



## **Time for Teaching Students about Earth Friendly Design**

The University of Oklahoma  
Graduate College

## Time for Teaching Students about Earth Friendly Design

A Professional Project submitted to the Graduate Faculty  
in partial fulfillment of the requirements for the degree of

Master of Science in Architectural Urban Studies

by

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## Acknowledgements

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Special gratitude to my family for allowing me the time to work on this when I know you often were in need of my time as well.

Leon, David and Amber you continue to bless my life and I am Grateful.

Jane, Karen, and all our family, I am honored to be blessed by your love and inspiration.

To all my friends...Let's Celebrate! I might find time to breathe now!

To everyone with TACSI and to those at Marshall Elementary much gratitude for welcoming me as I pursued ways to inspire our youth...may we all be young at heart.

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**Time for Teaching Students about Sustainability and Design**

## Introduction

With sustainability issues increasing in importance and the economic impact of the current financial situation threatening business as usual, the design field will be requiring additional knowledge and creativity from those in many disciplines, including architects and city planners. Creating enthusiasm for design in younger students will give them more years to focus on related types of study and develop the skills needed to meet additional challenges and be successful as they endeavor to improve communities and design.

## Goals and Methods

The goals that were set forth were to design a curriculum for teaching design to students, then to use the curriculum in the classroom in order to see what works best and what may need adjustments, and then to get feedback and advice in order to further refine the elements of the curriculum. There is a need for some flexibility to be built into the design in order for the curriculum to meet the needs of as many different program timeframes as possible with some being held for an hour each day and others, lasting longer. Additionally the number of days varies from school to school. There is also the need to meet the skill and concentration levels of all the students being taught through the curriculum.

In order to meet my goals I set off on a journey to learn more about teaching strategies, learning methods, and what approaches work best to insure that the teaching strategies used are relevant to the methods or ways in which the students absorb the information. The curriculum will be designed to achieve the most successful interaction possible. In order to meet the goals regarding the curriculum I had a number of objectives that would increase the amount of knowledge and skills I had, which included gaining further understanding of the mindset of the students I would be designing the curriculum for and also acquiring familiarity with age appropriate activities for the students. Upon learning about numerous innovative teaching approaches that were actually getting results I delved deeply into what these successful programs were doing and why.

The research methods included interviewing those in the fields of design, sustainability and education and studying best practices of several educational disciplines including case studies of numerous successful endeavors in the field of education.



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## Working with Tulsa Area Community Schools Initiative or TACSI

When it comes to improving communities TACSI is working hard to benefit many schools in the Union and Tulsa Public School Districts. They are seeking to improve the education students receive by building stronger communities around the schools they work with in order to increase the support children and their parents have available. When children are provided with better networks of support within their community they are more likely to excel in school.



<http://www.csctulsa.org/content.php?p=29> 4/2011

TACSI currently provides a full time coordinator to each of their fully participating schools that have reached what is referred to as the sustaining level of participation. The TACSI coordinators work to build connections between their school and the surrounding community. As stated on the TACSI website: “By sharing expertise and resources, schools and communities act in concert to educate the whole child--academically, emotionally, physically, and socially.”

When I learned that TACSI had schools wanting to provide their students with an architectural and design component during their summer camps I was enthusiastic about being able to get involved. When I realized that it would be beneficial for them to have a curriculum available to use I made it a priority to create one that is both enjoyable and informative. Working with TACSI has been a wonderful experience and I have loved seeing some of what they are undertaking in order to improve our communities.



Photo by Laura Mauck / Earth Friendly Game

During the summer of 2011, TACSI has three weeks of summer camp planned during the month of July, for students in six of their elementary schools. There will be availability for at least 62 students at each of the six schools to take part, which is a total of 372 students. In addition to the full day part of the camp some additional students will also be taking part in a program called Youth at Heart in the afternoons. I am looking forward to using the curriculum I created to teach some of the students at the full day camp about architecture and sustainable design. One of my main roles will be teaching fourth and fifth graders during the first week of the summer camp when the focus will be on literacy and the arts.

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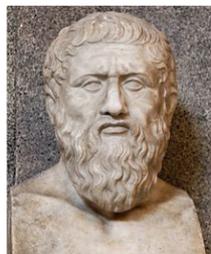
# History and Theory in Education

In order to have a background understanding of how the educational field has arrived at where it is today I studied some of the book entitled *Doctrines of the Great Educators*, by Robert R. Rusk, which discusses the history of theories in education. A number of the greatest thinkers when it comes to education are highlighted in the book, while it takes a look at the philosophies of education over the years. Starting with Plato and continuing into the 1900's one can see some of the major influences when it comes to various approaches to the meaning of education.

Being especially interested in how to improve education meant finding an interest in whom and what have been influential over the years. I found it interesting to learn a little about John Dewey. He said: "The teacher is not in the school to impose certain ideas or to form certain habits in the child, but is there as a member of the community to select the influences which shall affect the child and to assist him in properly responding to these influences." (Rusk, 1965)

I enjoyed learning more about Maria Montessori whom I found much information about that I was not familiar with, even though I felt I had a sense about her thoughts on education and have visited a school which uses her approach to education and bears her name. She did much research into how little children actually learn and through this designed a very hands-on, activity oriented type of teaching where the sense of touch was used extensively and the children learned through play designed to stimulate their curiosity. She had first gained recognition when she was able to work with children in Italy who were considered special needs, and teach them to not only pass the State examination, but to do above average on it. The success she had with these students influenced her to want to see what she could do for children without these special challenges.

Another more recent philosopher on education, which I was not familiar with, is Alfred North Whitehead who had made a couple statements that I feel deserve mentioning. "From the very beginning of his education the child should experience the joy of discovery." And then, "He summed up by affirming that in all education the main cause of failure is staleness." (Rusk, 1965)



Plato

historvofphilosophy.net



John Dewey

marxists.org

Maria Montessori



countrydayschool.net

Alfred North  
Whitehead



Dailycelebrations.com

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# History and Theory in Education

Jean Piaget is best known as a philosopher who delved deeply into subjects related to how children learn. He held the position Director of the International Bureau of Education from 1929 until 1968 and considered himself to be an epistemologist. His research involved creating new ways to study children and the learning process itself.

In Jean Piaget's book *To Understand is to Invent, The Future of Education*, a deeper look is taken at the less than obvious meanings and concerns related to Article 26 of the United Nation's Universal Declaration of Human Rights. Piaget was asked to give his perspective on the article and in true Piaget fashion we find ourselves exploring an interrelated web of what is possible, likely and for the best, when it comes to the "free" education that is a human right declared by the United Nations document.

The book covers such things as teacher shortages, a situation where there are less students interested in science than liberal arts, and the ages at which humans are able to grasp various types of learning, and the implications of at which ages things are understood in regards to how we approach providing the education that our young have been declared entitled to.

The full development of the human personality is a key aspect to Piaget's views on the potential of Article 26 and he discusses problems he finds regarding the ability to meet the expectations expressed in the article. The age at which full potential for understanding certain types of problems, like particular math problems for instance, has been found to be at least 15 or 16 meaning accuracy in determining aptitude is not fully possible until one reaches such an age.

## United Nations' Universal Declaration of Human Rights

### Article 26.

Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.

Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.

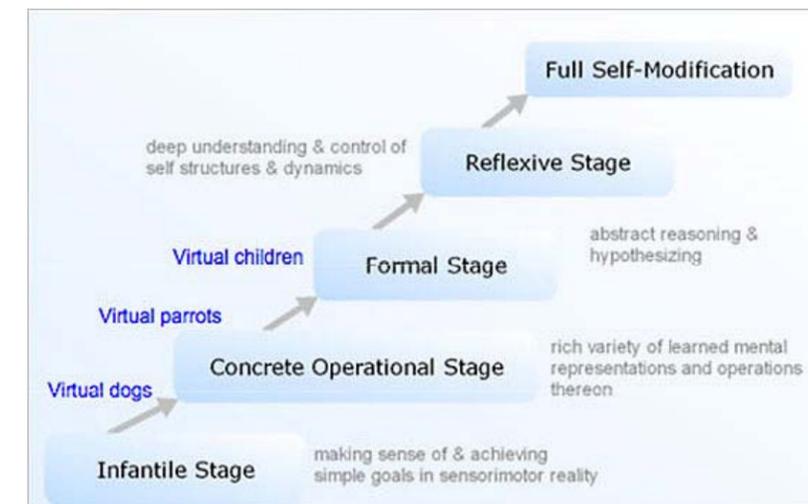
Parents have a prior right to choose the kind of education that shall be given to their children.

<http://www.un.org/en/documents/udhr/index.shtml>



notablebiographies.com

Jean Piaget's stages of human cognitive development



lifeboat.com

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## Research and Innovation in Education

Mr. Edward B. Fiske is an author, researcher and former Education Editor for the New York Times. He and his wife Helen F. Ladd, who is the Edgar T. Thompson Distinguished Professor of Public Policy and Professor of Economics at Duke University's Sanford School of Public Policy have done extensive research in other countries looking at some of the educational systems considered to be notable examples of successful approaches.

In his book, *Smart Schools, Smart Kids, Why do some schools work?* Mr. Fiske takes a most inspiring look at a variety of innovative and "successful" approaches to education reform. Through case studies that vividly describe the challenges and the triumphs of various ideas I was inspired and motivated to join the effort to make learning fun. Included are endeavors like shared decision making, co-operative learning with teacher-as-coach and student-as-worker, teamwork versus competition, Year-Round Education, Copernican Change, accelerated learning, authentic testing like using portfolios for grading, and learning communities. James P. Comer, an expert in the field, says: "Since the traditional sources of support for the child—the family, the neighborhood, social and religious organizations, nutritional and health care programs—are either fragmented or do not exist at all, the school must step into the vacuum."

I see this happening beautifully through the Tulsa Area Community Schools Initiative that has been growing for many years and now has a representative in many of our city's elementary schools. They place a community development specialist in each participating school. The TACSI representative works to find creative ways to bring the community and the school together with the goal in mind of improving education for the students by building stronger support systems. Most of the schools they work with are Title I schools where the majority of the student population is at risk due to financial and other difficulties of the families. I am happy to see this taking place as it reminds me of the saying: "It takes a community to raise a child," and I love to see our big cities finding ways to bring back the benefits of the smaller community attributes.

While I was researching what makes the difference between children simply being at school versus thriving while they are at school I was most inspired by the stories in this book of teachers, principals and other compassionate souls who went the extra mile to look at what made their students more successful, and implement very innovative approaches. Story after story brought tears to my eyes as they told of the challenges faced when trying to improve curriculum and approaches to education for the sake of their students.



Photo by Laura Mauck / School Garden at Marshall Elementary

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# Best Practice

*Best Practice, Today's Standards for Teaching & Learning in America's Schools* is a book by Steven Zemelman, Harvey Daniels and Arthur Hyde. The "Best Practice is a Philosophy—a set of harmonious interlocking principles of learning." (Zemelman, 2005)

The Seven Structures of Best Practice Teaching:

- Small-Group Activities
- Reading as Thinking
- Representing-to-Learn
- Classroom Workshop
- Authentic Experiences
- Reflective Assessment
- Integrative Units

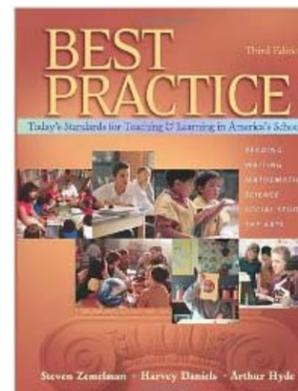
These are approaches that have been shown to work best overall when it comes to improving how well students are learning what they are taught.

People who care about how well children learn have studied the research and practices in many of the various disciplines in order to determine where the teaching methods determined to be best practice methods in each of the different disciplines are similar or have importance to the broad discipline of teaching itself.

As each discipline has taken it upon themselves to delve into understanding more fully how students learn best when it comes to their subject matter, results have given them insight into how best to teach the students in their type of classes, or studying their subject matter.

