

Connecting Knowledge Building Discourse to Hands-on Activities with JK Students

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Overview The 22 joiner kindergarteners (JK) have been studying butterflies for the last two months. The Knowledge Building sessions usually take place in half groups (11 students in each group) on a weekly basis. To best understand the students' authentic questions and theories, they were interviewed for what they notice about different life stages of butterflies, what they think, and what they wonder about. Their responses inform further Knowledge Building sessions. A Knowledge Building session usually starts with the teacher and student discourse on questions around butterflies such as, "Do you know why this person said that there are butterflies in Mexico?" Authoritative sources such as books, videos, and pictures are usually used to inspire students' initial ideas, discussions, and to help them re-think their theories. The discourse is followed by hands-on activities in which the students can apply what they have learned to draw or model different life stages of the butterfly or their body parts such as wings. The students have developed a rich understanding of various types of butterflies, butterfly migrations, and the life cycle of the butterfly. They have zoomed in on the caterpillar, chrysalis, and butterfly. Most recently, the children have explored how being able to camouflage is a matter of survival for many butterflies.

Discourse, authoritative sources, and activities

Discourse

Teacher: Why do you think when it closes, it looks like a leaf?

Tom: Because it has a sharp shape like a leaf.

Teacher: Why do you think the butterfly is pretending to be a leaf?

Lisa: It's just hiding.

Will: Because if a fox comes, it wouldn't eat it because foxes don't eat leaves.

Sara: It protects itself.

Eva: It just hides itself, like this (head hiding between knees)

Books, videos, and pictures to support discourse and activities (videos as an example)



Figure 2. Leaf butterfly camouflage



Figure 3. The symmetry patterns of the wings



Figure 4. The kids drawing symmetry patterns



Figure 5. Symmetry patterns drawn by the students

Knowledge Building Discourse

Excerpt of student discourse

Olivia, Jacob: Mexico is warmer. Butterflies don't want winter. In winter, there are no flowers so butterflies can't suck for food. Flowers are their food, like bees.

Noah: Butterflies eat and make honey.

Liam: Nectar

Jacob: Milkweed.

Emma: Butterflies don't want to get their wings cold.

Will: They do not want to be blown away

Noah: When they are a caterpillar, they eat leaves and turn into a butterfly...

Olivia: Butterflies need to fly away. If they don't, they may die.

Noah: They eat leaves, then they go to a cocoon, and then they turn into a butterfly.

"I notice" and "I think" Quotes

1. I notice this red caterpillar has a stinger at the back. I think it might use the stinger to defend itself against enemies. It might be helpful to avoid getting eaten. It might be poisonous, because it is red. I learned that red, black, white, yellow, and green are poisonous colors.

"I wonder" Quotes

1. I wonder how the butterfly flies.
2. I wonder why the legs are sharp and pointy?
3. I wonder, what does it do inside the cocoon?
4. I wonder what happens inside of the chrysalis when the butterfly is almost ready to come out?
5. I wonder if it is going to be a butterfly that has the same colors as when it is a caterpillar?
6. I wonder why they are hanging from trees?



Figure 6. A word cloud of students' wonderings

The Life Cycle of Butterflies

- Knowledge Building discourse
- Reading books/watching videos
- Hands-on Activities

Feb 11- Various forms of butterflies and butterfly migration

Feb 19- Various forms of butterflies and butterfly migration

Mar 4, 5-The life cycle of butterflies

Mar break

Mar 25, 26-Caterpillars and butterflies

Apr 1, 2- Butterfly camouflage & symmetry patterns of the wings

Figure 1. The Knowledge Building process

