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| **Lesson Title:**  Mineral Display Case |  |
| **Grade Level:** 3rd | **Quarter:**  1st |
| **Standards:**Science**S3E1** Students will investigate the physical attributes of rocks and soils.  b. Recognize the physical attributes of rocks and minerals using observation (shape, color, texture), measurement, and simple tests (hardness).Math**MGSE3.MD.5** Recognize area as an attribute of plane figures and understand concepts of area measurement.   |
| **Lesson Essential Question:** * How can I recognize the physical attributes of rocks and minerals?
* How can I calculate the area of a plane figure?

  | **Vocabulary:** Physical attribute (shape, color, texture, streak, hardness)Area  |
| **Lesson Materials:**• Minerals• Streak plates• Various types of candy• Cardboard boxes/cereal boxes• Construction paper• Scissors• Glue and tape• Markers• Popsicle sticks• Rulers• Clay or Playdough• Book  https://encrypted-tbn0.gstatic.com/shopping?q=tbn:ANd9GcRGM7DCcRe4W3vhaav_LjSw8WfyRg0styh-4U17EimQJLiZqLlzcJfLRQsVQOD996PVp773Ek8&usqp=CAE  | **Lesson Assessment:** Student JournalTeacher Observations  |
| **STEM Challenge Overview:**Create a mineral display case explaining the physical attributes of minerals and calculating the area of the case.  |
| **Teacher Background:**Students should recognize the physical attributes of minerals by using observations, measurement and performing simple test. Some of the physical attributes students should know are: shape, color, texture, streak, and hardness. If given a mineral students should be able to perform test to determine the streak and hardness. Read the short synopsis for *Julie the Rockhound*: <https://www.youtube.com/watch?v=fOpB8sjTr4Y>  |
| **INSTRUCTION** |
| 1. **Ask/Engage (day 1)**
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| Show the class various types of candy. Pick up one piece and ask the class to describe it to you: What flavor is it? What is its size? What shape is it? Is it hard or soft? Etc. You may need to open the candy and show what it is made of and to determine if it is hard or soft. Explain to the class that they just described the physical attributes of the candy. These physical attributes make each type of candy unique. Pick a different piece of candy and have the class describe it and compare it to the first piece. How are they alike? How are the different? Now show a handful of minerals. How are the minerals alike and different? Pick one mineral and see if the students can physically tell the shape, color and feel for the texture. How could we determine if it is hard or soft? Demonstrate or review how to test for the Moh’s Scale: <https://www.youtube.com/watch?v=9r7C5SD14Hw>. For minerals another physical attribute it the streak color. This is a simple test where you streak or strike the mineral once on a streak plate to determine the color of the streak.Introduce the challenge to the class.**Challenge:** Your class has been asked by the Tellus Science Museum to create new display cases explaining the physical attributes of minerals. As a team you will need to create a display case for **one** mineral. The case must be covered with a see through material and you will need to explain the minerals shape, color, texture, streak, and hardness. Your display case must have a minimum of 6 compartments and you will need to calculate the area of your display case. Good luck and be creative!Have students complete the ask/engage part on their student journal.  |
| 1. **Imagine/Brainstorm (day2)**
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| **Criteria:*** Create a minimum of 6 compartments in your display case
* Front of display case must be see through (transparent)
* You must explain how to recognize the physical attributes of minerals
* You must calculate the area of your display case

**Constraints:*** Use the materials provided
* Complete the challenge within the time allotted

Have students individually think of a solution to the problem and draw and label their design. |
| 1. **Plan/Design (day 3)**
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| Each student will present their ideas to their team. Teams will collaborate and decide on a final design plan. Students draw and label their final design plan and make a list of needed supplies. Build their design according to their plan. |
| 1. **Create / Test (day 3 continued- day 4)**
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| Student teams build their design according to their design plan.   |
| 1. **Evaluate/Improve –** and repeat Steps 1-5 **(day 5)**
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| Students evaluate their design for success. Did it meet the established criteria? Did their final design match their planned design? How would students improve their design? |

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Mineral Display Case STEM Challenge

 3rd Grade

**Challenge**: Your class has been asked by the Tellus Science Museum to create new display cases explaining the physical attributes of minerals. As a team you will need to create a display case for one mineral. The case must be covered with a see through material and you will need to explain the minerals shape, color, texture, streak, and hardness. Your display case must have a minimum of 6 compartments and you will need to calculate the area of your display case. Good luck and be creative!

 **Criteria:**

• Create a minimum of 6 compartments in your display case

• Front of display case must be see through (transparent)

• You must explain how to recognize the physical attributes of minerals

• You must calculate the area of your display case

**Constraints:**

• Use the materials provided

• Complete the challenge within the time allotted

**Materials:** Various materials will be provided by your teacher.

1. **ASK / ENGAGE:** What is the problem you are being asked to solve?

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1. **IMAGINE/BRAINSTORM:** What are some possible solutions to the problem that you are trying to solve? After you brainstorm, draw and label your ideas below.

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| **Idea #1** | **Idea #2** |

1. **PLAN/DESIGN:** Share your ideas with your group and collaborate to decide on a final design plan. Draw your team’s design below and make a list of the materials that you will need to complete your design.

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| **Team Design Plan**Calculate the area of your display case: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **Materials List** |

1. **CREATE/TEST**: Use your Final Design Plan to create and build your solution. Test your design. Did it work? Why or Why not?

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1. **EVAULATE/IMPROVE:**  How well did your design work? Did your solution solve the problem within the given constraints?

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How can you improve your design? How can you make it better? Draw and label your improved design below.

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| **Improved Design Plan** |