What these authors have done is to take a look at the big picture when it comes to teaching and determine in what ways the various disciplines could learn from each other in order to better meet the needs of the children in our schools.

Some of the smaller teaching disciplines also stand to benefit. Those where they may not have the manpower or finances to do the extensive research that math, science or reading teachers have been able to can perhaps gain insight from this research that could apply to them.



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## How Your Child is Smart and Classroom Instruction that Works

*How Your Child is Smart, A Life-Changing Approach to Learning* is a book by Dawna Markova, PH.D., in which she discusses the different approaches to learning that are most effective for the different learning types, which she classifies by addressing audio, visual and kinesthetic tendencies. All children are better capable of learning when time is put into discovering their particular styles of learning. It is also worth it to gain an understanding of how they best retain the knowledge they are presented with.

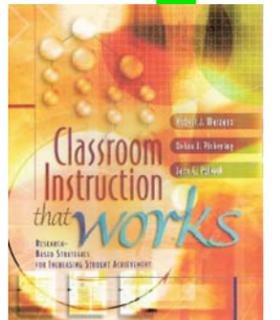
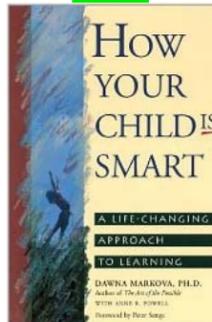
Reclaiming Your Child's Mind is a chapter in this book that starts with a quote from Albert Einstein that is worth mentioning. "It is, in fact, nothing short of a miracle that the modern methods of instruction have not entirely strangled the holy curiosity of inquiry."

Going with the Grain: Utilizing Differences in the Classroom, is another chapter which starts with a quote from Carl Jung that I'll share. "Education is not filling a vessel, but lighting a fire." (Markova, 1992)

*Classroom Instruction that Works, Research-Based Strategies for Increasing Student Achievement* is a book by Robert Marzano, Debra Pickering and Jane Pollock, in which they discuss what the research shows actually works best in the classroom. Research done in 1966 by a group headed up by James Coleman, and also research done in 1972 by a group headed by Harvard researcher Christopher Jencks both found the quality of schooling a student receives only accounts for about 10% of the variance in achievement. This meant little hope for improving education while it was taken at face value. What these researchers have done is to go back and look at an extensive number of research studies doing analysis of what the similarities and differences are in the way the studies were conducted.

After they spent much time and effort doing what is referred to as a meta-analysis, what they came to realize was that the research mentioned looked at entire schools and their ability to influence students. So although what schools could do as a whole may not show up as a large percentage, the ability of individual teachers to make a difference in the lives of students is actually quite significant.

The book covers nine strategies found to be effective including: identifying similarities and differences, summarizing and note taking, reinforcing effort and providing recognition, homework and practice, nonlinguistic representations, cooperative learning, setting objectives and providing feedback, generating and testing hypothesis, and cues, questions, and advance organizers. It is a thorough look at research into what classroom techniques work and why.



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# Tribes

Tribes is a program, in use at many schools, that is based on extensive research into learning and how a child's community, school and home are an interrelated support network for the benefit of the child's development. The addition of three social "R"s to the old "reading," "riting," and "rithmetic" is a key aspect to what they have found is important in the realm of children's ability to learn, retain and use knowledge. Their three social "R"s are Relatedness, Respect, and Responsibility.

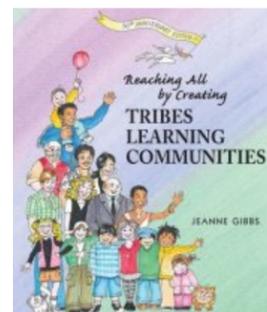
With a desire to give students the skills needed to be successful in today's world much research has been done to more fully understand the learning process. An important aspect is to look at developing the unique gifts and full potential inherent in each child.

It is in a supportive network that a child thrives best. It has been found through research that even children dealing with extreme conditions such as terrible neighborhoods and families with overwhelming problems like drug and alcohol abuse, divorce, inadequate childcare, neighborhood crime, unemployment, poverty and lack of health care can go on to be very successful. The key to their success has been found to lie in their development of resiliency.

Through the extensive research of longitudinal studies by Bonnie Benard and others it has been found that children with resilience have gone on to thrive despite dealing with the same desperate conditions of some of their peers and siblings who did not fair so well.

Attributes of the resilient child include: social competence, problem-solving skills, autonomy and a sense of purpose and future. Social competence includes pro-social behaviors like empathy, caring, communication skills and a sense of humor. Problem-solving skills include abstract and reflective thinking as well as flexibility. Autonomy includes a strong sense of independence, internal locus of control, self-discipline and self-esteem. A sense of purpose and future includes motivation to achieve, persistence, hopefulness, hardiness, a sense of anticipation and goal directedness. In a classroom with the Tribes process being used the teacher becomes a "facilitator," which by definition means "one who makes it easier."

My first encounter with the TRIBES method of improving the learning experience was at Thoreau Demonstration Academy where they had set out to implement numerous programs shown to improve schools. The hope was that other area schools would also be able to adopt these innovative approaches to education.



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## Teaching Methods in Design

The learning styles of students vary significantly with some excelling with a hands-on learning approach, others preferring the in-depth explanation approach, and some needing a demonstration of how to do the tasks in order to perform their best and gain enthusiasm. Types of activities that help students with long-term memory of the concepts include those where the student is given a chance to share what they have learned in comfortable, enjoyable and creative ways. Methods of teaching should include both individual and group projects where students go beyond mere memorization to a deeper understanding of why things are as they are. For instance, when determining the use of building materials durability needs to be considered in addition to aesthetic issues. Cost considerations need to include not only the initial cost, but also transportation of the materials, ease of installation and how long before repair and or replacement will be needed. Students should become familiar with required skills and knowledge for the various fields of design such as math for architecture and engineering, botany for landscape design and environmental careers, etc. When students understand the relevance of what they are learning it creates a better framework for them to apply themselves to the material and tasks they are presented with.

I created a curriculum for teaching about sustainable design with these things in mind and am grateful to Principal Kayla Robinson, TACSI Coordinator Amy Putman, Kristin Resendiz and the students who participated, and everyone at Marshall Elementary for the opportunity to share some joyous afternoons exploring creativity and design. From my experiences at Marshall Elementary I was able to adjust some of my thinking and plans for teaching about sustainable design in the future. I added some additional activities and adjusted the format of others. In addition my experience in the classroom was helpful in determining how long each activity would take for the age groups I am working with.



Marshall Elementary Students thinking about design



Building materials need to be considered. All photos by Laura Mauck



Marshall Elementary Students learning about design

## Time for Teaching Students about Sustainability and Design

## Sustainable Methods in Design

Sustainability is the capacity to endure. When things are done in a sustainable way nothing is used to such an extent that it will be used up and a new method will need to take its place. Sustainability is a long and unfamiliar term to many of the younger students so we start out with a look at environmental issues they are familiar with. These include the words reduce, reuse and recycle. They understand the need to reduce the amount of some things we use like water, petroleum products, many types of wood and other items that are not easily replenished. They also have learned that to reuse when possible saves having to buy something new, enabling cost savings and less use of raw products. The students are also taught about ways to recycle and some items that are easily converted back into materials that can be made into other products, or like when it comes to paper, cut down on the additional raw materials needed.

When teaching about the role of sustainability in design we start with what the students know and build on that understanding.

When it comes to building we can use sustainable approaches by reducing the use of products that come from non-renewable sources and that come from far away. By using local products when possible it reduces the amount of fuel needed to transport building materials to the site.

The reuse of building materials is an exceptional approach that has too long been minimized. When buildings are remodeled or demolished there are many materials that are still in good shape and could provide many years of use. When architects provide specifications for the use of recycled building materials this will provide incentive for more materials to be salvaged during the process of remodeling or demolishing a building. If there is not a likelihood of reuse taking place there is less incentive for anyone to try to salvage the remaining useful materials.

Recycling building materials requires time, effort, transportation and storage so there has to be a way to recoup the cost of this time and hard work, such as businesses wanting to buy the recycled products or someone ready with an immediate use. In the case of Habitat for Humanity there is a network of volunteers donating their time to both building and recycling. They also have Habitat for Humanity stores known as Restores, where the products are displayed until individuals and contractors can come buy the salvaged products.



Orgs.utulsa.edu



Restoretulsa.blogspot.com

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*Where your business helps us build for others.*

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## Time for Teaching Students about Sustainability and Design

## Design Club at Marshall Elementary



Photo by Laura Mauck / Sharnise

The students who took part in the design club at Marshall Elementary were awesome. They made each day special. We had some room challenges including some last minute changes of rooms even on the first day, but they always managed to find their way to where we were holding the club. Actually Kristin, who worked with me and teaches many of the four-year-olds at Marshall, was able to give my students a snack each day right after school and then assist in getting them to the right room if needed. There were a number of rooms we could use but they all had other things booked in them at various times.

The Art, Building, Creativity and Design Club at Marshall Elementary School in Tulsa was set up to run three days a week for three weeks. Amy Putman, the TACSI coordinator at Marshall, was my contact that helped initiate the club. The students, Kristen and I met after school on Mondays, Tuesdays, and Wednesdays at 3pm each day. The six students who were in the club went to the cafeteria for their snacks from 2:50 to 3:00 then came to our meeting.

The first day we had originally been scheduled to do the club in the library but although I was initially unaware of it, the room had been double booked the first day, which brought about the need to move the last minute after I had gotten everything set up in the library. We went to the art room, which actually worked out fine except I like to have things ready ahead of time.

We started out with a survey to learn more about the students and assess what their knowledge of the design field was at that time. We then created towers or other designs using some basic materials like play dough, toothpicks and a variety of uncooked pasta. This is an exercise in creativity, which also helps point out the need for choosing the right building materials. Basically I have the kids design their version a game that teachers could easily offer their students because it is inexpensive and fun. By selecting various amounts of each of the building items to be used in the game they are creating, the students are able to design their own version of the game and then name the game that they created.

In addition to the materials I bring, the students may make suggestions for additional items to be used in the game. If the items they suggest make sense and are safe then they can be brought in to test on another day. The students can then include them in their version of the game if they like the way the materials work out.

In testing their potential versions of the game the students are encouraged to build a structure that is as tall as they can get it to go, which is not easy with the materials they are given, thus the challenge to it. Once they get their height they are encouraged to include a requirement that it stand for a few minutes of predetermined time. The game also helps me assess the skill levels of the students. In the process I found the students needed a visual of what they should do, then their creativity took over.

Most of the students went for the height but one of them chose to do a design instead. Her creation essentially had the look of a flower. The ones that went for height had the challenge of getting to a height that surpassed the length of the tallest of the game pieces (spaghetti sticks) in creative ways. Because the play dough is the main connecting element and it is flexible, this aspect brings a need for creative thought and additional challenge is added to the game.



Photo by Laura Mauck / Jakelin

## Time for Teaching Students about Earth Friendly Design

## Design Club at Marshall Elementary



Photo by Laura Mauck / Taylor

We had an hour for the club each day and that seemed to work out well for most of the students. All the students but one were still working on the project till the next activity was supposed to take place. But one of the boys finished very quickly and started wanting to do something else, which concerned me initially till I learned as days went by that this was his normal approach to just about everything.

It took a while to fully understand this student but I was able to talk to some of the people that knew him and ask him some questions which eventually gave me some insight into how to help him and what his challenges are in life. Initially all I knew was that they had apparently let him out of detention just so he could come to the club.

When we finished the first activity we played a short version of a game where the students tell about animals they are familiar with and where they live. We were assessing the homes and habitats of the animals in the Tulsa area so I have individual maps for the students to mark where the animals are and a large map for them to put stickers on so they can share with the rest of the class, who can then see what areas they have marked.

Some of the students were able to finish these, but with the room change taking up some of our time I let the slower students take these home to finish them. Since one of the students was always ready for the next thing I had him go through the group of informational posters I have created that tell about buildings and design, so he could pick out ones he wanted to tell the club about on future days.

