# WHO CARES ABOUT SCIENCE LITERACY? pdf

## 1: Redefining "Science Literacy" As "Acceptance of Evolution" | Evolution News

*Teaching Science Literacy. She also cares about how the fuel emissions of different brands of cars will affect air quality and the environment. Jacqueline.*

A Transdisciplinary Framework for Consumer-Oriented Practice examines the wide range of resources used by health consumers to inform and support their decisions around their own health care. Using evidence-based practice and relevant theories, Health Technology Literacy: A Transdisciplinary Framework for Consumer-Oriented Practice analyzes the trend for health care systems to be reactive, while consumers are proactively seeking the health care information they feel they deserve. She is co-investigator for Robert Wood Johnson funded game to increase physical activity for adults by monitoring and social networking. She is a games research and development collaborator in the Humana Emerging Technology Applications Innovation Center. She was a visiting professor in health technology at the University of Wisconsin-Madison during a recent sabbatical. She is currently collaborating with colleagues in Cinema and Dance for an intergenerational health game that links physical activity, music, social networking and health care system interactions. She has examined intergenerational links specific to healthy lifestyle behaviors in multi-lingual populations. Jordan-Marsh is a co-investigator on the NIH funded grant: Personal Activity Patterns in Ethnically Diverse Elders which is designed to increase healthy occupations. She has served as the director of the USC Intergenerational Health Research Teamâ€”involving older adults and community collaboration for research and curriculum innovation. She has served as the director of nursing research and quality assurance at Los Angeles County Harbor-UCLA Medical Center where she was the Co-director of a million dollar program funded by Robert Wood Johnson to build an experience of community to improve patient care. Jordan-Marsh has written a book that helps the rest of us understand how taking better care of ourselves is being played out in the digital age. Technological solutions will certainly be high on the list for social workers, nurses, health care administrators, and public health advocates seeking to simultaneously improve access to quality health care, reduce health disparities, and contain spiraling costs. Jordan-Marsh obligingly and articulately introduces us to the range of available options and demonstrates how to harness technology to improve collaboration, enhance prevention, and empower consumers with self management tools. She has pre-envisioned the future and her wisdom comes just in the nick of time. Her approach combines meticulous scholarship with an accessible writing style that will satisfy researchers, clinicians, and those in allied health professions. Jordan-Marsh presents a model for empowerment during transitions in the new digital technology era. The book, Health Technology Literacy, will equip leaders in case management from any discipline to grasp the opportunities provided by an ecological perspective on health technology. A must for interdisciplinary teams where the consumer is the center. It should find a place in the libraries of healthcare professionals and consumers alike.

# WHO CARES ABOUT SCIENCE LITERACY? pdf

## 2: What Is Scientific Literacy? - The Intersection : The Intersection

*Science literacy is not about knowing stuff about science. It's not about knowing the difference between a planet and a dwarf planet (because really, who cares what you call Plutoâ€" it's still.*

Page 3 Share Cite Suggested Citation: Every Child a Scientist: Achieving Scientific Literacy for All. The National Academies Press. Science and technology have changed the way we work, communicate, and view the world. As adults, we can remember a timeâ€"not so very long agoâ€"when our homes and businesses were quite different. In the late s, answering machines and VCRs were not commercially available. Now they are commonplace. In the s, offices were beginning to use computers. Today, not only do most office workers have their own "PC," but many computers are part of an extensive networkâ€"the Internetâ€"that can bring information, photographs, and moving images to individuals at work and at home. Automobile manufacturing plants rely increasingly on automated systems to do the job hundreds of workers used to do. The workforce in such plants must have a radically different set of skills than did their predecessors. Agriculture has been influenced by scientific advances as well. Through genetic engineering, farmers and scientists are working together to develop more productive, heartier, and disease-resistant crops. These days, it is difficult to think of a job that does not require some expertise in technology. Take your neighborhood school. Only 10 percent of eighth-graders knew why eating potato salad made with mayonnaise that has been left out in the sun could cause food poisoning. Only 26 percent of twelfth-graders could figure out how to use a sieve, a magnet, water, and a filter to separate a mixture of steel pellets, copper pellets, iron filings, sand, and salt. Page 4 Share Cite Suggested Citation: During the past two decades, science also has become more integral to our daily lives. Twenty-five years ago, if a child injured her knee while playing soccer, parents would take her to the emergency room for an X-ray. Today, the doctor could recommend an MRI magnetic resonance image as well. The more familiar people are with such devices and procedures the easier it will be to make informed decisions about their use. Many of us in our own homes and workplaces are scrambling to keep up with science and technology, but our children cannot afford to be unprepared. They must be ready to take their roles as citizens, employees, and family members in a rapidly changing world and highly competitive global job market. Preparation for a more scientifically and technologically complex world requires the best possible education. Beginning in kindergarten, children must learn how to think critically, synthesize information accurately, and solve problems creatively. They also need new skills-facility with computers, the ability to communicate using all available media, and familiarity with the science and technology that form the foundation of the modern world. Is our educational system meeting the changing needs of our students? Administered to students in grades 4, 8, and 12, these tests are designed to provide a snapshot of our progress in science education. Although most students have some grasp of basic scientific facts and principles by the end of high school, they are not able to apply scientific knowledge to a new situation, design an original experiment, or explain the reasoning behind their answers. This Congressionally mandated test measures what students know and are able to do against what has been agreed as desirable for students to know and be able to do in science as well as in other subjects. Page 5 Share Cite Suggested Citation: When ranked against the other nations in this sample, U. Only students from Korea performed better. Unfortunately, by the eighth grade, U. The chart below summarizes these results.

