

SUPPLEMENTAL MATERIAL 2

In addition to turning in the two graphs described in the Methods section, the students were also asked to discuss and turn in thoughtful answers to several questions. Some examples include:

1. Summer bees typically learn olfactory PER in one or two trials, and winter bees generally will not learn olfactory PER in laboratory settings. Based on your data, do “autumn bees” resemble summer bees, do they resemble winter bees, or do they exhibit an intermediate phenotype? Why might summer bees be better at this task than winter bees? Explain.
2. Why was it important to test for a successful PER (without scent) prior to training?
3. What was the purpose of the sham scent applicator? In other words, why was it important to occasionally blow unscented air at the bees during training?
4. After several extinction trials, a bee may stop exhibiting a PER. Is this evidence that the bee has “forgotten” the CS-US association (that the memory went “extinct”)? Why or why not?
5. How would you test the hypothesis that the bees still remember the original CS-US association even after the apparent extinction of the response?
6. Why was it necessary to wait a few seconds between delivering the puff of scented air and delivering the sucrose solution?
7. Why was it important to not wait too long between delivering the puff of scented air and delivering the sucrose solution?