Drip, Drop, Erode!

Science

STEM

Grade Level
3-5

Length of Lesson
45 minutes

Objective:
By the end of this lesson, students will understand splash erosion is one kind of erosion farmers experience and how farmers try to minimize it.

Materials:

- Splash Zone Target
- Erosion example cards
- Erosion Prevention cards
- 5 teaspoons of dry soil
- Eyedroppers
- Water
- *"Weathering and Erosion"* by Torrey Maloof

Standards
NGSS:
3-ESS3-1; 4-ESS2-1
4-ESS3-2

Lesson Summary
In this lesson, students will learn what splash erosion is and how it affects farmers. Students will learn different control practices farmers use to minimize erosion.

Suggested Sequence of Events:

1. Set Up: Print out Erosion Example cards and Splash Zone Targets. The Erosion example cards can also be turned into slides.
2. Read the books "*Weathering and Erosion"* by Torrey Maloof or "A Handful of Dirt*"* by Raymond Bial to capture student interest.
3. Complete the activity following the procedures:

Engage:
Show students images of landforms created by erosion such as the Grand Canyon or Garden of the Gods Recreation Area. (See Teacher Resources.)
Ask students how these rock formations were created.
Show students images of farmland that has been altered by erosion. (Teacher Resources) Ask students what they think happened to these fields. Inform students they will be learning about splash erosion & how farmers try to prevent it from affecting their fields.

Activity:
a. Put students into groups of 2-3 and give each group an eyedropper, a cup of water, a Splash Zone Target, and ½ teaspoon of soil in a pre-measured cup.
b. Tell students to place their soil onto the center of their target. Instruct students to fill their eye dropper with water and hold it approximately 18 inches above the center of their target.
c. Have students squeeze 5 drops of water onto the soil. If they miss the soil, they can squeeze additional drops.
d. Have students record the number of splashes in each zone. (Splashes are drops containing soil.) Instruct students to compare their results with others.
e. As a class, use questions found on the next page to discuss why the soil dispersed the way it did. Draw connections to real erosion in agriculture.
f. As a class, review "Erosion Prevention Methods" found in the teacher resources section to discover how farmers prevent erosion in their fields.

TEACHER RESOURCES

Discussion Questions for section "e" of activity:

- Discuss what students observed when they completed the experiment, and how the soil particles were moved from the center of the target. (The particles were moved with splash erosion.)
- How do we see this experiment occur in real life? (Rain falls on open fields and moves soil particles from where farmers want it to be.)
- What zone contained the most drops of water? Why? (Bigger Drops=more force=more distance.) What would happen if the drops were larger or fell faster? How does that happen to farmers in real life? (Extreme weather.)
- Discuss how you can prevent splash erosion at home. (plant flowers or vegetables, cover soil with mulch, etc.)

Erosion Prevention Methods in Farming for section "f" of activity:

- Ask students how a farmer can prevent splash erosion.
- Discuss the following methods of erosion prevention:
  - Cover crops: farmers plant crops like clover, rye, or oats between seasons to protect the soil.
  - Furrows: Farmers create small ditches between rows of plants for water to drain down.
  - No Till Planting: Farmers plant the seeds directly into the ground without plowing.
  - Contour Planting: planting crops around the curve of a hill
  - Build a windbreak: planting rows of trees to slow down wind to prevent soil from blowing away.
- Show agricultural erosion prevention video: https://iaitc.co/ErosionPrevention

