Woodland Park Grade 7 Science Program

Design Challenge

Portfolio

Ecocolumns

Names:_____

Class: _____

Due Date: _____

Ecocolumns

LIFE IN A BOTTLE
Design Challenge Portfolio

Miniature ecosystems in a bottle

SCENARIO: During the past few weeks we have covered a lot of material regarding interactions between organisms and each other and the physical world. In the next week and a half you and your group will put that knowledge into practice by designing and building a miniature ecosystem using 2L pop bottles. The goal is to construct a viable ecosystem that supports all organisms it contains by cycling matter and energy. Consider what combination of organisms will accomplish this task before you bring them to school.

Your eco-column must adhere to the following constraints:

- it must be made out of 2L pop bottles
- it must contain at least 3 different types of organisms
- it must contain at least two distinct layers (one water layer)
- it must support all organisms indefinitely (in theory) **without adding additional nutrients**
- you must construct your eco-column in such a way that it allows energy, water, and air to circulate through the entire column
- **you must have all organisms that you plan to add to your eco-column approved by Mr. Winkelhage before you bring any of them to school**
- you must choose organisms that will interact with each other in some way
- you must choose organisms according to their size in such a way as to fit comfortably into the eco-column
- the eco-column must be completed by the end of 4 work periods in the Science Lab

Remember that you are working with living things. Show respect and treat all organisms humanely! Failure to do so may result in your and/or your groups removal from the activity!

Ecocolumns

LIFE IN A BOTTLE
Design Challenge Portfolio

Names: _____

Design Team Name: _____

Plan of Action

Design Situation/Problem:

Read the challenge of Life in a Bottle and address the following questions:

How will you make sure that your eco-column will be functional?

_____

_____

_____

What kind of organisms are good candidates for your project?

_____

_____

_____

_____

What ado you need in your eco-column in order to ensure that your organisms will survive?

_____

_____

_____

_____

_____

Constraint Report (restate the limitations on page 2):

Read the challenge outline page. **Restate** all the limitations/constraints of this challenge.

Consider everything from time to material, equipment, and final design requirements.

Life in a bottle constraint report

1.	4.	7.
2.	5.	8.
3.	6.	9.

Sketches are to be done in pencil, with a ruler.

Design Sketch #1

List of organisms:

_____

_____

_____ Approved by Mr. Winkelhage: _____

Final Design Drawing: (To be done once the column is finished!)

- ruler drawn as large as possible, in pencil only
- neat, labelled and properly titled
- detailed with approximate dimensions
- include your list of organisms

Final Design:

Reflection on your design

Sometimes designs work better than we thought they would, other times they disappoint us. Complete the following, remembering that you receive marks for <u>thoughtful</u> reflection not just for having a successful final product.

Sentence answers in ink please.

Did your final eco-column operate as you expected it would? What are the reasons that your design succeeded or "failed"? (This is not just a "yes", "no" question!!)

_____

_____

_____

_____

Having seen other groups' designs, how would you have improved/ modify yours for the future? (Even if your final design worked well I am expecting some possible areas of improvement.)

_____

_____

_____

_____

_____

_____

What did you enjoy about this method of assessment?

_____

_____

_____

How could this design challenge be improved for future classes?

_____

_____

_____

_____