Curriculum Design for a Productive, Harmonious Society
Standards, Model Curriculum, Perceptions of Stakeholders, and Achievement Indicators

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Abstract

This study explores the role of curriculum development within the context of a post-war society. Education exists for more than one purpose. One, of course, is to gain skill sets (Tyler, 2013; Wiles, 2009). More importantly, it is to develop a well-rounded individual with critical thinking ability who contributes to the well-being of society (Ohio, 2019). Productive adults need to be able to work as a team, to make decisions in a timely manner and to solve problems creatively (Dymond, 2013; Gonzales, 2008). Curriculum standards for a US state are analyzed as are sample activities. Individuals who were schooled in post-war societies, including Germany and Korea are interviewed for their perspective of their home country's curriculum. Scaffolding of all of these abilities begins around age five with kindergarten. In the younger years, children should develop a love for learning. How does one instill a love for learning? By creating engaging learning experiences - bring books to life with puppet shows, for example. Other skills that need to be developed (and how to do so) are discussed. Curriculum adjusts in the middle school years to accommodate for greater physical and mental abilities. High school becomes more intellectual and prepares young adults either for a trade, a trade school or university. Of important note is that throughout education, individuals not only develop personal skills, but the notion of 'giving back to society' is instilled from the beginning. Thus, a harmonious society of talented individuals is created.

Keywords: Curriculum Development, Education, Learning, Civil Society

Introduction

Curriculum represents educational development throughout life (Marsh, 1997). It should impart values and knowledge into an individual for his entire life. Moreover, it aims to shape individuals in accordance with society's framework, i.e. to build a responsible citizen. As such, curriculum has certain specifications that need to be discerned.

Curriculum is defined by Wiles as, "a set of desired goals or values that are activated through a development process and culminate in successful learning experiences for students" (Wiles & Bondi, 2007). The author describes the lack of developed curriculum as "a ship without a rudder". Curriculum is developed based on the purposes of school as defined by the community.

Education can be, according to Kothurkar (cited in Kuppuswamy, 1991) defined as, "...a process of changing the behavior patterns of human beings and evaluation procedures trying to determine the effectiveness of the educational course in bringing about such desired changes." It is a planned process. An effective planning of curriculum should bring about noticeable improvement in the society. These questions are proposed by Tyler (2013).

1. What educational purposes should the school seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these educational experiences be effectively organized?
4. How can we determine whether the purposes are being attained?

In other words, curriculum should be given a framework. According to Lau (2006), four symmetrical components of curriculum are recognized: purposes, experiences, methods and evaluation. The following quote from the Ohio Grades K-3 education standards opens another area of concern, "Research has shown that nonacademic factors contribute to long-term academic success. Skills such as self-regulation and persistence are necessary for students when tackling challenging tasks." The point here is that students need to learn not only academic skills but ethics and values through curriculum.

Curriculum can be seen as a pipeline in the creation of a prosperous, civil society. Previous model curriculums centered around teachers: 'the sage on the stage' (Lawson, 1944; Lau, 2006). Exams used to represent student demonstration of knowledge; some countries still rely mainly on standardized tests (Gonzales, 2008; So, 2014). However, research has demonstrated both aspects to be ineffective: student centered classrooms are more effective in creating skill sets in students: 'the guide on the side' (Tyler, 2013; Wiles, 2009). As well, 'test-heavy' societies fail to create harmony (Bezzina, Starratt, & Burford, 2009; Simovska & Prosch, 2016). Alternative methods for students to demonstrate capacity that involve community service improve 'harmony' without reduction in academic results (Dymond, Neeper, & Fones, 2010; So, 2014).

This study builds upon previous research, continuing to fine-tune purposes and improve upon methodologies. It modifies Tyler's questions a bit (2013). This research then adapts previous models according to updated understanding of the nature of learning, modern societal needs, skills for success and content knowledge. Analysis of findings is organized according to the research questions.

Research Questions

1. What educational purposes should the school seek to attain?

2. What educational experiences can be provided that are likely to attain these purposes, and how can they be organized?

3. How can we determine whether the purposes are being attained?

Methods

This study traces standards and implementation of a curriculum in the US Midwest. Documents detailing curriculum from the Department of Education are reviewed. Sample activities that have been implemented are visited. Educators are interviewed and surveyed for their opinions regarding the research questions. Various achievement indicators are assessed in response to question three. Using grounded theory, key themes emerge from all data. Analysis is displayed in response to each research question asked.

