

Learning Assessment #3 – Igneous & Sedimentary Rocks

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This assignment is the third of a series of in-class activities known as learning assessments. These assignments were used in an introductory physical geology course that is a requirement for geoscience majors but has no pre-requisites and is open to students in all faculties.

The purpose of the learning assessments is to provide students with frequent feedback on their understanding of the fundamental concepts taught in the course. The learning assessments also provide information to the instructors and teaching assistants on student learning which can be used to help direct instruction in the course.

Note: This learning assessment was divided over two class periods (50 minutes each). Parts I and II are completed in the first class, and Part III in the second class.

This assignment package includes:

1. Assignment with instructions and worksheets for Parts I, II and III
2. 1 of the 2 diagrams used in this exercise
(the second diagram has been uploaded separately under “Other Materials”)
3. Checklist of required elements (Parts I & II only)

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Learning Assessment #3: Igneous & Sedimentary Rocks and Processes

Part 1 – Igneous Rocks and Igneous Processes (26 points)

The cross section X-Y has four areas labeled 1, 2, 3 and 4. For each area describe the igneous rocks and rock cycle processes you would expect to be occurring at these areas. Use the table below to organize your response. You can use point form and sketches to help illustrate a process. Use the detailed map of the Daisen Volcano provided for Area 1.

Area	Rock Name, Rock Type and Chemistry (or magma chemistry) (i.e. gabbro, intrusive igneous rock, mafic)	Igneous Process(es)	Description of Process(es) (i.e what causes process(es), what happens in the area, what these processes trigger, etc.)
1*			
2			
3			
4			

- Refer to geologic map of Daisen volcano for rock types.

Part 2 – Sedimentary Rocks and Processes (9 points)

On the cross section X-Y indicate where each the following sedimentary processes occur as the predominant sedimentary process.

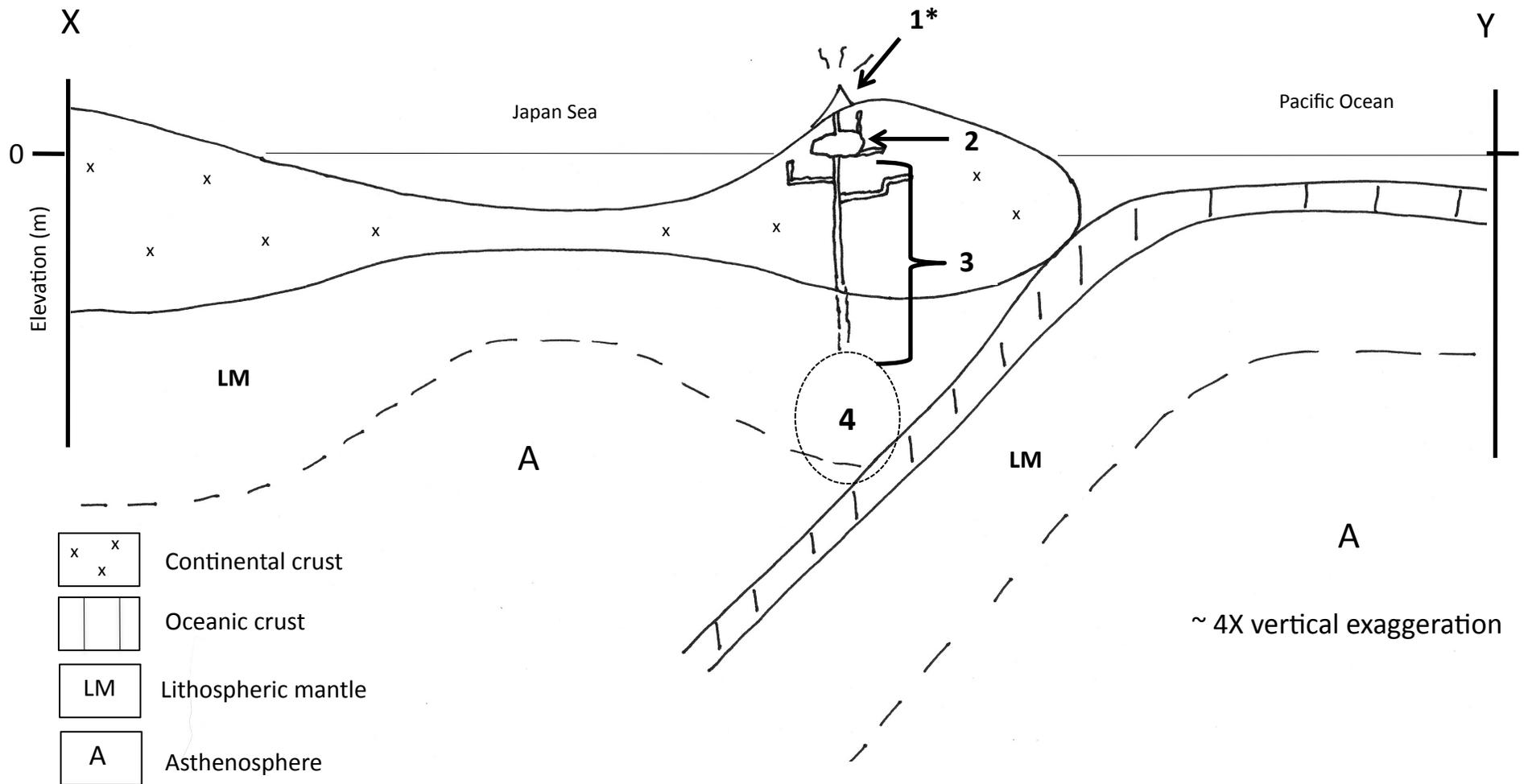
1. Weathering and Erosion
2. Transport (use a double lined arrow \Rightarrow to indicate direction of sediment transport)
3. Deposition and Lithification