He was excited and had decided he wanted to present more than half of the 20 or so posters on his own. I had a list for the students to sign up for helping with some of the upcoming presentations and all the students signed up for at least one subject with some students signing up to help with all of them.

On the second day we did a project that allows the students to, on a small scale, do some hands on building and gives them something they can take home and use. We took Popsicle sticks and glued them together to make either a box to hold trinkets or a small size house. Some of the Popsicle sticks are colored and there were decorative add-ons to use like beads for a little handle to lift the lid or stickers and things to personalize the boxes they made.

We also talked about playhouses and tree houses. I had planned on using the SMARTboard™ to show some tree houses and things to the kids. Almost all the classrooms at the school have SMARTboards™, as do most other Tulsa Public Schools, but for some reason no one could get the one in our room to work. At that time of the day there was no technical expert available. Not that they have one on staff all the time, but it was after school and many people are gone for the day. So we talked about design subjects and I got to know the students a little better. My must-move-on student had an art project he was working on in art class that he did some painting on, so things went well. One student was working on her box till the very end of our time, but a couple of the others finished just before her.



Photo by Laura Mauck / Marshall Students

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## Design Club at Marshall Elementary



Photo by Laura Mauck / Robert

On the third day we were looking at tall buildings or skyscrapers, which most of the students listed on their surveys as their favorite type of building. I had the students working on some puzzles that help them learn about many types of design careers, while I helped them one at a time to prepare for what they wanted to present. There is a word search puzzle they do where the names of design careers are hidden amongst the other letters and also one in which they match the names of careers to brief descriptions of them.

Each of the students was able to look at the posters to see which ones they wanted to learn about and then share with the others. Several of the students picked a couple buildings to share while some had their interest focused on only one. The posters have various amounts of information and the students were given a chance to do further research on the computers prior to presenting.

My get it done right away, stand-out student, who is taller than the other students and has a rather macho approach to things, often has an in-your-face attitude, sometimes even uses physical intimidation towards the other students, turned out to have an interesting fascination with swans. One of the posters is about Swan Lake and that is the one he picked to share about. The poster is focused on the homes in the area and other design details but my student likes the swans themselves so he set out to acquire pictures of swans to share with the other students. Strangely, the other students were able to get their papers printed that gave them more details about what they were presenting and then the printer quit working right when the swans were due to come out. The librarian could not figure out what was wrong, and the other students were ready to present, so I had my swan enthusiast come join us so we could finish before time ran out.

The students were very enthusiastic about doing their presentations. I had one who had requested going first so she did hers. Then came one of my favorite moments of the club. Another student who had said: "on no, I am not good at presentations," when I talked about them at the beginning of class had changed his mind and said: "let me go, I want to go next." His size is unique in that he is much smaller than all the other students his age. When he has been absent some days, the other students said he was probably not well so I think he has a condition that probably has a name to it, but I never asked what. The import thing to me is that he went from apprehension about presentations to excitement about them. I loved to see that happen.

It was kind of amusing at the time, but at one point when several students had done their presentations the swans suddenly started coming out of the printer. We were in the library that day, which is a large room and the printer was down at the far end from where we were, but you could still hear the printer and my swan enthusiast went running to retrieve them, all of them, even though they seemed to be coming out in flocks. I think he had pushed print several times when they did not come out right away.

Although the presentations went well from the kid's perspective there were several teachers in the room discussing some things. They were sitting at a table right by us and continued to talk while my students were doing their presentations. I was helping the kids by standing right beside them and filling in details when they needed me to so it would have been awkward for me to stop and go ask them to be quiet. I kept hoping they would politely stop talking, but as I considered options I thought it best to give the kids a sense of sometimes having the need to go on despite interruptions that may come up. Most of us have probably been at presentations where the people in a nearby room are so loud they can be heard or the heating or other mechanical systems make so much noise it is a distraction that must be overcome.



Photo by Laura Mauck / Eric

## Time for Teaching Students about Earth Friendly Design

## Design Club at Marshall Elementary

I would have loved for the students to have received more support from the whole audience while they were presenting, but I could not have foreseen the problem coming up as we had been in another room much of the time and not had the same situation on other days. Although there were challenges the presentations went well in that I had volunteers when it came time to decide who would go next. I felt it best to carry on since the students did not complain about the situation but I became hesitant to use the same presentation approach again.

On the fourth day, which was Monday of the second week, the students created design journals. They were able to name their journal and decorate the cover then they clipped out homes and other design related things from magazines to put in their journals. My get-it-done-right-away student put a lot of emphasis on getting the cover the way he wanted it. I think he liked this project pretty well, but he got really excited when I eventually pulled out the car magazines. Guys will be guys and cars have to be designed, so they had car talk while they worked. The girls continued to focus on their houses and things but they may have had a really nice car in their garage.

On the fifth day the students played what I call the frame game. They had an 11" by 17" piece of thick paper on which to design the current version of their "dream home." The suggested method of doing this was to use room shaped cutouts of colored construction paper. They could also do as much drawing as they wanted or choose another method of doing this if they had a brilliant idea. I gave the students some time to get started then showed them a variety of floor plans and blueprints using the SMARTboard™. They would get excited about some of the more unique houses I showed them and continued working on their ideas. Amy Putman was able to spend some time with us this day and she was intrigued, as was I, at how one of the students who had a nice size pool and other water features was also able to fit a WalMart inside his home.

As they were getting started I had talked a little about the use of a scale, such as one inch could equal two feet, but this was an obstacle to be ignored, after all I did call them dream homes. Other students had some interesting things included in their homes as well, and the creative component was going beautifully. Functionally one or two may be visiting their friends when they have the need to use the bathroom or a kitchen, but I suppose this could work wonderfully for cost savings, since the bathroom and kitchen are not the cheapest rooms to build.

The project went well but I am giving thought to how much I should go over the rooms and other things they might want to include. Their creativity was so much fun I think I might save that part for going over the next day, if the time schedule works out.



Students at Marshall Elementary



All photos by Laura Mauck



Working as Teams

## Time for Teaching Students about Earth Friendly Design

## Design Club at Marshall Elementary

On the sixth day we looked at how to do things in a more earth friendly way. The students wrote down words related to sustainability then were able to create their own word search puzzles using the terms we all came up with. One of the most enthusiastic students had missed the previous day so I tried to let her work on the frame game project we had done the day before also, but I may rethink how I approach it when I have students miss key activities.

We also talked about the books written by Sarah Susanka, an architect who is trying to improve lives by explaining to her clients and other people that at some point “too big” becomes a burden. She has written many books based on her initial theme called the “not so big house.” She shares how there are ways to be happier by cutting down on the space in a home and instead adding endearing, special or cozy features. With one of my students going so far as to think they might want a WalMart in their home, I felt these were important concepts to address with the students.

On the seventh day we discussed ways to add beauty to a building during the design and construction process, then we did a project where the students create something to hang in a window, which has some of the aspects of stained glass. They take an 11” by 17” sheet of poster board or thin cardboard and cut an opening in it. A sheet of white tissue paper or a slightly thicker type of paper that is still somewhat see through is attached to the back, then colored tissue paper is glued onto it to make pictures, designs, or patterns. The colored tissue paper can be cut into shapes or coaxed into a position where a design is created by the way the paper lies together with the surrounding colors. When dry these can be hung in a window and when the light shines through it, the light illumines the colors. The beauty created can be similar to how light looks after passing through a stained glass window.

My eager student was in peak form on this day. I believe he finished this one in record time. Over the course of the club I had come to understand him better and at this point I believed there were a lot of issues having impacted his life in unique ways. From the first day he had always asked if we could play music. This seemed like an innocent request that had the potential to bring some beautiful background music but at this point I believe it was a strategic first step on a mission that obviously must have worked for him at times. There are no radios in any of the rooms I came across, so to play music actually required turning on a computer. I always refrained from saying yes to the music. I like music but who was to say we would all have the same taste...and what about volume issues. Eventually I think I came across where the music was supposed to lead. When I had the students doing research for their presentations this meant using the computers. Well the next class my rapid-fire student was done with his project quickly, and asked to use the computer. I had a goal of encouraging them to continue design research on their own so it sounded great. I was busy with the other students and had hopes he was happy and learning more about design. He is very bright and quick to figure things out. As days went by I realized his main objective had come to be, and perhaps always was, the ability to play his favorite video game.

The last week of class is when we had group activities that needed everybody involved so I had let my gamer know we would not be using the computer the next week and it is apparent he had come in on this day with a powerhouse of energy determined to get to the computer despite, or perhaps even because I had said we would not be using it. He caught me off guard when he had finished his project in about two minutes, before some of the students had even arrived. He asked to use the computer and before I had time to think I found myself agreeing to let him. I had some printouts of stained glass window patterns ready to be colored if the students finished their work early but he was so intent on getting to the computer and I was still in shock at how fast he claimed to be done. His playing the video game would not have been such a big deal except it impacts the other students. Some of the others are also video game enthusiasts, and lets face it the games can be addictive. So some of the others would feel the urge and then my design enthusiasts would be upset that our project was not getting the attention it deserved.



Photo by Laura Mauck / Marshall Elementary Students

## Time for Teaching Students about Earth Friendly Design

## Design Club at Marshall Elementary

On the eighth day I had everything ready before the kids got there. We were playing the Earth Friendly Game, which works best when a lot of supplies are available for the students to use, so I had another table brought in and put everything on display for them to see. I had a poster showing some pictures to give them a sense of what the game entails. Kristen helped me get the game enthusiast to listen to how the game works and they were off and running...well I should say they kept me running to keep up with them because with so few students in the class I decided to be the cashier myself. There are supplies they need to purchase to use in creating a model home and the store opened that day with a waiting line.

Eventually they were busy working on their ideas and the store clerk could tidy up a bit, but I would say I certainly remained busy. Their projects went well, no video games were played, and actually the gamer ended up with something to ponder before the day was over. The students create homes using earth friendly ideas, and when they are ready they share their ideas with the class including other creative details about their house. The students then give each other awards in several categories. The awards include what are referred to as magic points. These are then used to buy some goodies that are available. Each student has 50 magic points to give to their classmates, which are dispersed between the four awards in the way the student chooses. The award categories were for best landscape, best structurally, most creative and most earth friendly.

Over the period the club had been meeting, the students had at times mentioned their unhappiness with the approach the master gamer had to what we were doing and certainly he had at times thrown insults and such toward the other students. He had been outspoken for a long time but now was their chance to speak out. And when they did I would say it hit him in the pocketbook or wallet. With 200 magic points being given out by the students only 10 ended up in his bank account. The prizes he had set his sights on were out of reach. I just hope that some day when he is about to throw an insult at someone he stops to think how it could come back at him in the long run.

The next day I reminded him about how he had battled with one of the other students in hopes of being able to tell about the house he created before she got to. To make it fair I had let them draw numbers to see who went first and he won. The interesting turn of events was that when the first girl had gone and it came to his turn he had no idea what he wanted to say. The girl he had beat in the draw-the-number-game actually ended up going before him as did another student because he needed time to decide what he wanted to say. The other students who had been listening during our time together had some wonderful earth friendly concepts to share and while his house was colorful and creative, these concepts were not something he had put much into. I also pointed out to him that when he had ended up in another student's chair and did not want to get up, things like that are the things that cost people votes when they need them. I also mentioned that when he and the other girl were vying for the same turn if he had been so thoughtful as to offer to let her go before him prior to their having to draw numbers, that would be the type of kindness that can help get votes.



Photos by Laura Mauck  
of Marshall Elementary Students



**Time for Teaching Students about Earth Friendly Design**

## Design Club at Marshall Elementary

On the ninth day we started out by doing the end of club survey. Then I had the students sign a souvenir picture frame. Next we were scheduled to do an additional version of the Earth Friendly Game where the students were going to build taller buildings, because that is what the majority of the students had voted for the day before. Actually that is what all the students wanted to do except for my challenging student who had quickly said no to playing the Earth Friendly Game again, within seconds after my posing the question to all the students. I had then offered him some special blocks that he could use to build something, which initially he claimed was what he still wanted to do.