Results

RQ 1. What educational purposes should the school seek to attain?

This research has found four themes around which the purposes of curriculum gather: *Nature of Learning*, *Societal Needs, Content Knowledge and Skills for Success*, see figure 1. Curriculum need not confine itself to content. All that a society requires from its citizens and vice-versa, all of the skills an adult needs in order to succeed, can be embedded. Human nature may have been overlooked in the past, but the natural trajectory of growth cannot be obviated by education.

Figure 1. Four categories of purposes for curriculum

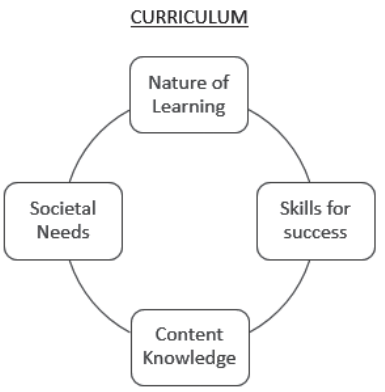

Figure 1. The purposes for curriculum can be divided into four categories.

The nature of learning incorporates several factors. First, humans are not vessels into which one simply pours knowledge. No five-year-old can sit and listen all day. Students who sit in room quietly do not learn and are not happy (So, 2014; Gonzales, 2008; Ohio, 2017). So, curriculum must be *engaging* or *active*, and *student centered* to *create life-long learners*. It is known that *different learning styles* exist, so a variety of activities need to be incorporated to account for *visual* learners verses *auditory* learners. It is also easy to

understand, although difficult for parents to admit to themselves, that not every child grows up to be a doctor. A parent cannot force a child to love computer engineering. Learning must be based on *individual strengths and interests.* The concept of *scaffolding* is not new to any educator. However, to elucidate, knowledge builds upon itself; complex math like calculus cannot be taught prior to simple arithmetic. A five-year-old is not ready to learn complex circuitry, unless of course they have already learned the basics.

In the past, *skills for success* were conceived of as a part of *content knowledge*. However, history has taught that character traits like *creative problem solving* and the others in table 1 need to be delineated as their own area, separate from *content knowledge*. The trait of *self-regulation* is a requirement of a productive human, irrespective of any subject they study. The same holds true for *critical thinking, work ethic,* and *resilience*. Furthermore, future engineers, doctors, and business owners all need to have self-confidence speaking in public. So, this ability is also considered as a skill separate from any content.

It may go without saying that society requires ethical citizens who maintain awareness of community needs and who love their country; thus, research demonstrated that *ethics, volunteerism* and *patriotism* are purposes required of a curriculum. As mentioned previously, not every student has the same abilities or ethnicity. It may be more of a surprise that all sources of data dictate that *tolerance* of those with different abilities and cultures (*multiculturalism)* be explicitly taught for *harmony.* The purpose of *honor elders* is easily comprehended.

Content knowledge may be the most readily apprehended category. Careers around technology mandate the need for all sciences, engineering and mathematics. Effective communication mandates language facility. A civil society requires humanity to learn from history.

Figure 2. Purposes of Curriculum in their respective categories

Societal Needs	**Skills for success**
Ethical	Creative Problem Solvers
Volunteer	Critical Thinking
Tolerant/empathetic	Work Ethic
Patriotic	Self-Confidence presenting in public
Multicultural	Perseverance / Resilience
Honor parents / elders	Self-regulation
Harmonious	

Nature of Learning	**Content Knowledge**
Engagement / activity	Language
Based on individual strengths and interests	Math
Different learning styles	Technology
Create life-long learners	History
Student centered	Sciences: Biology, Physics, Geology etc..
Scaffolding	Interdisciplinary

Figure 2. The purposes of curriculum are categorized.

RQ 2. What educational experiences can be provided that are likely to attain these purposes, and how can they be organized?

