



SONOMA COUNTY MUSEUM

BOTANY 12

SONOMA BOTANY

October 15, 2004 – February 13, 2005

EDUCATOR GUIDE

KINDERGARTEN – GRADE 12



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Maureen Cecil, Visitor Services Coordinator: 707-579-1500x8 or
mcecil@sonomacountymuseum.org

Hours:

Open Wednesday through Sunday 11:00 a.m. to 4:00 p.m.

Admission:

\$5 General Admission

\$2 Students, Seniors, Disabled

Free for children 12 and under

Free for members

The Museum offers free tours to school groups. Please call for more information.

THE SONOMA COUNTY MUSEUM
425 Seventh Street, Santa Rosa CA 95401
T. (707) 579-1500 F. (707) 579-4849
www.sonomacountymuseum.org

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INTRODUCTION

Exhibition content and context

GRADE RANGES: K-5, 6-8, 9-12

SUBJECTS: Visual Art, History, Science

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Traditional botanical illustration—with roots in European explorations of “the New World”—inhabits an arbitrary and capricious area in the natural sciences. At the intersection of art and science, this tradition has as much of a connection with myth and fictional notions of plant life as with careful scientific observation and analysis. Within these broad boundaries is a rich and unpredictable aesthetic space for artistic practice revealing the intimate association between the natural world and the human one.

BOTANY 12 features twelve contemporary artists from Sonoma County, the greater Bay Area and New York whose art is inspired by the natural world – specifically plant life. Assembles work that ranges from watercolors to video, from plein-air painting to installation and from a cabinet of curios to natural ready-mades, this exhibition explores the different ways we observe, catalog, record, and express our surroundings. The work is in turn fantastical, obsessive, abstract and narrative.

Meet the Artists: The following statements are from the artists to questions posed about their relation to plants and the natural world.

Rob Craigie: I really love plants. I enjoy looking at plant forms and thinking about how and why they have evolved. There is an orchid that has evolved to mimic a specific species of female bee. The orchid depends solely on the male species of this bee to be the transporter of its pollen. It is incredible to me that the two species have co-evolved—specifically a plant and an animal—to depend on each other in this manner.

It seems to me that I participate in a culture that is constantly trying to separate itself from the natural environment. I find myself often yearning to reconnect with the natural world.

The Garden Drawings create a dialogue about being intertwined with one's environment. The paper is used as a blotter for capturing experimental thinking, physical matter and the unfolding of natural processes. The drawings are created in a garden or "natural" setting. I let the events that unfold while drawing dictate the form of the drawing: an ant's pheromone trail mapped as it crawls away from a dead insect on the paper, or pollen particles that have fallen from a flower rocked by the wind.

The Garden Drawings assert the creative process as an eccentric metaphor of the scientific

process. Allowing ideas to emerge from this conflation is the foundation for each drawing's evolution. Maybe the drawings are my attempt to co-evolve with my environment-like the orchid and bee?

In *Walden* Henry David Thoreau wrote: "The intellect is a cleaver; it discerns and rifts its way into the secret of things. I do not wish to be any more busy with my hands than is necessary. My head is hands and feet. I feel all my best faculties concentrated in it. My instinct tells me that my head is an organ for burrowing, as some creatures use their snout and fore paws, and with it I would mine and burrow my way through these hills."

Pamela Glasscock: My work investigates the eloquence of plant forms; in these pieces, individual elements observed in detail--flowers, buds, leaves, fruit—are assembled in fictional gardens and abstract constellations on the paper surface. I have always found in nature the most meaningful content and seductive imagery; every day I am inspired by the challenge of painting these subjects. In presenting evidence of the marvelous and mysterious physical world, I am trying to communicate a range of emotional responses, play with implied metaphor, and

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celebrate with gratitude and amazement our relationship to the kingdom of flora.

Amanda Haas: My work is an investigation of natural materials and a mimicry of natural processes. It is my attempt to investigate how things age and decay, how time imparts reality, and how small, repetitive events result in significant changes over time. There are links to these phenomena in all organic matter and I try to record them in my artwork. My studio is a “cabinet of curiosities,” housing once-living plant life and other organic matter that cross my path from day to day. My artwork is nothing more than an attempt to create competition between my artistic process and a natural process, thereby vying for ascendancy in the struggle between the man-made and the natural world. The work starts from a materials base (wood, resin, paint, graphite, base metals, etc.) and develops into a search below and beyond and behind the surfaces. Manipulating and digging down deep into natural forms creates a context for a better understanding of man-made and natural processes.

The form my work takes springs solely from the intimate act of discovering what a material does best. I crave the feeling of insignificance in the face of the enormity of a project. The humiliation and awe I experience are a kind of addiction to my art making. With great uncertainty, I struggle to impose an idea on the material, never being sure of success until completion. Struggle is absolutely essential to my process. I seek the fear of failure, the loss of control, to assure that the odds are even between myself and my material - that the outcome of my work is uncertain. This is tantamount to my experience of contemporary existence and our modern culture. When small, fleeting events of natural process (that illustrate a sense of chance or of loss) become trapped within my art, they are connected to a calmer, long-term view of existence.

Tony King: One of the great pleasures of painting the natural world is the element of surprise and discovery, not only of new images, but of expanded perceptions. My original interest in palms was stimulated by a fascination of the

form of the Canary Island palm - a near-perfect sphere atop a great stalk. The first palm paintings were more portraits of graceful frond heads than landscapes, but as the series has grown, I have become equally intrigued with the stage below. Palms are California icons (appropriately, non-native except for one species). Those who planted them early last century are gone, as are many of the houses that stood beneath them. These plants have become passive markers above an ever-changing environment and culture.

William O’Keeffe: Natural history as source material for my paintings has always been a religious interest. However, a major change in my perception of the natural world came when I was studying and cataloging flora and fauna for the Burren Wildlife Foundation in County Clare, Ireland. Influenced by the minutiae of decay, rot, and the inherent grace of natural forms, I started using organic material and other matter to create abstract works that are emblems for the intricacies and delicate balances that govern the mutual influence of each organism and its environment. I am still pursuing and respecting the rich sensuality of this natural world.

