



HOW BEES COMMUNICATE

Bees use chemicals, touch, sound, and movement to share key information about food, danger, and hive health. This behaviour reveals a highly organised, cooperative social structure.

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KEY FACTS

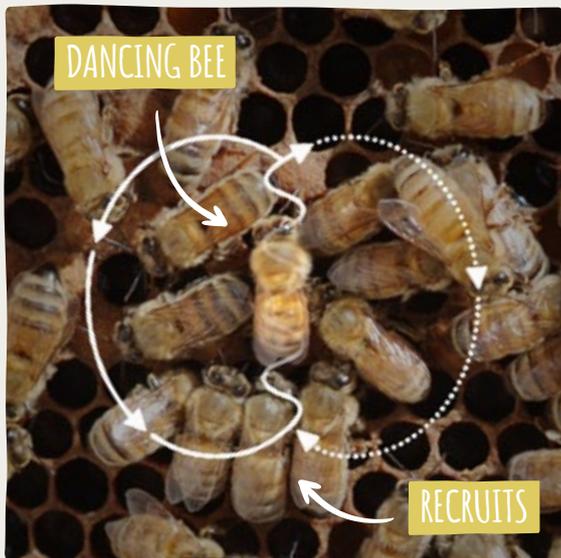
Bees use the **waggle dance** to tell others the exact direction and distance to food sources.

Bees release **pheromones** to signal alarm, attract mates, or coordinate roles within the hive.

Bees **tap antennae** to recognise other bees and share information.

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Bees may be small, but their ability to communicate is truly remarkable. Inside a hive, thousands of bees work together in perfect coordination, without speaking a word! Instead, they rely on an intricate mix of movement, scent, and touch to share vital information. A *waggle dance* shows where to find food (nectar and pollen), *pheromones* send alerts, and *antennae taps* maintain connection. This unique communication allows bees to stay organised, adapt quickly, and ensure the entire colony not only survives, but thrives.



Communication in motion: a honeybee performs the waggle dance to share the location of food with her hive

WAGGLE DANCE

The waggle dance is a very sophisticated way of communicating where to locate a food source within the environment.

There are two forms of dance performed by the bee. The first is small circular movements which indicates the food source is close by (less than approximately 50 metres).

The second is more complex. When a foraging honey bee returns to the hive, she will 'dance' in the direction the food source may be found. The duration of the waggle translates to the distance from the hive. A short waggle means it's close, a long, drawn out waggle means the food source is far away. The bee uses the sun as a point of reference and then 'dances' at certain angles from that point. This communicates the direction of the food source. The dance is in the pattern of a figure eight. The bee will complete her movements, circle back, and repeat. The number of circles indicates the quality of the food source!



Power in a scent: queen pheromones keep the hive united, signaling her presence and guiding the colony's behavior



Buzzing with information: bees engage in antennae tapping to share vital cues and strengthen social bonds

PHEROMONES

Bees don't just use movement to communicate, they also rely on smell. Pheromones are special chemicals bees release to send important messages within the hive. These invisible signals can warn of danger, guide bees home, or signal that the queen is present and healthy. Each pheromone has a specific role, and bees detect them using their antennae. It's like a built-in chemical language that keeps the hive safe and organised. Types of bee message pheromones:

Alarm pheromones: Released when a bee stings; smells like bananas and warns of danger.

Queen pheromones: The queen emits this hormone to keep the hive organised and signal her health.

Nasonov pheromones: Help worker bees find their way back by fanning it from the tip of their abdomen.

ANTENNAE TAPPING

Bees can communicate through touch using their antennae. When bees meet, they often gently tap each other's bodies or faces with their antennae to gather information. These taps help identify whether a bee belongs to the hive, determine roles (like worker or queen), and request or offer food.

Antennae are packed with tiny sensors that detect smells, movement, and chemicals – allowing bees to "read" important messages. This form of touch-based communication is especially useful in the dark, crowded hive. Bees also use antennae tapping during the waggle dance to track the dancer's movements and understand where food is located.

This quiet, powerful tool helps bees stay connected, coordinate tasks, and keep the colony thriving.



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Centre for Bee Education is a collaboration between When Bee Foundation and Bee School by Beechworth Honey and provides a wealth of learning resources and tools on the important role bees and other pollinators play in the environment and food production systems.

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