Resoundingly, the data suggests that these experiences need to be interactive. Students need to demonstrate skills. To be *good citizens*, for example, in the early years, while playing, if children fight over a toy, a teacher facilitates this learning experience by saying, "Use our words, not our hands." It is the children who are at the center, learning how to share a ball or take turns at the water table. This activity represents an example of students learning social skills and developing motor skills. As they progress, in grade seven, they create an advertising flier that delineates the achievements of the Muslim world between 750 B.C. and 1600 A.D., from advancements in anatomy and pharmacology to astronomy and calendars. This activity represents characteristics of respect for other cultures and religions. By high school, the students put Galileo on trial, with half the class representing the Catholic Church and the other half standing on the side of the scientific method. It seems absurd that this scientist who discovered that earth is not the center of the universe was put to death for religious reasons. The growing children enact their knowledge and ability to discern proper logic from false reasoning. This activity also demonstrates critical thinking and learning from history.

On the blackboard in this first-grade classroom of figure 3, colored pieces of paper represent activities: leading the "Pledge of Allegiance", the child in charge of taking messages to another classroom, and the line leader (who is in charge of turning out the lights when the class leaves the room). Every day, different students carry different responsibilities that are age appropriate. Also each day, students across the country recite a pledge of allegiance to the US, which scaffolds love for country or patriotism.

Figure 4 is of a 4th grade girl presenting an article she wrote that honors veterans. She is standing with her father, who is a veteran. The teacher is at the left of the image. The girl wrote a formal, patriotic article. She then presented in front of an audience with support from adults. The ability to present publicly is also scaffolded from

an early age. This activity is interdisciplinary, combining history, writing, and respect for those who serve society.

Figure 3. Classroom displays of student responsibilities

Figure 3. Each student carries age-appropriate responsibilities.

Figure 4. Fourth grade student presentations on Veterans Day

Figure 4. Students write on a patriotic subject, then present to the class.

All data suggest that students need to be excited about learning. To become life-long learners who adapt to new technologies, they simply need to like learning. So, kindergarteners enact stories with puppets, which demonstrates understanding in a fun way, see figure 5. Children here are the puppeteers. They are enacting character, setting, theme and moral. At the end of each puppet show, that group of students recites the ethical lesson in the story: in this case - individual actions can hurt others - teaching the importance of self-control. This fun activity represents literacy development, along with moral understanding and self-regulation. They also grow their own plants from seeds at this age, which demonstrates science.

Figure 5. First graders puppet performances based on stories with morals

Figure 5. First graders perform puppet shows that demonstrate ethics.

By middle school, they are creating a pretend product inspired by a Greek god, with all of his/her characteristics. Advanced Placement Physics students create Rube Goldberg machines. Figure 5 is of an evening showcase where parents come to the school to see

high school students demonstrate physics with a chain reaction machine that they designed from household parts. In addition to creative problem solving and repurposing of resources, this celebration of physics brings parents to the school, another important aspect discussed later.

Another vital aspect of curriculum seems to be to tie knowledge to real life and the surrounding community. Science students design a water quality test buoy, deploy it in a local pond, collect results, analyze the data and come up with a solution to low quality. They then present their findings at a 'town-hall meeting'.

Figure 5. Advanced Placement Physics students' chain reaction machines

Figure 5. Parents celebrate student creations at an evening event in the school.

All high school students are required to perform twenty hours of community service: handing out cans of food in a 'food pantry', driving dinner to an elderly person's house or fixing a bridge in a nearby park. In this way, students understand that despite their independence, they must be responsible members of society, protecting resources and those with less ability. Community service becomes a life-long habit. The volunteer activity of the high schoolers

in figure 6 was to fix a bridge in a local park on a weekend. A parent volunteer is ensuring safety. They planned for four months, after school, and worked with the city parks office to find the need of the community. A local construction business loaned seven drills and other tools. The owner of the business also volunteered, which will, in the long-run bring him more business. This activity demonstrates creative problem solving, self-confidence, critical thinking, leadership and service to society. Over the course of months, it also created a habit of healthy use of leisure time.

Figure 6. A city park bridge restored by volunteer high schoolers

Figure 6. High school students find a problem in the community, plan and implement a solution.

Including diverse learners in the classroom has also proven important. Children with Down Syndrome, for example, are working alongside advanced learners, often with an aide. See figure 7. Germany rehabilitated its academic ranking by incorporating measures to improve outcomes for those less capable (Atmacasoy, 2017). Every curriculum entity includes an adapted strategy for English lan-

guage learners. The term *disability* has been replaced with *ability*, with the focus on what a student can do, not what they cannot. For example, during a service learning project, an advanced student combined individual spreadsheets into a master spreadsheet, while another student performed a simple task of data entry (Dymond, 2010). This particular example also demonstrates a team of individuals with different abilities working well together to achieve a common result in the community.

