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| **Course:** Introduction to Engineering | | | | | | |
| **Unit:** The Electric Guitar | | | | **exercise:** Introduction and Anatomy of Electric Guitar | | **Time Frame:** 1 Hour |
|  | Preparation: *Summary of “to do’s” that the teacher should understand and prepare before bringing this lesson to the classroom.* | | | | | |
| **Information:**  Before beginning this exercise, students should have an understanding of material covered in:   * Presentation: Anatomy of an Electric Guitar   **Materials:**   * Electric Guitar (optional) * Short length of steel rod (optional)   **Tools:**   * Magnets & Field Viewers (Nasco # SB48222M, SB30028M) (optional) | | | | | | |
|  | Safety: *Summary of safety strategies in the lesson.* | | | | | |
| There are no safety strategies for this exercise. | | | | | | |
|  | Desired Results: | | | | | |
| Established Goals: | |  | Transfer: | | | |
| *Problem Solving Techniques and Applications Standards:* | | *Students will be able to independently use their learning to…*   * Understand and appreciate the anatomy of the guitar. | | | |
| Meaning: | | | |
| Understandings  *Students will understand that...*   * Guitar pickups are devices that pick up the vibrations made by guitar strings and convert them into pulsing electricity | | Essential Questions  *Students will keep considering...*   * How different instruments could use the technology that is available in the guitar | |
| Acquisition OF KNOWLEDGE AND SKILL: | | | |
| *Students will know...*   * What a guitar pickup is * How a guitar makes sound | | *Students will be skilled at...*   * Labeling guitar anatomy * Identifying if a guitar works | |
|  | Evidence: | | | | | |
| Evaluative Criteria: | |  | Assessment Evidence: | | | |
| * Completed | | | *Performance Task(s):*  **The Electric Guitar: Student Notes Page**  In this exercise, students will label different parts of a guitar, fill in notes on magnetic properties, take notes on guitar pickups. | | | |
| * Completed * Completed | | | *Other Evidence:*   * Assessment rubric included at the end of the Guitar Design Portfolio * Sounds like STEM unit test found in the Test Topic | | | |
|  | Learning Plan: *Summary of Key Learning Events and Instruction* | | | | | |
| **Outline:**   1. **Set Introduction**   Use the Electric Guitar Notes slideshow to introduce terminology. There is an outstanding video to accompany the slideshow in the Supplemental Resources section.   1. **Demonstration**   If you have magnets and/or magnetic field viewers, demonstrate varied situations to the students or, better yet, let them explore for a short time.   1. **Demonstration**   If you place a simple bar magnet on a viewer like the Nasco SB48222M and wave a steel rod back and forth over the top of the magnet you can observe the disturbance of the field in the viewer.  **Progress Monitoring:**  The instructor will need to monitor the classroom, check students’ work and ensure students are on task and following directions. | | | | | | |
|  | Differentiation: *Summary of Key Differentiation Techniques* | | | | | |
| Please use this space to insert your differentiation techniques. Depending on the needs of students, various techniques might be needed in a classroom, therefore use the information below and experts in the area needed to design your plan for differentiation.  The ASCD Study Guide for Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.  by Carol Ann Tomlinson, Jay McTighe  Integrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.  by Carol Ann Tomlinson, Jay McTighe  ISBN-13: 978-1416602842  ISBN-10: 1416602844  Differentiating Reading Instruction  *by Laura Robb.*  ISBN13: 9780545022989  A Teacher's Guide to Differentiating Instruction  The Center for Comprehensive School Reform and Improvement | | | | | | |

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|  | career Connections: *Summary of Career Opportunities Associated with this Lesson* |
| **Musician**  Some musicians play the guitar and should know how it works.  **Music Instructor**  Music instructors should know how sound is produced from instruments.  **Physicist**  Physicists can envision magnetic fields and determine their properties. | |
|  | Keywords: *Please Insert Keywords from this Lesson with their Definitions* |
| PICKUP – a device that produces an electrical signal in response to some other kind of signal or change  GUITAR – a stringed musical instrument with a fretted fingerboard  RESONANCE – the reinforcement or prolongation of sound by reflection form a surface or by the synchronous vibration of a neighboring object | |