

**COURSE:** MIDDLE SCHOOL

**UNIT:** ENVIRONMENTAL AND AGRICULTURAL CONCEPTS

**EXERCISE:** GO WITH THE FLOW

**TIME FRAME:** 1-2 Hours



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

Teachers will need to ensure that the proper supplies are available for students to build their solutions.

You will need these following items:

**Materials:**

- Garden soil
- Pipe cleaners
- Straws
- Small plastic or paper cups
- Cardboard (different thicknesses - food and packaging boxes work well)
- Paper (different thicknesses – construction, copy, tissue, etc.)
- Aluminum foil
- Coffee filters
- Popsicle sticks
- Toothpicks

**Tools:**

- Sprinkle style watering can
- Paint roller trays



**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:*

**TRANSFER:**

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

Collaborate with teammates to design and build a working soil erosion prevention model that replicates a real-world erosion prevention technique and retains the most soil possible during a simulated rainfall.

**MEANING:**

**UNDERSTANDINGS**

*Students will understand that...*

- Human interaction in the environment can have positive and negative impacts
- Farming can be done in different ways
- Soil has a direct impact on growth of vegetation

**ESSENTIAL QUESTIONS**

*Students will keep considering...*

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**ACQUISITION OF KNOWLEDGE AND SKILL:**

*Students will know...*

- Different regions have different soils

*Students will be skilled at...*

- Designing an erosion prevention system



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- Difference between strip and contour farming
- Drainage systems
- Energy Dissipators
- The Purpose of retention ponds & underground detention systems
- Different farming techniques
- Soil identification

## S2 EVIDENCE:

### EVALUATIVE CRITERIA:

- Placeholder

### ASSESSMENT EVIDENCE:

#### *Performance Task(s):*

**Task Placeholder**  
Online assessment

#### *Other Evidence:*

- Model evaluation
- Reflection questions

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

### 1. Introduce Activity

Collaborate with teammates to design and build a working soil erosion prevention model that replicates a real-world erosion prevention technique and retains the most soil possible during a simulated rainfall.

### 2. Brainstorm

- Brainstorm as a team how the materials could be used in different ways to simulate one or more of the listed erosion prevention methods. Plan what materials you wish to include in your plan. List at least 3 different materials on the chart. Include how it may be used in your model and any pros or cons you predict.

### 3. Construct

Students will make a plan about what method(s) and materials you will use. They will sketch a top view drawing of their hillside and erosion prevention features. They should label the materials used and draw the amounts they plan to use in the appropriate places. Also, they should predict what will happen in the simulation.

### 4. Test

- Students will build their models according to their plan and analyze the results

### 5. Communicate Results

Students should present their model to the class sharing which erosion prevention method(s) they followed, what materials they chose, and how they predict water to flow through their model. Observe how much soil gets carried away and accumulates in the bottom area of the paint tray. Watch for any structures that become moved or damaged and if any changes happen to the soil landscape during the rainfall. Let the model settle overnight. Compare the soil loss in the model with the others in the class.

### Progress Monitoring:

Teacher should observe students and provide on-going feedback during the activity. While introducing the unit, the teacher will pause and ask for questions to make sure everyone understands.

Students will complete self-assessment and brainstorm how they could improve their skills in the future. At the end of the unit, there will be a quiz to measure their overall understanding.

**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

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