



# The Great Globe Project

## Overview

The Great Globe is a 1:100,000 scale model of the earth that will stand over 40 stories in height. Over 10 million 4" triangular tiles will cover the rotating 420 ft diameter globe. Every natural and manmade feature on Earth larger than 30 ft. will be viewable on the surface of the model. Thousands of American children will collaborate with other middle school students around the world to research, computer-model, and fabricate 3D color tiles of the Earth's surface. Starting with satellite imagery and topographic data from NASA, these citizen scientists will become stewards of a triangular area on the globe 6 miles (10 km) on a side. They will research their part of the Earth and work to create a digital model. With the help of an extensive network of scientists and professionals, the students will become part of a global Earth survey. They will collect data on anything they find interesting while experiencing the joy of discovery and the satisfaction of teamwork while collaborating with tile builders from all over the world. New students will be mentored by graduates of The Great Globe program.



## Statement of Need

The Great Globe will encourage the children of the world to embrace science, math, and engineering as well as introduce them to the concept of viewing Earth as a connected global community. In order to solve the pressing problems facing our civilization, we need creative scientists, engineers, inventors, and philanthropists more than ever. The Globe will serve as a powerful tool with which to raise awareness, foster collaboration, and create solutions for issues facing our global community including environmental sustainability, poverty, hunger, and disease.

Getting children interested in science, math, and engineering is a challenge because they may see these subjects as abstract, impersonal, or irrelevant. Without a kindling of interest in the sciences by the time a child reaches middle school, students may make academic choices locking them out of science-based careers.

## Core Activities

This project is structured primarily for middle school students. Each student is assigned a triangular sector on Earth based on an icosahedron geodesic mapping system. Their seven character tile area code (ex. D345287) is synchronized with NASA's WorldWind satellite, USGS map, and topography database. The student enters their personal ID number on the Great Globe website to work on their virtual tile. The satellite image used as a starting point for students will reflect existing data, but will probably not represent the current condition or true color of the Earth's surface. The primary task for students is to learn everything they can about their section of Earth and modify the color and physical detail of the model tile. The finished tile should reflect what the section looks like on the first day of summer in order to maintain a consistency in appearance on the completed model. The student's initial task will be to find out where on Earth their sector is. There are no country names or boundaries labeled on the sector. There will be a wealth of resources available to students during this discovery process including teaching of Geography and mapping techniques and how to correlate the tile area code to other latitude and longitude based references. Specific data on the color of the ground cover will require pulling together a number of clues.



For example: If it is farm land, what crops were planted this year? What is the color of the plants on the first day of summer? Has there been a flood or draught? Are there new buildings and housing developments? Getting this information will require a good deal of effort making support from the network of Great Globe advisors crucial. Scientists, explorers, engineers, and other information providers are being assembled to guide the students online.

### Ground Truthing

The connection with the real world through the “ground truthing” exercise is the heart of the educational program provided by The Great Globe. Students make contact with actual experts in the field. Once a color has been determined for a specific area the student uses a paint program to modify the tile. Since each sector represents about 14 square miles this could involve a lot of research and thus may require a number of students to work together as a team.



Landforms can also be modified using solid modeling software. A glacier that has receded, a volcano that has erupted, or a dam that has been built can all be added or subtracted from the base model. The easy to use modeling program allows buildings to be added as well as cargo ships, monuments, or any other manmade structure larger than 30 ft (10 meters).

In addition to surface features there are an unlimited number of other things that could be discovered within the sector boundaries: How many people live there? (*demographics*) How much energy do they use? (*energy conservation*) How much waste? (*recycling, sustainability studies*) What social challenges do the people face? (*disease, poverty, war*) What animal or plant life exists there? What was it like 1,000 years ago? (*history*) All of the information found will be added to a worldwide database categorized by sector. This database forms an incredibly powerful backbone of information for the project that represents a permanent and Global tool for communicating, collaborating, and working to solve problems all over the world.

### Tile Printing and Assessment

When the virtual tile is finished the file is sent to one of 200 3D color printers. The printing center can be located in a school, museum, office space, etc. and can be safely operated by 10 year olds with adult supervision. Successive paper thin layers of plaster are hardened by color inkjet print heads forming a solid tile. Each printer is capable of producing about 130 tiles per day. After printing, the tile is sent back to the student to be over painted with permanent pigment colored glazes. It is a critical part of the project for students to be able to hold and work with the actual tile they spent so much time and effort creating digitally. Children all over the world will hold a common bond with one another and know that together, they are the ones who have constructed The Great Globe.



The 4” tiles are attached to 36” triangular mounting panels in groups of 81. The finished panel is then sent to the construction site and attached to the rotating geodesic spherical spaceframe.

A deadline of one year is given to supply a finished tile. During the entire tile creation project, students record all discovered information, references, and contacts in the database under their tile sector area code. Monitoring of the students progress at any time can be done online by entering the area code to see the current results of their research.



## Organization

The Great Globe Project is being established as a worldwide non-profit education program under the Great Globe Foundation. It is estimated that it will take 3 years to produce the 10.5 million tiles required to cover the Globe. Once all of the tiles are in place, they will continue to be replaced over subsequent years with updated versions reflecting the changes that have occurred on Earth since the previous tile.

Future generations of children will be able to participate in this permanent process of documenting our changing planet.

Over a dozen schools have signed up as beta test participants. The cost of each student to participate and make one tile is approximately \$50 dollars. Most of the children in the world will not be able to afford the cost to participate and will rely on grants and "tile scholarships" that enable this program to reach children the world over.

This project is an extension of a previous student-built globe project in Minnesota engineered by Mr. Beaulieu in 1993. Over 30,000 children participated in the development and construction of a 42 ft (1:1,000,000 scale) model of Earth. The previous globe was assembled and disassembled several times and was the star attraction at the Earth Day event in 1995.

Preliminary construction has begun on the site for the Great Globe. The completion of the globe structure and installation of the first set of tiles is scheduled for late 2012. This project will become a destination for millions of people from around the world and establish Arizona as a leader in worldwide environmental education and philanthropy.



## Contact Information:

If you would like to join our educational support network, would like more information about The Great Globe Foundation, or are interested in our tile-center franchise opportunities, please contact:

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We are committed to solving Global problems through collaboration and action. If you are a non-profit organization interested in partnering with The Great Globe, please contact:

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