The students got excited when I offered to let them work in teams that day, and my hold out suddenly wanted to play. We had lost one girl because her mom needed to pick her up at three, so I had offered the chance for teams when I thought four students were participating. As the holdout asked to join, the other students quickly announced others as their teammates and he said he still wanted to play but he would do it himself.

Upon figuring out how many points each team should have to use, the students were off and running and the game was underway. The question about points was based on the fact most students did not use all their points the day before and they wanted to use them for some of their team's points. The problem was one of the teams had one person and the others had two, so eventually it was decided all teams would have 100 points. I was not sure they would want to do teams so I had not put a lot of thought into the amount of points aspect.

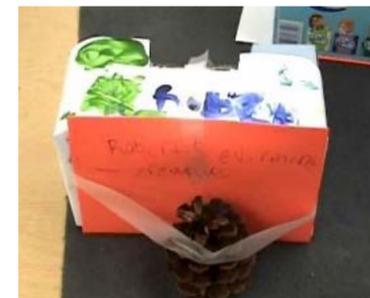
In addition to the awards and magic points they received from the other students the day before, I gave them each a special award and a generous amount of magic points to spend. This hopefully helped to make the experience a little more enjoyable for the disagreeable student who got few points. Gaining some insight and understanding of better approaches can be helpful. But there was no point in him not having a few more magic points to increase his potential for some fond memories of the club.

While the students were building I brought them over one at a time to use their magic points to buy some of the goodies available. I had them all draw a number to determine who went first, which seems like it would make things go smoothly. One of the students decided to claim they had a two that was actually a five, and by the time the real two had spoken up the five thought they should continue to buy something since they were there already. Need I say who? Well the two was brought up and the five put back in their proper place, and all went well except for some of the best things being bought before the five got their turn.

The students asked to be able to use things from the houses they had made to make their taller buildings, so I said yes. After all isn't recycling a big part of what it is all about. I hated to see the houses taken apart, but earlier in the day some of another teacher's students had messed them up a little anyway. I gave the students thank you notes for taking part in the club, which included my email address so they can be part of an online version of the club I will be creating.



Photos by Laura Mauck  
of Marshall Elementary Students



## Time for Teaching Students about Earth Friendly Design

## Design Club at Marshall Elementary

The students expressed their love of the club and some could not understand why it needed to end. By the time it was over I felt a strong sense of compassion for all the students and a desire to see them be successful, even my energetic, finished-right-away, game enthusiast. I have full compassion for him despite the challenges he disperses generously.

When I asked the student about his siblings, he told me that he had 7 sisters and 2 brothers. Then on another day when I was talking to a knowledgeable teacher I was told he was an only child. That was a shock after what he told me, but then she went on to explain he has both scenarios to deal with.

Can you imagine spending Monday through Friday alone with your dad in an only child type of situation then going to your mom's for the weekend and having seven sisters and two brothers to deal with. Many of these siblings, I imagine, have spent more time there with the mom and may portray a sense of it being more their territory. Thus, the need to boldly name it and claim it in order to end up with everything one needs. As I learned more about the situations this student deals with, various things seemed to make more sense. I appreciate his love for painting and believe he can be a huge success if he chooses to put more thought into matters of politeness.

The students had expressed an interest in continuing the club, which is something I can do by sending out further information on things related to some of the topics we have been discussing. The design field continues to grow as new inventions are designed to alleviate problems or challenges we face. These sometimes bring about additional challenges we might not even be able to imagine.

The new challenges bring about additional inventions and more for us to talk about.

Look at how the loss of bees stands to impact us. Can you imagine life without fruits and vegetables? Well luckily, I guess you could say, there are a lot of innovations taking place in indoor gardening these days. A design field that until recently was mainly left for hydroponic gardeners looks like it could find necessary prevalence in the near future due to so many bees flying the coup, or coming up missing in action I guess you could say.

These issues are alarming, but if our designers of the future get started at a young age maybe they will overcome even the alarming challenges we see looming on the horizon.



Photos by Laura Mauck / Earth Friendly Game



**Time for Teaching Students about Earth Friendly Design**

## Lessons Learned at Marshall

The students loved making things and a lot of the activities allow them to use their creativity so these went over really well. Changes to make include having some craft glue to put the beads on the lids of the boxes. The regular glue does not hold them on well enough when they are used to lift the lids. For the towers I think I would like to include a couple more types of materials. I am creating a few more of the design related puzzles. For the paper version of a stained glass window I want to make some more samples. I think theirs were too much like the one I did and there are a lot of looks that can be created. For the Earth Friendly Game I would like to find some large sheets of really thin white or colored paper because some of the students like to do a good job of covering the boxes and I would like to see them use coloring to decorate them more and create the look of various textures and types of siding.

I have already made a lot of additions to the curriculum based on my experience in the classroom at Marshall Elementary School, such as adding the ways to enhance the design curriculum using the SMARTboard™ and including other additional activities for when students finish before others do.

Regarding future versions of the club I think a lot of things worked really well, but I also found a variety of things that I may change a little.

My next version of the club will be four days a week for two weeks, so one of the days has essentially been cut and I will have eight days for an hour instead of nine. This one will be for fourth graders at McClure Elementary, so I will need to make sure that if it is needed some of the projects are simplified a little. I look forward to fine tuning this version.

Following the McClure Club I will be getting ready for a different version I will be doing in July. Currently the plans are for me to do four elementary schools, with fourth and fifth graders combined. I will have two sessions at each school lasting either two or two and a half hours each. This means a total of only 4 or 5 hours at each school and trimming a lot of the activities.

At this time I plan to do this by cutting a couple projects and sending a couple home with the students so they can do them there instead if they want to. The puzzles that teach about design careers are an informative aspect of the club that I don't want to cut out but could easily be done at home. It helps to work with them a little when they are doing the craft projects and sending the supplies home does not appeal to me as they might never get used.

Initially I would say preparatory activities like the tower game I call Name the Game and the trinket box will be done then the Earth Friendly Game will be played. The puzzles and the dream home activity will be sent home.

Another option would be to give the students a choice between doing the tower game, the look of stained glass or the trinket box. Then we could also play the game where they talk about animal habitats and perhaps do a design journal before playing the Earth Friendly Game. I will look at the amounts of supplies needed prior to finalizing my decision because I may have close to 100 students. I would hate for most of the students to want to do the same activity and then have a shortage of supplies mean they had to choose a different one. Yet, having enough supplies for 100 to do all of them, even though they will each be doing only one, does not make sense.

I would love for them to have a chance to do presentations about some of the buildings they like, but these work better when I know the students and how supportive I need to be. With only two brief periods to work with them I think focusing on the crafts will be better. Although I could have a sign-up sheet to see how many want to do presentations. When done right the students can do them one at a time while the other students are still able to continue working on the project at hand. Some students need to focus more than others, but the ones who want to learn about the buildings could look up from their projects for the presentations they are interested in. As long as the presenters do not feel they are not getting the attention they deserve this could work out well. At their age they may be more focused on what they are saying than how many in the audience are looking at them.

Obviously I have a lot more time to think about it, but I recently got the update on how my schedule will be so I am excited about figuring out what activities to include. The summer camps are something I have been looking forward to.

## **Time for Teaching Students about Sustainability and Design**

On the following pages you will find a copy of the curriculum designed to be used for teaching students about design.

This version is for fifth graders, and was created as part of my professional project to obtain a Masters of Science in Architectural Urban Studies.



## **Welcome Home to Earth Friendly Design**

### **A Curriculum for Teaching Fifth Graders about Architecture, Design and Sustainability**



Created by Laura Mauck  
2011



**Welcome Home to Earth Friendly Design  
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**Welcome Home to Earth Friendly Design**



# Teaching Strategies



All photos by Laura Mauck of Marshall Elementary students

## Welcome Home to Earth Friendly Design

### Curriculum Overview

The curriculum is designed to take the students on a journey through the world of design that will inspire them to further pursue aspects of it that are most intriguing to them. A survey of many design fields with insights into how design plays a key role prior to creating buildings and other things is the approach used in the curriculum.

Not all fifth graders are at the same perception level so the projects in the curriculum may be adjusted some if necessary. Initially the goal is to open the students up to exploring how many ways there are to approach design. We want them to realize not all communities are designed the same and not all homes are like the ones in their area.

There is an emphasis on creative activities where students get to work with their hands. A sense of joy often comes from seeing something we create take form and it is wonderful when students are able to experience this because it is in essence the eternal flame from which the sparks ignite to spread enthusiasm about our creative capabilities.

Puzzles are also included because these are a fun way to present concepts to the students that are a little beyond their capacity to fully understand, but once they have come across them may peak their interest enough that their next contact with them will bring a sense of familiarity and further interest.

Worksheets, helpful forms, and other items have been included to make the use of this curriculum as stress free as possible in hopes that its use will bring a sense of pure joy to those presenting the projects as well as those taking part in the experience.

## Curriculum Selection Information

Curriculum Overview: Should be read first for insight into purpose and process

Table of Contents: This shows the full list of options. Recommended reading prior to Selecting the specific activities your participants will be taking part in.

### Teaching Strategies: An important aspect of the curriculum

Share to Learn: Highly recommended unless you have very little meeting time

**Activities: Several of these can be selected if you do not have time for all**  
They are ranked (H) high (M) medium and (L) low for how essential to curriculum.

Animal Homes: Requires less time than others, addresses sustainable concepts (M)

Build a Box House: A great activity that leaves participants with a useful item (M)

Design Journal: A learning experience regarding current designs being used (M)

Earth Friendly Game: Participants really get to put their creativity to the test (H)  
(A great activity for the first day of the final week)

Earth Friendly Tower Game: Really enjoyed by students but not essential (M)

Frame Game: Students create a floor plan for their current dream home (H)

Look of Stained Glass: Participants will have a lovely decoration for a window (L)

You Name it Game: Opportunity to really look at the importance of materials used (L)

### Puzzles: These can be sent home with students or done in class

Creative Careers Word and Definition List: great for students to learn terms

Creative Careers Matching Game: students draw a line from word to meaning

Creative Careers Word Search Puzzle: 20 careers to learn about while having fun

Creative Careers Word List for Puzzle

Creative Careers Word Search Answer Key: hang on to this till they give up

Earth Friendly Word Search Puzzle: 20 environmental terms to learn while having fun

Earth Friendly Word List for Puzzle

Earth Friendly Word Search Answer Key: hang on to this till they give up

Welcome Home to Earth Friendly Design  
**Suggested Curriculum**  
for a two week version

Do Build a Box House

Discuss Tree houses and Playhouses

Do You Name the Game

Discuss Building Materials

Do Animal Locator Game

Discuss Animals at the Zoo including ones that are threatened or endangered

Do Share to Learn with topic of Environmentally Friendly Design

Discuss Going Green and LEED Certification...What do they mean?

Do Design Journal

Discuss How to Market Green Design even though it can cost more

Do Frame Game where they design Dream Homes

Discuss rooms that are essential versus others that are great to have

Do Share to Learn about skyscrapers

Discuss essential inventions that made these possible, elevators, etc.

Do Earth Friendly Game

Discuss City Planning and Community Places

Do Tower version of Earth Friendly Game

Discuss Design Competitions

Do Design Careers Puzzle

Discuss skills needed for the various types of positions

These are put in this order to create a flow of thought processes that might have the most meaning to the students, but could be adjusted to meet your needs and schedule.

Welcome Home to Earth Friendly Design  
**Suggested Curriculum**  
for a one week version

**Time for Teaching Students  
about Sustainability and Design**

Do Build a Box House and also Look of Stained Glass if you have time

Discuss Tree houses and Playhouses

Send Creative Careers Word Search and Puzzle home with them

Do You Name the Game and if you have time Animal Locator Game

Discuss Building Materials and the puzzles they took home

Discuss skills needed for the various types of positions in the puzzles

Discuss Animals at the Zoo including ones that are endangered

Send Earth Friendly Word Search home with the students

Do Share to Learn with two topics Environmentally Friendly Design and Towers

Discuss what Going Green means and the puzzle they previously took home

If you have time also discuss inventions like elevators, air conditioning, etc.