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## 3: Teaching Science Literacy - Educational Leadership

*Science literacy tests make science out to be a set of dry, disconnected facts - and yet it is the connections that make science so interesting. A bad teacher can make kids memorize the periodic.*

Maria Grant and Diane Lapp Four actions help teachers foster citizens who are critical thinkers about science-related issues. Jacqueline, a 12th grader, is purchasing her first car and feels torn as she balances conflicting desires and messages. She yearns to be seated behind the wheel of a stylish vehicle, a yearning fueled by advertisements portraying women in luxurious cars. She also cares about how the fuel emissions of different brands of cars will affect air quality and the environment. Jacqueline realizes she needs more informationâ€”including information on carbon emissions, the ozone layer, and global warmingâ€”to make a careful decision. Every day, the need to make decisions related to science confronts young people. Although buying a car might seem to be a financial or lifestyle issue, the choice connects to environmental science. Fortunately, Jacqueline has practiced solving problems, analyzing data, and making informed, data-driven decisions in her science classes; and she understands that her decisions today can affect the environment she will live in tomorrow. She reads about the strengths and weaknesses of each model, including pricing and resale value, and makes notes to guide her decision making. Critical Literacy as Personal Empowerment As part of working toward scientific literacy for students, teachers must consider the concept of critical literacy. Just look at the number of science-related issues that directly affect human beingsâ€”global warming, access to clean water, and the availability of renewable energy, to name just a fewâ€”and ask yourself two questions: Do most students think about the effect of these issues on their everyday lives? Do our students consider the roles they might play in changing how a science-connected problem is resolved over the coming decades? Probably not, unless they are taught to do so. A key part of being critically literate is becoming involved in issues beyond the personal. Informed acts that make a difference in societyâ€”whether as simple as casting a ballot for or against an environmental issue or as complex as working on the research and development of a new alternative fuel sourceâ€”are characteristic of individuals who possesses critical science literacy. As a science educator and a literacy educatorâ€”who are also both high school teachers and university professorsâ€”we propose four actions to promote critical literacy in science classrooms. Identify science topics of interest. An astute science educator can weave real-world science topics into a standards-based curriculum without sacrificing a moment of purposeful instructional time. A look at global warming in the physics classroom can lead to a basic discussion of water density or to a sophisticated explanation of the Stefan-Boltzmann law which can be used to determine how much energy the sun gives off and to calculate the temperature of Earth, both crucial elements in understanding global warming. Such conversations lend relevance to what might otherwise be an isolated discussion of theory. And students who think critically about germane issues are more likely to be interested, active participants in the classroom. We believe every standards-based notion needs to be connected to the real world. Consider the following suggestions for topics: X-rays and the human body connected to anatomy and nuclear medicine. The effects of drugs on the body and mind related to anatomy, neuroscience, and health. Oil spills connected to oceanography, geology, and marine biology. Drought and water use connected to geology and earth science. The effect of natural disasters connected to geology and earth science and health. Classroom science teachers must build an extensive list of this type before they plan their lessons and then invite students to own the list by adding topics that they would enjoy studying. The goal is to make students want to live science. Engage students in reading the research. For background science information, science-related texts are the first resource to examine. Unfortunately, students often stumble in reading science textbooks or scholarly articles, which generally use unfamiliar, multisyllabic words and sentences that require extensive background knowledge. Science educators must generate connections among science concepts, societal issues, and the vocabulary students will meet in textbooks. Consider a chapter on water in an earth science textbook that deals with concepts aligned with the science standards: The book might use such terminology as fluvial systems, flow management, and restoration. These are important terms for any relevant conversation on water use, but likely unfamiliar ones.

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An understanding of where and how river waters originate and issues related to human use and reuse of water could help motivate students to learn such terms and build a foundation that would eventually allow for an expanded discussion of flow management and restoration. One strategy is to assemble an array of topic-related texts from various sources, including trade books, news articles, and even poems. Scientists in the field often read every article they can find on a topic to build background knowledge and gain an understanding of terminology currently used in a particular field of study; they call this practice "reading the research. The Story of Water on Earth Kids Can Press, provide access to water-related vocabulary and foundational ideas about water use, both of which are essential to higher-level reading on the topic. A collection of news articles related to pertinent water-use issues might ignite passion and spark related conversation among newly motivated students. Lists of science-related trade books and reading resources are available from the National Science Teachers Association and the American Association for the Advancement of Science. Consider the so-called "toilet to tap" proposals that provoked debate in San Diego in the s. The idea is that toilet water from one community can be cleaned and pumped back into reservoirs that provide water to the home taps of other communities. Although a heated argument led to the demise of the initial proposal, the practice of reusing toilet water has been tried in numerous communities. This is a real-world, relevant issue that some states may soon present for the approval of voters, a population that will shortly include our middle and high school students. Teach students to read like scientists. They must also develop the ability to read and think like scientists. This means developing strategies for reading scientific writing and building a deep understanding of related vocabulary. One of the best ways for teachers to help students learn how to comprehend a science text is to model the thinking that occurs while reading graphs, charts, data tables, and data analysis sections. Proficient science readers will read the text that correlates to a table of data, for example, and then study the table, looking for features like units of measure, data range values, and column titles. They will then look back at the text to reread, or continue reading, in an effort to connect this information to the text. A teacher can conduct a think-aloud while reading so students can learn what proficient science reading looks and sounds like. For instance, 9th grade science teacher Ms. Kim looks at a chart in a text and says, "I think this is showing the percentage of freshwater on earth. I know that I just read in the text that freshwater means there are little or no dissolved salts in the water. Likewise, a teacher can model how to recognize typical text patterns in science writing, show how to use root words to determine word meaning, or connect prior knowledge to new ideas. A teacher might say, I remember last week when we read about how water is transferred through an aqueduct, or a long system of canals and tunnels, between Colorado and Southern California. Maybe the aqueduct near Washington, D. Guide learners to evaluate data. Students need to understand how to evaluate data sources. Numbers connected to chemicals found in seawater sampled near the explosion of the British Petroleum oil well in Louisiana would probably hold no meaning for the untrained student. Students need to understand where data were collected, how they were collected, and what they represent. Although data collection may not always be possible in a classroom lab, a teacher can ensure that students have opportunities to review real-world data from multiple sources. Environmental Protection Agency for real data on everything from the level of oceanic sediments to the locations of toxic chemical storage sites in the United States. Students could analyze numerous sources of data related to the recent oil spill in the Gulf of Mexico. For example, in small groups students might compare online sources showing U. They could create a compare-and-contrast chart and write a summary of their conclusions and lingering questions. Beyond Car Shopping Teaching focused on fostering critical literacy has far-reaching implications. As young people like Jacqueline experience such instruction, they become more perceptive about the world around them and more empowered to make decisions about how they interact with that world. Reading and writing in science: Tools to develop disciplinary literacy. Examining the juxtaposition of issue, author, and self. Multicultural Perspectives, 12 3 , â€” The science students need to know. Educational Leadership, 67 1 , 28â€”

