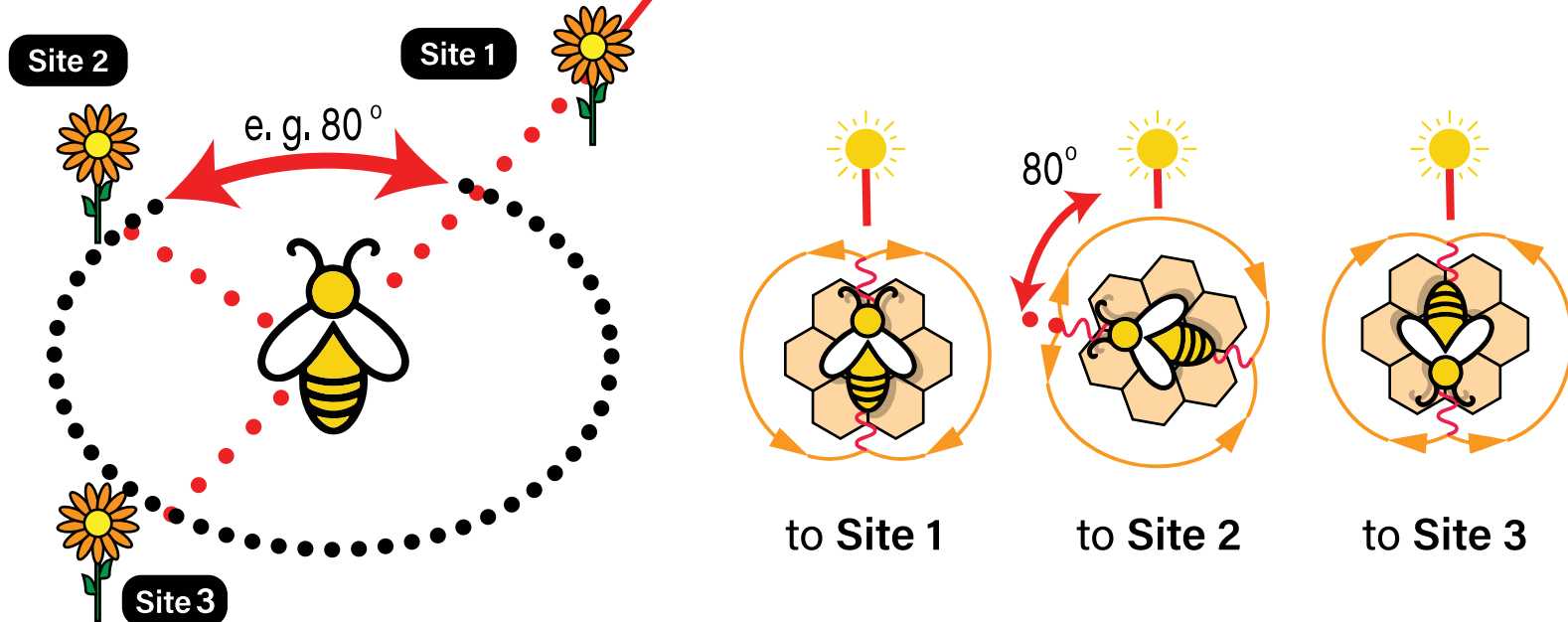


RECRUITMENT IN HONEYBEES

The classical waggle dance model

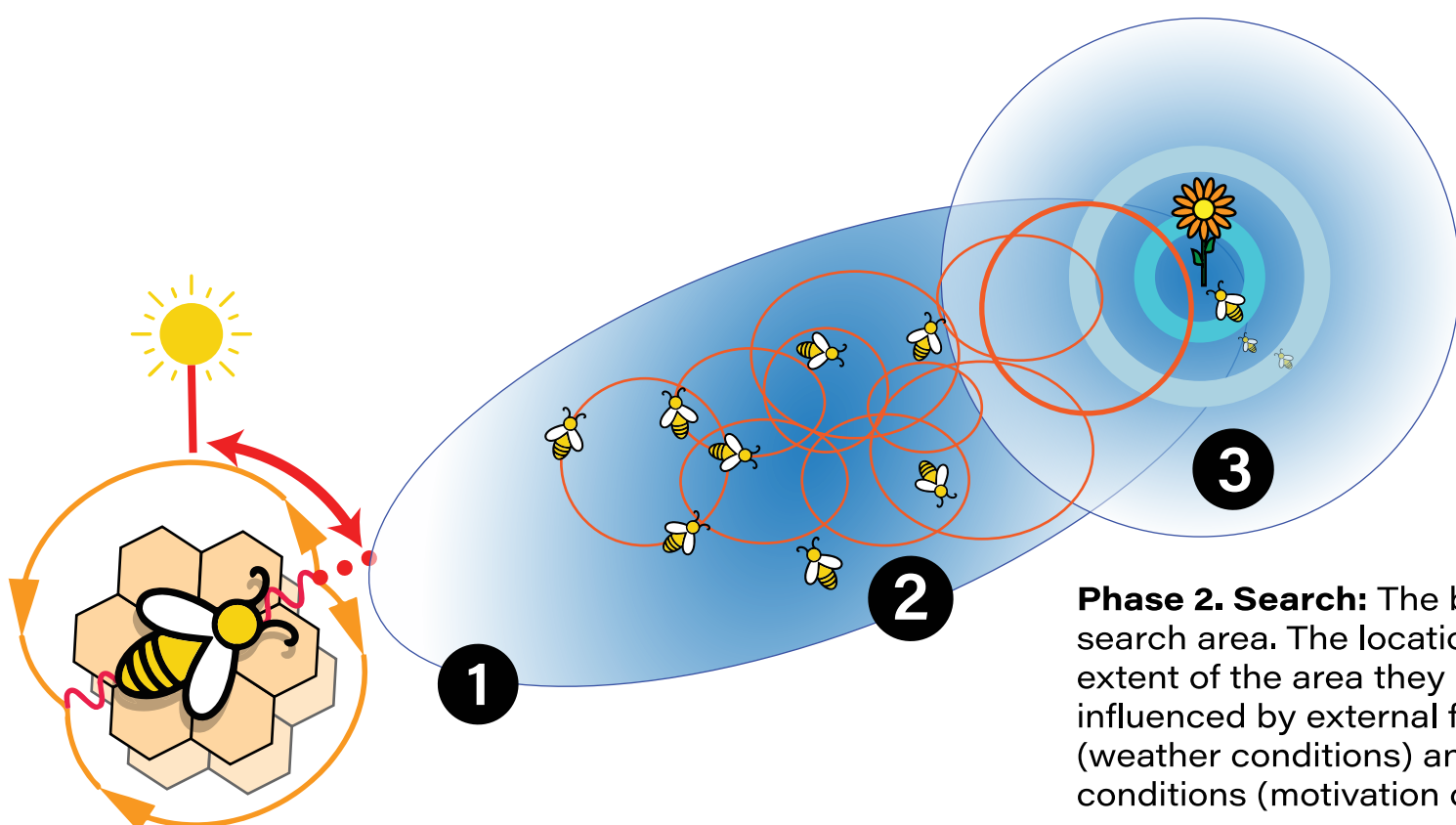


The waggle dance of honeybees provides precise ("true") information about the direction and distance of a food site from the hive. In the graphic shown here, the dances to site 1 and site 3 indicate vertically up or down. Bees in the field orientate to the sun's position and so the dance followers understand that the food sites 1 and 3 are in a straight line in relation to the sun. Similarly, following the dance for site 2, followers fly at an angle of 80 degrees left in relation to the sun's position to arrive at the goal. The length of the waggle dance indicates the distance to the feeders.



The new three-phase-model

The waggle dance of bees provides imprecise ("half true") information about the direction and distance of the food site from the hive, indicating only an approximate area in relation to the hive within which the food site can be found. A dance follower (recruit) flying to a food site unknown to it, for which a foraging bee has advertised in its dance, proceeds through three separate phases:



Phase 1. Sent: The recruit flies out of the hive in the approximate direction and over the approximate distance to reach the general search area indicated in the dance.

Phase 2. Search: The bees reach the search area. The location, shape and extent of the area they search is influenced by external factors (weather conditions) and internal conditions (motivation of the searchers).

Phase 3. Attraction: Should the recruits in the search area come across the scent of the flowers they detected on the dancer, or the scent released from the dancer who continues signalling out in the field, they can orient toward and arrive at the site.