By using acrylic gel as a binder, I am able to incorporate natural pigments, bones, organic matter, sand, earth, wax, hair and paper into the work to create what I refer to as “Dreaming Landscapes.” Ancient, historical, derelict—these landscapes are scarred, etched, corroded, and abstract; they are born out of feelings and observation of nature at work and do not represent any specific place or object.

I ask and hope that my work will give the individual the impetus to observe and discuss the natural world from an alternative perspective. The landscape with its unique commingling of the fertile and the barren, the wild and the domestic, the visible and the invisible, the vast and the intimate, deserves to be thought of as the soul of our existence. We owe the place that we inhabit respect, courtesy, and reverence. We should all have some practical knowledge of nature’s domain.

Philip Ross: When I was about ten years old, during summer vacation, my family stopped to

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visit Three Mile Island while on route from some place to another. This was a few years after the near meltdown of their core rods, and we all wanted to witness in person the spooky cooling towers we had seen quite regularly on TV. We stood in the viewing area, on the opposite side of the river from the towers, and solemnly gawked. I remember that there was a neat row of recently planted trees in the sightline between the viewing platform and the towers, lovely flowering trees that partially obscured the base of the nuclear power plant. It was painfully obvious that this was part of some PR campaign, an attempt to neutralize the iconic image of those towers. It made the feelings of remorse, dread, whatever the sentiment that near nuclear meltdown evokes, just a little more difficult to experience. This was my first overt recognition of the power of landscape as an aspect of language. Much of my artwork has been centered on the pursuit of understanding this: the use and ability of nature to exist as a function of language.

For a long time I made art using highly artificial materials to make objects that looked "natural". I desired a transcendent, or at least deeper connection to the living world, but always felt that I was experiencing a construction of syntax, conditions, and idioms. Often, while on walks in the woods I would feel frustrated, wanting more than an aesthetic experience, but uncertain how I might find a way of understanding nature as something more than a subjective or artificial construction. While working as a chef at a camp I was taken along on a mushroom hunt one day by a friend. This changed everything for me. It gave a purpose and intention to being in the woods. In order to become a better hunter I had to become educated about the environment in which the mushrooms came into being. While becoming familiar with woodland ecology I also started to grow things in my studio, using living organisms to create objects that were of obvious human origin. This involved building a clean room and teaching myself the protocols for sterile tissue culture. The crux of this is creating an environment in which everything but the specific organism you are working with is neutralized or killed. This was in such stark contrast to the experiences I was having in the woods, yet it is the most successful tool that

seems to exist for the study and nurturing of the organisms we choose to grow.

The piece I have included in Botany 12 has evolved from this process of learning and making work. It is a self-contained, battery powered survival capsule for one living plant. A series of glass enclosures provide a controlled hydroponic environment; the plant's roots are submerged in nutrient-infused water, while LED lights supply the necessary illumination. In it I hope to make the plant's physiology fully viewable while also showing the technology and resources necessary when a living thing is cut off from the rest of the world.

Stephanie Syjuco: Part of my job for several years involved scientific illustration for a museum, and I was shocked to discover how much artifice can go into stylistically diagramming nature. To be blunt, it's not so much the natural world that interests me, but rather the ways in which we have traditionally depicted it--projected upon it, really--that I find fascinating.

Traditional botanical drawing especially has come to embody a kind of romantic and yet scientific viewpoint in depicting natural objects. The ways in which nature is drawn show more about the psychology of the human species than they do about nature itself, which becomes more a set of characters in a scientific passion play.

Specifically with "Comparative Morphologies," I wanted to use the familiar visuals of 19th century traditional botanical prints but skew the subject matter and make parallels to how the 21st century is inclined to romantically think about technology and "progress"--perhaps showing how we have "naturalized" gadgetry and even blurred the boundaries between the natural and artificial. I did not intend to depict this as either positive or negative. I'll leave that up to the viewer to decide.

Rachel Urkowitz & Lisa Oppenheim: The "World of Plants" arose from an interest in orchids as both a natural and cultural phenomenon. We try to incorporate our different approaches into an organic collaborative process that builds on itself, like sediment, or the sediment of history, as Robert Smithson might

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say. We're interested in the fictions that arise from a set of so called facts, whether they are phenomenal (physical, perceptual) or historical. The distinction between the natural world and the world of human production is one of these fictions: forests are razed and re-planted; species of plants are produced through cross breeding, and now, genetic modification; nature is created and altered according to aesthetic or corporate desire. In this sense, the natural world becomes haunted by human intervention. The orchid is just such a ghost.

Collaborating with Lisa Oppenheim, using highly mediated, contained examples of nature as our subject matter, asks questions about the ways in which nature and cultural construct one another. The history of the breeding of orchids, for example, cannot be separated from their history as colonial commodities.

The metaphors associated with the orchid are endless, often contradictory, but always tie back to a certain anthropomorphism, and an underlying idea that nature is both inevitable and willful (much like human progress). We try to demystify the category of nature, exploring the ways in which the idea of the pristine or the untouched, usually connected to some notion of the past, has never been.

Kathryn Van Dyke: From the time I was 3 years old I remember the light where I lived. Smells of the earth, of humid or dry air, lake water and steamy summer rain, along with the colors and textures of nature, permeate my memories. I lived on a bluff above Lake Michigan next to five acres of woods. Many of my daytime hours were spent exploring outside. Early on I noticed and began to understand and process the language of our natural world. It became a part of the structure I use to see, make sense of, and communicate with the world. My work comes directly from these early experiences.

By working with material that originates in the natural world, I hope to amplify, through focused attention, the importance of and also, the miraculous nature of, the natural world. Ultimately, my hope is to inspire in some way, a

love for nature and culture, along with a healthy respect for our life here on earth.

