The variation of color intensity when UV beads are placed in water and on a dry surface

Kim Pajur, Olivia Brenay

Question

Will placing UV beads in water affect the amount of ultraviolet absorption?

Hypothesis

The UV beads placed in water will have more ultraviolet absorption than the UV beads placed on a dry surface.

Control and Test groups

Control: UV beads on dry surface.

Test: UV beads in water.

Standards

- Put the beads out at 12 PM.
- Take pictures every ten minutes .
- Use room temperature water for the Test Group.
- After 30 minutes in the sun the beads sit in a dark area for 10 minutes.
- Must be a sunny day.

Manipulated and responding variables

Manipulated: Putting UV beads in water.

Responding: Color intensity of UV beads.

Protocal

1. Obtain twenty UV beads.
2. For the test group get room temperature water and put it into a clear glass.
3. Wait until 12 PM on a sunny day.
4. Take the beads outside.
5. Place one set onto a dry surface while the other goes into the water. (The water is your test and the other is your control.)
6. Keep time and take a picture of your beads every 10 minutes.

7. After 30 minutes has passed take the beads and put them into a dark area that gets no sunlight.

8. Let the beads sit in the dark area for 10 minutes.

9. After the 10 minutes pass take the beads and put them back into the sunlight. (test goes back into water and control stays out.)

10. Continue to take pictures of the beads for every ten minutes.

11. After 30 minutes has passed take the beads out of the sun and dispose of the water.

OBSERVATIONS

Test- Once the beads were placed into the water they quickly turned a dark orange. As time progressed they became slightly darker.

Control- Once I set the beads into the sunlight on a dry surface they rapidly turned a bright orange and they stayed about the same color for the whole thirty minutes and all twenty beads were very close if not the same color.

Data

Test Group:

N=20

Max=159

Min=133

Range=26

Median=148

Q3=153.5

Q1=142

IQR=11.5

Upper Fence=170.75

Lower Fence=124.75

Outliers=None

Control Group:

N=20

Max=247

Min=180

Range=67

Median=190.5

Q3=207

Q1=184.5

IQR=22.5

Upper Fence=240.75

Lower Fence=150.75

Outliers=244, 246, 247

Stem and leaf plot

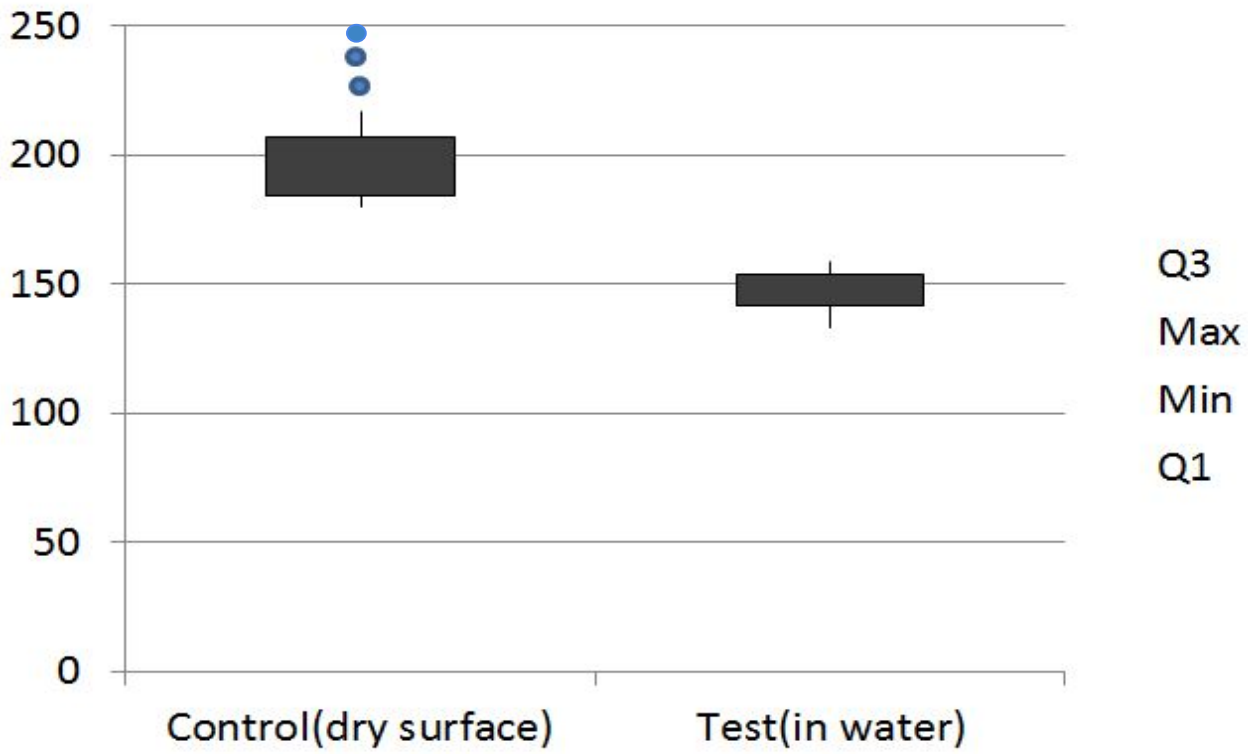
Control

13	3	6						
14	1	2	2	4	5	5	7	8
15	1	2	3	4	5	6	8	9

Test

18	0	0	2	3	4	5	7	7	9
19	0	1	8						
20	2	5	6	8					
21	7								
24	4	6	7						

Color Variation of UV beads on a dry surface and in water



Conclusion

The original hypothesis that stated the UV beads placed in water will have more ultraviolet absorption than the UV beads placed on a dry surface was supported. The beads in the water had absorbed more ultraviolet rays than the beads on a dry surface. The data was significantly different. The reasons for the outliers could have been that the sun was a little less clouded for the beads in the fences than the outliers causing them to be in a higher range. To improve this experiment we could have had all the beads for test and control in the same area. To improve this experiment more would be to make sure the sun is not being blocked out or covered by any clouds during the procedure.