Do Design Journal and also Frame Game if you have time

Discuss rooms that are essential versus others that are great to have

Discuss what makes designs popular if you have time

Do Earth Friendly Game and if you have time add the Tower Version

Discuss what the students learned during the week

Discuss City Planning and Community Places also if you have time left

These are put in this order to create a flow of thought processes that might have the most meaning to the students, but could be adjusted to meet your needs and schedule.

## Welcome Home to Earth Friendly Design



# Activities



## Animal Homes

This project is created to shift the focus to nature and how we interact with our environment in order to have the students give some thought to where animals in our area are able to call home. Participants can discuss how we can help protect wildlife habitats and how much impact we have had on nature and the natural habitat most animals still call home.

### Materials needed:

- ◆ Animal Homes handout for students
- ◆ An 8 1/2"x11" map of the Tulsa area with suburbs of Tulsa included
- ◆ A larger but similar map of the Tulsa area
- ◆ Stickers to use for marking where animals live on the large map (such as stars)
- ◆ Markers, Crayons and or pencils for marking where animals live on the small maps

### Materials (optional):

- ◆ Animal shaped stencils (for being more precise what animals live where but just an added touch for more details)(stars can be color coded to do much the same thing)
- ◆ Additional Stickers in animal shapes (fun for the students, but could be pricey if you buy a lot)

### Instructions:

**(Time to finish project roughly 15 to 30 minutes)**

Have the students fill out their forms with animals and their habitats that they are familiar with. When a few students are done you can start having them go up to the large map one at a time to mark one or two of the animals they have on their list using the stickers mentioned in the supply list.

When the students mark areas the animals live you could let other students raise their hands to share if they can think of another place the same animal calls home. Or you could wait till everyone has had a turn then open it up to everyone taking turns to discuss more habitats for the chosen area.

(If you want you could explain to the students how the EPA wants to find a way to increase animal habitats because more and more animals are becoming extinct, endangered and threatened. Give them a sense of helping a firm that has been hired to do an initial assessment of where animals call home in the Greater Tulsa area)

### Enhancing curriculum with the SMARTboard™

Additional types of animals can be pulled up on the SMARTboard™© screen and their habitats discussed. Looking at how design plays a key role in how much of their habitats are lost can be discussed with an emphasis on ways to improve our interaction with nature and the plants and animals that still call nature home.

## **Build a Box House** Trinket Box or Small House

This project gives the students some small-scale hands-on building experience and also something usable to take home. Boxes are made with Popsicle sticks which are glued together to make either a box to hold trinkets or a small size house.

### **Materials needed:**

◆ Popsicle sticks either plain or colored (standard size are needed for this, the jumbo size can warp when wet with glue and do not easily create a square box) (Many stores including WalMart and Dollar Tree keep these in stock so you can shop for the best prices)

◆ glue (school glue is fine for putting the sticks together, wood glue is good but needs extra drying time, craft glue is needed to keep beads on when using for a handle)

◆ add-ons of your choice (beads or something for a handle, stickers are good, etc.)

◆ duct tape or clear packaging tape (only needed for the small house version)

### **Materials (optional):**

◆ paint (some students love this but letting the box dry before painting works best)

◆ construction paper (brown or other to use for the ends of the roof)

**Instructions: (Time to finish project roughly one hour, may need more time for painting)**

**Step 1) Have the students lay 12 of the standard size sticks flat, side by side evenly, then glue two sticks the opposite direction but flat at opposing ends. Make two of these one for lid and one for the base of the box. (adjust # if needed, not all sticks are quite the same)(make three if doing house and use two for the roof)**

**Step 2) Using base build up the sides of the box by continuing to glue two more sticks laid flat but the opposite direction each time. This creates the walls adding height to the box, which can be made as high as the student wants providing enough sticks are available. (I use a sample of the box as an example for the students)**

When doing the small house version the lid becomes roof shaped by using two of the flat lids and taping them together at the edges of the sticks then taping the ends to form a pitched type roof. The construction paper can be used to add to the look of it.

### **Enhancing curriculum with the SMARTboard™**

Playhouses and Tree houses are fun for the students to look at and discuss while making the boxes. There are some interesting ones available by using the Internet and going to Google Images then typing tree houses or kid's playhouses. It is best to let the students get the boxes part of the way finished before pulling up the images. A student done with the project early makes a good assistant for picking which tree houses to enlarge and show the other students up close. If more than one student is done early they can take turns.

## **Design Journal**

The Design Journal is a class project that helps the students explore the finished look of things that have been designed. Participants are able to think about how much they like various styles and the project lends well to a discussion of what the students find as they are creating their journals.

### **Materials needed:**

◆ Some type of blank journal, whatever works best for you. A notebook with paper, a spiral notebook, or some blank paper stapled inside a cover of construction paper or card stock all would work well for this project. Ten sheets of paper will do.

(students love to personalize these, especially by creatively decorating the cover)

◆ An appropriate selection of magazines (most communities have free home buying guides that work great and you can get enough that the students won't quarrel over being able to use the one they want) (there are usually some car guides available also and while the girls may choose a nice car for their garage the guys really love to discuss the cars in them) (adding to these some magazines with home interiors and artwork is suggested, these are found at many thrift stores) (some old calendars work well too if they have related pictures)

◆ Scissors

◆ Glue (having several varieties can be good, the glue sticks are quick but not all students can cover their pieces adequately to make these work)

◆ Markers, Crayons and or Colored pencils

### **Materials (optional):**

◆ Letter stencils (were very popular for doing the cover but I had students on a waiting list to use them)

◆ Stickers (fun for the students but could reduce the amount of drawing they do and potentially hinder creativity, might add more color though)

**Instructions: (Time to finish project roughly one hour, optional more time on additional days)**

Have the participants cut out things they like from magazines and glue them into a booklet that they can take home and add to in their spare time, or even add to on future days of the design club/class if they finish a project quickly or you can fit it into the class schedule. The students are welcome to do drawings in addition to cut-outs.

### **Enhancing curriculum with the SMARTboard™**

Types of design can be discussed and listed on the notepad of the SMARTboard™

You can do this, you can have the students take turns, or if you have a student that finishes their journal quickly you can have them lead the discussion. Examples with pictures can be used as well by going to the Internet or creating them your self.

## Earth Friendly Game

Students are able to use what they have learned as they take part in this hands-on activity that revolves around the group of students coming together to create an environmentally friendly community. Having an 8' rectangular table for each 6 to 8 students is suggested and you can put these end to end.

### Materials needed:

- ◆ Empty tissue boxes (at least 1 or 2 for each student) (similar boxes could be used)
- ◆ An 11" x17" piece of paper or cardstock for each student (this represents their piece of land, on it they can create a landscape that surrounds the house they will design)
- ◆ Markers, Crayons, colored pencils, glue, tape, stapler, scissors (enough for all)
- ◆ All kinds of paper, some thin enough to easily cover the boxes works well. (I use colored and white copy paper, construction paper and thin rolled paper)
- ◆ Usable discard items like empty paper rolls, plastic cups, and additional empty boxes
- ◆ Things to use for nature like pine cones, plastic or real leaves or flowers, things they can make little trees or other plants out of and small containers of play dough
- ◆ Some certificates or awards and/or some fun stuff for the participants to buy with the magic points they receive from the other students. A few dollar store items, some trinkets and a little candy would be good. Be sure to assign point values. (You could go all out with this or omit the magic points and just have certificates for the winners)

### Materials (optional):

- ◆ Stickers, beads, little puffy balls or cotton balls, pipe cleaners & doodads galore!
- ◆ Aluminum foil, felt and foam sheets, small pieces of thin cardboard
- ◆ Stencils (for being more precise with some of their drawing)
- ◆ Additional items you would like for them to use

### Instructions:

**(Time to finish project can vary a lot but roughly an hour)**

Ahead of time you will need to create some "debit cards" for the participants each with a student's name and their points total. Some of the activities offer an opportunity for the students to receive materials points to use in this game, and their total of these is added to 100 to get the amount they will have to spend. Index cards work well or you can create the debit cards with the students' names on them and print them out ahead.

You also need to have the certificates or awards ready for the students to fill in the amount of magic points (these are not the same as materials points) and or who they are giving them to. (I give each student 50 magic points to divide between their four awards as they choose, but consider the total point value all the students will end up with and the total point value of your magic points goodies. It is best to have more points worth of goodies than the total amount of magic points the students will have).

Set-up the supplies ahead of time in such a way that you have created a small supply shop, with prices on everything. Large, pricey or one of a kind items should be between 5 & 20 points each, medium size items 3 to 10 points each, small items 1 to 5 points each, and tiny items like beads 2 to 5 of them per point. You will need a cashier, which can be you, another adult or teacher, a helper or have 2 or 3 of the students take turns. (they can be given extra points for this as incentive)

Give each of the students their "debit cards" with the amount of their points on it. Remind the students how they each get to spend only the points left on their card.

Explain to the students that the goal of the game is to create an earth friendly home in a new environmentally friendly community. Remind the students that they will each get several awards to hand out (and if you are using the magic points system that they will be able to get things with the magic points they receive along with their awards).

Have them politely pick their location, places may be charged for and given slightly different prices. You can have a smaller table which you designate living in the country, or another made to be like waterfront property. (I use blue placemats or fabric to create the look) Property prices can be between 5 & 25 points or land can simply be allotted with no charge. The goal is for them to have enough points to creatively design their home, gain an understanding of the aspects of supply and demand, and not use up a crazy amount of the supplies. Another option is giving them their first box for free.

Have a free 11"x17" paper at each place to designate land. Once the students know where they live they may get in line to go shopping. It usually works best to have them get a few things to get started then take turns going back to shop for more.

When the students are close to finished have them take turns telling about their creation and the features they have included. It is more important that they have included creative ideas than for them to have everything look exactly like what it is supposed to be, although hopefully it does not appear that it will soon fall over.

When everyone has finished telling about theirs the students can divide their allotted points between each of their awards and choose a student other than themselves to receive each award by putting their name on it, then giving it to you. You will hand them out by the names on them. This keeps things somewhat anonymous.

I have the students add up their own points then give me their certificates to check them. If you have enough time you can let them spend their magic points but I like to have them buy one thing each then come back the next time to spend the rest. After I have double-checked all the points, and given out some awards or points of my own, then I call them up one by one (order having been drawn) during another activity, to spend their Magic Points. This helps keep the chaos down. So does making sure you have a reasonable price or number of magic points assigned to all the goodies.

### Enhancing curriculum with the SMARTboard™

Video or pictures of what the students have created can be shown on the screen and the details can be looked at and appreciated the next time the club/class meets.

## Earth Friendly Game Team or Tower version

Students enjoy the Earth Friendly Game so much I let them play it again on another day if they want to. For variety the group of students can do this second version in teams if they want to and or they can build tall buildings or commercial buildings instead of houses. I sometimes have the teams each go to a specified area of the room instead of having them all in one area. This allows them to discuss their plans with some privacy.

