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Work experience:  
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**5 E Lesson Plan**

**(A) General Information**

**Name of the School**: Shree Shivaji Maratha Jr. College and High School, Pune -2

**Name of the Teacher**: Aparna Yadav

**Date: 18th Apr 2019**

**Subject:** Physics

**Grade:** 11th

**Topic:** Sound Waves

**Unit:** Sound Velocity

**Curriculum Standards**: Maharashtra State Board

**(B) Lesson / Unit Planning:**

1. **Short Description of the Concept:** Teaching sound basic properties like wave form, velocity and affecting parameters (e.g. temperature, pressure and humidity) using technology.
2. **Statement of Learning Objectives**: The students will be able to understand the concept and related parameters with the help of the tools and technology used while teaching.
3. **Differentiation strategies to meet diverse learner needs:** Each student will be able to take part actively in the discussion and activities as the activities are planned where participation of each student is required.
4. **Common Learners Misconceptions:** Using technology can waste a lot of time. This misconception can be proven wrong with this lesson plan. The students will learn the effective use of technology and also understand the focus of the lesson.
5. **Adaptations/ Accommodations’ for Exceptional Students:** Exceptional learners are welcome to go ahead and study more websites or create using technology taught in the classroom.
6. **Precautions/ Safety measures**: Respecting the mind of each student in order to avoid any conflicting or hurting issues during discussions. Ad-blockers and updated antivirus will help to focus on topic while using websites for topic exploration.

**(C) Instructional Process:**

|  |  |  |  |
| --- | --- | --- | --- |
| **5 E’s** | **Activities** | **Guiding Questions** | **Materials** |
| **Engage** | **Musical instrument like flute, whistle, speaker and guitar pictures and actual instruments.**  **Spring and long string** | How these musical instruments produce sound?  How you hear the sound?  How waves travel though spring and long string? | Actual available musical instruments or pictures  Spring and long string |
| **Explore** | **Video** | What do you think the video is about?  What are the keywords in video narration? | Internet connection |
| **Explain** | **Popplet Mindmap** | Explanation of concept through popplet mindmap | Internet connection |
| **Elaborate** | **Use knowledge to do collaborative activity(Kahoot game)**  **And Google Form** | Use of knowledge gained | Internet connection |
| **Evaluate** | **Make a Rubric for evaluation** | Test the students’ abilities | Rubric |

**D) Reference/Resource:** Maharashtra State Board 11th Physics Text Book

**Lesson Plan: Physics**

**Topic: Sound Waves**

**11th Grade**

**Time: 4 periods**

**Objectives:**

After the lesson, the students will be able to:

1. **List (Remember)** the main concepts and related keywords of sound through collaborative learning strategy.
2. **Remember** the important physical quantities, definitions and their units.
3. **Explain (Understand)** the effects of different characteristics of medium particles to propagate sound waves
4. **Discuss (Understand)** Effects of pressure, temperature and humidity on Sound wave velocity.
5. **Summarize (Understand)** the equations of Sound velocity with collaborative learning strategy.
6. **Express opinion/Analyze** **(Analyze)** after watching the video based on the lesson (Video based activity).
7. **Demonstrate (Apply)** the main formulae while solving different numerical with Google Forms.
8. **Apply (Apply)** their understanding in collaborative Kahoot Game.
9. **Differentiate** **(Analyze)** longitudinal and transverse waves.
10. **Review** **(Evaluate)** the ability of solving problems through Rubistar.
11. **Develop** understanding of propagation of sound.
12. **Create/compose** and do experiments related to sound waves.

**Period 1:**

**Knowledge:** **Activating Strategy/emotional Hook (Engage):**

1. The teacher will use a few pictures and actual musical instruments to show the sound generation and propagation using them.
2. Teacher will ask student to use the instrument to make sound and explain or guess how sound is generated.
3. Teacher will ask to show spring oscillations and long string oscillations to students.
4. Teacher will explain how these oscillations differ from each other.

Now, the teacher will read out the definitions. The students will then underline the keywords in those definitions. They will then repeat the teacher and learn those.

The students will discuss the main properties of sound. The teacher will ask some questions based on it:

**Period 2:**

**Explore: Comprehension**

Once the students are familiar with concepts, the students will now go ahead to the next step. Now, the students will watch a video about the lesson.

<https://www.youtube.com/watch?v=GkNJvZINSEY>

This will help them understand the concept of sound waves.

Questions:

1. What do you understand from the video?
2. Can you hear in space?

Teacher will further explain the effect of different properties of medium on sound speed.

Teacher will also explain characteristics of progressive waves.

**Period 3:**

**Explain and Elaborate:**

Teacher will explain the topic to students using Popplet mindmap:

<http://popplet.com/app/#/5317090>

Teacher will derive the equations of relation between velocity, frequency and wavelength.

Teacher will also obtain the equations of effects of temperature, pressure and humidity on velocity of sound.

Students will elaborate their understanding with google form created to fill in by students as an activity at home.

.Google form link:

<https://docs.google.com/forms/d/e/1FAIpQLSfF_s4oxs3MpjZzlZCO9jCs2mywpvBeenr6lqWFexQmUe7Oxg/viewform?usp=sf_link>

**Period 4:**

**Elaborate and Evaluate:**

Teacher will check Google form filled by students and guide further.

Teacher will conduct a group activity to play Kahoot game:

<https://create.kahoot.it/details/sound-waves/812f75fa-8ff0-4f53-a604-5be9082ae4cb>

1. Teacher will group students in group of 4.
2. Fastest answering group will win the game.

This activity helps students to express their understanding in group and show team efforts.

**Period 5, 6 and 7:**

**Create and Apply: [Practical in the laboratory]**

1. The teacher will introduce students to new instruments required in experiment e.g. tuning fork, rubber pad etc.
2. Teacher will explain the experiment to students by doing it once
3. Students will conduct the experiment and note down their observation and readings.
4. Student will calculate the result.

After the experiment teacher will do evaluate students using below rubistar

<http://rubistar.4teachers.org/index.php?screen=ShowRubric&module=Rubistar&rubric_id=2794209&>