# WHO CARES ABOUT SCIENCE LITERACY? pdf

## 4: What Americans know and don't know about science

*We assess the current empirical evidence regarding the outcomes of science literacy for individuals, including evidence on the association between science literacy and attitudes towards, perceptions of, and support for science and the relationship between science literacy, health literacy, and behaviors (particularly behaviors related to health).*

BOX Factors Other Than Knowledge That Influence Attitudes Toward Science The debate surrounding the exact role that knowledge plays in attitudes toward, public perceptions of, and support for science has been at the core of discussions about science literacy and public understanding of science. Others argue that models that privilege knowledge in the opinion formation process are overly simplistic see, e. More specifically, these scholars have highlighted that individual factors other than knowledge can have a significant influence on attitudes toward science. The committee has chosen to highlight a select number of these factors: Findings show a relationship between media use and attitudes toward science in general e. For example, Ho and colleagues , in an analysis of media use and public attitudes toward embryonic stem cell research, found that attitudes toward stem cell research were shaped by cues from the news media. These results suggest that mass media provide an important part of the social context by which citizens perceive controversial science. The measured attitude items can be classified into five areas: Controlling for measures of age, gender, and education that were common to all datasets, the meta-analysis found that there was a small, positive overall relationship between science knowledge and attitudes. Equally important, however, the study found that the size of this relationship varied substantially by whether the measure of attitudes was focused on general science or a specific topic and whether the knowledge measure was a general science measure or one Page 89 Share Cite Suggested Citation: Concepts, Contexts, and Consequences. The National Academies Press. In a study of perceptions of embryonic stem cell research, Nisbet and Goidel found that value predispositions related to Christian conservatism and social ideology influenced citizen evaluations about that research. Brossard and Nisbet found a direct and positive relationship between deference to scientific authority and support for agricultural biotechnology. Strength of religious beliefs was found to be negatively related to support for funding of nanotechnology Brossard et al. Trust A large literature also examines trust, defined as having multiple dimensions, including integrity, dependability, and confidence National Research Council, Research also suggests an inverse relationship: Roduta Roberts and colleagues found that attitudes, rather than perceived knowledge, led directly to an increase in trust in science and technology. This does not mean that science knowledge levels do not matter, but, rather, that they may be affecting individuals differently depending on their values and other factors. Brossard and colleagues provided initial evidence for this type of indirect relationship in their study of nanotechnology. Religiosity served as an interpretive tool for individuals to make sense of nanotechnology. That is, levels of knowledge interacted with religiosity such that the link between knowledge and support was significantly weaker for highly religious respondents than it was for less religious respondents. Specifically, the correlation between general scientific knowledge and a range of specific science attitudes was generally weaker than the correlation between general scientific knowledge and general scientific attitudes. For example, the data suggested almost no relationship between general science knowledge and attitudes about genetically modified food, a potentially negative relationship between biology-specific knowledge and attitudes about genetically modified food, and a small, but negative relationship between that same general science knowledge measure and attitudes toward environmental science see also Gaskell et al. The results further suggested that the basic relationship between general science knowledge and general attitudes was slightly larger than initially estimated Page 90 Share Cite Suggested Citation: Our findings suggest that, if one examines all measured knowledge and attitude domains, there is a small but positive relationship. Other scholars have reinforced these findings and shown that this relationship becomes more complicated when assessing specific science knowledge and attitudes. Individuals may have broadly positive or negative attitudes toward science and may hold a set of attitudes toward specific scientific issues or disputes that do not align with their general attitudes toward science. The study found that willingness was positively related to knowledge of the causes of climate change, although the relationship was

