCSS. Nonetheless, the standards establish the importance of visual literacy. Identifying specific standards that map to visual literacy provides entry points for incorporating a visual literacy curriculum within the CCSS environment.

In the key design considerations for developing the Common Core State Standards (2010), the report specifies that, "students need the ability to gather, comprehend, evaluate, synthesize, and report on information and ideas, …and to analyze and create a high volume and extensive range of print and non-print texts in media forms old and new" (p. 4). Much of the information and ideas being distributed today are in the form of images (charts, graphs, concept maps, information graphics, visual journalism). In order to comprehend and evaluate those, visual intelligence – visual literacy – is required. This is also true at the other end of the spectrum that calls for creating "texts" in old and new media forms.

The following chart displays a sampling of specific CCSS expressly indicating that foundational teaching in visual literacy is demanded in order to meet the goals set by Common Core. Teaching visual literacy can and should be integrated into subjects across the curriculum. It is integral to our ability to comprehend and express information and ideas.

Sample of Common Core State Standards Related to Visual Literacy	
Standards for English Language Arts (ELA)	
RL.K.5	Recognize common types of texts (e.g., storybooks, poems).
RL.K.6	With prompting and support, name the author and illustrator of a story and define the role of each in telling the story.
RL.K-5.7	RL.K.7 With prompting and support, describe the relationship between illustrations and the story in which they appear (e.g., what moment in a story an illustration depicts). RL.1.7 Use illustrations and details in a story to describe its characters, setting, or events. RL.2.7 Use information gained from the illustrations and words in a print or digital text to demonstrate understanding of its characters, setting, or plot. RL.3.7 Explain how specific aspects of a text's illustrations contribute to what is conveyed by the words in a story (e.g., create mood, emphasize aspects of a character or setting). RL.4.7 Make connections between the text of a story or drama and a visual or oral presentation of the text, identifying where each version reflects specific descriptions and directions in the text. RL.5.7 Analyze how visual and multimedia elements contribute to the meaning, tone, or beauty of a text (e.g., graphic novel, multimedia presentation of fiction, folktale, myth, poem).
RI.2.7	Explain how specific images (e.g., a diagram showing how a machine works) contribute to and clarify a text.
RI.1.9	Identify basic similarities in and differences between two texts on the same topic (e.g., in illustrations, descriptions, or procedures).
RI.4.7	Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.
W.K.2	Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
W.K.6, W.1.6, W.2.6	With guidance and support from adults, explore a variety of digital tools to produce and publish writing, including in collaboration with peers.
W.5.2a	Write informative/explanatory texts to examine a topic and convey ideas and information clearly. a. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

CCRA.SL.2	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
CCRA.SL.5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
SL.2.5	Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
SL.5.2	Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
SL.5.5	Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
CCRA.R.7	Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
RL.7.7	Compare and contrast a written story, drama, or poem to its audio, filmed, staged, or multimedia version, analyzing the effects of techniques unique to each medium (e.g., lighting, sound, color, or camera focus and angles in a film).
RI.8.7	Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.
W.8.2a	Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.
CCRA.SL.2	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
CCRA.SL.5	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
SL.8.2	Analyze the purpose of information presented in diverse media and formats (e.g., visually, quantitatively, orally) and evaluate the motives (e.g., social, commercial, political) behind its presentation.
SL.8.5	Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

SL.9-10.5, SL.11-12.5	Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
Standards for Literacy in History/Social Studies, Science, and Technical Subjects	
CCRA.R.7	Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
RH.11-12.7	Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.
RST.9-10.7	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.
RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

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