Environmental Restoration Task

We've learned a great deal about macroinvertebrates and how they help us understand water quality. In this part of the lesson we are going to use what we have learned to develop models to demonstrate how we can restore an environment after a visitor center is built.

The Mississippi River ecosystem is important to a variety of populations and communities. Take a moment to review this information about a visitor center a community is planning on building in their area.

List two key items that you found interesting about the plan.

Your task is to engineer a model to represent the restoration of an area of the Mississippi river bank where the visitor center is being built.

Criteria:
Develop a model of a restored riverbank that maintains the water quality necessary for your macroinvertebrates to survive. It must provide shade, food for your macroinvertebrates, and resist erosion.

Constraints:
One day to plan
One day to build
One day to test
Budget of $100

Materials:

Each group will have one plastic shoebox to build their model in.

Each group may purchase:

Rocks	$20/small cup
Dirt	$10/small cup
Sand	$10/small cup
Clay	$15/small cup
Styrofoam/Cardboard	$20/small cup
Trees	$5/tree
Small plants	$3/plant

Environmental Restoration Plan
First Prototype

Before you are able to access your building supplies, you need to complete a drawing of your prototype. You also need to annotate your drawing to note the materials being used.

Explain two science ideas you used to inform your design.

Environmental Restoration Plan
Materials Order

Materials	Cost
Sand	$10
Rocks	$20
Dirt	$10
Clay	$15
Styrofoam/Cardboard	$20
Trees	$5
Small plants	$3

You will be given a total of $100.00 to build your model.

Please list the items you would like to purchase and the total cost.

Item Name	Quantity	Cost for Item	Justification

Total Cost:

Environmental Restoration Plan
Prototype 1 Test

It's time to test your first prototype.

Complete the table below as you conduct your tests.

	Qualitative Data	Quantitative Data
Erosion		
Shade (for cooler temps)		

Observations: Write down what you noticed during the trials for your first prototype.

What went well?

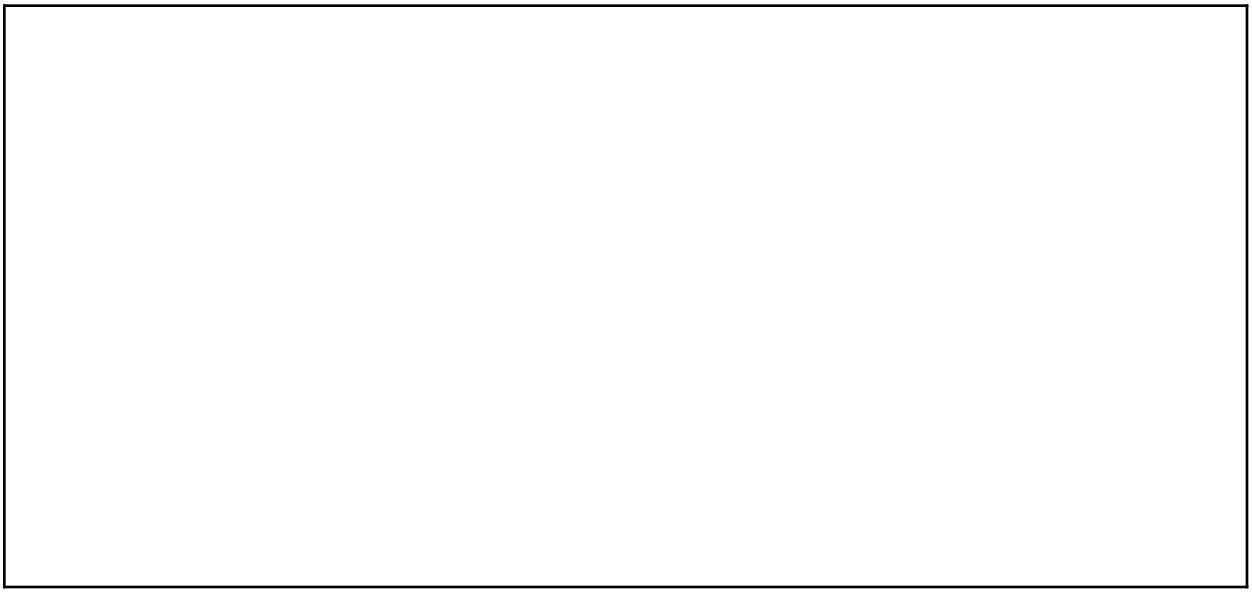
What didn't go well?

Based on your trials and observations, what parts of your prototype do you think you should change? Why should you make those changes?

What we could change	Why we would make the change

Environmental Restoration Plan
Second Prototype

Before you are able to access your building supplies, you need to complete a drawing of your second prototype. You also need to annotate your drawing to note the materials being used.



Explain how this prototype is different from your first prototype.

Environmental Restoration Plan
Prototype 2 Test

It's time to test your second prototype.

Complete the table below as you conduct your tests.

	Qualitative Data	Quantitative Data
Erosion		
Shade (for cooler temps)		

Observations: Write down what you noticed during the trials for your second prototype.

What went well?

What didn't go well?

Based on your trials and observations, what parts of your prototype do you think you should change? Why should you make those changes?

What we could change	Why we would make the change

Environmental Restoration Plan: Gallery Walk

Sketch or use words to describe two different restoration designs that you viewed.

How were these designs similar to or different from your design?

After viewing the designs, are there changes you want to make to your design? Why/why not?

Environmental Restoration Plan
Conclusion

Review the data tables for your prototype trials and complete the data table below.

Complete the table below as you conduct your tests.

	Prototype 1	Prototype 2
Erosion		
Shade (for cooler temps)		

Write a CER to answer the question - Which environmental plan design was more effective? Make sure you include a scientific principle.

If you could make one final change to your design, what would you change and why?