

Division Of Geological Survey

HANDS ON

EARTH SCIENCE

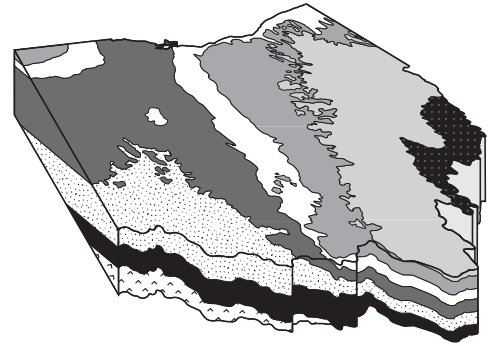
No. 7

MODELING OHIO'S GEOLOGY

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Geologic maps are representations of the geology of an area. For example, the geologic map of Ohio shows the distribution of bedrock belonging to six geologic systems, that is, rock laid down during corresponding geologic time periods.

Geologic maps generally are colorful, and commonly are accompanied by cross sections that help in their interpretation. Still, it's not always easy for the student to understand what these maps represent. One hands-on way to help understand such maps is to make your own three-dimensional model. It is quite easy to make such a model of Ohio—all you need is plaster, a mold shaped like Ohio, paints, and a geologic map of Ohio. Many craft stores sell plaster and molds for making plaster objects. If your craft store does not have an Ohio mold, the store can order molds of Ohio and other states from the Deep Flex Plastic Mold Co., Murfreesboro, Tennessee. Their Ohio mold produces casts that are 5.5 x 5.5 x 1.0 cm in size. Multiple molds can be purchased for classroom use. Inexpensive acrylic paints can be used for painting your model. Six colors will be needed for the top view and two additional colors for the cross-sectional view. A simple, page-size geologic map illustrating the geologic systems can be ordered from the Ohio Division of Geological Survey.



To make your three-dimensional model, mix plaster according to the recipe on the container and pour it into the plastic mold. Let it dry for at least two hours. Then, using the geologic map of Ohio as a guide, paint the area representing rock belonging to each geologic system a different color. The top view will be easy—it's the same as the map. The sides of the model will be more difficult, requiring an understanding of the tilting (dip) of the rock layers beneath the surface and a basic understanding of geologic principles. The accompanying illustration will help. When painting your model, be sure to remember that younger rock layers in Ohio overlie older layers; this is the Law of Superposition. In a classroom, students can either work in small groups or make individual models. The final model can be protected by spraying it with an acrylic fixative. Teachers may want to make a large-scale plaster map; directions for such a map are given in the reference cited below.

Geologic maps also can be made using different colors of play clay or similar materials to represent rocks belonging to different systems. However, because of shrinkage during drying, these models will not be as attractive as well-painted plaster models.

The geological gourmet might prefer to make edible geologic-map cookies. This project requires a state cookie cutter (available, for instance, from the Ohio Historical Society, 1982 Velma Ave., Columbus OH 43211). A simple sugar cookie recipe from any general cookbook can be used. A glaze frosting can be made using powdered sugar, a tad of warm water, and a few drops of food coloring; again, a recipe can be found in any general cookbook. At least six colors of frosting will be needed for a geologic map of Ohio. You can try making three-dimensional cookies by cutting out a thicker than usual cookie. However, if you are not an expert cookie maker you will find it difficult to frost the sides of the cookies, so it may be best to simply do the top view of the map. Add a chocolate chip to identify your city. One warning—making edible geologic maps takes time! If this project is done for the classroom the cookies can be baked at home by the teacher or by parent volunteers the day before frosting in class.

SOURCE: "A simple, inexpensive method for making a three-dimensional geologic model of your state," by Suellen Hopfer and J. T. Hannibal, in *On the rocks: earth science activities for grades 1-8*, S. G. Stover and R. H. MacDonald, eds., SEPM (Society for Sedimentary Geology), 1993.