

Name:

Date:

Class:

## UV Beads Exposure Scale Template **Example**

### Directions:

1. Arrange 10 UV beads in a single, flat layer on a smooth surface. Two rows of five beads placed side by side work well. A small Petri dish works best to hold the beads in place. If supplies are limited, 5–10 beads are sufficient.
  - a. For best visibility, place the Petri dish or beads on a sheet of plain white paper.
2. Using a ruler, position the UVB reptile lamp so the bulb is exactly 5 inches above the beads. Keep the lamp stable using a stand, books, cups, or another support to maintain the correct distance throughout the experiment.
3. Expose the beads to the lamp for each of the following time intervals: **0 seconds (control), 20 seconds, 40 seconds, and 60 seconds.**
4. After each exposure, take a photo of the beads to document the color change.
5. Allow the beads to return to their original (colorless) state before beginning the next trial, or use a fresh set of UV beads for each exposure.
6. Tips for best results:
  - a. Run each time interval in triplicate for more reliable data.
  - b. For the most consistent comparison, use beads of the same original color for each trial.
7. Insert your photos into the template below.
8. Estimate the sunscreen's SPF using the following formula:
  - a. Estimated SPF = UV Exposure Level (No Sunscreen) \_\_\_\_\_ ÷ UV Exposure Level (With Sunscreen) \_\_\_\_\_
  - b. **Example:** If the beads reach a UV exposure level of **15** during the control trial (no sunscreen) after 60 seconds, but only reach a level of **5** when a plastic bag containing sunscreen is placed over the beads, then:
  - c. **Estimated SPF =  $15 \div 5 = 3$**

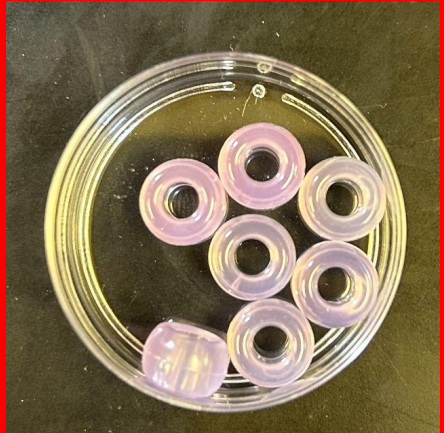
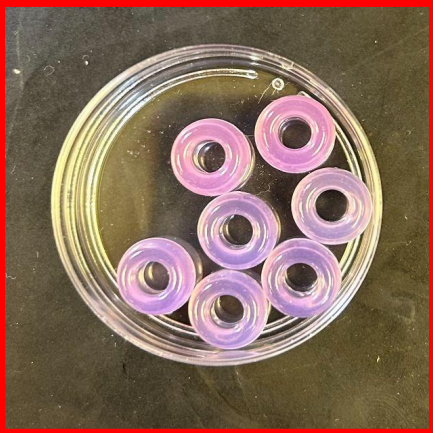
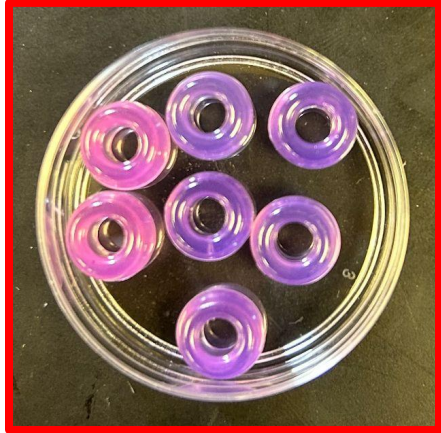
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9. **Important:** Do not place the UV beads inside the plastic bag containing sunscreen. Sunscreen residue can coat the beads and affect their accuracy in future experiments. Instead, place the sunscreen inside the sealed plastic bag and position the bag over the beads during testing. The UV light will still pass through the sunscreen, allowing the beads to change color while keeping them clean and reusable for multiple trials.

| UV Bead Exposure Scale                                                             |                                                                                     |                                                                                      |                                                                                      |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| No UV Exposure                                                                     | Low UV Exposure                                                                     | Moderate UV Exposure                                                                 | High UV Exposure                                                                     |
| Level 1                                                                            | Level 5                                                                             | Level 10                                                                             | Level 15                                                                             |
|  |  |  |  |
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