Victoria Wagner: In my art practice and my teaching curriculum the systems of the growth, function and form have been an inspiration and mechanism for exploration for many years. Nature's design has provided me with the tools to explore simplicity within complexity. I do not mean to sound arbitrary, but within each rudimentary movement in nature a symphony of articulation in speed, color and shape exist. In my studio work I try to isolate the modes of color, pattern and movement into one simple and readily available arc so that they become a harmony that can be taken in immediately and sentimentally. My paintings are an assumed happenstance of a passing moment in nature's history.

As you read this time has become a commodity.... meaning that whatever exists outside your window exists only within the window of time that you have made available for it. Your children grow older and your plants wither and wilt and a world of wonder grows and responds to nature's call. There is a chronicle of nature's history going on simultaneous to your growing older and as benign as it seems, it is a monument to what follows. The layers of our earth are a testament to what has been collected as winds blow away on other continents. In creating awareness to the systems beneath our feet, my work hopes to open a dialogue about what we have seen and what we may have missed. I seek to create the temporal and decomposing forms that comprise our botanical system, thereby bringing attention to their fragility in the event that they are remiss.

Bill Wheeler: Why am I a plein air painter? It is because the four walls of my studio are too confining. I can paint for only so long out of my head. Then my paintings become forced, stilted, and artificial. Nothing can replace the exhilaration of painting outside, whether it be the emerging Irises of Spring, the immodest Roses, the climbing Morning Glory, or the golden hills of parched grass, the windrows of Cypress, or a myriad of other Botanical subjects which invite me to unlimited improvisation and inspiration.

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Plein air painters have gotten a bad rap in the contemporary art world, connected to the stereotype of the Sunday Painter. For the modernist it is all too often either the totally abstract or “in your face” Photorealism, both of which miss the point. For me it is more to use the Botanical world as a reference. I draw inspiration from it, including the mystery, depth, and beauty of the abstract, while still retaining elements of the recognizable, reflecting not so much what the botanical subject looks like, but what it IS.

Adam Wolpert: Plant life became a major source for my work after I moved to Sonoma County ten years ago and began living and working on an organic farm and nature preserve. I spend time almost every day with plants: observing, painting and caring for them. Plants appeal to every sense and sensibility. They give us scent and sustenance, they enliven our environment and provide a foundation upon which all of the myriad creatures can grow and express themselves. For me, plants are an endless source of formal fascination. Every color and gesture, texture and juxtaposition can be found in

the plant world. With my botanical paintings I always work directly, observing and painting plants out in the field. I am as concerned with their gestures, vibration and their effect on the atmosphere around them as I am with their anatomy.

As we struggle to address the daunting challenges we face today, we must make a shift from a fragmented to a holistic perspective in order to reconnect with the web of life of which we are a part. I believe that one of the fundamental problems of our time is erosion of connectivity and a scarcity of relationship, to each other and to our environment. One important step towards this shift is a return to our relationship with plants through gardening and farming, through wild land restoration and even through painting. Plants are the great connector linking people and animals to each other, the soil, water and very air we breathe. My paintings are a small part of this discussion, this cultivation of relationship, this aspiration to recognize, appreciate and learn from these ancient teachers.



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Life in Sonoma County is inextricably entwined with the land. The county’s agricultural history includes stories of European and American settlers, as well as today’s “Wine Country” tourist economy. The contemporary emphasis on sustainability and preservation points simultaneously to an ancient understanding and a progressive view of the connections between the botanical world and the human one.

Sonoma Botany explores the themes of cultivation and preservation in Sonoma County history and culture through twelve plants whose impact has been significant. Among the dozen are species that sustain native cultures, cash crops that form the region’s economic foundation, and plants threatened with extinction that have mobilized preservationists and slowed development. Woven into the story of these plants are the lives of Milo Baker, Sonoma County’s most influential botanist and Luther Burbank, Santa Rosa’s famed horticulturalist.

Luther Burbank (1849-1926)

People have played both a purposeful and unconscious role in shaping plant life across the centuries but Luther Burbank, one of the most prolific horticulturalists, took agrarian know-how and transformed it into something new.

The son of a New England farmer, Burbank made his way to California in 1875. He settled in Santa Rosa, where his brother Alfred lived, and set about establishing himself as a plant breeder and nurseryman. Largely self-educated, Burbank brought with him some early experience and success. Most notably, he discovered a seed-pod on an early rose potato plant, leading him to develop a new variety, which he sold for \$150.

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Inspired by his new home, which he famously referred to as the “chosen spot of all the earth as far as nature is concerned,” Burbank built his plant business, developing a prodigious number of new fruits and flowers and improving countless other plant stocks for cultivation. Through his catalogue, *New Creations in Fruit and Flowers* (first issued in 1893) Burbank became internationally famous and crafted his image as something more than a simple nurseryman.

As his reputation grew, Burbank was criticized by scientists who pointed to exaggerated claims and what they considered an unscientific approach. Burbank had not set out to be a pure scientist, but his efforts at self-promotion and his public popularity left him open to attack. While some leading minds of the day were able to separate Burbank from his image and arrive at a balanced view of his career, disdain from segments of the scientific community continued throughout his life. Yet his reputation among the general public rivaled that of contemporaries Henry Ford and Thomas Edison, both of whom visited him in Santa Rosa in 1915.

Despite controversies about his methods, Burbank’s talent with plants was undeniable. Employing what he described as “intuition,” Burbank accelerated and guided the natural processes of evolution, selecting and breeding, crossing and re-crossing plants on a massive scale. According to knowledgeable observers, his greatest talent was selection. Amidst hundreds of similar plants he could quickly identify those that showed promising traits or variations. His legacy is a long list of contributions to the plant world, from dozens of plum varieties to the spineless cactus. Beyond that, he aroused the imagination of an entire generation as to the connections between humans and plants. His work bridged a gap between early genetic scientists and farmers working the land, looking for the most prolific and profitable crop to plant in the soil.

Milo Baker (1868-1961)

Milo Baker, a Santa Rosa Junior College professor, was one of the most respected botanists in California. Between 1931 and 1958, he compiled the most significant and comprehensive catalogs of regional plant life, collecting and identifying 15,000 specimens. Of these, 2,717 different plants were collected between Santa Rosa and the Oregon border. This collection is now part of the North Coast Herbarium at Sonoma State University.