weaker once measures of overall environmental attitudes were included in the analysis. In contrast, Bauer and colleagues analyzed three separate years of Eurobarometer data and found that, while specific knowledge of biology increased across the three surveys, optimism about both biotechnology and genetic engineering actually decreased during that time. The authors also found that scientific knowledge was only weakly correlated with a host of application areas for either biotechnology or genetic engineering. Other studies have concluded that higher levels of scientific knowledge were correlated with negative perceptions of biotechnology e. Priest and colleagues explored public perceptions toward biotechnology in both the United States and Europe. While the authors found science knowledge and educational levels to correlate differently with several different application areas of biotechnology from a strong, positive correlation of 0. Page 91 Share Cite Suggested Citation: Priest , using a path analysis, explored the competing roles of awareness, food safety concerns, genetics knowledge, and trust in key scientific institutions on encouragement for biotechnology, including the genetic engineering of crops, cloning, and engineering bacteria to produce pharmaceuticals, among others. This study revealed a moderate positive relationship between specific knowledge of genetics and encouragement of biotechnology applications. However, the strength of the knowledge-attitude link was much less pronounced than the one found between institutional trust and biotechnology encouragement. Brossard and Nisbet also found a small but positive relationship between factual knowledge of agricultural biotechnology and support for the technology after controlling for a large number of variables, including sociodemographic variables, media use, levels of trust, and reservations about the effects of science. However, they found that the main determinant of public support for agricultural biotechnology was the level of deference toward scientific authority and not knowledge levels or trust in information providers. Other scholars have observed negative relationships between various measures of scientific knowledge and public attitudes, particularly for issues characterized by ethical debates Knight,  For example, Cacciatore and colleagues a found that, even after controlling for a host of factors, increased knowledge about biofuels was associated with a greater tendency to perceive increased risks relative to benefits from the alternative fuel. However, as discussed below, the researchers stressed that processes were complicated and that knowledge had a weaker effect on attitudes for people who showed strong emotional reactions to the topic. In another study, Kahan and colleagues explored the effects of science literacy and numeracy on climate change attitudes and found that both scientific knowledge and numeracy were associated with decreased risk perceptions regarding the dangers of climate change. Mediators and Moderators As illustrated above, there is increasing evidence that the direct link between science knowledge and attitudes toward scientific issues is weak and is mediated or moderated by other factors. Page 92 Share Cite Suggested Citation: Lee and colleagues found a moderating effect of negative emotion on the relationship between nanotechnology knowledge and perceptions of the risks relative to benefits of nanotechnology. Specifically, nanotechnology knowledge had a significantly stronger effect on perceptions of risks versus benefits among individuals who reported low levels of negative emotion toward the issue. People without strong negative emotions toward nanotechnology were much less concerned about the risks of nanotechnology as their knowledge levels increased, while those with strong negative emotions were relatively unmoved in their perceptions of risks regardless of their knowledge level. This pattern was also found when general support for nanotechnology was the dependent variable of interest. Ho and colleagues noted similar patterns in their work investigating public attitudes toward stem cell research. As with the results for nanotechnology, the authors found that the positive effects of knowledge on stem cell support did not persist once a host of demographic and media use variables were controlled for in the regression model. Consistent with the results noted above, they found that the influence of knowledge on support for embryonic stem cell research was significantly stronger for people low in religiosity in comparison with people high in religiosity. They also found that knowledge had a much stronger relationship with support for stem cell research among liberals than conservatives. Finally, a similar pattern was observed for deference to scientific authority, with knowledge having the strongest effect on support among those reporting high levels of scientific deference. Kahan and colleagues investigated two competing hypothesesâ€”what they call the science comprehension hypothesis that increases in scientific knowledge will lead to greater scientific support and the cultural cognition theory

that people form their perceptions of risks based on the risk perceptions of those groups with whom they identify â€”to explain public attitudes toward climate change. Although they found a negative effect of science literacy and numeracy on climate change concern, they also found that general science knowledge interacted with worldviews in predicting such attitudes. Specifically, knowledge served to polarize the viewpoints of egalitarian communitarians and hierarchical individualists, with increased literacy elevating concern about climate change for the communitarians and decreasing the concern of the indi- Page 93 Share Cite Suggested Citation: As the work discussed above suggests, the path from scientific knowledge to positive attitudes toward science or support for science is not always clear. Knowledge affects different subgroups in a population differently depending on a host of factors, including levels of religiosity, political predispositions and worldviews, and deference to scientific authority. These patterns seem to vary depending on the specific scientific issue being explored and the culture in which the data is collected. More research is needed to understand this phenomenon. Effects of Interventions to Increase Knowledge on Attitudes Experiments related to science knowledge typically seek to assess the effect of providing individuals with new information and comparing the views of those individuals to groups who received either no new information, different information, or some other intervention. However, such experiments can be challenging to interpret. Although effects may emerge, simply learning new facts on their own may not be an adequate representation of the effects of science knowledge or literacy. Specific circumstances may place more or less literacy demands on individuals or allow or disallow for opportunities to apply that literacy. Given this, evidence from interventions that do not take into account context may be limited in its general applicability. Consistent with similar research on nonscience topics, studies on science-related deliberation clearly show that it is possible to increase basic knowledge through various short-term interventions Sturgis et al. However, the studies also typically show that such learning often has little relationship to attitude change. Gastil and Dillard found these types of outcomes along with differences by ideology for a range of issues, including energy and health topics. Egalitarian communitarians are defined as individuals who favor less regimented forms of social organization and greater collective attention to individual needs Kahan et al. Page 94 Share Cite Suggested Citation: Science information-related experiments not involving discussion similarly found that providing participants with information has a limited effect or an effect that is contingent on predispositions, such as ideology or worldviews. Furthermore, these studies show that people tend to interpret any new information in a way that fits with their worldviews i. Kahan and colleagues have further shown that the process of giving people additional information actually helps people figure out how to use their worldviews to judge a new technology. For example, one study found that views about nanotechnology were initially relatively similar across cultural worldviews prior to receiving risk and benefit information but, once such information was provided, people reacted divergently, in a manner consistent with their different cultural predispositions toward technological risk generally Kahan et al. Similar effects for issues such as climate change have also been found Braman et al. Brossard and colleagues used a citizen science project scientific research conducted, in whole or in part, by amateur or nonprofessional scientists to explore methods of improving understanding and knowledge of the process of science and bird biology. The study found a significant increase in knowledge of bird biology among those in the treatment condition following the completion of the project. To summarize, the available evidence suggests that providing people with an opportunity to learn about a topic may result in some learning, but it is unlikely to substantially affect attitudes on scientific issues. The reason that individuals likely do not change their attitudes in response to new information is similar to the reason that variables such as ideology or worldview moderate the relationship between existing science knowledge and attitudes about science. Individuals use both existing and new information to reinforce existing attitudes rather than to change their attitudes. It is also possible that people typically use new information to figure out what their cultural group likely believes. Because of these phenomena, determining causalityâ€”knowing whether knowledge is driving attitudes, whether attitudes are driving people to become Page 95 Share Cite Suggested Citation: Importantly, experimental work, which can shed some light on this issue, has limits; it can be difficult to increase knowledge levels without framing the information in such a way that makes it difficult to pinpoint knowledge, and not the introduction of a specific viewpoint, as the cause of a shift in attitude. In

