

**COURSE:** Middle School

**UNIT:** Environmental/Agricultural Concepts

**EXERCISE:** Design a Cool School

**TIME FRAME:** 3-4 Hours



**PREPARATION:** *Summary of “to do’s” that the teacher should understand and prepare before bringing this lesson to the classroom.*

## Objectives:

At the completion of this lesson, students will be able to:

- List the different components used to design a high-performance school building.
- Evaluate the qualities of a high-performance school building.

## Resources:

- Internet
- Clear tape
- Scissors (class set)
- Copies of the following for each group of students (found in Student Pages):
  1. Cool School Design Information
  2. School Components
  3. School Layout #1
  4. School Layout #2
  5. Questions About Your School Design
  6. High Performance School Evaluation



**SAFETY:** *Summary of safety strategies in the lesson.*

Please use this space to describe safety procedures or highlights for this lesson.

**S1**

## DESIRED RESULTS:

### ESTABLISHED GOALS:

*Problem Solving Techniques and Applications Standards:*

Science: F3, F4, F5, F6

Math: 3A

Technology: 2D, 4A, 4B, 4C, 5A, 5B, 5C, 5D, 5F, 8A, 8B, 8C, 8D, 11B, 12A, 15C, 19A, 20B, 20C, 20D

ABET: A, C, D, E, G, J

### TRANSFER:

*Students will be able to independently use their learning to...*

- Understand building design and sustainability

### MEANING:

#### UNDERSTANDINGS

*Students will understand that...*

- Buildings can be design with efficiency using renewable energy

#### ESSENTIAL QUESTIONS

*Students will keep considering...*

- Building Designs

### ACQUISITION OF KNOWLEDGE AND SKILL:

*Students will know...*

- Benefits of design
- How the environment can be affected by poor design

*Students will be skilled at...*

- Designing better buildings

**S2 EVIDENCE:**

## EVALUATIVE CRITERIA:

- Online test

## ASSESSMENT EVIDENCE:

*Performance Task(s):***Online test***Other Evidence:*

- Cool School worksheet

**S3 LEARNING PLAN:** *Summary of Key Learning Events and Instruction***Outline:**

- <Set Induction>
- **Cool School**
  - Create groups
  - Design school layout #1
  - Read cool school design information sheet
  - Design school layout #2
  - Worksheet
  - Evaluation
  - Presentations
  - Discussion

**Learning Experiences:**

1. <Set Induction> Discuss with your students some of the pros/cons of big open windows in residential construction.
2. Review the [Cool School Design Information sheets](#) (Student Pages). More complete information sheets can be found in the Energy Design Guidelines for High Performance Schools: Cold and Humid Climates by the US Department of Energy on the Department of Energy web site: <http://www.nrel.gov/docs/fy02osti/29107.pdf>.

A Checklist of Select Key Issues can be found in the Teacher Pages. NOTE: You may wish to review other Guidelines depending on your climate. Meet with your school's building's facilities manager to find out what the high-performance elements of your school are. Ask them to show you so you will have firsthand knowledge to pass on to your students. If the facilities manager is not sure which elements are high performance, provide a copy of the [Cool School Design Information Sheets](#) from this activity and discuss the various elements.

3. Put students into small groups
4. Initial instructions for this activity should be vague. After students read the Cool School Design Information, you should see a change in designs.
5. After students have read the Cool School Information sheets have them complete the second part of the activity.
6. Lastly have students present their designs to the class. Encourage students to ask question during this time to better understand why other groups made the decisions they did.

**Evaluation:**

- Online unit quiz

**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 Understanding by Design: Connecting Content and Kids.  
by Carol Ann Tomlinson, Jay McTighe

<b>COURSE:</b> Middle SchoolError! Reference source not found.		
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Integrating Differentiated Instruction and Understanding 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

## CAREER CONNECTIONS: *Summary of Career Opportunities Associated with this Lesson*

Please use this space to insert careers that might be connected to this lesson. This section will need continuous updating as new careers and emerging technologies change the opportunities available in the workforce.

Good sources for career connections:

Occupational Outlook Handbook  
<http://www.bls.gov/ooh>

The National Career Clusters® Framework  
<http://www.careertech.org/career-clusters>

## KEYWORDS: *Please Insert Keywords from this Lesson with their Definitions*

Please use this space to insert keywords and their definitions  
 Use resources like [dictionary.com](http://dictionary.com) to find definitions to your keywords