

Investigation Project: Complex Virtual Lab

Title: Critters!

- **Testable question:** What is the best terrain for the species *Critterius hirsutus* to live on?
 - **What I changed (Independent variable):** type of terrain
 - **What stayed the same (Controlled Variables):** temperature, light, moisture
 - **What I measured:** Number of *Critterius hirsutus* that move to the different terrains
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Research:

After reading the Briefing document [[LINK to pdf of Critters Briefing Document](#)], I discovered that limiting factors are those conditions that affect how well an animal survives in any given environment. These factors can be biotic (living factors) such as predators or plants or abiotic (non-living factors) such as temperature, moisture or sunlight. All animals need food, water, shelter, and air to survive.

Hypothesis:

If *Critterius hirsutus* live in a sandy terrain they will survive better than in a grass terrain.

Why I think so: I think this because their body color will cause them to be camouflaged in the sand preventing them from being eaten by predators (a biotic limiting factor).

Materials:

- *Critterius hirsutus* in container
- Terrain (sand, grass, rocks)
- Thermometer
- Heat lamps
- Fan
- Light switch on a dimmer (dim, moderate, bright)
- Moisture making machine with dry, moderate and humid settings
- Food and water for the *critterius hirsutus*



Procedure:

1. Place 10 Critterius hirsutus in a container in the middle of two environments—one with a grassy terrain and the other with a sandy terrain.
2. Adjust the temperature, moisture, and light of the environments so they are the same. The only difference should be whether or not the terrain is grassy or sandy.
3. Release the Critterius hirsutus from the container and observe the number of critters that choose to go to each environment.
4. Repeat the test using the combinations listed below.

Temperature	Light	Moisture
Cool=13 degrees Celsius	Dim=dimmer switch at 1	Dry=25% humidity
Warm=21 degrees Celsius	Moderate=dimmer at 3	Moderate=50% humidity
Hot=32 degrees Celsius	Bright= dimmer at 5	Humid=75% humidity

Variable Combinations to Test:

hot/dim/dry
 warm/bright/dry
 cool/dim/dry
 cool/mod/dry
 hot/mod/mod
 hot/dim/humid
 hot/dim/mod
 warm/mod/dry
 cool/mod/mod

hot/bright/mod
 warm/bright/mod
 cool/dim/mod
 cool/mod/humid
 hot/mod/dry
 warm/dim/mod
 hot/bright/dry
 warm/mod/mod

hot/bright/humid
 warm/bright/humid
 cool/dim/humid
 cool/bright/dry
 warm/dim/dry
 war/dim/humid
 hot/mod/humid
 warm/mod/humid



Data:

Critter Response to Sandy and Grassy Terrain		
(Number of Organisms That Moved to Each Terrain Condition)		
Conditions in the Containers	Sandy Terrain	Grassy Terrain
hot/dim/dry	0	10
hot/dim/mod	0	10
hot/dim/humid	1	9
hot/mod/dry	0	10
hot/mod/mod	1	9
hot/mod/humid	2	8
hot/bright/dry	0	10
hot/bright/mod	2	8
hot/bright/humid	2	8
warm/dim/dry	0	10
warm/dim/mod	0	10
war/dim/humid	1	9
warm/mod/dry	0	10
warm/mod/mod	2	8
warm/mod/humid	1	9
warm/bright/dry	1	9
warm/bright/mod	1	9
warm/bright/humid	1	9
cool/dim/dry	1	9
cool/dim/mod	1	9
cool/dim/humid	2	8
cool/mod/dry	0	10
cool/mod/mod	2	8
cool/mod/humid	1	9
cool/bright/dry	1	9
cool/bright/mod	0	10
cool/bright/humid	2	8



Results and Conclusion:

The results show that my original hypothesis is not supported by the data. In every test, the Critters migrated to the grassy environment. In each case I tested there were at least 80% of the critters that moved to the environment with the grassy terrain. It appears that camouflage may not be necessary for the critters to survive since they are brown and the environment they prefer has green grass.

