**LESSON 4: SEDIMENT DEPOSITION AND RIVER STRUCTURES**

**ESSENTIAL QUESTION:**

What combination of factors both natural and manmade is necessary for healthy river restoration and how does this enhance the sustainability of natural and human communities?

**GUIDING QUESTION:**

As rivers age and slow they deposit sediment and form sediment structures, how are sediments and sediment structures important to the river ecosystem?

**OVERVIEW:**

The focus of this lesson is the deposition and erosional effects of slow-moving water in low gradient areas. These “mature rivers” with decreasing gradient result in the settling and deposition of sediments and the formation sediment structures. The river’s fast-flowing zone, the thalweg, causes erosion of the river banks forming cliffs called cut-banks. On slower inside turns, sediment is deposited as point-bars. Where the gradient is particularly level, the river will branch into many separate channels that weave in and out, leaving gravel bar islands. Where two meanders meet, the river will straighten, leaving oxbow lakes in the former meander bends.

**TIME:**

One class period

**MATERIALS:**

Lesson 4 - Sediment Deposition and River Structures PowerPoint

Mass Wasting and Flash Floods PowerPoint

Stream Table PowerPoint

Stream Table

Sand

Reflection Journal Pages (printable handouts)

Vocabulary Notes (printable handouts)

**PROCEDURE:**

1. Review Essential Question and introduce Guiding Question.

2. Hand out first Reflection Journal page and have students take a minute to consider and respond to the questions then discuss responses and questions generated.

3. Hand out and go over the Vocabulary Notes. Students will define the vocabulary words as they watch the PowerPoint Lesson.

4. Present PowerPoint Lessons.

5. Run Demonstration on Stream Table of a low-gradient mature river.

6. Run Demonstration of Mass Wasting and Flash Floods.

7. Show features such as the thalweg, meanders, cut-banks, point-bars, and braiding.

8. Hand out second Reflection Journal page and have students take a minute to consider and respond to the questions then discuss responses and questions generated.

**WASHINGTON STATE STANDARDS:**

**SCIENCE**

1. **EALR4: 6-8 ES3A**: Our understanding of Earth history is based on the assumption that processes we see today are similar to those that occurred in the past.

* Describe Earth processes that we can observe and measure today (e.g., rate of sedimentation, movement of crustal plates, and changes in composition of the atmosphere) that provide clues to Earth’s past.

2. **EALR 4: 6-8 ES2G**: Landforms are created by processes that build up structures and processes that break down and carry away material through erosion and weathering.

* Explain how a given landform has been shaped by processes that build up structures and by processes that break down and carry away material.

**READING**

1. **EALR 1**: The student understands and uses different skills and strategies to read.

* Component 1.2 Use vocabulary (word meaning) strategies to comprehend text.

**SOCIAL STUDIES**

1. **EALR 5**: The student understands and applies reasoning skills to conduct research, deliberate, form, and evaluate positions through the processes of reading, writing, and communicating.

* Component 5.2: Uses inquiry-based research.

**WRITING**

1. **EALR 2**: The student writes in a variety of forms for different audiences and purposes.

* Component 2.1: Adapts writing for a variety of audiences.