A native of Iowa, Milo Baker came to California as a child. After graduating high school, he accepted a teaching position in Modoc County, walking 100 miles to assume the post in 1887, collecting his first plant specimens along the way. He soon began a lasting correspondence with E.L. Greene, the first plant taxonomist at UC Berkeley, and went on to study botany under professor Greene. After teaching high school in San Francisco, Baker moved to Kenwood in 1901, where he spent the next 21 years farming his Kenwood ranch. During that time, he earned a Masters degree in botany from Stanford University. In 1922 he joined the SRJC faculty.

Baker initiated a biennial wildflower show, attracting botanists from all over Northern and Central California. In the 1920s and 1930s, during the month of April, he would take students in his Model A Ford on scouting trips. The day before the show his students collected wildflowers and he would spend the night classifying them. After his retirement in 1945, Baker remained curator of the North Coast Herbarium and served as the president of the California Botanical Society. He taught occasionally, presiding over his last field botany class at the age of 90.

For Baker, botany was a lifelong pursuit for knowledge and, as he put it, “undertaken for the sheer pleasure of finding out what seed plants grow in this vast and varied region.” In the weeks before he died at age 92, he was looking for someone to join him in collecting violet seeds from Alaska’s mount Whitney. SRJC honored him with the naming of Baker Hall, as did the local organization of the California Native Plant Society, which became the Milo Baker Chapter.

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Apocynum cannabinum

Dogbane or Indian hemp, *Apocynum cannabinum*, is an herbaceous perennial which grows along streambeds and ponds, in springs and seeps, and, most vigorously, in open, seasonally flooded fields. It can be found across North America but is extremely localized. A single, three-acre plot of dogbane located in Santa Rosa is perhaps the most important in the entire state of California.

Historically, Native Americans used dogbane fiber to weave netted bags, fish nets and snares, tumplines, dresses and bowstrings.

Contemporary weavers carry on the traditions of collecting, processing and weaving with dogbane fibers. Favored for its dark color, quantity, quality and accessibility, Santa Rosa dogbane attracts gatherers from numerous tribes and ethnicities throughout the western United States.

After the first frost, gatherers collect the dead stalks. They usually scrape the stalks, then crack them lengthwise and carefully pull out fibers from the plant's woody core. Gatherers roll the plant material between their hands to loosen and soften the fibers. Finally they roll the fibers between their fingers or between their hand and leg to produce a length of very durable cordage.

Once the largest single continually used gathering site in the country at over 27 acres, Santa Rosa's bed of dogbane has been reduced in recent years to a three acre plot. Preservation of the Santa Rosa bed, under the direction of the Sonoma County Agricultural Preservation and Open Space District, has deep and far reaching significance. Perhaps used as a gathering site for many centuries, this unique stand of dogbane holds a special meaning for native gatherers. Members of the Native American community, in conjunction with the Open Space District, continue to work to maintain the site and are currently engaged in efforts to educate youth in the preservation and use of traditional resources.

Avena sativa

Avena sativa is a cultivated "old-world" oat introduced to California accidentally. Exactly when and how it got here is unknown, but the oat joined a multitude of exotic grasses that now dominate portions of the California landscape.

The arrival of Europeans in North America changed the landscape in many ways. The oat is one representative of a dramatic shift in California botany. When annual grasses from the "old world" were introduced, they quickly overcame the native, perennial bunch grasses, which thrived throughout this region. The golden summer hillsides, one of California's definitive landscapes, are in fact partly a European construct.

A botanical analysis of bricks from Mariano Vallejo's Petaluma adobe revealed that *Avena sativa* likely grew in Sonoma County prior to 1836. That year, Vallejo enacted a treaty prohibiting the Native American practice of burning grass fields. The grasses were too important to Europeans as a food source for their cattle and livestock. The alteration of Indian land management techniques, whether through treaty or the decimation of Native populations, hastened changes to the natural environment.

Early Americans arriving in Sonoma County frequently commented on the impressive expanses of oat grasses – that they grew higher than a man's head. The first farmers were excited by the prospects of growing grain in these fertile valleys. Their instincts were correct as grain crops, including oat hay, became one of the earliest important cash crops in Sonoma County. At its peak, in 1870, the county's harvest reached 1,300,000 bushels.

Blennosperma bakeri

Sonoma Sunshine, *Blennosperma bakeri*, is a small, daisy-like yellow flower, related to the sunflower. The plant thrives in vernal pools, the seasonal wetlands which occur through winter rains and dry out in the spring. The flower grows only in Sonoma County and, along with local natives Sebastopol Meadowfoam and Burke's Goldfields, is listed as rare and endangered. Local botanist Milo Baker discovered *Blennosperma bakeri* in 1946.

Sonoma Sunshine became controversial in the 1980s and 1990s when its rarity forced developers to alter construction plans throughout the county. Urban expansion and

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agricultural practices were damaging vernal pools. State and Federal laws protecting seasonal wetlands and endangered species forced controversial changes. Mitigation efforts are now required of anyone encroaching on vernal pools. Developers must either protect an existing pool, relocate it, agree to assist in general preservation to compensate for the destruction of a pool, or even help create an artificial habitat.

Currently, not enough is known about artificial pools to gauge their long-term viability. Besides wildflowers, vernal pools sustain endangered animal species such as the red-legged frog, the fairy shrimp, the Western spadefoot toad, the Ricksecker water scavenger beetle and the Loggerhead Shrike (bird).

Camassia quamash

A member of the Lily family, *Camassia quamash*, or common camas, produces brilliant flowers and edible bulbs. Native Americans used *Camassia* as an important food source. In the springtime, Pomo and Miwok women would dig up the bulbs, using a hardened stick, from wet meadows where *Camassia* flourished. Cooked in earthen pits, the bulbs would take on a sweet, nutty flavor and were considered a delicacy.

Luther Burbank became interested in *Camassia*'s qualities as both an ornamental flower and a source of nutrients. He began collecting and hybridizing wild forms of *Camassia* as early as 1890, and wrote "there exists a tribe of plants ...of which we have hitherto made no mention, that possess qualities of flower-bearing of a high order, combined with the capacity to produce roots of such quality of edibility as to suggest competition with our best tuber bearers, including the potato itself."

