

CLEMMM AND THE POLAR
COORDINATES



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Once upon a time, in the early days of the first beehives, there was a little bee named Clemmm (the end of her name sounds like humming).

Clemmm was small and thoughtful, with tiny wings, and she couldn't fly very far. The other bees made fun of her as they buzzed off with their strong wings to gather pollen from far off fields.

She watched them come and go, flying out to secret places only they knew (every bee found his or her own flowers, no one ever shared their secret knowledge.)

One day, it was raining hard, and the other bees were staying inside. Some of them started making fun of Clemmm.

"You're useless," one said.

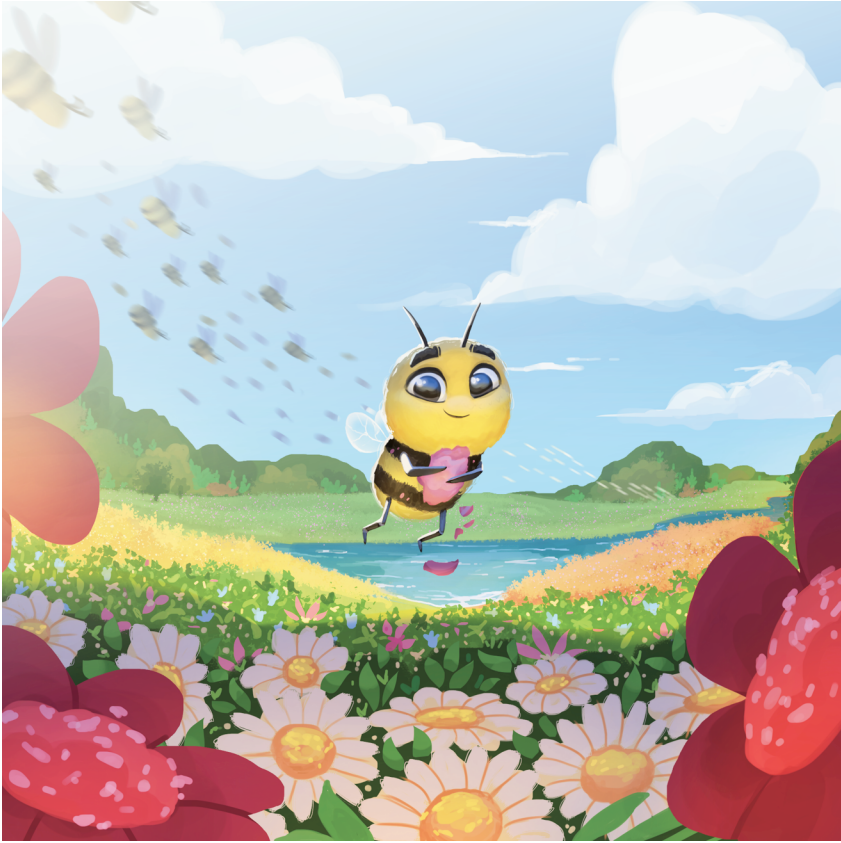
"Even if you found a flower, you're too weak to carry any pollen back," another said.

With tears in her eyes, Clemmm darted out into the pouring rain, resolved to discover the largest collection of flowers any bee had ever encountered. She was determined to return with more pollen than any other bee had, regardless of the difficulty.

She flew and flew, her wings getting sodden. It got dark, and still

she looked. The sun rose and set three times, and still she flew through the forest, looking.

Until on the last day, when she could barely move her wings anymore, she found a huge meadow full of flowers. She couldn't believe what she was seeing. Thousands of flowers, all full of pollen.



She gathered as much as she could carry and quickly found her way back to the hive (even though Clemmm was small, she had always been good at finding her way. She always noticed small details, wherever she went.)

The other bees were shocked when she came back with so much pollen, and even more shocked as she kept going and coming back with even more.

Clemmm buzzed with pride as she carried back another load of pollen, but she'd flown so much, she was so tired, and as she dumped the next load of pollen, her little wings gave out.

The other bees shook their antenna in annoyance and glared at her.

"Even when you find pollen you are useless," one snapped.

"It's all going to go to waste," another said.

Clemmm looked down sadly, thinking maybe they were right, but then she had an idea.

She stood up and began to do a dance. It was a popular bee dance, which she adapted. She shook from side to side, walking in a figure eight. The eight pointed in the direction of the flowers. She danced for exactly how long it took to reach the flowers, then she stopped.

The other bees looked at her confused, so she explained, then did the dance again. She showed them what direction to fly in, and then mimicked flying for that amount of time. Slowly, they started to get the idea, and some of them took off.

It wasn't long before they returned, laden with pollen. That night the hive had more pollen than it ever had before.

From then on, Clemmm was a hero and an explorer. She would fly out, finding the best fields of flowers, then she would come back and do her dance, showing the others where the flowers were. Soon other bees started doing Clemmm's dance. And, working together, they were able to become the most successful and happy hive in the forest.

Unknowingly, in the great tradition of bee mathematicians, Clemmm had invented polar coordinates, which is simply a way of showing where something is by showing what direction it is in and how far away it is.

Today, bees everywhere use polar coordinates to work together, telling each other where all the best flowers are, all because of Clemmm.

