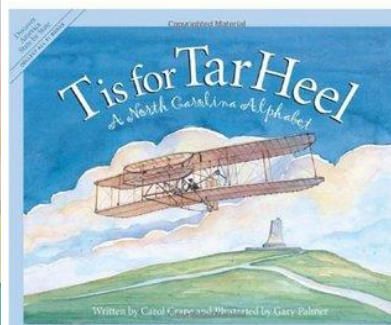
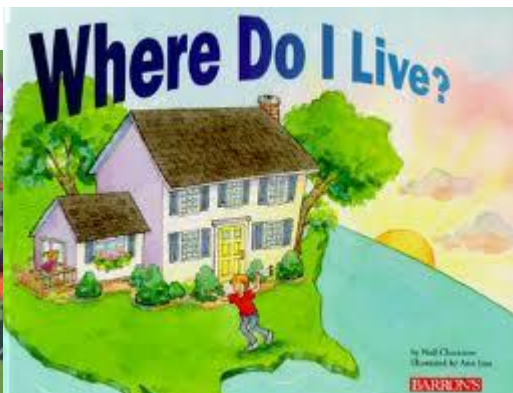
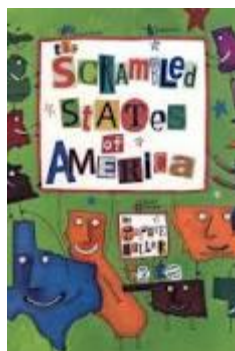


3D Printing Topographical Maps: 4th Grade

Engage Explore Explain Elaborate Evaluate

E Engage with Books:



Engage with Media:

[NC Regions](#)

[NC Regions](#)

[NC Regions](#)

[Booker Travels: NC](#)

Have students take notes and tell what regions were where

S- Earth History (How Landforms are made)

T- 3D Printing

E-Designing their Topographical Map

A-Drawing their regions and what types of things you would find in it.

M- Measurement and Longitude and Latitude

Curriculum Connections:

The Learner Will Apply the Five Themes of Geography to North Carolina and its people

Essential Standard Clarifying Objectives 4.L.1 Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.

4.E.2 Understand the use of fossils and changes in the surface of the earth as evidence of the history of the Earth and its changing life forms.

4.E.2.1 Compare fossils (including molds, casts, and preserved parts of plants and animals) to one another and to living organisms. 4.E.2.2 Infer ideas about Earth's early environments from fossils of plants and animals that lived long ago. 4.E.2.3 Give examples of how the surface of the earth changes due to slow processes such as erosion and weathering, and rapid processes such as landslides, volcanic eruptions, and earthquakes.

Vocabulary: Coastal, Mountain Region, Piedmont, Topographical

I Can Statements:

I Can explain and tell where the different NC regions are.

I Can find NC on a Map

I Can find the three regions of NC

I Can use and navigate the site STL Generator

I Can create a STL file

I Can download an STL File

I Can print an STL file on the 3D printer

E

First Day: Engage (see above under engage)

E

Second Day: Explore

- Have students go and explore the site below:
<http://jthatch.com/terrain2stl/>
- Have students do the tasks below: (Use Challenge Cards)
- Locate North Carolina
- Locate desired location by dragging and zoom (mouse wheel will zoom)
- On the right menu, click the "Center to View" button (and a red box should appear)
- Change the "Box Size" to the desired frame-size (by sliding the button on the ride side of your screen) for your file (red highlight)
- Find the street View

E

Third Day: Explain

Students will sit in their groups that their teacher has assigned prior to class.

Each table will have examples of topographical maps. Students will look at the maps and will be able to explain what a topographical map is. Ask why some areas are flatter than other areas. Ask them how that happens. How are landforms formed?? Have books on the tables with different

Explain how the 3D printer works and how you download your stl file to the cura program. Go over how to change the measurement of the file so the base of the map is thicker. Explain that the 3D printer is in millimeters. Have students tell you how many millimeters are in a centimeter. Show them a ruler. Ask what a good size would be for their map.

As students are doing the above, have a group come to the 3D printer and find their region, download it and change the dimensions. Go over with students the measurement of each Map. This is found on the x, y, z. Ask how many millimeters are in a centimeter. Have students figure out how tall their map should be. If you do not change the dimensions the map will be thin.

A good model is:

Width : 75

Depth:

Height: 93

E **Fourth Day: Elaborate:** Students write a paragraph on their region putting in what types of landforms, cities, and landmarks are found there. The students then draw their region putting these things in their pictures

As students are doing the above, have a group come to the 3D printer and find their region, download it and change the dimensions.

Product:

A topographical map

E **Evaluation:** Students have a paper, drawing and topographical Map. Teachers created rubric for project.

Some groups may need to come in the morning to print. Try to have a group print each time you have a class.