By crossing various species, Burbank was able to produce bulbs of up to five inches in length, whereas the largest bulb of a wild plant measured, according to Burbank, only two inches. Despite his enthusiasm, *Camassia* never surpassed the potato in popularity, or even caught on as a food source. The story of *Camassia*, however, points to a plant whose historical uses are no longer common and demonstrates Luther Burbank's willingness to experiment with unusual plant varieties.

Carex barbarae

Sedge, also known as white root, is a grass-like plant with long, underground stems, called rhizomes. Sedge grows from Ventura County in Southern California to southern Oregon, thriving in riparian areas, moist places along streams or on slopes, bordering marshes and on valley flats that are wet in the spring.

Sedge is vital to Native Americans, who use the long, white rhizomes for the sewing strand in coiled baskets. Sedge is harvested, split apart, and the bark stripped from the rhizomes. The basketry material is then stored and allowed to dry. Before use it is soaked until flexible and then carefully trimmed for uniformity.

For centuries Native peoples of Sonoma County used baskets for routine activities such as food gathering and preparation, as well as for special occasions including sacred rituals. In recent years, a number of master weavers have been at the forefront of preserving native basketry skills, and the traditional culture associated with basket making. Notable among them are Annie Burke, a Cloverdale Pomo, and her daughter Elsie Allen. The two women departed from tradition by teaching non-family members their art, but also spread knowledge and appreciation of Pomo culture and its highest art form.

In the late 1970s native weavers fought to preserve their traditional basket materials. The construction of the Warm Springs Dam and creation of Lake Sonoma threatened to destroy important sedge beds. A group of weavers including Lucy Smith, Mabel McKay and Laura Somersal, among others, worked with the Army Corps of Engineers to transplant and preserve sedge beds.

Humulus lupulus

The hop, *Humulus lupulus*, grows as a vine and produces spikes of green flowers shaped much like small pine cones. At the base of the flower, known as a "bract," is found the lupulin, a yellow substance that gives a hopped beer its distinctive flavor.

Amasa Bushell and Otis Allen introduced hops to Sonoma County, harvesting their first crop in

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1858. Within a few years, hops generated over a million dollars annually in Sonoma County. During the boom times, particularly the early 1880s, Santa Rosa was a national leader in hop production.

Perhaps more than other crops, the hop harvest took on social significance. Because hops are extremely perishable, there is only a thirty-day window for bringing in the crop. This urgency lent a unique sensibility toward hop picking, and by the end of the 19th century the harvest was a competitive sport, with pickers literally racing against one another. Hop pickers crossed a wide segment of society. Over the years, harvests drew Pomo Indians, Chinese contract workers from San Francisco, Japanese workers from Hawaii, Dust Bowl refugees, housewives and high school students. Some hop ranchers provided land which turned into informal campgrounds, accommodating entire families.

A series of events led to the decline of county hop production in the 20th century. Prohibition hurt the local market, keeping prices down. They recovered during World War II, but declined again partly due to changing tastes that favored lighter beers without hops. The invention of a hop-picking machine by a Santa Rosa grower in 1939 encouraged a shift to larger scale operations and away from the smaller ranches of Sonoma County. Finally, soil problems caused by new irrigation practices used after World War II hastened the end of the industry. The last Sonoma County crop was harvested in 1961.

Malus sylvestri

The apple is the most widely cultivated tree fruit in the world. The apple's genetic history is long and varied, and there is still debate over which wild species are among the main ancestors of today's cultivated apple. One of the candidates is *Malus sylvestri*, the European crabapple.

When raised from seed, domesticated apples often revert close to the wild species. In other words, planting the seeds from a Jona Gold or Gravenstein may produce something similar to *Malus sylvestri* or a number of other varieties of wild apple. This variability, contained within each seed of a domesticated apple, has helped make

the fruit successful in its journey from Europe to the Americas, and from wild, to cultivated, to wild and then cultivated again.

In Sonoma County, the most important variety of cultivated apple is undoubtedly the Gravenstein. The Russians of Fort Ross introduced the Gravenstein, planting trees on the hill overlooking the Pacific Ocean. The first commercial orchard was planted by Charles Julliard in 1875. In the 1880s, orchardist Nathaniel Griffith proved the apple's viability as a commercial crop, earning himself the nickname "Grandfather of the Gravenstein." By 1910, the inaugural year of the Gravenstein Apple Fair, the county had 5,700 acres of apples. At the 1911 fair, Luther Burbank proclaimed, "the Gravenstein apple has, above all others, proved to be the money winner in Sonoma County. It cannot be raised successfully in the hot valleys of Southern California. Sonoma County seems to be its home." By 1920 the acreage of apple orchards had increased to 27,000. By 1953, at the height of apple production in the county, the crop's value hit \$5,565,000.

Recent years have seen Sonoma's apple industry rapidly decline. In the 1990s vineyards replaced orchards at a significant rate, reducing the county's apple acreage to 4,000 by the end of the decade.

Prunus americana

The American plum, *Prunus americana*, is a deciduous large shrub or small tree with a broad crown that reaches heights of up to 15 feet. It produces round, edible fruit about 1 inch in diameter in colors ranging from red to yellow. The American plum is one of a number of species Luther Burbank used in his extensive work with plums. For instance, the Santa Rosa Plum, regarded by Burbank as one of his best, was a hybrid of *Prunus Americana*, *P. triflora*, *P. simonii* and others.

Prunes, which are simply plums suitable for drying with the pit left in, played an important role in the Sonoma County economy of the early 20th century. Warren Dutton, a successful banker from Tomales, became interested in the fruit when he saw his prune trees produce much more

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fruit than the adjacent cherry trees. He approached Luther Burbank in March of 1881, and asked him to supply 20,000 trees by fall. Considered by many growers to be an impossible task, Burbank took up the challenge. Knowing he could not succeed by conventional means, Burbank and his assistants grafted prune buds onto almond seedlings. Known as “June budding” the technique allowed Burbank to deliver 19,500 trees by December 1st. Dutton called him a “wizard,” a title that would stick with him.