**Materials needed:** **essentially the same as for standard version but having some additional larger boxes works well, cereal boxes or something similar)**

- ◆ Empty tissue boxes (at least 1 or 2 for each student) (similar boxes could be used)
- ◆ An 11" x17" piece of paper or cardstock for each student (this becomes optional for this version but might still be useful)
- ◆ Markers, Crayons, colored pencils, glue, tape, stapler, scissors (enough for all)
- ◆ All kinds of paper, some thin enough to easily cover the boxes works well. (I use colored and white copy paper, construction paper and thin rolled paper)
- ◆ Usable discard items like empty paper rolls, plastic cups, and additional empty boxes
- ◆ Things to use for nature like pine cones, plastic or real leaves or flowers, things they can make little trees or other plants out of
- ◆ Some certificates or awards and/or some fun stuff for the participants to buy with the magic points if they receive them. A few dollar store items, some trinkets and a little candy would be good. These should all be marked with a price in magic points. Carefully choose prices high enough that the magic points store will not sell out too quickly. (If this is done on the last day when wrapping up you can skip magic points. I give them some thank you notes and they often have just bought their goodies so they are still excited. It's best to update them on what they will be receiving prior to starting)

### Materials (optional):

- ◆ Stickers, beads, little puffy balls or cotton balls, pipe cleaners & doodads galore!
- ◆ Aluminum foil, felt and foam sheets, small pieces of thin cardboard
- ◆ Stencils (for being more precise with some of their drawing)
- ◆ Additional items you would like for them to use

### Instructions:

**(Time to finish project can vary a lot but roughly an hour)**

Ahead of time you will need to create some "debit cards" for the participants, each with a student or groups name and their points total. Index cards work well or you can create a copy of the "debit cards" with the students' or groups' names on them and have them ready. These can be turned over and used on the back when the space on front runs out. The students sometimes ask to use the points they have left from the time before if they did not spend them all. This is up to you but can work fine. It might be good to let them know ahead how you are doing it. One way would be to let them keep their previous leftover points and add another 100 points or so per group. Keep in mind that some students are more frugal than others.

Set up the supplies ahead of time in such a way that you have created a small supply shop, with prices on everything. Large, pricey or one of a kind items should be between 5 & 20 points each, medium size items 3 to 10 points each, small items 1 to 5 points each, and tiny items like beads 2 to 5 of them per point. You will need a cashier, which can be an you, another adult or teacher, a helper or have 2 or 3 of the students take turns. (you could still give extra materials points for this)

Give each of the students or groups their "debit cards" with the amount of their points on it. Remind the students how they each get only what is on their card to spend.

Explain to the students the goal of today's game and any other important details especially ones that are different from the previous time.

Once the students know where their spot is this time, they may take turns going shopping. It usually works best to have them get a few things to get started then take turns going back to shop for more.

When the students are finished have them take turns telling about their creation and the features they have included. It is more important that they have included creative ideas than for them to have everything look exactly like what it is supposed to be.

When everyone has finished telling about their creation, the teams or students can be recognized for their accomplishments. Predesignated awards or trophies could still be given out, even if the magic points are not done this time.

### Enhancing curriculum with the SMARTboard™

Video or pictures of what the students have created can be taken and details can be looked at and appreciated by showing them on the SMARTboard™ screen. Lists of environmentally friendly techniques the students included could be listed using the SMARTboard™ Notepad feature and these could be discussed in detail provided you have time. Ones already on the market could be looked at on the Internet and compared to the versions the students created for the purpose of learning about their details and perhaps cost and availability, rather than how accurately they were created or depicted by the students.

## **Frame Game**

### Creating a Floor Plan for a Dream House

This project helps to teach the students about floor plans and blueprints in a fun and creative way. They are first allowed to explore their ideas then shown some examples of how homes have been designed.

#### **Materials needed:**

- ◆ Pieces of paper, poster board or card stock (preferably 11"x17" but 8 1/2"x14" could be used) (Preferably white, but colored paper could be used if it is easier for you to come by)
- ◆ Variety of colored construction paper (I suggest having some square or rectangular shaped patterns ready to use for pre-cut rooms that can be scaled one inch to two feet or so)
- ◆ Glue (school glue is best for this, when using glue sticks edges don't always stay down well)
- ◆ Markers, Crayons and or Colored pencils
- ◆ Scissors

#### **Materials (optional):**

- ◆ Pre-cut shapes of specific rooms already marked or color-coded (for less dreaming and more realism)(I would suggest these if doing the project again on a second day)
- ◆ Paint (not necessary but some children love to paint and could use this to do a landscape plan or design around their home's outer walls or even decorate the interior)

**Instructions: (Time to finish project roughly one hour, may need more time for painting)**

Step 1) Students can start either of two ways, rooms or exterior of the house. I suggest having them start by drawing their house then see how they want to fit the rooms inside. When finished or frustrated they can turn their paper over and start by deciding what rooms they want next to each other then creating the walls of the house around them. The house can be any shape, but you can explain that the cost can be higher for non-rectangular houses if it requires more building materials and time to construct. Having patterns for the rooms works well, especially if you want the students to be more realistic about their designs. The shape of house they end up with may leave room on the paper for them to draw a landscape outside the frame of their home.

Step 2) The list of rooms they have included in their home can be discussed before, after, or while they are busy with the project. I found that bathrooms and kitchens could be easily overlooked for pools and other water features or play areas.

Step 3) If using pre-cut shapes participants glue the colored paper shapes to their paper after deciding roughly where they want everything to go.

Step 4) Have them draw or decorate the rest of their home and its exterior if desired.

#### **Enhancing curriculum with the SMARTboard™**

Show floor plans and blueprints to students while they are working on the project. There are some interesting ones available by going on the Internet to Google Images then typing floor plans or blueprints or pulling up some examples of buildings to look at. These will give the students ideas about how they want their homes to look. If students finish early have them draw another house for a family member or a friend.

## **Look of Stained Glass**

### Creating Colored Paper Windows

This project fits well with an exploration of the artistic aspects that are found in many of our buildings. The tradition of stained glass being used as an integral part of churches and other buildings dates back centuries, but continues today.

#### **Materials needed:**

- ◆ Pieces of poster board or card stock (preferably 11"x17" but 8 1/2"x11" will be fine also, these are used as frames so I use white and let the kids draw on them a wood or other texture if they want, but colored paper or poster board would be good also)
- ◆ Large sheets of white tissue paper, or you can use thin waxed paper. Cut to 9"x15" if using the 11"x17" poster board or 8"x10" if using the 8 1/2"x11" poster board
- ◆ Variety of colored tissue paper (rolls of colored but see through plastic work well in addition to the tissue paper) (I suggest having some simple shaped patterns to use with the paper like hearts, diamonds, circles, shamrocks, squares etc., about an inch in diameter)
- ◆ Glue (school glue is best for this, when using glue sticks edges don't always stay down well)
- ◆ Markers, Crayons and or Colored pencils
- ◆ Scissors

#### **Materials (optional):**

- ◆ Pre-cut shapes of tissue paper or clear type plastic
- ◆ Some string and stapler (attach for hanging purposes)

**Instructions: (Time to finish project roughly 45 minutes, may need more time for painting)**

Step 1) Help the students cut a hole in their piece of poster board or card stock with out cutting through the outer inch or two. Having patterns for this works well especially if the student wants theirs to be a circle. The shape they cut out will leave the hole for their window, with what is left becoming the frame. Suggestions include diamonds, rectangles, or the look of an arched doorway. If students want to cut their own it could be fine but may be less even, and they need to be careful not to cut to the frame part.

Step 2) A sheet of white tissue paper should be glued to the back of the frame.

Step 3) Participants glue colored paper shapes to their paper window. Scrunching torn paper together can make a pattern, but pre-cut shapes give a more distinct look. Certain markers can be used to draw on the paper, but pretest them to make sure they work well. Gluing paper to the back of the window looks best but either side works fine.

Step 4) Have them decorate their frame and attach string for hanging them if desired. (These may be taped to or hung inside a window for the light to shine through them)

#### **Enhancing curriculum with the SMARTboard™**

Show stained glass windows to students while they are getting started. There are some beautiful ones available by going on the Internet to Google Images then typing stained glass windows or pulling up some buildings that have them. The pictures will give the students ideas about how they want their images to look. If students finish early have them draw a stained glass pattern on the shape they cut out and then color it in or have some stained glass patterns, which are available on the Internet, printed out and ready for them to color.

## Share to Learn

During one of the first few meetings of the design club or class tell the students they will be getting a chance to tell the others about some buildings they like. I have some posters about architecture that I show the students to help them get excited about buildings. These can be found on the Internet by first going to the OU Tulsa Design Studio site and then to Time to Teach Students about Earth Friendly Design.

Have a sign-up sheet with the topics you want to cover so the students can put their names by the topics they want to help you tell the other students about. Once you see what they are interested in sharing you can adjust your topics and what days you will be doing Share to Learn. During the process participants are able to think about how much they like various styles of buildings and prepare what they want to share with the other students.

### Materials needed:

- ◆ Journals, spirals or some paper for the students to take notes on.
- ◆ Posters or printouts about the buildings selected by the students.

### Materials (optional):

- ◆ Handouts (for the students to have information to take home with them about what all the students shared but these are optional and can be prepared by the students themselves)

**Instructions:** (Time to finish project varies with how many students are taking part so allowing more time for this on additional days might be an option)

Have the participants look at any posters or materials you have that correspond to the topic you want them to discuss and allow or help them to pick an appropriate subject. Give them what you have that they can use for their presentation then have them do additional research. Help them get ready and print out any needed materials.

Predetermine in what order the students go. When the students are ready gather them all together in the area where they will be sharing.

For the first day of presentations you stand in front with them and as they share you politely add to what they have to say. This can be done by asking them a question they will know the answer to or can look up in their notes or on the poster or filling in interesting details they were not likely to be about to say.

When doing this on additional days stay at the front if any students will need your help but you can remain silent for those who want to and can do it on their own. This is meant to be a fun experience for the students and give them confidence for the future.

Following their presentations you can present some other interesting subjects also.

### Enhancing curriculum with the SMARTboard™

For this activity it is good to have the student as the focal point but if you don't have posters or large pictures and cannot print off the ones I have on the Internet you can pull them or other pictures and information up on the SMARTboard™ for the students to use during their presentations. Also with enough time to work on it the students could make their own posters, PowerPoints or other presentations to use.

## You Name It Game

This project is designed to be a fun creative way to get participants into the design frame of mind and give them some hands-on-experience with properties of materials including their benefits and the challenges they offer. It also provides a chance to visually perceive the students' thought processes and knowledge of design.

### Time for Teaching Students about Sustainability and Design

### Materials needed:

- ◆ Containers of play dough (the small party favor size works best for this and is usually in stock at stores like WalMart) (you can get a great deal when they clear out holiday versions such as those for Halloween) (roughly two containers per student needed)
- ◆ Pasta (at least one or two long varieties such as spaghetti and linguini or fettuccini, I suggest also having some shorter pasta such as penne, one package each should be enough for up to 20 kids) (Cook the pasta for 0 minutes, in fact don't even get it near water unless you want to make the game harder for the kids)
- ◆ Toothpicks are good to include (but not essential)
- ◆ Additional items requested that you see potential for working well and want to get

### Materials (optional):

- ◆ Additional items the students request that you see no potential for but want them to try anyway
- ◆ If the students want to keep some of their examples, bases for them to build their projects on would be good, so they can move them more easily before they dry. (A lot of things would work such as: a piece of cardboard roughly 1'x1' to 2'x2', wax paper on top of something sturdy, or a nonflexible piece of plastic about the right size)

**Instructions:** (Time to finish project roughly one half hour, may be tried again with additional materials that students want to test, or they can test things at home)

Have participants start by using one play dough and a selection of the other materials maybe 6 to 12 each. After 10 minutes or so, I let them use one more play dough if they need it, but the challenge is better with one. They are testing a version of a game that entails having students try to create the tallest durable tower they can (stands for 10 or 15 minutes) with their chosen amount of the available materials. Goal is to have fun learning about each other and create challenging, enjoyable and affordable games. Doing this activity with them is often encouraging for the students, and getting it to stand while higher than the length of the longest game piece is the tricky part.

Students should fill out a form once they have decided on a name for their game and how much of each item to use in their version. Some students prefer creating a design with the materials instead of a tower, which is fine; they should still list a name for their version and the amount of each of the materials they want to have used.

### Enhancing curriculum with the SMARTboard™

Types of building materials can be discussed and listed on the notepad of the SMARTboard™ then the students determine whether these would be environmentally friendly supplies to use for building in their area. You can have the students take turns, or if you have a student that finishes creating their game quickly you can have them lead this discussion. Pictures and information about the products may be obtained by going to the Internet via the SMARTboard™.