Bonus: In the areas of deposition and lithification, show where the different types of clastic sedimentary rocks (group together the sandstone/conglomerate and siltstone/shale) would be expected to form. Also show the best location for limestone rock formation.

Name: _____

ID: _____

Learning Assessment #3: Igneous and Sedimentary Rocks (Cross Section X-Y)



*Detailed map of Area 1 is provided (Daisen Volcano Map)

Learning Assessment #3: Igneous and Sedimentary Rocks

Student Checklist

Part 1: Igneous

Area 1

Predominant Rock Type/Name

___ Rock type

___ Rock name

Igneous Processes and Causes

___ Igneous process

___ Igneous process

Area 2

Predominant Rock Type/Name

___ Rock type

___ Rock name

Igneous Processes and Causes

___ Igneous process

___ Igneous process

___ Igneous process

Area 3

Predominant Rock Type/Name

___ Rock type

___ Rock name

Igneous Processes and Causes

___ Igneous process

___ Igneous process

___ Igneous process

Area 4

Predominant Rock Type/Name

___ Rock type

___ Rock name

Igneous Processes and Causes

___ Igneous process

___ Causes

___ Causes

Part 2: Sedimentary

On Cross Section:

___ Weathering & Erosion

___ Weathering & erosion

___ Transport – Eurasia

___ Eurasia transport direction

___ Transport – Japan

___ Japan transport direction

___ Japan transport direction

___ Deposition & lithification

___ Deposition & lithification

Predicted Sedimentary Rock Types:

___ sandstone & conglomerate

___ sandstone

___ sandstone

___ siltstone and shale

___ siltstone and shale

___ limestone

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Part 3 – Geologic History of the Daisen Volcano

Using information you can derive from the map of the Daisen Volcano provided, describe the volcanic activity that would have been occurring at the different time periods indicated in the table below. Make a cross section sketch of the volcano for each time period.

Time Period	Description of Volcanic Activity during time period	Cross-section sketch
Pre - 1.3 Ma		
1.3 – 1.2 Ma		
1 – 0.02 Ma		
0.02 – 0 Ma (today)		