Prunes soon became one of the county’s leading crops. After 1900, many farmers replaced peach trees with prune trees as the fruit was good for both drying and canning. Production increased significantly during World War I, when the dried fruit was shipped to servicemen in Europe. In 1924 Healdsburg was dubbed “Buckle of the Prune Belt” in a publicity contest. By 1936, county prune acreage reached 24,404.

Quercus lobata

The image of rolling, golden grasslands scattered with oak trees represents a classic California landscape. Of the nine species of California oak trees, the valley oak is generally considered the most grand by virtue of its size, age and beauty.

The Native Americans of Sonoma County relied on the oak tree, including the valley oak, for their main food source, the acorn. Acorns were pounded into meal or flour and made into mush, soup or bread. To encourage a greater abundance of plant foods, the Pomo, Miwok and Wappo peoples actively tended the oak woodlands. They also gave thanks to the tree for the sustenance it provided, honoring oaks in their songs, stories and rituals.

In the nineteenth century, American and European visitors frequently wrote about oak trees in their early descriptions of the region. Positive accounts of oak woodlands were so common and so similar that there is little doubt the tree played a role in attracting eager settlers to places like Sonoma County. Oaks were emblems of the now classic California landscape, and they signified fertile soil.

A typical description comes from English travel writer Frank Marryat in 1850:

...[W]e passed through the Sonoma Valley, which in many places, but a few hundred yards in width and studded with groups of oaks...has all the appearances of a private park.

Over the last 150 years valley oaks, which thrive in the deeper, wetter soils of the lowlands, have been threatened by agricultural and residential development. The pumping of groundwater has lowered the water table leaving many valley oaks stunted, and efforts are underway to preserve these “urban oaks.” While the valley oak has proven resistant to threats such as sudden oak death, it is vulnerable to continuing development. Without education and careful management the valley oak, truly a symbol of California heritage, could be lost.

Sambucus mexicana

Blue elderberry, *Sambucus mexicana*, is a common shrub, found throughout North America. In California, it typically grows in the understory of riparian woodlands and produces blue berries with a waxy coat.

Elderberry is a culturally significant plant to Native American tribes in California and is used traditionally today. The dried branches have a soft, pith center which is hollowed out to make clapper sticks and traditional flutes. Clappers are used ceremonially by Native tribes, including the local Coast Miwok and Pomo. The soft central pith also makes the dried elderberry stalk an ideal fire drill for igniting fire in the traditional manner. Elderberry flowers and berries are also harvested for traditional uses. By gently shaking the stalks, the flowers are collected in baskets. Then they are dried made into a tea used to reduce fevers and treat flus and colds. Berries are also dried over winter and used in jams, jellies and pies. Special care is taken in the preparation of elderberry foods and medicines as all green parts of the plant are toxic and fresh berries can cause nausea.

Gathering elderberry can be a challenge for Native Americans and others who harvest. In some places it is illegal to gather the elder plant due to the presence of the elder beetle, an

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endangered species. Since the beetle does not live above 2000 feet elevation, many gatherers collect the plant from the Sierra Nevada foothills and mountains.

Sequoia sempervirens

Sequoia sempervirens, the Coast Redwoods of California, are the tallest trees in the world. Redwoods grow three to five feet per year and live to be many hundreds of years old, some live to several thousand years.

People have long admired the redwood tree for its majesty and practicality. For centuries, Native Americans used redwood bark as a material for many things, including shelter, clothing, and toys. When Euro-Americans moved west in the 1800s, they needed raw material for homes and communities. Redwood timber was the most desirable of all the lumber along the north coast of California. In addition to its massive size, the redwood was – and remains – highly valued for its sturdiness, workability and resistance to pests.

In the nineteenth century, timber harvesting became the top manufacturing industry in the west. The earliest known commercial sawmill on the North Coast was Captain Stephen Smith's steam-operated mill, which he shipped into Bodega Bay in 1843. The first logging operations were west of Healdsburg by Mill Creek and in the Big Bottom region of the Russian River. By the 1880s sawmills in the timber regions of Sonoma County turned out 30,000 feet of lumber per day.

The redwood later became an emblem used to promote the northbay region. In 1921, North coast county officials, concerned over the lack of state and federal funds being spent on roads, formed what became the Redwood Empire Association. The organization lobbied for the construction of a new highway, the Redwood Highway, which opened in 1924. The lure of redwood forests north of San Francisco also helped to encourage more tourism in Sonoma County and other destinations to the north.

Since stands of old-growth redwood were severely depleted due to years of logging, balancing the intrinsic and promotional value of preserving the ancient trees with issues of economics and private property is a controversial and on-going issue.

Vitis vinifera

The wine grape, *Vitis vinifera*, is the major species of grape, accounting for over 90% of world production. *Vinifera* grapes are thought to have been domesticated approximately 5000 years ago in the Middle East. They require a long growing season, high summer temperatures, a dry ripening season and a mild winter.

The Russians at Fort Ross were the first to plant vines in Sonoma County in the early 1800s, followed by the Mexican padres who planted grapes at the Sonoma Mission. These early varietals, or grape types, produced local table wines but were not highly sophisticated.

In the mid 1800s European immigrants introduced traditional grape growing and winemaking techniques from the “old country,” transforming Sonoma County's wine industry. In 1857 Count Agoston Haraszthy, a Hungarian nobleman, planted Zinfandel and Tokay cuttings in the Sonoma Valley. He returned to Europe to study winemaking and in 1862 wrote *Grape culture, Wines and Winemaking*, which became an indispensable resource for California vintners.

Phylloxera (a kind of louse), the depression of the 1870s and Prohibition from 1920 to 1932 came close to ending Sonoma winemaking. By planting disease resistant grapes, temporarily switching to other crops and exploiting loopholes in prohibition law, Sonoma county winemakers found ways to survive. By the 1970s wine consumption in the United States was gaining in popularity. The trend continued such that premium wine production is now the leading agricultural pursuit in Sonoma County.

