



Gifted LearningLinks Program
Enrichment Course Syllabus

Loretta S. Rice
Email: xxx@xxx.xxx

Course Title: The Geometry of Architecture

Session: Winter 2012

Course Description:

How many geometric shapes can you discover in your favorite building, bridge or skyscraper? Students explore proportion, point, segment, ray, line, angle, and triangle as parts of the whole in architecture. Sacred geometry, golden ratio, and the concept of Gothic Master Diagram are introduced as students discover the origins of architecture in the field of art. Students create their own buildings by making scale drawings relevant to the success of their designs. Higher-level thinking skills are broadened and strengthened as students face design challenges related to the principles of mathematics and architecture. Students will create a photo gallery contributing several photos of buildings and structures unique to their surrounding communities. Students will investigate building methods from ancient times to present day as well as recent improvements and advances in science and technology, which have impacted both architectural and structural designs today. Participants create their own buildings by making scale drawings of designs and solving their own design challenges using principles of mathematics/architecture using Google Sketch-Up™. Students will have a new perspective and appreciate a variety of structural surroundings from houses and offices to schools, hospitals, theaters, galleries and shopping centers. Hopefully this course will have sparked an interest in architecture, building and planning structures as a future career.

Geometry and Spatial Sense Outcomes:

Upon successful completion of this course students will:

- *Become familiar with how mathematics/geometry relates to the fundamental of architecture*
- *Actively seek out, recognize and explain the occurrence and application of geometric properties and principles in the everyday world*
- *Explore, estimate and calculate area and perimeter in maximizing space*
- *Draw, build and incorporate the use of 2-D and 3-D geometric shapes and solids in mathematical patterns*
- *Solve problems related to the calculations of the perimeter and the area of regular and irregular two-dimensional shapes*

- *Explore and focus on angles, congruency and the use of protractors and other measurement tools*
- *Identify, extend, and create patterns in a variety of context to solve problems*
- *Use mathematical language to discuss and explain student understanding of the concepts presented with their like-minded peers*
- *Discuss ideas, make conjectures, and articulate hypotheses about geometric properties and relationships*

Architectural Outcomes:

Upon successful completion of this course students will:

- *Demonstrate an understanding of various standing structures and their elements*
- Understand how the frame of a building works
- Formulate questions, evaluate and identify needs and problems related to structures and mechanisms in the outdoor environment, and explore possible solutions
- Investigate appropriate materials used to build structures in a specific climate/region
- Determine and demonstrate the difference between tension and compression
- Identify and critique pre-construction stages of sites around town
- Justify the need for various building codes
- Identify buildings/structures which feature innovative design and construction
- Plan, create, and design individual architectural models and drawings to reflect their understanding of mathematical relationships in building structures.
- Recognize, identify, appreciate and articulate various structures in any environment using geometric and architectural language
- Reflect and celebrate individual/group project achievements
- Experiment and use technology to create and enhance architectural plans

Resources:

- Will be provided on the course site.
- For a complete list of articles and websites click on Course Documents of the course site.

Materials Needed:

Weekly Journal (provided)

Graph paper <http://incompetech.com/graphpaper/174/>

Readings: (provided)

CTD Statement on Third-Party Web Sites

Instructors are required to thoroughly review any third-party web sites they intend to use in their courses for inappropriate content. However, because web content continuously changes, CTD disclaims any responsibility for any of the content contained on third-party web sites used in course materials. If you become aware of anything that may be inappropriate, please notify CTD staff immediately.

Course Timeline:

	Topic/Focus	Activities & Reading Assignments	What do I need to post to the Discussion Board?	What do I need to turn in?
Week 1	GLL Orientation to Online Learning and Course Site Orientation Geometric Terms	Week One Assignments - Check the "Announcement" page for weekly information. Go to "Assignment" page and look in Week One folder.	Introductions posted on the Discussion Board before the end of Week One.	Student Interest Survey Pre-Assessment Form Introduction to peers in Student Lounge on the Discussion Board
Week 2	Class Photo Gallery Skyscrapers Tents Course Documents Tour What Does An Architect Do?	Taking Digital Photos to contribute to the Class Photo Gallery Readings: <u>The Art of Construction</u> Chapters 1-5	Submit two or more of your journal entries on the DB. Respond to two or more of your peers on the Discussion Board.	Response Journal Week Two and Participation on the Discussion Board
Week 3	Beam Structure Materials The Floor of Your Room Architectural Terms Interactive Sites: Forces/Material/Loads What Does An Architect Make?	Adobe Connect™ Session TBA	Submit two or more of your journal entries on the DB. Respond to two or more of your peers on the Discussion Board	Response Journal Week Three and Participation on the Discussion Board
Week 4	A Steel Frame The Part of the Building You Don't See What Does An Architect Learn? Google Sketch-Up™	Adobe Connect™ Session TBA	Submit two or more of your journal entries on the Discussion Board.	Response Journal Week Four and Participation on the Discussion Board

Week 5	What Tornadoes, Earthquakes and Changes in Temperature Can Do What Does An Architect Use? Introduction of Final Project	Adobe Connect™ Session TBA	Submit three or more of your journal entries on the DB. Respond to three or more of your peers on the Discussion Board.	Response Journal Week Five and Participation on the Discussion Board
Week 6	The Pyramids Ropes and Cables Sticks and Stones Strings and Sticks Shape and Strength What Does An Architect Ask?	Adobe Connect™ Session TBA	Submit three or more of your journal entries on the DB. Respond to three or more of your peers on the Discussion Board.	Response Journal Week Six and Participation on the Discussion Board
Week 7	Barrels, Dishes, Butterflies, Bicycle Wheels, and Eggs What Does An Architect Use?	No Adobe Connect™ Session Use this time to work on the Final Project of your choice.	Submit three or more of your journal entries on the DB. Respond to three or more of your peers on the Discussion Board.	Response Journal Week Seven and Participation on the Discussion Board
Week 8	Balloons and Back to the Tent What Does An Architect Need? Sacred Geometry	Adobe Connect™ Session TBA	Submit three or more of your journal entries on the DB. Respond to three or more of your peers on the Discussion Board.	Response Journal Week Eight and Participation on the Discussion Board
Week 9	Final Presentations	Final Project Student Choice Adobe Connect™ Session TBA	Final Project Self-Evaluation	Week Nine Participation on the Discussion Board

Refer to this course timeline frequently. Based on the results of the pre-assessment and individual learning readiness, this course timeline is subject to change.

Student Evaluation and Grading Policies:

Enrichment students will receive a final narrative evaluation after the course is complete.

Instructor Biography:

Loretta received her B. A. in Early Childhood Education from Northeastern Illinois University Chicago, Illinois 1975.

Her M. A. Education Curriculum & Instruction from Clarion University, Clarion, Pennsylvania 1976.

She taught in the following school districts:

Glenview School District #34 Glenview, IL. Grade 5, 1991-2007

Hillsborough County Public Schools Brandon, Florida Grade 5, 1989-1991

Ministry of Education Nassau, Bahamas Grades 7-12, 1983-1989

Oak Park School District #97 Oak Park, IL. Grades 1-3, 1976-1983

Loretta is a retired teacher. She teaches Project Excite, Saturday Enrichment Program, One-week Summer APOGEE Program and Gifted LearningLinks at the Center for Talent Development.

Loretta is also a member of the Illinois Association For Gifted Children.

Contact Information:

xxx@xxx.xxx

Work Phone xxx-xxx-xxxx

Office Hours:

By appointment

Acrobat Connect Classroom: TBA

All questions will be answered within 24 hours except for weekends and holidays.