HISI - Lesson Outline

Module Title Klamath-Trinity watershed (Chem) **LS Team** Hoopa **Grade level:** 7-12

Lesson # 1(chem intro) Title: Why are The fish dying	**Number of Minutes: 47**
Mathematical purpose: To be able to read an article and understand the data that is collected and how it is reported on. How temperature, oxygen, toxins are reported	Scientific Purpose: To better understand the 2002 fish kill on the Klamath river and introduce the needs of salmon (water). Students will learn about what salmon need to survive an how the fish kill may have affected these needs
Materials needed: Article 1: Riverwood news: fish kill triggers water emergency Article 2: Siskiyou daily news: what caused salmon deaths	Academic vocabulary: Gill Rot Fish Kill Low flow Toxins
Common Core Standards (copy and paste): CCSS.Math.Content.HSS.ID.A.1 CCSS.Math.Content.HSS.ID.A.2 CCSS.Math.Content.HSS.ID.A.3 CCSS.Math.Content.HSS.ID.A.4 CCSS.Math.Content.HSS.ID.B.5 CCSS.Math.Content.HSS.ID.B.6 CCSS.Math.Content.HSS.ID.C.7 6.SP.B.5	Next Generation Science Standards (copy and paste): MS-LS2 Ecosystems: Interactions, Energy, and Dynamics LS2.A: Interdependent Relationships in Ecosystems LS2.B: Cycle of Matter and Energy Transfer in Ecosystems LS2.C: Ecosystem Dynamics, Functioning, and Resilience LS4.D: Biodiversity and Humans HS-LS2 Ecosystems: Interactions, Energy, and Dynamics
When students are finished they will understand: The needs of salmon in the river (temp/O2/clean water/habitat) Who are the Stakeholders involved in 2002 Klamath fish kill Possible reasons for 2002 fish kill Possible solution to prevent another fish kill	What are teacher questions or prompts? How are fish (salmon) important to you What do fish (salmon need to survive) What do you think killed the fish in the Klamath river in 2002 What stakeholder group do you most identify with What are some possible solution to prevent another fish kill
What are questions you anticipate students will have? why were the flows so low in the river	What are misconceptions students might have? That the farmers caused the fish kill

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who is responsible	That Warren Buffet caused the fish kill The effect of illegal water diversion on our rivers

General outline of the lesson:

Chemistry portion of the module: water-exploring solutions

I. Sources and properties of water
II. Water and its contaminates
III. Solubility,solution concentrations, pH, solubility curves
IV. Water purification

V. Sources of water (fish kill)
   a. Pre-test : studetns will answer a pretest question “what are the needs of salmon in our river in terms or temperature, pH, dissolved oxygen, and turbidity.
   b. Introduce 2002 Klamath river fish kill : Klamath river fish kill earth justice vid (5:43)
      i. Brainstorm: students come up with a list of stakeholders involved (farmers, fishermen, tribes,)
      ii. Students will come up with possible reasons and solutions to 2002 fish kill

VI. Reading – Students will read 2 articles about fish kills and answer questions about the articles
   a. Riverwood news: fish kill triggers water emergency
      i. Reading guide
   b. Siskiyou daily news: what caused the salmon deaths

VII. Properties of water Lab pg 5-6 (Chemistry and the community Unit4 Water: exploring solutions

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*Accommodations for students will Special Needs (See end of lesson outline)

Supplemental files/resources will follow

Chemistry and the community Unit4 Water: exploring solutions
Klamath river fish kill earth justice vid
Riverwood news: fish kill triggers water emergency
Reading guide
Siskiyou daily news: what caused the salmon deaths

Unit 1: water-exploring solutions

1. Sources or water
2. Water and its contaminates
3. Solubility,solution concentrations, pH
4. Water purification
5.

I. Sources uses and properties of water*
   a. Pre-test : students will answer a pretest question "what are the needs of salmon in our river in terms or temperature, pH, dissolved oxygen, and turbidity.
   b. Introduce 2002 Klamath river fish kill : Klamath river fish kill earth justice vid (5:43)
      i. Brainstorm: students come up with a list of stakeholders involved (farmers, fishermen, tribes,)
      ii. Students will come up with possible reasons and solutions to 2002 fish kill

II. Reading – Students will read 2 articles about fish kills and answer questions about the articles*

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a. Riverwood news: fish kill triggers water emergency
    i. Reading guide
b. Siskiyou daily news: what caused the salmon deaths

III. Properties of water Lab pg 5-6 (Chemistry and the community Unit4 Water: exploring solutions

III. Water and its contaminates*

a. Read pg 14-17 (Chemistry and the community Unit4 Water: exploring solutions
    a. Reading guide (physical properties of water)
b. Particulate view of water
    a. Macroscopic vs particulate view of world PPT (3 slides)
    b. Modeling mater: pictures in your mind (students create and evaluate various visual models of matter)
c. Temperature, dissolved oxygen and life
    a. Read pg 27-28
        i. Complete reading guide
    b. Do lab and answer lab questions (link to Lab)

IV. Water testing*

a. Read pg 34-35
    i. Investigation and gathering/ interpreting evidence
b. Acids and Bases in solution
    i. Read pg 35-36
        1. Developing skills questions 1-4 (pg 36)
c. Solution concentration and pH
    i. Read pg 36-38
        1. Interpreting the pH scale 1-6 (pg 37)
        2. Sources of acid and basic contamination (pg 38)
            a. Gather information and explore questions 1-4 (pg 38)
    ii. Lab (gathering evidence) Titration of HCl (pg 40-41)
d. Analyzing water quality Data (pg 42-43)
    i. Students will be assigned to a group to study some of the data listed on pg 42. Each group will complete an analysis of for its assigned data and share with whole class

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* **Accommodations:** Designed to accommodate for student with Specific Learning Disabilities (SLD) with processing disorders in Auditory and/or Visual processing, SLD with processing disorder in Attention or Cognitive Abilities, and Other Health Impairments (ADD, ADHD).

Part II

- Read articles aloud while student reads/follows along
- Rephrase questions if needed
- Lab partners grouped by strengths and needs
- Provide data table/template for lab data

Part III

- Read pages 14-17 aloud while student reads/follows along
- Provide copy of PowerPoint for note taking support
- Read pages 27-28 aloud while student reads/follows along
- Rephrase questions if needed

Part IV

- Read pages 34-35 aloud while student reads/follows along
- Rephrase questions if needed
- Read pages 35-36 aloud while student reads/follows along
- Rephrase questions if needed
- Read pages 36-38 aloud while student reads/follows along
- Rephrase questions if needed
- Group assigned according to strengths and needs