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VOCABULARY

abstract	Artwork in which the subject matter is stated in a brief, simplified manner. Little or no attempt is made to represent images realistically, and objects are often simplified or distorted.
aesthetics	A branch of philosophy; the study of art and theories about the nature and components of aesthetic experience.
background	The part of the picture plane that seems to be farthest from the viewer.
balance feeling of	The way in which the elements in visual arts are arranged to create a equilibrium in a work of art. The three types of balance are symmetry, asymmetry, and radial.
collage	An artistic composition made of various materials (e.g., paper, cloth, or wood) glued on a surface.
composition	The organization of elements in a work of art.
content	Message, idea, or feelings expressed in a work of art.
contour drawings	The drawing of an object as though the drawing tool is moving along all the edges and ridges of the form.
contrast	Difference between two or more elements (e.g., value, color, texture) in a composition; juxtaposition of dissimilar elements in a work of art; also, the degree of difference between the lightest and darkest parts of a picture.
cool colors	Colors suggesting coolness: blue, green, and violet.
figurative	Pertaining to representation of form or figure in art.
foreground	Part of a two-dimensional artwork that appears to be nearer the viewer or in the front. <i>Middle ground</i> and <i>background</i> are the parts of the picture that appear to be farther and farthest away.
gouache	A painting medium similar to watercolor but opaque instead of transparent.
impasto	A thick or lumpy application of paint, or deep brushstrokes (as distinguished from flat, smooth brushstrokes).
installation art	The hanging of ordinary objects on museum walls or the combining of found objects to create something completely new. Later, installation art was extended to include art as a concept.
middle ground background.	Area of a two-dimensional work of art between foreground and

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mixed media	A work of art for which more than one type of art material is used to create the finished piece.
mood	The state of mind or feeling communicated in a work of art, frequently through color.
movement	The principle of design dealing with the creation of action.
multimedia	Computer programs that involve users in the design and organization of text, graphics, video, and sound in one presentation.
nonobjective	Having no recognizable object as an image. Also called <i>nonrepresentational</i> .
organic	Refers to shapes or forms having irregular edges or to surfaces or objects resembling things existing in nature.
plein air	Plein-air painting comes from the French “en plein air” meaning “in the open air.” The terms was widely used to describe French Impressionist painters in the 19 th century who broke with the tradition of painting in studios to paint outdoors – paint what they saw in nature.
ready made	Term for an object chosen by the artist from a different context, e.g. a vacuum cleaner or an advertising image, and incorporated into an art context.
still life	Arrangement or work of art showing a collection of inanimate objects.
texture is	The surface quality of materials, either actual (tactile) or implied (visual). It is one of the elements of art.
warm colors	Colors suggesting warmth: red, yellow, and orange.
watercolor	Transparent pigment mixed with water. Paintings done with this medium are known as <i>watercolors</i> .

Many of the definitions from California State Standards in the Visual Arts.



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SAMPLE ACTIVITIES

NATURE JOURNAL – Nature Journaling is regular recording of observations, perceptions, & feelings about the natural world. Nature journaling is a link between artistic skill, scientific analysis and creative expression. Through careful observation, students sharpen their sense of perception.

Materials



-  paper
-  drawing tool: pencils, pens (any combination)

Ideally, students will be able to work on their nature journals outside. If you have a school garden, this might be a perfect place to work. Students can also work indoors, looking out a window. Do a series of one-minute drawings and record your observations.

-  Pretend you are a scientist, carefully recording the world around you. Record what you see.
-  Remain calm and quiet while observing. Breathe slowly and concentrate on the details around you.
-  Spend exactly one minute observing and drawing a particular thing (a tree, a group of flowers, a bug crawling on a leaf). Be as specific and precise as you can. Draw exactly what you see.
-  Describe the scene (or the thing) you have just drawn without making a judgment. Write something that refers to the season, time of day, place of sighting to make the setting and identify the circumstances for the drawing.

BOTANY 12 / Sonoma Botany references: Read Rob Craigie’s description of his Garden Drawings. Pay special attention to his work in the exhibition. Also, be sure to look at the pages from Milo Baker’s field notebooks in the upstairs galleries.

POETRY WRITING ACTIVITY—Ask students to bring in an object to class – ideally a plant-related object. Place all the objects on a table and ask students to walk up to the table and pick any object but the one they brought to class. Then ask students to:

-  Spend 10 minutes carefully observing the object and brainstorming as many words or phrases that come to mind. Remind students not to think too hard but to write (almost automatically) what comes into mind.
-  As homework: ask students to write a poem using the brainstormed words and phrases. Students should not take the object itself, but should work directly from their recorded observations and from memory.

Group discussion: Ask students to read their poems out loud. Lead a class discussion about the poetry writing activity. How did the process of observing and writing affect your understanding of the object? What were the differences between observing with the object in front of you (brainstorming) and writing from your notes and memories of the object?

*This activity can be enhanced by having students do a drawing exercise in addition to writing. Contour or blind contour drawings work particularly well.

BOTANY 12/Sonoma Botany references: Pay special attention to the “cabinet of curiosities” in Amanda Haas’s installation (how do we use objects to inspire memory?).

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Botanical Gardens, Botany, Gardening and Curriculum Information

California Native Plant Society K-12 Educational Resources: http://www.cnps.org/links/teacher_links.htm

Jane Goodall Institute's web-based curriculum: Roots and Shoots: <http://www.rootsandshoots.org/>

Education Programs at the New York Botanical Gardens: <http://www.nybg.org/edu/>

Royal Botanical Gardens, Kew: <http://www.rbgekew.org.uk/>

Smithsonian Institution, Department of Botany: <http://www.nmnh.si.edu/botany/>

United States Botanical Garden: <http://www.usbg.gov/>

San Francisco Botanical Garden: <http://www.strybing.org/>

Occidental Arts and Ecology Center, Programs and Services including arts programs and school garden programs: www.oaec.org/OAEC_Services.html

Master Gardeners of Sonoma County: <http://cesonoma.ucdavis.edu/Gardener/index.shtml>

Kids Gardening Website: <http://www.kidsgardening.com>

School Garden Network of Sonoma County: <http://www.schoolgardens.org>

Other botany-related exhibitions

Cornerstone Festival of Gardens: Sonoma: <http://www.cornerstonegardens.com/>

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The Drawing Center – exhibition: “Ocean Flowers”: <http://www.drawingcenter.org/ocean.htm>

Louisiana Museum of Modern Art – exhibition: “The Flower as Image”: <http://www.louisiana.dk/>

Sonoma Botany resources

Luther Burbank Home & Gardens: <http://www.parks.sonoma.net/burbank.html>

Natural Resources Conservation Services plant database: <http://plants.usda.gov/>

Calflora – information on wild California plants for conservation, education and appreciation:
www.calflora.org.