addition, the nature of experiments is such that analyses of knowledge acquisition and subsequent long-term effects on attitudes are difficult to make. As discussed throughout this report, science literacy and health literacy can operate at many different levels of society, from the actions and decisions of individuals to the collective actions and decisions of a community or even a society. The benefits of science literacy and health literacy can also accrue at each level of society: This section discusses the current evidence on the application of science and health knowledge. We first present frameworks for understanding the relationship between knowledge and action and then analyze the evidence on the relationship between science knowledge, health knowledge, and health-related behaviors. Most of the evidence as to the application of science literacy and health literacy focuses on health-related behavior and does not include a wider set of behavioral outcomes. In reviewing the existing evidence, the committee recognizes that there may be individuals or communities or societies who are deeply knowledgeable and engaged, yet nevertheless do not act or take actions that may be at variance with the consensus view of scientists on scientific issues e. Framework of Science Literacy and Health Literacy and Action Identifying the effects of science literacy or health literacy can be challenging. Often, their effects on any sort of action, decision, or behavior are imagined to be linear, unidirectional, and deterministic: However, science literacy or health literacy alone is rarely entirely necessary or wholly sufficient for producing a particular desir- Page 96 Share Cite Suggested Citation: Therefore, science literacy and health literacy should be seen as only a probabilistic and partial influence on actions, decisions, and behaviors. For example, if a person makes healthy dietary choices, it does not necessarily mean that she or he did so because of new nutritional knowledge. Personal habits, social norms, and cultural affiliation can all play a role in shaping behaviors, as can a wide range of beliefs that may or may not reflect or derive from scientific knowledge. The assumption that only scientific knowledge and understanding underlies a particular conclusion, action, or behavior is contradicted by the evidence.

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## 5: CiteSeerX â€” Reading and Writing in the Service of Inquiry-Based Science

*Scientific literacy entails being able to read with understanding articles about science in the popular press and to engage in social conversation about the validity of the conclusions.*

Hours of operation offered to complement the elementary student school day. For more information, please contact aslcforkids gmail. We welcomed over students from diverse backgrounds as well as an additional staff member to assist with our campers with special needs. Each week brought miracles of nature right to our camp site - a visit from the gray heron on the first day of bird camp and turtles resting on the log as we ventured out on our first morning of turtle week. Nature was awakening and present to us in a way that could not be explained except that we knew the universe was alert and in wait for us to get in our places to be a part of it and observe the grand show! As the summer unfolded, there was unrest in our community and we found it imperative to provide a safe place for healing and conversation in camp. They described themselves as a pebble of love being gently thrown into a pond and each ripple that emanates from the stone throw represents love rippling out to our families, our schools, our communities and the world. Campers see themselves as peacemakers as they bond and interact with nature and each other on a daily basis. They show respect and honor to the world through sketching, moving, dramatizing and singing! Our handmade journals were purposefully made from recycled report card envelopes and the campers documented vocabulary, observations and fact finding each day after thoughtful sharing in our daily check in circle. Reaching beyond the building of literacy skills, campers became literate in life skills - acceptance, love, respect and kindness. All this wrapped up into an amazing and powerful experience for all! Arts and Science Literacy Camp for Kids As we wrapped up another successful summer of Arts and Science Literacy Camp, a word that continues to resonate is "transformative" â€¦and camp was nothing short of that! Students came to us with great enthusiasm and a host of needs that were supported through a host of experiences offered this summer. Engaging literacy through the arts transforms the learning and when linked to nature, this combo becomes an unpotentiated fuel that ignites passion and deep learning in both children and adults. We hosted the high school students from the Ulster Project, connected with new artists, and even composed our theme song! We opened our hearts and minds to friends with special learning needs including autism and ADHD and welcomed children from homeless families as well as non-traditional families. Our camps were rich in ethnic diversity. We were blessed with new friends and new experiences. Saveland Park was the backdrop for multiple nature walks, sketching experiences, and observations. Several visits from the great blue heron, the emergence of a cicada from its exoskeleton, and turtles resting on a log made the camp day even more exciting and memorable! Working in large and small groups, every day was an adventure. Pages filled and minds expanded. Using a whole language approach, ASLC camp experientially builds background knowledge in our students by connecting the linguistic words and nonlinguistic images, sounds, smells, touch to create meaning. These connections directly relate to enhanced vocabulary as well. Having students document learning in their hand made camp journals reinforces new concepts and helps to expand upon already known information. Building background knowledge is key to building academics and nature camp activities and teaching are just the way to do it! The process includes the following components: Journals are made from recycled materials such as file folders, envelopes, and brown paper bags. Campers sketch and label thematic samples as well as plan arts activities that showcase learning. Journals go almost everywhere the camper goes! These culminating experiences provide a vehicle for the celebration of learning as well as an evaluative tool for staff to observe the summative and analytical skills of campers. Putting this research into action set the stage for campers to experience the weekly themes at a high level and was truly transformative! Students came to us with great enthusiasm and a host of needs that were supported through a variety of experiences offered this summer. Parent support and involvement were high! Student responses to camp say it all I really like the projects, the music, the dancing, and playing instruments. Doing the artwork helps me focus and concentrate. My behavior has changed too. I was acting bad in first grade and in Nature Camp I am actually acting better. Reese Transformative, fun, and experientialâ€¦all while building literacy in our campers and in our community Next