Welcome Home to Earth Friendly Design

# PUZZLES

These may be used in class  
or sent home with students  
and reviewed next time

## Creative Careers Word Search Puzzle

Circle all the names of careers you find in the puzzle

Time for Teaching Students  
about Sustainability and Design

ABCDEFGHI NKLAROPFRS  
I NTERI ORDESI GNERARP  
PRI NTMAKERCANTERSOT  
GRAGRAPHI CARTI STHPA  
OPCI TYPLANNERADTI OR  
PAI NTERAPOTTERNEOTH  
OPSETDESI GNERCUSNTE  
EPREI CECARVERHAODER  
TFURNI TUREDESI GNERN  
I LLUSTRATORPOTHGSZE  
UPSETDESI GNEREOWI ES  
CARTOONI STALLCORGER  
LANSCULPTORI OTPI NKY  
GLANDSCAPEARCHI TECT  
EAGLOPOWOODCARVEREM  
MORTERANTULENDARPOA

WORDLIST FOR CREATIVE CAREERS WORD SEARCH PUZZLE

ARCHITECT  
ARTIST  
CARTOONIST  
CARVER  
CITY PLANNER  
ENGINEER  
FASHION DESIGNER  
FURNITURE DESIGNER  
GRAPHIC ARTIST  
ILLUSTRATOR  
INTERIOR DESIGNER  
LANDSCAPE ARCHITECT  
PAINTER  
POET  
POTTER (TWO TIMES)  
PRINTMAKER  
SCULPTOR  
SET DESIGNER (TWO TIMES)  
SONGWRITER  
WOODCARVER

**Earth Friendly Word Search Puzzle**  
Circle all the Earth Friendly Ideas  
that you find in the puzzle  
Answers on attached List

REUSABLEWATERBOTTLESE  
PROTECTINGHABITATSLOC  
PEGASUSLAIRETAMLACOLU  
GRAGRASOLAREENERGYPCAD  
OCROPROTATIONAETIOARO  
PAEARTHDAYTTECTEOELPR  
RECYCLEDMATERIALSLCAP  
EPYGRENEDENIWEXWDECRNC  
UFCARPOOLINGDOENEYOEI  
SLLUSTOXTORPUTRGSCPLN  
ERENEWABLERESOURCESSA  
CPRCIXOTNONLENPRGROXG  
LANSCREUSINGGRAYWATER  
GLANTGNINEDRAGCINAGRO

## WORD LIST FOR EARTH FRIENDLY WORD SEARCH PUZZLE

CARPOOLING

CROP ROTATION

EARTH DAY

LOCAL CROPS

LOCAL MATERIALS USAGE

NONTOXIC

ORGANIC GARDENING

ORGANIC PRODUCE

PROTECTING HABITATS

PURE WATER

RECYCLE (CAN BE FOUND TWICE)

RECYCLED MATERIALS

REDUCE

RENEWABLE RESOURCES

REUSABLE WATER BOTTLES

REUSE

REUSING GRAY WATER

SOLAR ENERGY

SOLAR PANELS

WIND ENERGY

## Bibliography

Bellows, Layla. "Citizen Schools Diversifying Architecture from the Bottom Up." *AIA This Week*. AIA, n.d. Web. 27 Aug. 2010. <[info.aia.org/aiarchitect/thisweek09/0724/0724p\\_citizenschools.cfm](http://info.aia.org/aiarchitect/thisweek09/0724/0724p_citizenschools.cfm)>.

Emporis. "Tallest Building in the World - The Blog about the skyscrapers of the world." *Tallest Building in the World - The Blog about the skyscrapers of the world*. Skyscraper, n.d. Web. 18 Apr. 2011. <<http://www.tallest-building-in-the-world.com>>.

Fiske, Edward B., and Sally D. Reed. *Smart schools, smart kids: why do some schools work? ; the nation's leading education correspondent reports on the grass-roots revolution that is transforming America's classrooms*. New York: Simon & Schuster, 1992. Print.

Gibbs, Jeanne. *Reaching all by creating tribes learning communities*. Windsor, Calif.: CenterSource Systems, LLC, 2006. Print.

Hong, Kay. "Sparks." *Search Institute*. Search Institute, n.d. Web. 18 Mar. 2011. <[www.searchinstitute.org](http://www.searchinstitute.org)>.

Markova, Dawna, and Anne Powell. *How your child is smart a life-changing approach to learning*. Berkeley, CA: Conari Press, 1992. Print.

Marzano, Robert J., Debra Pickering, and Jane E. Pollock. *Classroom instruction that works: research-based strategies for increasing student achievement*. Alexandria, Va.: Association for Supervision and Curriculum Development, 2001. Print.

Petrash, Carol. *Earthways: simple environmental activities for young children*. Mt. Rainier, Md.: Gryphon House, 1992. Print.

Piaget, Jean. *To understand is to invent: the future of education..* New York: Grossman Publishers, 1973. Print.

Rusk, Robert R.. *The doctrines of the great educators,*. Rev. and enl. 3d ed. Melbourne: Macmillan;, 1965. Print.

Susanka, Sarah. *Creating the not so big house: insights and ideas for the new American home*. Newtown, CT: Taunton Press ;, 2000. Print.

Zemelman, Steven, Harvey Daniels, and Arthur A. Hyde. *Best practice: today's standards for teaching and learning in America's schools*. 3rd ed. Portsmouth, N.H.: Heinemann, 2005. Print.

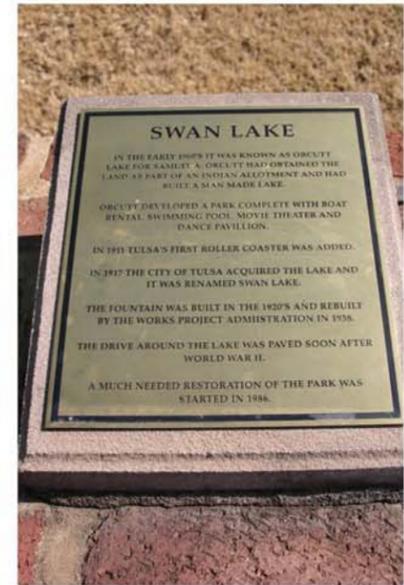
## Appendix

Included in this section are materials used in the process of teaching design to the students.

The posters about buildings are used as a starting point for the students from which they can do additional research and then tell what they learned in a Share to Learn presentation.

Other forms are used as needed with some of the activities.

**Time for Teaching Students about Sustainability and Design**



Examples of a few of the homes in the Swan Lake area which is a few blocks north of 21st street and Utica. The area was renamed Swan Lake in 1917 when the City of Tulsa acquired the lake.



Photographs by Laura Mauck



Frank Lloyd Wright designed the house known as **Westhope** for his cousin Richard Lloyd Jones.



Frank Lloyd Wright was well known for his unique design style. He also created furniture for some of the homes he did.

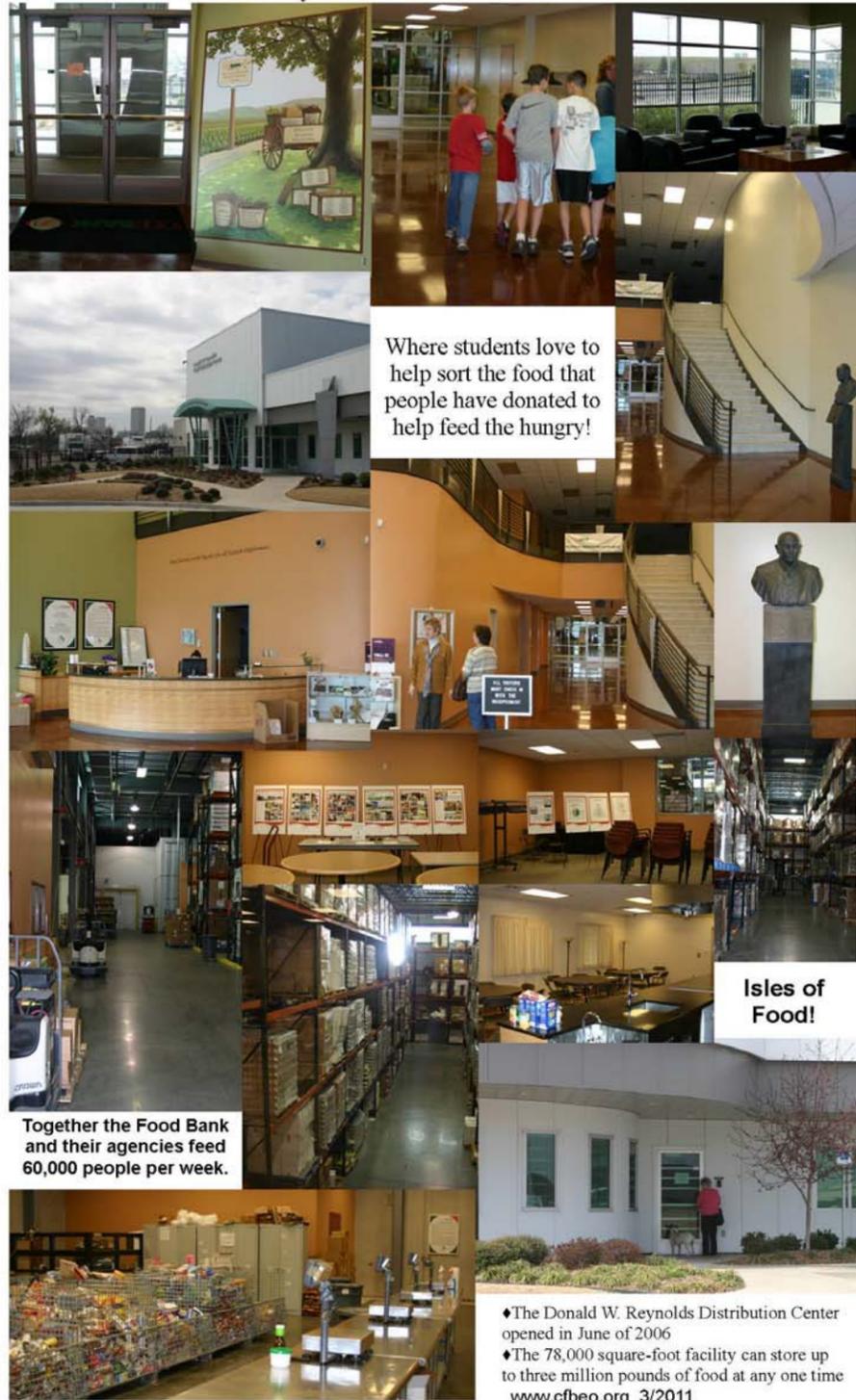
The home was built in Tulsa at 3704 S Birmingham Ave, in 1929, by architect Frank Lloyd Wright. The house is one of Tulsa's Art Deco treasures, but being nestled in a residential neighborhood, it is often overlooked. The house is listed on the National Register of Historic Places, but Tulsa has not given the area any protection beyond a routine RS-1 zoning.

Westhope is one of only three Frank Lloyd Wright designed buildings in Oklahoma. Built in 1929, Westhope is larger than most Frank Lloyd Wright designed houses, containing 10,000 square feet of floor space. Unlike many houses of comparable size, the unique scale of its interior spaces fosters a comfortable ambience whether it is accommodating one person or 400 people. The two-story house has a four-car garage, garden room, shop and workroom, pool, fountain, fish pond, formal garden areas, four patios, and also a covered entryway. It has a steam converter heating system, and a chiller-circulating water system for cooling.

