Name: _____

Learning About Erosion

Environmental engineers design technology or structures to help solve problems in the environment. Some environmental engineers find ways to stop erosion. Erosion is the loss of soil, rock, or sand. Erosion occurs when large amounts of soil, rock, or sand are swept away because of wind or water.

Today, you get to learn about an environmental engineer and problems with erosion. First, read the article attached about erosion. Then, answer the questions below.

1. Ken wrote a survey and gave it to 100 farmers. Why do you think Ken wrote a survey? How else could Ken gather information from farmers?

2. In the article, Ken made observations of farms to see if there were signs of erosion. Describe two signs of erosion. Then, draw a picture of what the signs of erosion look like.

Name: _____

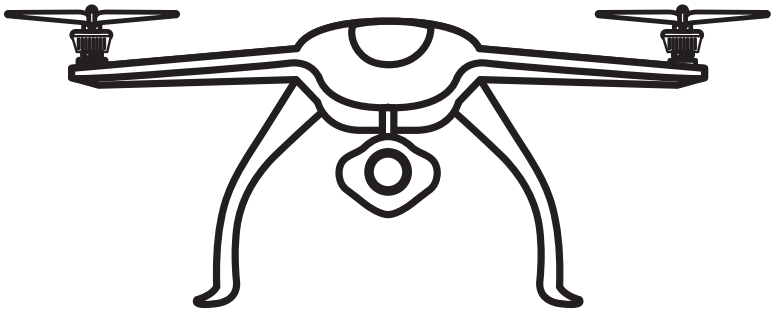
Learning About Erosion

3. After Ken noticed that some of the farms had signs of erosion, he made a plan to talk with the farmers! Describe at least 1 suggestion that Ken gave the farmers to stop erosion from happening in the future. Then, draw a picture of what it would look like.

Name: _____

Learning About Erosion

4. Ken decided to use technology to look for signs of erosion. The technology he chose was a drone! Take a look at the picture below of a drone. Design the drone so that it can look for signs of erosion. For example, you might make your drone waterproof so that it take pictures of farms when it is raining outside. Add at least two features to your drone. Label what features you add. Then, describe how your drone looks for signs of erosion.



Ken the Environmental Engineer: Drones and Erosion

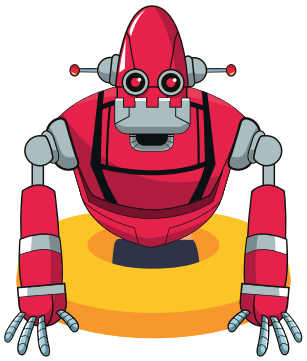
Meet Ken!

Hi! My name is Ken, and I'm an environmental engineer. Environmental engineers find solutions to solve problems in the environment.

Here are a few examples of problems and solutions:

Problem: There is pollution in a small lake. The lake is filled with plastic bottles and trash!

Solution: Design a robot that can remove plastic and micro debris, which are small pieces of garbage that float around in a lake.



Problem: There is soil erosion on farms. Erosion is when soil is washed away. When the soil is washed away, all that is left is rocks or clay. Farmers cannot grow their plants in rocks or clay.

Solution: Tell farmers to plant their crops closer together so soil doesn't wash away.

What I'm Working On

I am working as an environmental engineer in Vermont! In Vermont, many farms are noticing they do not have as much soil in their fields as last season. I am going to investigate whether farms have signs of soil erosion. Here are the steps that I am going to take:

Step 1:

Conduct a survey to see which farmers have noticed less soil on their farms this season compared to last season.

Step 2:

Visit the farms where farmers are noticing less soil and look for signs of soil erosion.

Step 3:

Report my findings to the farmers.

Step 4:

Come up with a plan to prevent soil erosion from happening in the future.

Conduct a Survey

The first step is to ask farmers if they think there might be erosion on their farms. I sent out surveys to 100 farmers.
Here were the questions on my survey:

Name: _____

Location: _____

Have you noticed less soil in your fields this season?

Yes No

Have you had soil erosion on your farm before?

Yes No Not Sure

Is there anything else you would like me to know?

_____

_____

_____

After I got all of the surveys back, I looked through the responses that the farmers sent. I identified 10 farms that might have soil erosion based on what the farmers wrote in their survey.

Making Observations of Farms

The next step is to make observations of each farm. That way, I can see if there are any signs of erosion. Signs of erosion include:

Bald spots: Spots where there aren't grasses, trees, or crops growing.

Exposed tree roots: These roots are above ground instead of underground.

Cracks in the soil.

Brown or colored water in nearby water.

It would take me a very long time if I had to drive to each farm and walk around. Instead of going to each farm, I decide to send a drone! A drone is a unmanned vehicle that flies in the air. "Unmanned" means there is no person inside of the vehicle! Instead, the drone is controlled by a computer or a person who uses a controller.

The drone will be able to collect pictures and videos about what each farm looks like. Then, I can look at these pictures and videos and see if there are signs of erosion.

Talking With Farmers

The next step is to tell the farmers if I think there is erosion on their farms. I sent an email with the following information:

6 of the 10 farms did not have signs of soil erosion.

Reasons these farms did not have signs of soil erosion:

- All had plants that were growing close together.
- All of the soil had plants growing on it. There were no bald spots with no plants.
- There are no signs of cracking in the soil.

4 of the 10 farms did have signs of soil erosion.

Reasons these farms did have signs of soil erosion:

- There were bald spots or places where plants were growing far apart.
- There were places where you could see a lot of soil but no plants.
- Many of the plants that were in and around the fields had their roots above the soil! The soil that had been covering up the roots must have eroded away.

Making a Plan

The next steps are to set up phone calls with the farmers who have signs of soil erosion on their farms. That way, I can explain ways to prevent soil erosion from happening in the future.

Here are a few suggestions I am going to give:

- Build a wall of plants (grass or bushes) that go in front of a crop.
- Always leave the roots in the soil when collecting fruit or vegetables from plants. It is important that roots are not ripped out of the ground!
- Plant crops close together.