The trait of *critical thinking* can begin being developed earlier than one may perceive. A child building a castle, choosing the right blocks and arranging them correctly, is learning to discern.

Figure 7. Mainstreamed 'diverse' learner

Figure 7. Students with Down Syndrome (and other diverse learners) are in mainstream classes.

A middle schooler who is comparing the historical version of a story with a fictional one is engaged in critical thinking, asking herself, "Why did the author choose to dramatize this?" By high school, students are debating the merits of every subject conceivable: Is vegetarianism healthy? Are school uniforms beneficial? Is social

media unhealthy? They are constructing their knowledge based on evidence and able to communicate with those they disagree in a civil manner. They comprehend as well as critique. Because they are engaged, they naturally assess veracity of claims and soundness of reasoning. Scaffolding the ability to communicate an opinion (based on evidence) in opposition to someone else while remaining calm is vital for a civil society. See attached link to procon.org in references for a list of debate topics.

The subject of assessment is also addressed. Korea's high achievement on standardized tests is counterbalanced by one of the lowest levels of student happiness in the world (So, 2014). In fact, the disposition of students improved when the government started offering the option of service learning or internships in place of testing. The United States uses assessment as another learning opportunity, in moderation. In K-3, students' math worksheets (1+2=__ or 12+13=___) are timed. A student has to complete as many as possible of 100 such problems in 60 seconds. The concept of being timed, which is scaffolded through all grades, creates learners who make decisions in a timely manner. In the real world, people do not have all the time they want to solve a problem. If an important bridge is damaged, it needs to be fixed quickly, so that society can return to normal as soon as possible. Administrators and engineers do not have an endless amount of time to engineer the perfect solution. The graduation tests (SAT or ACT) are timed. By this point in their lives, students have been acclimated to timed testing. One other aspect of this activity is that they are rarely completable. Very few students can complete 100 math problems in one minute, no matter how simple. Not all students finish the SAT or ACT. This design helps students understand at a visceral level that not everything will get finished, which is correlated with resilience or persistence. This assessment also familiarizes students to stress, but it is only a small percentage of the curriculum. That being said, US universities do not only rely on this score for admission. Most universities now use *holistic* criteria for admission, which includes any leadership positions students had along with sport achievements. An application to

university has several criteria beyond grades and SAT scores. Leadership and personal development of interests weigh heavily in admission decisions.

Language arts combines with history: they read original documents from the Civil Rights movement, then current events in the news, and analyze where humanity is now from where it was in that moment of history. Further, based on evidence, they write persuasively to government leaders advocating their position regarding relevant issues.

Schools where parents are engaged perform better as well. "It takes a village to raise a child," is an old adage. The term *deliberate* parenting encapsulates the purposeful nature of interactions between a parent and child.

Table 1

Correlation of activity types to characteristics of learners for a productive society

Societal Needs

Desired Characteristic	**Educational activity**
Ethical leaders who contribute to the welfare of society	Ethics explicitly taught and embedded into class Community service
tolerant, empathetic	'Diverse' Learners in class, with support

Each time a child reaches a new level of advancement and freedom, the parent can reinforce, "There is no freedom without re-

Multicultural	Creation of a product with the characteristics of a Greek god Creation of flier lauding innovations from Muslim world
Patriotic	Reciting the 'Pledge' daily Presentation of written essay on Veteran's Day
Honor parents / elders	Students write a poem on Mother's Day. Mother's come to school for celebration.
Future parents	High School students carry a real, raw egg around for two full days. The egg cannot break.
Harmonious society	Debate to learn to disagree politely & calmly, based on evidence

sponsibility." Concepts from a country's founding documentation or constitution can be a part of daily speech, in class and in the home. Parents can explicitly teach ethics through interactions with their children and the school. Parents run *Chess Club* and other after school activities. In this way, students learn to stay busy with developmental yet fun activities. This trait, over time, becomes a strong work ethic and self-regulation in choice of how to spend leisure time. Parents all across the country spend their Saturdays and Sundays as *assistant soccer coaches* and *baseball coaches.* They volunteer their time because healthy competition is what forms a child's

character, her value system, his physical prowess and motor skills. Small business owners 'sponsor' a team. They buy the team shirts, and the shirt then has the business name written on it. In this way, even the poor can participate. Parents who volunteer may have no idea how to play soccer, but they are on the field with energy, following the expertise of the head coach. If a child displays interest or talent in singing, suddenly a mother becomes a *children's choir manager*. If the child joins an upcoming theatrical presentation of a fairy tale, the parent can sew a costume or find any number of ways to support the child's activity. Towns in which families and schools work in concert, they have the best outcomes.