year promises an expanded number of weeks and the inclusion of greater numbers of kids from throughout the city, perhaps running morning and afternoon sessions each week. We are growing our partnerships and our funders. Each week between students entered the Tippecanoe Presbyterian Church gathering space to explore a weekly nature theme including honey bees, camping, pond life, and birds. Through researching, reading, and hands-on arts activities students were able to make connectionsâ€¦to themselves, to their families, to their community, and to their world. Field trips to Whitnall Park and Havenwoods as well as our neighborhood pond at Saveland Park enhanced learning and created deep and meaningful connections for our students. Our team of teachers brought expertise in areas such as reading and literacy, theatre arts, music, visual arts and arts integration. From reading nonfiction to journal writing, creating and designing 3D honey bees and dragonflies, students were active, engaged, and motivated. These were performed for each other around the campfire, in the Tippe sanctuary, and in the parlor gathering space. Students written reflections include: There is no way this program could be as successful and highly engaging for children without your support. Our gratitude and appreciation to all who believe that the arts connect and raise us up to be successful no matter where we are in our emotional, physical, spiritual, and cognitive journey! Powered by Create your own unique website with customizable templates.

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## 6: Health Technology Literacy: A Transdisciplinary Framework for Consumer-Oriented Practice

*Does science literacy matter? Yes, and here's why July 22, am EDT we should care very much indeed about basic science literacy and the principles science brings to light.*

By Cary Funk and Sara Kehaulani Goo Before you read the report, test your science knowledge by taking the interactive quiz. The short quiz tests your knowledge of questions recently asked in a national poll. After completing the quiz, you can compare your score with the general public and with people like yourself. Take the Quiz A new Pew Research Center survey finds that most Americans can answer basic questions about several scientific terms and concepts, such as the layers of the Earth and the elements needed to make nuclear energy. But other science-related terms and applications, such as what property of a sound wave determines loudness and the effect of higher altitudes on cooking time, are not as well understood. But far fewer are able to identify the property of a sound wave that determines loudness. Twenty-two percent of Americans incorrectly say that astronomy â€" not astrology â€" is the study of how the positions of stars and planets can influence human behavior. How much Americans appear to know about science depends on the kinds of questions asked, of course. Science encompasses a vast array of fields and information, and the questions in the new Pew Research survey represent a small slice of science knowledge. The survey of 3, adults including 2, adults online and respondents by mail was conducted Aug. Why science knowledge matters A variety of scholars have argued that public understanding of science issues and concepts is a hallmark of an informed public. Those with higher education levels are more likely to know answers to questions about science. There are also times when gender, age, race and ethnicity matter. There are substantial differences among Americans when it comes to knowledge and understanding of science topics. In the new survey, education proves to be a major factor distinguishing higher performers on our science questions from those who get fewer correct. Adults with postgraduate and college degrees performed better than those with a high school diploma or less. This pattern is consistent with a Pew Research report on this topic. That research finds that higher educational levels are associated with more factual knowledge of science, and that college graduates who took at least three college-level courses in science or mathematics have higher levels of science knowledge than do those who took fewer science and math courses. Questions on this survey deal primarily with topics tied to the physical sciences, rather than life sciences such as those related to health and medicine. Research by the federal government has found that gender differences in science knowledge tend to be larger on questions about the physical sciences than the life sciences. For instance, on one previous question, women were more likely than men to answer correctly that antibiotics do not kill both viruses and bacteria. At the same time, men were more likely than women to know that the main function of red blood cells is to carry oxygen throughout the body. The Science and Engineering Indicators report found no difference between adult men and women on factual knowledge of biomedical topics. On some questions, younger adults are particularly well-informed. On at least one question, however, adults ages 65 and older are more informed than younger adults: Whites are more likely than Hispanics or blacks to answer more of these questions correctly, on average; the mean number of items correct is 8. The pattern across these groups and the size of the differences vary, however. The findings on race and ethnicity are broadly consistent with results on science knowledge questions in the General Social Surveys between and  Pew Research analysis of the GSS data finds white adults scored an average of 6. While whites, blacks and Hispanics with higher education levels know more factual science items on average, mean differences by race and ethnicity occur among all education levels. Science encompasses a vast array of fields and information. Across the set of 12 science knowledge questions in this survey, it is clear that some information is widely known while other information is much less so. To allow for comparisons across a wider array of questions and topics, we include a series of tables in this report with findings from the new Pew Research survey and from previous Pew Research studies. Comparisons across surveys should be made cautiously. The new survey includes several questions with images or photographs displayed online or in a print questionnaire. Little is known about how different modes of interview could influence the findings. Nonetheless, these comparisons help illustrate that the broad patterns

of differences in science knowledge by education and demographic subgroups in this new survey are generally in keeping with previous Pew Research surveys that tapped public knowledge about science. Bauer, Nick Allum and Steve Miller,  But see Susannah Priest,  See Chapter 7 , table and appendix table  Also see Liana Christin Landivar,  Census Bureau, Washington, DC.

