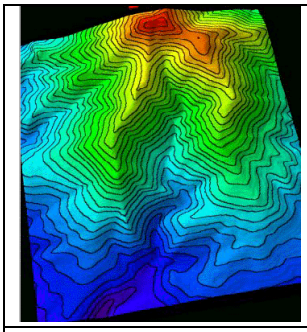
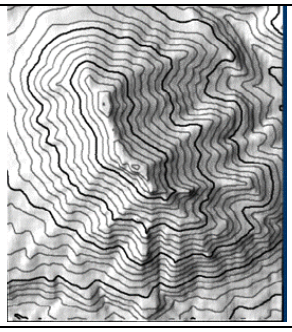
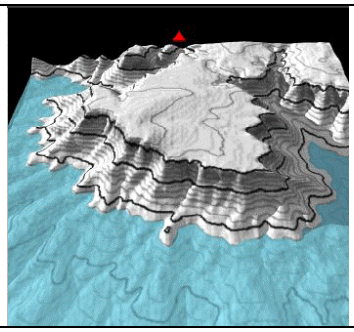
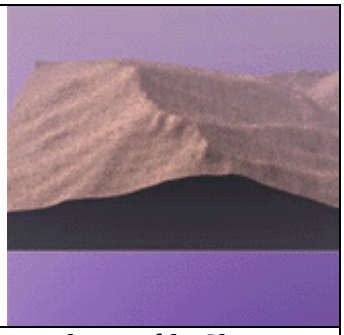
Topographic Maps Module Content Guide

This content guide serves to cover the basic concepts within the Topographic Maps Module. This is intended to assist you, the teacher, in creating effective lesson plans, preparing additional activities, and constructing appropriate assessments. Within this content guide, a justification of the use of topographic maps as well as brief definitions and descriptions of terminology associated with topographic maps is given. Words in bold are key words that students should recognize and understand by the end of the lesson. A table below each section shows an example of each described feature (screenshots captured from the module).

1. Types of movies in the module. The four views shown in the table below are representative of the types of movies with which students can interact throughout the module. Students can click and drag the mouse in each movie file to tilt and rotate a terrain (1a), to increase and decrease amount of shading (1b), to flood a terrain (1c), and to slice into a terrain to view profiles (1d).

			
1a – Tilt and Rotate Movie	1b – Shading Movie	1c – Water Flooding Movie	1d – Profile Slicing Movie

2. **Topographic Maps** – Why should students study topographic maps?
Society uses topographic maps:

- to study the distribution of plants and animals, rainfall, or soil types
- to determine safe places to build factories, communication towers, or houses
- to plan the best uses of land.

Geologists use topographic maps to make geologic maps, which show what rocks and geologic structures (e.g., faults) are exposed at the surface. We use geologic maps:

- to study the distribution and geometry of rock units on and below the surface
- to find mineral and energy resources
- to evaluate the potential for natural hazards, such as landslides, earthquakes, and volcanoes.

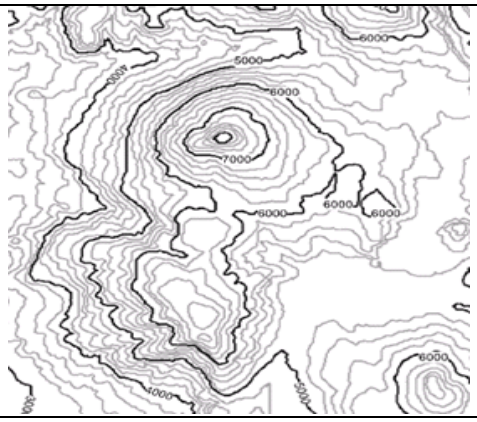
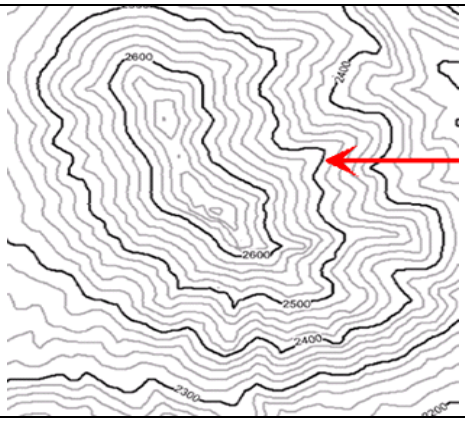
Adventurers use topographic maps:

- to find their way on a backpacking trip or hike
- to find appropriate places for mountain biking or rock climbing
- to determine how extreme the conditions will be.

♦ **Topography** of a landscape represents the shape of the surface features.
♦ **Topographic maps** are a way to represent the three-dimensional features of a landscape on a two-dimensional surface (a map). (See figures 2a and 2b in the table on the next page.)

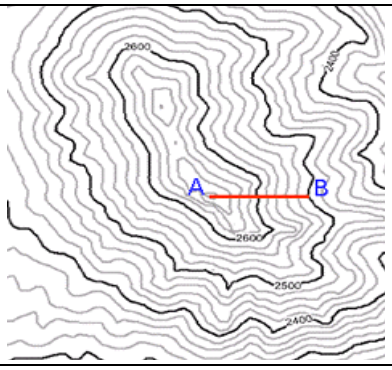
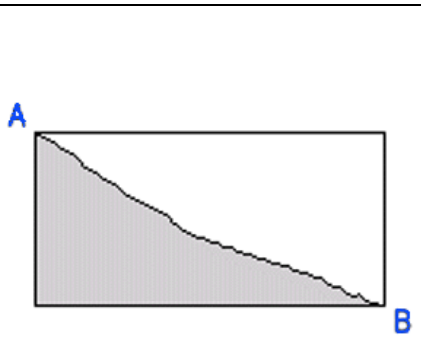
3. Contour Lines

- **Contour Lines** describe the shape of a landscape. These lines connect points of equal elevation. If you were to travel along one line, you would stay at the same height above sea level. (2a)
- **Index Contours** are reference lines on topographic maps. Every fifth contour line is darker, or highlighted, to provide a quick reference guide for elevation changes. Index contours are marked with elevations to allow users to quickly determine specific elevations of contour lines. (2b)

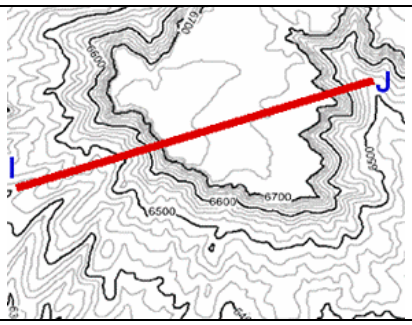
	
2a – Topographic map with contour lines and index contours	2b – Contour lines and index contours (in bold); arrow points to an index contour

4. Elevation Profiles are what you would see if you could slice through a portion of a terrain and look at it from the side. These profiles show what a hike along a line between two points on the topographic map might look like. Constructing profiles helps when analyzing environmental problems related to unstable slopes.

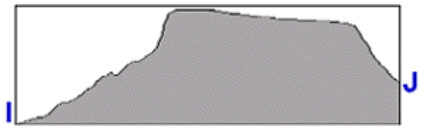
- Images 3a and 3b below show a topographic map and elevation profile of a hill. In the topographic map (3a), points A and B are labeled and connected to show a path a hiker might follow. The elevation profile (3b) shows the side view of that path.

	
3a – Topographic map of a simple hill	3b – Profile of hill between points A and B

- Images 3c and 3d below show a topographic map and elevation profile of a cliff. In the topographic map (3c), points I and J are labeled and connected. The elevation profile (3d) shows the side view of that path.



3c – Topographic map of a cliff



3d – Profile of cliff between points I and J