Table 2

Correlation of activity types to characteristics of learners for a productive society

Skills for Success

Desired Characteristic	Educational activity
Creative Problem Solving	Build a chain reaction machine from recycled items
Critical Thinking	Read original documents about pivotal moments from history and analyze - Galileo was put to death because of the debate between science and religion - Early USA witch trails in which women were burned to death because a community member called them a witch - Hitler killed millions because of their religion Compare and contrast merits of philosophies
Work ethic, based on individual strengths & interests	Work ethic, based on individual strengths & interests
Self confidence	Give presentations regularly throughout years

Perseverance / Resilience	Timed testing in moderation Replace concept of 'failure' with 'learning opportunity
Self-regulation	Enact fairy tales Supervised play & group work Health classes throughout years
Harmonious society	Debate to learn to disagree politely & calmly, based on evidence

RQ 3. How to determine whether the purposes are being attained?

Societies are continually monitoring the "success" of their schools. According to *US News & World Report*, the US is number two worldwide, based on its well-developed public education system and other traits. The United Kingdom ranked first, and Canada-third. TIMSS 2007 ranked the US a little lower in mathematics and science (US News). Respondents indicated a number of other possible statistics that could help ascertain if the purposes are attained.

Several respondents in this study suggested looking at other criteria to ascertain whether or not a curriculum has been successful. Koreans have been very proud of their high academic achievements. However, this success has been at the expense of student happiness, with one of the highest suicide rates for teenagers in the world (So, 2014). So, international rank cannot be the only determiner. A general sense of well-being is vital for success of any country and hence its curriculum. Generally speaking, countries with the highest focus on standardized tests are at the bottom of the *student happiness* list: China, South Korea and others (Morrison, 2017). The United States is above average. Countries with the highest student happiness, howev-

er, rank at the absolute lowest of the academic achievement list (Dominican Republic and Mexico), from which one gleans that a balance of achievement and happiness is required.

Innovation can be a measure of curriculum success. That the US, South Korea and Germany all rank among the top ten in inventions per capita could indicate that these curriculums are producing critical thinkers with the ability to solve problems in new ways.

If one widens the lens beyond just education but to society as a whole, a rubric of criteria has been established for *thriving* societies: including adventure, citizenship, cultural influence, entrepreneurship, heritage, movers, open for business, power and quality of life. At the top of this list rest the Netherlands, France and the US (Mejia, 2018).

The clearest indication of 'results' is visible in the area of volunteerism, which is embedded into every school district in the US. It is not surprising that despite a reputation for 'individualism', the US is the second most generous nation in the world (Isaac, 2015). Adults continue to donate time, money and energy back into their communities here, long after graduating.

To trace the concept of *life-long learner,* one could look at which countries have the most graduate degrees, with the theory that students continue to seek further education opportunities throughout life. In this category, the US outpaces its closest rival by over 200% (Gray, 2017).

Tolerance for ethnicities is measured by a World Value's Survey that asks people to identify kinds of people they would not want as neighbors. Countries least likely to respond "people of a different race" are the US, Canada and Australia (Fisher, 2013). This statistic indicates people in these countries are least offended by multiculturalism.

To amalgamate this long list of statistics, in attempt to discover if the purposes of curriculum can be witnessed in society, academic studies must be balanced with social concern. It should be noted this data is anecdotal. However, curriculum purposes are perceived throughout society, as indicated by various measures.

Discussion

The needs of society and the nature of learning coalesce in a curriculum. Through the performance of specific activities, individual capacity is scaffolded over time in vital domains (both content and skill sets). Completion of any new curriculum over the course of a generation is followed by the transformation of society. The world witnessed a new Europe evolve after World War II and a productive South Korea rise in the early 2000s. Lessons regarding curriculum have been learned along the way, from which newly emerging economies can benefit.