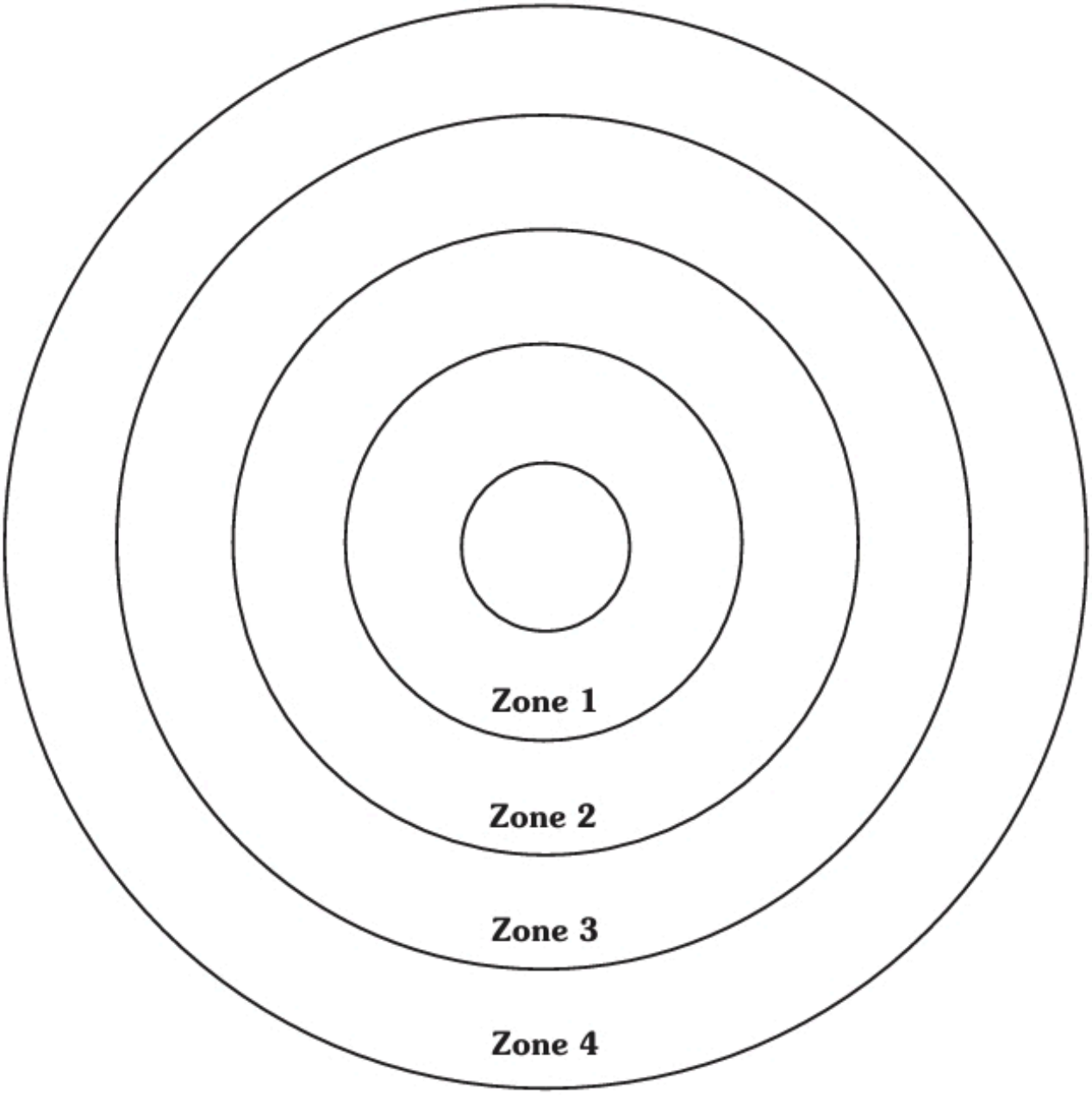
Extension Ideas:

- Read the "Who is responsible for Soil Conservation" article in our IAITC Soil Ag Mag at agintheclassroom.org
- Introduce other methods for controlling erosion. Let students watch portions of the video, Dirt: Secrets in the soil. https://www.youtube.com/watch?reload=9&v=i5S88OKrEQU
- Teach students about the Dust Bowl and how it affected American farming in the 1930's. Read students the book, "*The Great American Dust Bowl"* by Dan Brown or "Erosion: How Hugh Bennett Saved America's Soil and Ended the Dust Bowlby" by Darcy Pattison.
- Watch a short documentary on the Dust Bowl and how it impacted citizens in Utah. https://www.youtube.com/watch?v=kWNJ3TX-SIM
- Watch this video to learn about additional types of erosion and how they affect our landforms. https://www.youtube.com/watch?v=vYhoHkNMBlY

Lesson adapted from NAITC lesson "Keeping Soil in Its Place."

Splash Zone Target Resource

Splash Zone Target



TEACHER RESOURCES

Erosion Example Cards:

The Grand Canyon in Arizona *image: Britannica*

TEACHER RESOURCES

Erosion Example Cards:

Garden on the Gods Recreation Area in Herod, IL *image: EnjoyIL.com*

TEACHER RESOURCES

Examples of Field Erosion:

image: ar.insoredpencil.com

TEACHER RESOURCES

Example of Cover Crops:

TEACHER RESOURCES

Example of No Till Planting:

