Essential Question: How are design and daily living related.

Introduction: Designing Everyday

Objects surround us. We often overlook the fact that someone created each of these at times functional, at times bizarre, and at times poorly designed objects. Every curve, bolt, color, and material reveals a decision that someone made about the objects design. Because objects are made within the context of society, the decisions that lead to their existence can reveal economic, political, social, and ethical expectations, which reflect that society.

This set explores everyday objects by looking at how engineering and design occur within the context of society and history. The associated lesson plan is intended for 6-8 grade middle school science and engineering students and meets Minnesota Academic Science Standards related to The Nature of Science and Engineering strand.

Students will use the set to explore examples of utilitarian objects from various time periods and cultures. The exploration will provide a lens with which students can further investigate the objects that surround them. As a summative project, students will design a new object or redesign an existing object to function within the context of society.

Audience
6-8 Grade Middle School Science and Engineering Students

Timing
Two 45-minute class periods for working through the set, completing journal questions, small group discussion, and optional class discussion. Three days of out of class work time to complete the assessment.

Rationale
Designing Everyday is a guided inquiry to prompt students to consider the objects that surround them and how they were designed. Little to no pre-teaching is necessary to deliver this lesson. The lesson itself will act as an introduction to the vocabulary and concepts associated with design.

Formative assessment and redirection can occur on an individual basis as students work through the set via the use of their Journal. The small group discussion at the end of the set is to be used as a way to get students sharing ideas about design and asking questions. A class discussion can follow the small group discussion if the teacher finds it of value.

Minnesota Academic Science Standards
8.1.3.2.1
1. The Nature of Science and Engineering
3. Interactions Among Science, Technology, Engineering, Mathematics and Society
2. Men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry.

Describe examples of important contributions to the advancement of science, engineering and technology made by individuals representing different groups and cultures at different times in history.

8.1.3.3.1
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1. The Nature of Science and Engineering
3. Interactions Among Science, Technology, Engineering, Mathematics and Society
3. Science and engineering operate in the context of society and both influence and are influenced by this context.

Explain how scientific laws and engineering principles, as well as economic, political, social, and ethical expectations, must be taken into account in designing engineering solutions or conducting scientific investigations.

Objectives:
- Define design.
- Describe elements of good design.
- Evaluate the design of an everyday object considering its historical and cultural context.
- Design or redesign an object considering its historical and cultural context.

Outline of Content and Journal
I. Pre-Project Questions: Considering the Objects in My Life
   Think about objects that you use everyday.

   Complete the following in your Journal:
   1. Use an example to describe how one or more of these objects affects your life.
   2. If you could change something about one of these objects what would it be? Explain why you would make this change.

II. Everyday Objects?
   Check out the following slides that show examples of everyday objects from throughout history and from different parts of the world.

   As you look, think about how you would use these objects and how they were made.

III. What is Design Anyway?
   What is design?

   What other words describe design?

   Explore this "map" of the word design from snappywords.com.

IV. Objectified
   A good extension would be to watch the film in its entirety using guiding questions to focus students on how design occurs over time, how it is a process, how it is influenced by technology, and how people from around the world contribute to it.

V. What is Good Design?
   Scan the Bios of some of the IKEA Designers.

   Identify designers and/or ideas about design that best reflect your view of design.

   Complete the following in your Journal:
   1. What is design?
Essential Question: How are design and daily living related.

2. What do you consider to be good design?

VI. Searching for Design
Now that you have an idea about what good design is, let's consider the design of the following chairs.

Before you begin draw a chair in your Journal.

As you evaluate the chairs consider:
- materials used
- time period of production
- intended purpose
- cultural & societal significance
- cost

VII. Reflection 1
Complete the following in your Journal:

1. Compare the design of a chair from the slides to the one you sketched in your Journal.
2. If you could design a new chair or redesign an old one, how would you do it?
3. Draw a sketch of what you consider to be the perfect chair.

Continue to explore design by looking at the following lamps. How is a lamp supposed to look?

VIII. Reflection 2
Complete the following in your Journal:

1. Which lamp would you put in your room? Why this one?
2. How much should designers consider the people who may buy their designs?

Look at the last few slides and think about the design of the objects you use everyday. What objects would you redesign or what objects still need to be invented?

VIII. Small Group Discussion
Discussion: Use your Journal to discuss good design.
1. What object from the slides most influenced your ideas about design? Why this object?
2. How does culture and society influence design? How does design influence culture and society?
3. How have people from around the world influenced design over human history?
4. How does cost influence design?
5. What ideas do you have about redesigning the objects that surround you?

Assessment
Students will use the following rubric to guide their work and may present their project in any format that they choose such as, a paper and pencil drawing, power point (or other media type presentation), Photoshop, CAD program, or through a physical model. Statements and explanations can be made orally or in writing.
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Assessment
Designing Everyday

Assessment:
Use your ideas of good design to create a new object that to your knowledge has never existed before.

OR

Use your ideas of good design to redesign an object that you use everyday.

Your project must include the following:

- A drawing of at least three different views of your object (such as top, sides, cut away).
- An explanation as to why the object was created OR redesigned.
- A statement describing the intended purpose and/or use of the object.
- An explanation of how the object fits into the context of culture and society.
- A statement of your philosophy of good design.

<table>
<thead>
<tr>
<th>DESIGNING EVERYDAY</th>
<th>Partially Meets 1</th>
<th>Approaches 2</th>
<th>Meets Expectations 3</th>
<th>Exceeds 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drawing</strong></td>
<td>Includes a drawing of the object.</td>
<td>Includes a drawing of the object that is labeled and/or drawn from more than one perspective.</td>
<td>Completes a clear and detailed drawing of the object that is labeled and drawn from three different perspectives.</td>
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</tr>
<tr>
<td><strong>Explanation</strong></td>
<td>States why the object was created or redesigned.</td>
<td>Explains why the object was created or redesigned.</td>
<td>Uses examples to clearly explain why the object was created OR redesigned.</td>
<td></td>
</tr>
<tr>
<td><strong>Purpose</strong></td>
<td>States the purpose of the object.</td>
<td>States the intended purpose/use of the object including ideas such as, where, when, by whom, and how it will be used.</td>
<td>Clearly states the intended purpose/use of the object including where, when, by whom, and how it will be used.</td>
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</tr>
<tr>
<td><strong>Context</strong></td>
<td>Explains how the object fits into culture or society.</td>
<td>Uses an example to explain how the object fits into culture or society.</td>
<td>Uses examples to clearly explain how the object fits into the context of culture and society.</td>
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<tr>
<td><strong>Philosophy</strong></td>
<td>Describes good design.</td>
<td>Uses an example, which reflects a personal philosophy of design.</td>
<td>Clearly uses several examples, which reflect a personal philosophy of good design.</td>
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