Of important note is that implementation of this matrix of endeavors requires 'buy-in' from a number of stakeholders. Teachers in Korea have been criticized for being passive (So, 2014). Teachers need to be trained in active engagement, in facilitating, not lecturing. They need to learn to be comfortable with students in the front of the room, debating, with the rest of the class chiming in. For a teacher to be comfortable not being the smartest person in the room requires confidence. A classroom with growing plants has some dirt on the floor. Creating puppet theaters requires a lot of paper cutting and gluing. Active classrooms can be messy. Teachers need to learn to distinguish unclean from messy to be comfortable with a little disorder.

Furthermore, the administration has to agree to community partnerships. A school becomes a porous gateway with volunteer parents going into classrooms, and students going to a local park to clean it. Local businesses help by providing tools. These businesses benefit with an elevated reputation (hence, they gain more clients) and by gaining valuable employees. There is movement that is organized chaos.

The concept of energy is important. This physical movement both requires and builds positive energy in people and a community. From Anthropology it is known that the most dangerous animal on earth is the male of any species at the end of adolescence, asserting its independence (Choudhury, 2010; Ellis, et. al., 2012;

Steinberg, 2008). Parents happily volunteer to coach their budding teens on a sports field for hours in the evenings during the week and half a day on the weekend because it is a positive dissipation of natural energy. These sports can also build teamwork skills and healthy competition. The direction of energy in society shifts palpably. Students, parents, teachers and other community members go to bed tired yet fulfilled each day.

This hustle and bustle entail a mindset shift. Parents and teachers stop saying, "That is the government's job." Instead, they think, "If not me, then who?" Bringing parents into the school for celebrations (like the physics one above) is one step enabling the community to make this shift. Parent-teacher conferences are another exercise that bring parents into the school, helping parents embrace this shared responsibility for a productive, harmonious society.

Once initiated, all stakeholders observe success in incremental gains, which reinforce this new behavior, bolstering the mind-set shift. These behavior changes, accompanied by mental growth, become a self-fulfilling prophecy.

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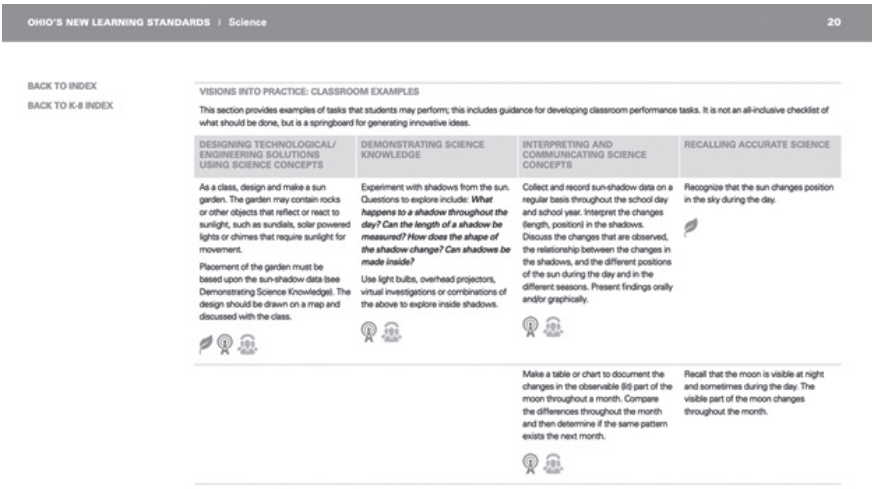
Appendix A