Description was prepared by the Tulsa Preservation Commission  
For more pictures go to: [http://www.galenfryinger.com/oklahoma\\_tulsa\\_westhope.htm](http://www.galenfryinger.com/oklahoma_tulsa_westhope.htm)

Photographs by Laura Mauck

**Community Food Bank of Eastern Oklahoma**



Photographs by Laura Mauck

**Dallas Skyline set to have two large scale Green Developments in near future**



Dallas is going green in a total planned way. Recently a competition was held to redesign a rundown block in downtown Dallas and among all the architects, designers who submitted their plans, Forwarding Dallas, a Portuguese based architectural firm was picked as a winner. Their design is high both on eco-sustainability and aesthetics. The residential blocks have a typical hill-side structure which will be used to grow plants and it incorporates renewable energy sources like solar panels and wind turbines to supply power. There are plans in place for rain-water harvesting as well. So this community housing will



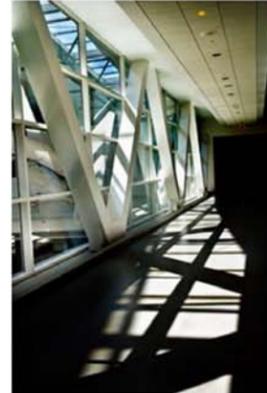
Design of Atelier Data and Moov is aesthetically extremely appealing and high on affordability too, it plans to recreate beautiful hills and valleys with prefabricated construction materials. The actual construction of this green haven is expected to begin in 2011. With such eco-sustainable housing designs becoming a reality, eco-conscious souls can make plans to shift out to green havens in next decade.

Both articles:www.GreenLaunches.com 1/2011



North Carolina based architecture firm Little Diversified Architectural Consulting has conceived an incredible project that will transform a vacant parking lot in Dallas to a completely self-reliant eco-city. The project has been given the name as Entangled Bank. The project will feature a green-walled citadel emblazoned with solar panels, an agricultural field and also an extensive system for greywater treatment and recycling. This will provide sustainable food, water and energy to the residents living in the building. The entire project will have residences, retail and educational institutions and will also include communal sky pastures with a 80,000 square feet of agricultural farmland which is vertical and also a 20,000 square foot grain field that provides food for the city's inhabitants.





Naturally lit corridor

## DLL Convention Centre is the ultimate green architecture for G-20 summit

Built at the cost of \$375 million the David L. Lawrence Convention Center is situated along the Allegheny River in downtown Pittsburgh and occupies nearly eight acres of land. Don't let that fool you; the building has a Gold LEED certificate which more than screams green at you. Pittsburgh is well known to be known as the "City of Bridges." Architect Rafael Vinoly of Rafael Vinoly Architects (RVA) in New York City, built this green marvel which is hosting the G-20 Leaders' Pittsburgh Summit on Finance for 2009. Ten percent of the building's materials are recycled, with over 95% of the demolition waste from the original center crushed and used as infill. Most parts of the building are naturally lit and it also boasts of a state of the art waste water recycling system. The waste water recycling system filters and purifies wastewater from the sinks, fountains and faucets in the building and recycles the water for use in the building's restroom commodes.

The largest use of water in convention centers occurs in the restrooms. Combined, these two water-savings systems enabled the center to reduce its municipal water usage by 8.5 million gallons in 2008. The signature swooping roof of the building draws its inspiration from the many suspension bridges that span across Pittsburgh's three rivers. The building features 236,000 square feet of column-free space in the main halls with more than 31,000 square feet of ballroom space and nearly 80,000 square feet of meeting space in 53 rooms.

<http://www.greenlaunches.com/architecture/dll-convention-centre-is-the-ultimate-green-architecture-for-g20-summit.php> 2/2011

### Building Project Timeline

1990

A study was released showing that expansion of the David L. Lawrence Convention Center was necessary in order for the region to remain competitive as a convention site. Pittsburgh and Allegheny County officials requested \$150 million from the Commonwealth of Pennsylvania for expansion of the David L. Lawrence Convention Center.

1996

Elected officials agreed to expand the convention center by tripling the amount of exhibit space.

1998

In March, Mayor Tom Murphy and the Allegheny County Commissioners unveiled so called "Plan B" which dedicated hotel taxes and a portion of the county-wide sales tax to the convention center project.

In April, Governor Tom Ridge released \$150 million in state funding for the expansion.

In May, the Southwestern Pennsylvania Convention Center Design Commission is formed to oversee the design of the new convention center.

In July, the Public Auditorium Authority of Pittsburgh and Allegheny County (now the Sports and Exhibition Authority) along with the Southwestern Pennsylvania Convention Center Design Commission initiated a \$750,000 international design competition funded by the Heinz Endowments and the Hillman, Benedum, McCune, Buhl and Richard King Mellon Foundations.

1999

The design proposal from Rafael Vinoly Architects is unanimously chosen after 25 design proposals were evaluated.

2000

In April, ground is broken for the new David L. Lawrence Convention Center. A three phase construction schedule is planned.

2002

In February, Phase I of the construction is complete as three exhibit halls open. In October,

Phase II is complete adding another exhibit hall and 10 meeting rooms.

2003

Phase III is complete bringing the total number of exhibit halls to five, two lecture halls, 51 meeting rooms and a grand Ballroom.

In September, the Grand Opening of the new David L. Lawrence Convention Center.

<http://www.greenfirst.us/administration.html> 2/2011



## Sky Village High Rise in Copenhagen

MVRVD and Adept Architects are the masterminds behind this incredible Sky Village high rise. Designed as an acropolis of stackable green-roofed units, the structure recently won a competition to construct a new high-rise in Rødovre, an independent municipality of Copenhagen. The high-rise incorporates lots of sustainable design elements to reduce its environmental impact, and its main concept is centered around a system of individual units that can be stacked in various configurations to maximize available space and allow for easy structural changes in response to market demand.

<http://inhabitat.com/sky-village-by-mvrdv-and-adept/> 2/2011



<http://www.contemporist.com/2008/11/03/%E2%80%98sky-village%E2%80%99-wins-competition-for-new-building-in-copenhagen/> 2/2011



## The Bahrain World Trade Center

Also called Bahrain WTC or BWTC this is a 240 m (787 ft) high twin tower complex located in Manama, Bahrain. The towers were built in 2008 by the multi-national architectural firm Atkins. It is the first skyscraper in the world to integrate wind turbines into its design.

The two towers are linked via three sky bridges, each holding a 225KW wind turbine, totaling to 675kW of wind power production. Each of these turbines measure 29 m (95 ft) in diameter, and is aligned north, which is the direction from which air from the Persian Gulf blows in. The sail-shaped buildings on either side are designed to funnel wind through the gap to provide accelerated wind passing through the turbines. This was confirmed by wind tunnel tests, which showed that the buildings create an S-shaped flow, ensuring that any wind coming within a 45° angle to either side of the central axis will create a wind stream that remains perpendicular to the turbines. This significantly increases their potential to generate electricity.

The wind turbines are expected to provide 11% to 15% of the towers' total power consumption, or approximately 1.1 to 1.3 GWh a year. This is equivalent to providing the lighting for about 300 homes annually.[3] The three turbines were turned on for the first time on the 8th of April, 2008. They are expected to operate 50% of the time on an average day.



Bahrain World Trade Center @ GoogleImages.com and Wikipedia

## The Pearl River Tower: a clean technology skyscraper.

Skyscrapers are shooting up all over the world making sure their heads that pop up on the horizon remain green. To top them all, China will now have the world's greenest skyscraper. This fall, the Pearl River Tower in Guangzhou, China will open its doors to the world. Soaring 71 stories high, this 2.3 million square foot building has its green features set right and boasts of a rainwater collection system which uses solar water to provide hot water for the building.

The building will be the world's tallest Zero Energy Building. These type of buildings generate more power than that they consume from the grid. This will be the first building that will use wind turbines incorporated into the body of the building and functional at lower wind speeds. The building also uses photovoltaic panels on its outer layer that absorbs and retains juice from the sun. The Pearl River is also the largest radiant-cooled office building in the world using raised floor ventilation, heat sinks, and vertical vents.

Of Pearl River Tower's accomplishments, many are related to sustainable design features including:

- ◆The largest radiant-cooled office building in the world
- ◆Most energy efficient super-tall building in the world

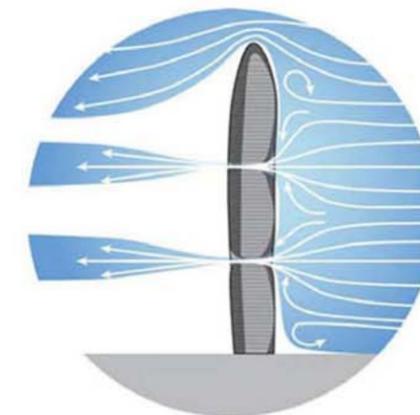
The tower is an example of China's goal to reduce the intensity of carbon dioxide emissions.

<http://www.greenlaunches.com/architecture/chinas-pearl-river-tower-will-be-the-worlds-tallest-zero-energy-building.php> & Pearl River Tower images@Google.com 10/2010



## Timeline

- Fall 2005 : Design Competition
- 8 September 2006 : Ground Breaking Ceremony
- November 2006 : Enabling Works begin
- 18 July 2007 : Public bidding for the construction
- January 2008 : Main Package construction begins -26.2 m (-86 ft)
- August 2008 : Building Core construction reaches ground level 0 m (0 ft)
- April 2008 : 15th Level 80.6 m (264 ft)
- November 2009 : Glass curtainwall installation begins
- December 2009 : Building reaches upper wind turbine level
- 28 March 2010 : Topped-out or roof put on





School of Art, Design and Media at Nanyang Technological University in Singapore



The building's unique, award-winning design, seems to offer a new experience or view from every different floor or location within and around it, which is quite suitable for a design school, considering the subjects taught it should inspire creativity.



www.google.com/imgres?imgurl=http://www.inhabitat.com/wp-content/uploads/2008/nyecountdownarch.jpg&imgrefurl=http://inhabitat.com/top-ten-green-architecture-projects-of-2008-2/2011

The roofs create open space, insulate the building, cool the surrounding air and harvest rainwater for use in landscaping irrigation. Planted grasses mix with the native greenery to colonize the building and bond it to the aesthetically appealing setting.



### Stained Glass Art House Lights up the Night

A New York artist named Tom Fruin put this piece on display near the water on a plaza in Copenhagen. While some would say its abstract patterns seem out-of-place others find it plays off the multi-colored lights found around it there in the downtown area at night.

Understated by day, this house-shaped art installation comes alive at night with a dazzling spectrum of projected colors. Illuminated from the inside, it casts beautiful light on the brick-paved ground of the public square around it.

http://flickr.com/photos/home-stained-glass-art-house-lights-up-the-night/32011



chstainedglass.com 3/2011

Many buildings are designed with stained glass windows built into the walls to catch the light as it shines through and project beautiful colors into certain parts or even most of the interior of the building.

Stained glass comes in many varieties with some like the building above having geometric shapes and others like the ones below having recognizable design patterns in them. Sometimes items like these votive candle holders are made of stained glass.



blogspot.com 3/2011

chstainedglass.blogspot.com 3/2011

glasswindow.com 3/2011

### Animal Homes

The Environmental Protection Agency wants to find a way to increase animal habitats because more and more animals are becoming extinct, endangered and threatened. We are going to do an initial assessment of where animals call home in the Greater Tulsa area. We want to do a good job so that we have an opportunity to help with further assessments in the future. Your help is appreciated.

Please list 10 animals you may have heard of or are familiar with:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

Please locate with a pencil where the animals live on your map and be prepared to share their habitats with your classmates by putting a sticker on the big map.

Your Name: \_\_\_\_\_

For helping us you will receive 5 extra materials points to be used in the Earth Friendly Game during the final week of the club/class in appreciation for your doing a great job.



**This award goes to**

\_\_\_\_\_

**For outstanding Creativity during  
the Earth Friendly Game!**

**It is worth \_\_\_\_\_ magic points**

# Share What You Find

Your Favorites, Out of the Ordinary or Simply Fascinating  
Sign Up Sheet

Put Your Name – and whether you wish to do a small, medium or large presentation

Topic 1 -- Tree houses, play houses, forts

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Topic 2 -- Tall Buildings

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Topic 3 -- Dream Homes or Favorite Homes

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Topic 4 -- Commercial Buildings

Topic 5 -- Government Buildings and City Planning

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Topic 6 --Career you'd like to share and/or Design Competition or Individual Project

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