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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)

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|  | 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.
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| 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
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| 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
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|  | 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 McTigheIntegrating Differentiated Instruction and Understating by Design: Connecting Content and Kids.by Carol Ann Tomlinson, Jay McTigheISBN-13: 978-1416602842 ISBN-10: 1416602844Differentiating Reading Instruction*by Laura Robb.*ISBN13: 9780545022989A Teacher's Guide to Differentiating InstructionThe 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 changeGUITAR – a stringed musical instrument with a fretted fingerboardRESONANCE – the reinforcement or prolongation of sound by reflection form a surface or by the synchronous vibration of a neighboring object |