Sample Science Curriculum



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BACK TO K-8 INDEX

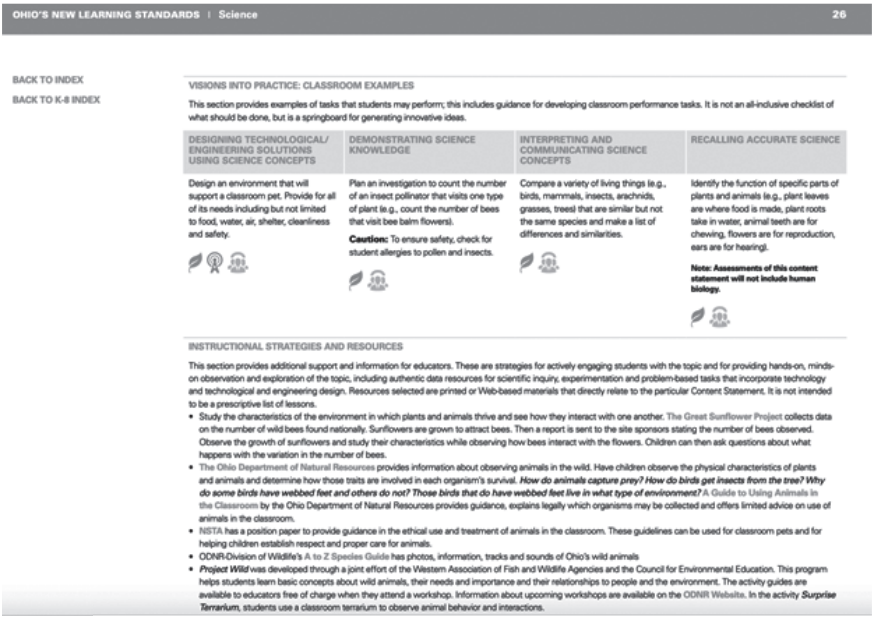
VISIONS INTO PRACTICE: CLASSROOM EXAMPLES

This section provides examples of tasks that students may perform; this includes guidance for developing classroom performance tasks. It is not an all-inclusive checklist of what should be done, but is a springboard for generating innovative ideas.

DESIGNING TECHNOLOGICAL/ ENGINEERING SOLUTIONS USING SCIENCE CONCEPTS	DEMONSTRATING SCIENCE KNOWLEDGE	INTERPRETING AND COMMUNICATING SCIENCE CONCEPTS	RECALLING ACCURATE SCIENCE
As a class, design and make a sun garden. The garden may contain rocks or other objects that reflect or react to sunlight, such as sundials, solar powered lights or chimes that require sunlight for movement. Placement of the garden must be based upon the sun-shadow data (see Demonstrating Science Knowledge). The design should be drawn on a map and discussed with the class.	Experiment with shadows from the sun. Questions to explore include: ***What happens to a shadow throughout the day? Can the length of a shadow be measured? How does the shape of the shadow change? Can shadows be made inside?*** Use light bulbs, overhead projectors, virtual investigations or combinations of the above to explore inside shadows.	Collect and record sun-shadow data on a regular basis throughout the school day and school year. Interpret the changes (length, position) in the shadows. Discuss the changes that are observed, the relationship between the changes in the shadows, and the different positions of the sun during the day and in the different seasons. Present findings orally and/or graphically.	Recognize that the sun changes position in the sky during the day.
		Make a table or chart to document the changes in the observable (lit) part of the moon throughout a month. Compare the differences throughout the month and then determine if the same pattern exists the next month.	Recall that the moon is visible at night and sometimes during the day. The visible part of the moon changes throughout the month.

Appendix B

Sample Science Curriculum



OHIO'S NEW LEARNING STANDARDS | Science 26

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VISIONS INTO PRACTICE: CLASSROOM EXAMPLES

This section provides examples of tasks that students may perform; this includes guidance for developing classroom performance tasks. It is not an all-inclusive checklist of what should be done, but is a springboard for generating innovative ideas.

DESIGNING TECHNOLOGICAL/ ENGINEERING SOLUTIONS USING SCIENCE CONCEPTS	DEMONSTRATING SCIENCE KNOWLEDGE	INTERPRETING AND COMMUNICATING SCIENCE CONCEPTS	RECALLING ACCURATE SCIENCE
Design an environment that will support a classroom pet. Provide for all of its needs including but not limited to food, water, air, shelter, cleanliness and safety.	Plan an investigation to count the number of an insect pollinator that visits one type of plant (e.g., count the number of bees that visit bee balm flowers). **Caution:** To ensure safety, check for student allergies to pollen and insects.	Compare a variety of living things (e.g., birds, mammals, insects, arachnids, grasses, trees) that are similar but not the same species and make a list of differences and similarities.	Identify the function of specific parts of plants and animals (e.g., plant leaves are where food is made, plant roots take in water, animal teeth are for chewing, flowers are for reproduction, ears are for hearing). **Note: Assessments of this content statement will not include human biology.**

INSTRUCTIONAL STRATEGIES AND RESOURCES

This section provides additional support and information for educators. These are strategies for actively engaging students with the topic and for providing hands-on, minds-on observation and exploration of the topic, including authentic data resources for scientific inquiry, experimentation and problem-based tasks that incorporate technology and technological and engineering design. Resources selected are printed or Web-based materials that directly relate to the particular Content Statement. It is not intended to be a prescriptive list of lessons.