California Indian Basket Weavers Association: www.ciba.org

California Native Plant Society, Milo Baker Chapter: <http://www.cnpsmb.org/body.html>

Sonoma County Agricultural Preservation and Open Space District: <http://www.sonoma-county.org/opensp/>

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SAMPLE RELATED STANDARDS

VISUAL ARTS

1.0 ARTISTIC PERCEPTION

Processing, Analyzing, and Responding to Sensory Information Through the Language and Skills Unique to the Visual Arts

Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

2.0 CREATIVE EXPRESSION

Creating, Performing, and Participating in the Visual Arts

Students apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art.

5.0 CONNECTIONS, RELATIONSHIPS, APPLICATIONS

Connecting and Applying What Is Learned in the Visual Arts to Other Art Forms and Subject Areas and to Careers

Students apply what they learned in the visual arts across subject areas. They develop competencies and creative skills in problem solving, communication, and management of time and resources that contribute to lifelong learning and career skills. They also learn about careers in and related to the visual arts.

LANGUAGE ARTS

WRITING

2.0 Writing Applications (Genres and Their Characteristics)

Students write compositions that describe and explain familiar objects, events, and experiences. Student writing demonstrates a command of standard American English and the drafting, research, and organizational strategies outlined in Writing Standard 1.0.

LISTENING AND SPEAKING

1.0 Listening and Speaking Strategies

Students listen critically and respond appropriately to oral communication. They speak in a manner that guides the listener to understand important ideas by using proper phrasing, pitch, and modulation.

2.0 Speaking Applications (Genres and Their Characteristics)

Students deliver brief recitations and oral presentations about familiar experiences or interests

that are organized around a coherent thesis statement. Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0.

HISTORY / SOCIAL SCIENCE

Grade 1

1.4 Students compare and contrast everyday life in different times and places around the world and recognize that some aspects of people, places, and things change over time while others stay the same.

1.5 Students describe the human characteristics of familiar places and the varied backgrounds of American citizens and residents in those places.

Grade 2

2.4 Students understand basic economic concepts and their individual roles in the economy and demonstrate basic economic reasoning skills.

2.5 Students understand the importance of individual action and character and explain how heroes from long ago and the recent past have made a difference in others' lives

Grade 3

Continuity and Change

Students in grade three learn more about our connections to the past and the ways in which particularly local, but also regional and national, government and traditions have developed and left their marks on current society, providing common memories. Emphasis is on the physical and cultural landscape of California, including the study of American Indians, the subsequent arrival of immigrants, and the impact they have had in forming the character of our contemporary society.

3.2 Students describe the American Indian nations in their local region long ago and in the recent past.

3.3 Students draw from historical and community resources to organize the sequence of local historical events and describe how each period of settlement left its mark on the land.

Grade 4

California: A Changing State

Students learn the story of their home state, unique in American history in terms of its vast and varied

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geography, its many waves of immigration beginning with pre-Columbian societies, its continuous diversity, economic energy, and rapid growth. In addition to the specific treatment of milestones in California history, students examine the state in the context of the rest of the nation, with an emphasis on the U.S. Constitution and the relationship between state and federal government.

4.1 Students demonstrate an understanding of the physical and human geographic features that define places and regions in California.

4.2 Students describe the social, political, cultural, and economic life and interactions among people of California from the pre-Columbian societies to the Spanish mission and Mexican rancho periods.

4.4 Students explain how California became an agricultural and industrial power, tracing the transformation of the California economy and its political and cultural development since the 1850s.

Grade 5 United States History and Geography: Making a New Nation

5.1 Students describe the major pre-Columbian settlements, including the cliff dwellers and pueblo people of the desert Southwest, the American Indians of the Pacific Northwest, the nomadic nations of the Great Plains, and the woodland peoples east of the Mississippi River.

1. Describe how geography and climate influenced the way various nations lived and adjusted to the natural environment, including locations of villages, the distinct structures that they built, and how they obtained food, clothing, tools, and utensils.

2. Describe their varied customs and folklore traditions.

Grade 6

6.1 Students describe what is known through archaeological studies of the early physical and cultural development of humankind from the Paleolithic era to the agricultural revolution.

Grade 7

7.10 Students analyze the historical developments of the Scientific Revolution and its lasting effect on religious, political, and cultural institutions.

7.11 Students analyze political and economic change in the sixteenth, seventeenth, and eighteenth centuries (the Age of Exploration, the Enlightenment, and the Age of Reason).

SCIENCE

Grade 2

Life Science: Plants and animals have predictable life cycles.

e. *Students know* light, gravity, touch, or environmental stress can affect the germination, growth, and development of plants.

f. *Students know* flowers and fruits are associated with reproduction in plants.

Earth Science: Earth is made of materials that have distinct properties and provide resources for human activities.

e. *Students know* rock, water, plants, and soil provide many resources, including food, fuel, and building materials, that humans use.

Grade 4

Life Science: Living organisms depend on one another and on their environment for survival.

c. *Students know* many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.

Observation and Experimentation: Scientific progress is made by asking meaningful questions and conducting careful investigations.

a. Differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

Grade 6

Ecology (Life Sciences)

6. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment.

Grade 7

Evolution

3. Biological evolution accounts for the diversity of species developed through gradual processes over many generations.