

Grapefruit Lesson



Overview

Students learn the need for map projections by attempting to cut the skin off of a grapefruit and making it flat enough to use as a readable map.

Objectives

Students should:

- Understand why flat maps cannot be made without some kind of distortion.
- Be able to state various compromises that mapmakers use.

Materials

One grapefruit per student; one black marker per student; one serrated plastic knife per student; sponge and paper towels for clean-up; wall or desk maps with a variety of projections — polar, conic, mercator, etc.— kept out of sight until latter part of lesson.

Methods and Discussion

1. Distribute grapefruits, knives, markers, towels.
2. On each grapefruit, students draw equator, prime meridian, international date line, and a few real or make-believe countries.
3. With knife, students attempt to remove skin in such a way that the peel is in one piece (or at least in large pieces) and could be used as a map. Allow 10-15 minutes.
4. Examine results, let students describe their particular ordeals, then get out samples of different projections for examination and discussion.
5. Discussion includes some analysis of what kinds of problems students encountered (“I couldn’t get it flat,” “These two places that are supposed to be next to each other ended up far apart,” and so on), a presentation by the teacher of the different

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projections, and a look at the compromises inherent in each projection, what is gained, and what is lost in each one.

6. Students can be invited to eat grapefruits at end of class.

Variations

- Exercise can be done in pairs or small groups to save on fruit and to enhance student discussion and group problem-solving skills. If small groups are used, it's always useful to ask a question or two at the end about the problem-solving difficulties that the groups faced, and how they were resolved.
- Teacher can do one grapefruit in front of the class, with students helping, offering suggestions, etc.
- It can be done in reverse. Find a desk map with an equator about the same length as your grapefruit's circumference and try to fit the map to the grapefruit using scissors and scotch tape.