TEACHER RESOURCES

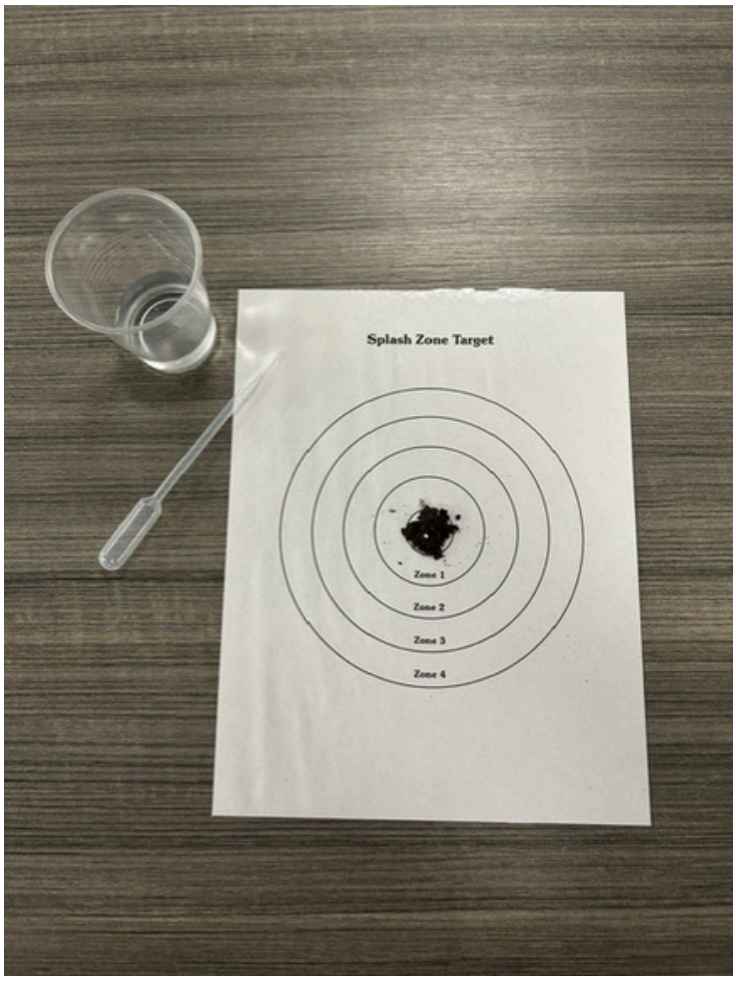
Example of Furrowing:

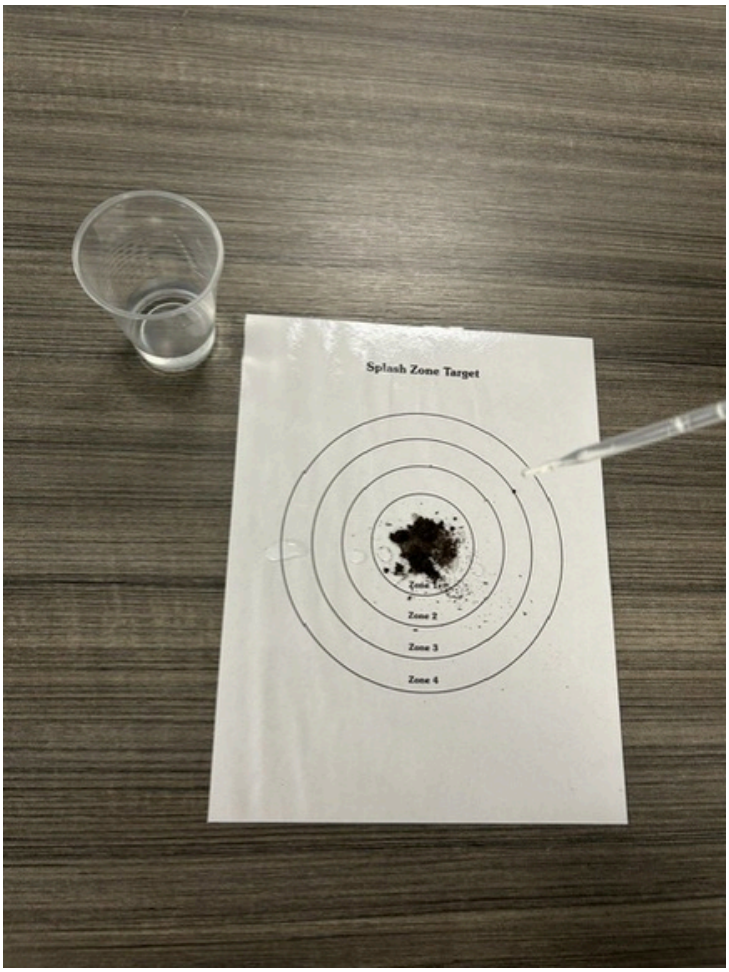
TEACHER RESOURCES

Example of a Windbreak around a field:

TEACHER RESOURCES

Example of set up and results:





TEACHER RESOURCES

Erosion Example Cards:

Arches National Park *image: Britannica*