# WHO CARES ABOUT SCIENCE LITERACY? pdf

## 7: Americans may know more than you think about science | Science | AAAS

*As much as I'm super excited to get into the specific science literacy skills for this series, I feel like I need to set the context. Why should we learn sci.*

Prehistoric literacy[ edit ] Origins of literacy[ edit ] Literacy is emerged with the development of numeracy and computational devices as early as 8, BCE. Script developed independently at least five times in human history in Serbia , Mesopotamia , Egypt , the Indus civilization , lowland Mesoamerica , and China. During this era, literacy was "a largely functional matter, propelled by the need to manage the new quantities of information and the new type of governance created by trade and large scale production". Proto-cuneiform texts exhibit not only numerical signs, but also ideograms depicting objects being counted. The Egyptian hieroglyphic writing system was the first notation system to have phonetic values. These civilizations used glyphic writing and bar-and-dot numerical notation systems for purposes related to royal iconography and calendar systems. These systematic notations were found inscribed on bones and recorded sacrifices made, tributes received, and animals hunted, which were activities of the elite. These oracle-bone inscriptions were the early ancestors of modern Chinese script and contained logosyllabic script and numerals. Indus script is largely pictorial and has not been deciphered yet. It may or may not include abstract signs. It is thought that they wrote from right to left and that the script is thought to be logographic. Because it has not been deciphered, linguists disagree on whether it is a complete and independent writing system; however, it is genuinely thought to be an independent writing system that emerged in the Harappa culture. Origins of the alphabet[ edit ] According to social anthropologist Jack Goody , there are two interpretations that regard the origin of the alphabet. Many classical scholars, such as historian Ignace Gelb , credit the Ancient Greeks for creating the first alphabetic system c. But Goody contests, "The importance of Greek culture of the subsequent history of Western Europe has led to an over-emphasis, by classicists and others, on the addition of specific vowel signs to the set of consonantal ones that had been developed earlier in Western Asia". Ten years later, English Egyptologist Alan Gardiner reasoned that these letters contain an alphabet, as well as references to the Canaanite goddess Asherah. In , William F. This included a series of inscriptions from Ugarit , discovered in by French archaeologist Claude F. Some of these inscriptions were mythological texts written in an early Canaanite dialect that consisted of a letter cuneiform consonantal alphabet. Another significant discovery was made in when three arrowheads were uncovered, each containing identical Canaanite inscriptions from twelfth century BCE. According to Frank Moore Cross , these inscriptions consisted of alphabetic signs that originated during the transitional development from pictographic script to a linear alphabet. Moreover, he asserts, "These inscriptions also provided clues to extend the decipherment of earlier and later alphabetic texts". During the Late Bronze Age , successor alphabets appeared throughout the Mediterranean region and were employed for Phoenician , Hebrew and Aramaic. According to Goody, these cuneiform scripts may have influenced the development of the Greek alphabet several centuries later. Historically, the Greeks contended that their writing system was modeled after the Phoenicians. However, many Semitic scholars now believe that Ancient Greek is more consistent with an early form Canaanite that was used c. While the earliest Greek inscriptions are dated c. It was then that the new script "Square Hebrew" emerged and the older one rapidly died out. As the Bronze Age collapsed , the Aramaeans moved into Canaan and Phoenician territories and adopted their scripts. Although early evidence of this writing is scarce, archeologists have uncovered a wide range of later Aramaic texts, written as early as the seventh century BCE. Due to its longevity and prevalence in the region, Achaemenid rulers would come to adopt it as a "diplomatic language". Aramaic merchants carried older variations of the language as far as India , where it later influenced the development of Brahmi scripture. It also led to the developments of Arabic , Pahlavi an Iranian adaptation , "as well as for a range of alphabets used by early Turkish and Mongol tribes in Siberia , Mongolia and Turkestan ". The Aramaic language would die out with the spread of Islam and with it, its influence of Arabic. Ancient and post-classical literacy[ edit ] Further information: Latin alphabet Until recently it was thought that the majority of people were illiterate in ancient times. The Republic amassed huge archives of reports on every aspect of public life".

The army kept extensive records relating to supply and duty rosters and submitted reports. Merchants, shippers, and landowners and their personal staffs especially of the larger enterprises must have been literate. In the late fourth century the Desert Father Pachomius would expect literacy of a candidate for admission to his monasteries: And if he is illiterate he shall go at the first, third and sixth hours to someone who can teach and has been appointed for him. He shall stand before him and learn very studiously and with all gratitude. The fundamentals of a syllable, the verbs and nouns shall all be written for him and even if he does not want to he shall be compelled to read. Even after the remnants of the Western Roman Empire fell in the s literacy continued to be a distinguishing mark of the elite as communications skills were still important in political and Church life bishops were largely drawn from the senatorial class in a new cultural synthesis that made "Christianity the Roman religion," [22]. However, these skills were less in needed than previously in the absence of the large imperial administrative apparatus whose middle and top echelons the elite had dominated as if by right. Post-Antiquity illiteracy was made much worse due to a lack of suitable writing medium. When the Western Roman Empire collapsed, the import of papyrus to Europe ceased. Since papyrus perishes easily and does not last well in the wetter or damper European climate, the alternative was parchment which was expensive and accessible only by the Church and upper layers of the society. Once paper was introduced into Europe in the 11th century in Spain. Its use spread north slowly over the next four centuries. Increased literacy saw a resurgence because of its use. By the 15th century paper had largely replaced parchment except for many luxury manuscripts some of which used paper. The Reformation stressed the importance of literacy and being able to read the Bible. The Protestant countries were the first to attain full literacy; Scandinavian countries were fully literate in the early 17th century. Spread of literacy since the mid-twentieth century[ edit ] Adult literacy rates have increased at a constant pace since  Literacy data published by UNESCO displays that since , the adult literacy rate at the world level has increased by 5 percentage points every decade on average, from  However, for four decades, the population growth was so rapid that the number of illiterate adults kept increasing, rising from million in to million in  Since then, the number has fallen markedly to million in , although it remains higher than in despite decades of universal education policies, literacy interventions and the spread of print material and information and communications technology ICT. However, these trends have been far from uniform across regions. North America , Europe , West Asia , and Central Asia have achieved almost full adult literacy individuals at or over the age of 15 for both men and women. In much of the world, high youth literacy rates suggest that illiteracy will become less and less common as younger generations with higher educational attainment levels replace older ones. Progress towards gender parity in literacy started after  On a worldwide scale, illiteracy disproportionately impacts women. This disparity was even starker in previous decades: Martha Nussbaum , for example, make illiterate women more vulnerable to becoming trapped in an abusive marriage, given that illiteracy limits their employment opportunities and worsens their intra-household bargaining position. Moreover, Nussbaum links literacy to the potential for women to effectively communicate and collaborate with one another in order "to participate in a larger movement for political change. Making literacy classes available can be ineffective when it conflicts with the use of the valuable limited time of women and girls. For example, literate people can be more easily trained than illiterate people, and generally have a higher socioeconomic status; [44] thus they enjoy better health and employment prospects. The international community has come to consider literacy as a key facilitator and goal of development. The study claims that developing literacy in this area will bring "economic empowerment and will encourage rural women to practice hygiene, which will in turn lead to the reduction of birth and death rates. This concluded that there were economic gains for the individuals, the companies they worked for, and the Exchequer, as well as the economy and the country as a wholeâ€”for example, increased GDP. Continuing the global expansion of public education is thus a frequent focus of literacy advocates. The report features countries from a variety of regions and of differing income levels, reflecting the general global consensus on "the need to empower women through the acquisition of literacy skills. In , however, the UNDP replaced the adult literacy measure with mean years of schooling. A UNDP research paper framed this change as a way to "ensure current relevance," arguing that gains in global literacy already achieved between and meant that literacy would be "unlikely to be as informative of the future. There are millions, the majority of whom are

