Name

TA

Geology 12

LG #9: Structural Geology

BIG IDEA: The form, arrangement, and structure of rocks are affected by three-dimensional forces over time.

Fundamental Knowledge (I know):

- Internal and external factors that affect the plasticity of rock strata (for example, temperature, pressure, chemical composition)
- Faulting and folding - results of specific tectonic environments and forces:
  - faulting (e.g., normal, reverse, thrust, strike-slip)
  - folding (e.g., symmetrical, asymmetrical, plunging folds, domes, basin)
- Geologic maps, cross-sections, and block diagrams:
  - representation of surface and subsurface structures using past or present data
  - geologic mapping symbols (e.g., strike and dip)
  - symbols for different rock types and fossils
  - age of strata
  - methods of data collection (e.g., surveying, GIS)

Curricular Competencies (I can)

	Proficiency Scale Teacher and Student self assessment (Circle one)	**Example**	**Evidence (How do you know?)**
Use knowledge of scientific concepts to draw conclusions that are consistent with evidence. Analyze cause-and-effect relationships.	**Emerging (C-/C)** **Initial Understanding**	Completed Activity #1 – Journal with fundamental knowledge and vocabulary (in your words). Activity #2 is complete.	
	Developing (C+/B) **Partial/Near Complete Understanding**	Completed Activity #1 – Journal with fundamental knowledge and vocabulary (in your words with details). Completed the suggested learning activities below (Activities #2 & #3)	
	Proficient (B+/A) **Complete Understanding**	Completed Activity #1 – Journal with fundamental knowledge and vocabulary (in your words, with examples and diagrams, connecting to the main ideas). Suggested activities (Activities #2 & #3) are thoroughly completed, provide details, use vocab that is related accurately and good resources.	
	Extending (A+) **Sophisticated Understanding**		

Student Signature: **Teacher Signature:** **Date:**

Resources can be found at www.THSSscience.com
User: THSS
Password: science

Suggested Learning Activities:

RESOURCES

1. Text: **Physical Geology & the Environment**

2. Online Resources:

Intro to Geologic structures - https://www.youtube.com/watch?v=ofIkpZCKDy0

https://www.youtube.com/watch?v=wBeuUlh9ckE

Geological Maps general - https://www.youtube.com/watch?v=qdz9DN74ukY

https://www.thoughtco.com/how-to-read-a-geologic-map-1440914#

Geological Maps of BC - https://pme.ubc.ca/exhibits/geology-of-british-columbia/

https://www.cgenarchive.org/vancouver-geomap.html

Activity #1: Journal

1. Refer to your text Physical Geology & the Environment Ch. 11 Geologic Structures. Read pages 276-297.

Alternatively, you can check out the online resources listed above and/or find your own to help research the definitions below.

2. In your journal:

- Describe the difference between strike and dip.
- Describe the difference between a geologic map and a geologic cross section.
- What is the difference between a fold and a fault.
- Describe (or diagram) the different folds: anticline, syncline, overturned, recumbent.
- Explain what a plunging fold is. How would it look different on a map view than a non-plunging fold?
- Diagram and describe a basin and a dome.
- What is the difference between a joint and a fault?
- Describe the different faults: normal, reverse, left lateral strike sip, left lateral strike slip, thrust fault.
- Diagram and describe the difference between a horst and graben.

Activity #2: Geologic Map Symbols - Worksheet

1. Complete the table found on page 4.

Activity #3: Create Your Own Map

How do you suppose people created geologic maps before the advent of photography, aviation, satellite imagery, and remote sensing? What data might have been gathered to determine the geology of an area?

Imagine you're a geoscientist in the early 1800s. You want to create a geologic map of your area. Get out your sketchpad, or a sheet of plain paper, and give it a try. Map your own back yard, school campus, or neighborhood.

1. In designing your map, consider the following questions:

- What type of information are you trying to communicate?
- Why are you creating a geologic map?
- How might you show various elevations?
- What could different lines, shapes, and colors represent?
- What symbols can you use to indicate significant features of the area you're mapping?

2. Tap into your own creativity to find ways of mapping what is— or what might be — beneath the surface of your area.

3. Be sure to include a map key, also sometimes called a legend (i.e., this is a table of the symbols used within your map and their definition). For example, a map key may indicate that a thin, solid line denotes a known fault with a known location.

4. Compare your completed map sketches with actual current geologic maps. What differences do you see?

5. What are the practical uses of geologic maps? Who would find them useful and why?

Geologic Map Symbols - Worksheet

Research and choose nine (9) structural geologic map symbols that are commonly used. Clearly show the symbol (image) along with a short explanation of what the symbol means when found on a geologic map.

Symbol	Explanation