- Study the characteristics of the environment in which plants and animals thrive and see how they interact with one another. The Great Sunflower Project collects data on the number of wild bees found nationally. Sunflowers are grown to attract bees. Then a report is sent to the site sponsors stating the number of bees observed. Observe the growth of sunflowers and study their characteristics while observing how bees interact with the flowers. Children can then ask questions about what happens with the variation in the number of bees.
- The Ohio Department of Natural Resources provides information about observing animals in the wild. Have children observe the physical characteristics of plants and animals and determine how those traits are involved in each organism's survival. ***How do animals capture prey? How do birds get insects from the tree? Why do some birds have webbed feet and others do not? Those birds that do have webbed feet live in what type of environment?*** A Guide to Using Animals in the Classroom by the Ohio Department of Natural Resources provides guidance, explains legally which organisms may be collected and offers limited advice on use of animals in the classroom.
- NSTA has a position paper to provide guidance in the ethical use and treatment of animals in the classroom. These guidelines can be used for classroom pets and for helping children establish respect and proper care for animals.
- ODNR-Division of Wildlife's A to Z Species Guide has photos, information, tracks and sounds of Ohio's wild animals
- ***Project Wild*** was developed through a joint effort of the Western Association of Fish and Wildlife Agencies and the Council for Environmental Education. This program helps students learn basic concepts about wild animals, their needs and importance and their relationships to people and the environment. The activity guides are available to educators free of charge when they attend a workshop. Information about upcoming workshops are available on the ODNR Website. In the activity ***Surprise Terrarium***, students use a classroom terrarium to observe animal behavior and interactions.

Appendix C

Sample World History Curriculum

Ohio's New Learning Standards: K-12 Social Studies

Ohio | Department of Education

Modern World History

Theme	***This course examines world events from 1600 to the present. It explores the impact of the democratic and industrial revolutions, the forces that led to world domination by European powers, the wars that changed empires, the ideas that led to independence movements and the effects of global interdependence. The concepts of historical thinking introduced in earlier grades continue to build with students locating and analyzing primary and secondary sources from multiple perspectives to draw conclusions.***
Topic	***Historical Thinking and Skills*** Students apply skills by using a variety of resources to construct theses and support or refute contentions made by others. Alternative explanations of historical events are analyzed and questions of historical inevitability are explored.
Content Statement	***2. The use of primary and secondary sources of information includes an examination of the credibility of each source.***

Content Elaborations

The use of primary and secondary sources in the study of history includes an analysis of their credibility – that is, whether or not they are believable. This is accomplished by checking sources for:

- The qualifications and reputation of the author;
- Agreement with other credible sources;
- Perspective or bias of the author (including stereotypes);
- Accuracy and internal consistency; and
- The circumstances in which the author prepared the source.

Expectations for Learning

Analyze the credibility of primary and secondary sources.

Instructional Strategies

Provide examples of primary and secondary sources related to history content being studied. Have students use a graphic organizer to help them analyze the credibility of the sources. Sources should be in multiple formats and mediums, representing differing perspectives and timeframes.

Students create a National History Day project, examining primary and secondary sources to analyze historical events to provide evidence to support a thesis. Information on Ohio History Day can be found at http://www.ohiohistory.org/historyday/.

Diverse Learners

Strategies for meeting the needs of all learners including gifted students, English Language Learners (ELL) and students with disabilities can be found at this site. Additional strategies and resources based on the Universal Design for Learning principles can be found at www.cast.org.

To help students analyze primary sources:

- Provide a highlighted document;
- Create a bulleted list of important points;
- Have students work in heterogeneous groups;
- Modify the readability of the document by inserting synonyms for difficult vocabulary;
- Provide two versions of text, one in original language and one in modified language;
- Provide students a typed transcript, often available on history websites; and
- Add captions or labels to clarify meaning of graphics and images.