women, who lack opportunities to learn or who have insufficient skills to be able to assert this right. The challenge is to enable them to do so. This will often imply the creation of preconditions for learning through awareness raising and empowerment. They might have difficulty getting and maintaining a job, providing for their families, or even reading a story to their children. For adults, the library might be the only source of a literacy program. Diversity in Action[ edit ] Dia! Parents, caregivers, and educators can even start a book club. The program seeks to equip students with skills to continue learning in the future. The person becomes an example to children and grandchildren and can better serve the community. Reading Buddies matches children of adult literacy students with college students who meet with them once a week throughout the semester for an hour and a half. The college students receive course credit to try to enhance the quality and reliability of their time. The goal is to help the child gain interest in books and feel comfortable reading aloud. Time is also spent on word games, writing letters, or searching for books in the library. Throughout the semester the pair work on writing and illustrating a book together. Although Reading Buddies began primarily as an answer to the lack of child care for literacy students, it has evolved into another aspect of the program. Working since , the HLC is "committed to improving literacy by empowering adults through education". Through one-on-one tutoring, the organization works to help adult students reach at least the fifth-grade level. Broader and complementary definitions[ edit ] Traditionally, literacy is the ability to use written language actively and passively; one definition of literacy is the ability to "read, write, spell, listen, and speak". For example, in the United States , the National Council of Teachers of English and the International Reading Association have added "visually representing"[ clarification needed ] to the traditional list of competencies. Similarly, in Scotland , literacy has been defined as: Increasingly, communication in commerce and in general requires the ability to use computers and other digital technologies. Since the s, when the Internet came into wide use in the United States, some have asserted that the definition of literacy should include the ability to use tools such as web browsers , word processing programs, and text messages. Similar expanded skill sets have been called multimedia literacy , computer literacy , information literacy , and technological literacy. Other genres under study by academia include critical literacy , media literacy , ecological literacy and health literacy [89] With the increasing emphasis on evidence-based decision making, and the use of statistical graphics and information, statistical literacy is becoming a very important aspect of literacy in general.

## 8: How Much Do Americans Know About Science? | Innovation | Smithsonian

*The idea that the nation faces a crisis in science education has more than hit home: Many Americans think U.S. teens perform even worse on standardized science tests than they actually do.*

## 9: Does science literacy matter? Yes, and hereâ€™s why

*The idea of community literacy has been around for decades, says panelist Noah Feinstein, a sociologist and science educator at the University of Wisconsin, Madison, citing the role of HIV.*

# WHO CARES ABOUT SCIENCE LITERACY? pdf

*A comparison of self-prescribers and physician-seekers within the aging population Chemistry of carbon The bridge: the life and rise of barack obama All about government financing Labeling and inspection of imported meat Vietnam (Countries) How to Run a Community Recycling Center Research Writer for Criminal Justice CD-ROM That None Shal Die Treatise on the law of mortgages of real property Principles of microbiology gm atlas Voice and Data Security Greek and Roman Actors Ing greek grammar exercises Chicken Soup for the Gardeners Soul Gift Book Wireless communications in developing countries Choice of the elect Intimate Details (Harlequin Intrigue Series) Clinical features and diagnosis of macrovascular disease Chantel Hile, . [et al.] High-frequency and microwave circuit design Lizzie Logan gets married Financial accounting student value edition Military Cryptanalysis Project crocodile in india Religious diversity and multiculturalism in Southern Europe : the Italian mosque debate Anna Triandafylli Great-Uncle Dracula and the dirty rat Mysteries of Charters Cathedral Winds of persecution The charisma myth olivia fox cabane The ultimate inbound marketing guide Litany of the Saints.170 Sammys siren (Magic sounds) Jim corbett omnibus 2 Roles and interaction forms Haccp food safety manual Praying Gods Will for Your Life Did dinosaurs eat pizza? 1. Summary and detailed tables. Geographic visualization concepts tools and applications Hang Your Guns High*