Finlandia University Lesson Plan

Name: LeAnn Larson

Subject: Science

Grade Level: 4

Number of Students: 20

Length: 60-65 minutes

Pre-Instructional:

Science Section

Strand 1. Constructing New Scientific Knowledge

Content Standard 1.1: All students will ask questions that help them learn about the world; design and conduct investigations using appropriate methodology and technology; learn from books and other sources of information; communicate their findings using appropriate technology; and reconstruct previously learned knowledge.

Benchmark- Elementary

1. Generate questions about the world based on observations.

2. Develop solutions to problems through reasoning, observation, and investigations.

5. Develop strategies and skills for information gathering and problem solving.

Strand IV. Using Scientific Knowledge in Physical Science

Content Standard 4.4: All students will describe sounds and sound waves; explain shadows, color, and other light phenomena; measure and describe vibrations and waves; and explain how waves and vibrations transfer energy.

Benchmark- Elementary

1. Describe sound in terms of their properties. (high, low, loud, soft)

2. Explain how sounds are made. (Vibrations: fast, slow, large, small)

Grade Level Content Expectations

Science Processes

Inquiry Process-

S.IP.04.11- Make purposeful observation of the natural world using the appropriate senses.

S.IP.04.12- Generate questions based on observations.

Inquiry Analysis-

S.IA.04.13- Communicate and present findings of observations and investigations.

Reflection and Social Implications-

S.RS.04.11- Demonstrate scientific concepts through various illustrations, performances, models, exhibits, and activities.

Physical Science

Energy-

K-7Standard P.EN: Develop and understanding that there are many forms of energy (such as heat, light, sound, and electrical) and that energy is transferable by convection, conduction, or radiation.

Objectives

1. As a result of this lesson students will be able to describe and demonstrate with a vibrating object how sound travels through substances using wave motion.

2. At the end of this lesson students will

3. As a result of this lesson students will be able to hypothesize that the shorter the string the more vibration you will be able to hear and visualize.

Materials/ Special Arrangements/ Individual Modifications

- Overhead (for teacher use)/overhead markers
- Data sheets (one for each student) Pencil
- 3 pieces of string (100cm, 50cm, 25cm)

- 3 washers
- Plastic cup with hole cut in the bottom
- Unsharpened pencil
- Guitar

During Instruction

1. The teacher will begin the lesson by introducing and discussing vibration. The teacher will ask what it means, (define it: a rapid back and forth movement). The teacher will then demonstrate vibrations by blowing air through the lips making a car like noise. The teacher will then focus on music and ask them if they can think of any instruments that depend on vibration to be heard (voice (vocal cords), guitar, drum, etc). The teacher will then explain that they are going to be experimenting with the basic set up of a string instrument.

2. Developmental Activities

a. The teacher explain that they will be breaking up into groups of two or three to complete their experiment. Students will be allowed to chose their groups this time.

b. The teacher will explain the procedure of the experimental activity:

Procedures

1. Tie the washer to the 100 cm string at one end.

2. Thread the other end of the string through the hole inside the bottom of the plastic cup. Pull the string all the way through the hole in the cup so that the washer is inside the cup.

3. Tie the pencil to the end of the string hanging out of the cup.

4. While sitting in a chair, step on the pencil and hold the cup up to your ear. Make sure the string is pulled tight.

5. Pluck the string with your fingers. Listen to the sound inside the cup. Write down your observations.

6. Pluck the string again, this time look at the string and rank the vibrations according to this scale:

1= few vibrations, string vibrated farther apart, easy to see

2= more vibrations, medium size vibrations, vibrations closer

3= several vibrations, difficult to see, string vibrated very close

7. Record the ranking on the data table.

8. Repeat steps 1-7 two more times for a total of three trials.

9. Repeat steps 1-8 using the 50 cm string and the 25 cm string.

c. The students will be given their materials and given the green light to go ahead with their experiment by following the data journal.

d. The teacher will walk around, monitor conversation and ask the groups questions.

e. Once the students have finished their experiment and data sheets the teacher will write the results of the groups on the overhead and ask the students for a trend.

Concluding Lesson

The teacher will bring out a guitar at the end of the lesson and give it a strum. The teacher will have the students come close to demonstrate a short, middle, and long cord strum. The teacher will ask the students if there are any comparisons with the guitar and experiment that they just completed. The teacher will then explain that we hear sound as changes in the frequency and height of sound waves. We hear the frequency of sound waves as pitch, and we hear the height of sound waves as volume, or amplitude.

Follow- Up Activity or Assignment

1. Students will continue with the sound unit. No follow up assignment to this activity unless the student does not complete within the allotted time: it will then become homework.

Post-Instructional

Evaluation of Student Learning

Students will be evaluated on their behavior during the procedure as well as their data sheet,

graph, and experiment results summery page.