

Visible Elements in Photo



- A honeybee (brown and gold striped body, visible legs and wings) on a purple flower
- Purple flower with many small, densely packed petals clustered in the center
- Green foliage and blurred garden background
- Bee's position: angled toward the flower's center where pollen would be concentrated

Reasonable Inferences

- From bee's body structure: The bee's hairy body and leg position suggest it is collecting pollen as it moves across the flower—hairs trap pollen particles.
- From flower's petal density: The tightly clustered petals indicate the flower is designed to hold pollen and position it where visiting insects will contact it.
- From bee-flower interaction: The bee needs reliable access to the flower's center; flowers must be stable and accessible enough for pollinators to land and feed safely.

Engineering Task

K-2 Challenge:

Design a purple flower out of paper or fabric that a toy bee can land on safely. Make sure your flower has a soft, bumpy center where the "pollen" (glitter or sand) sticks to the bee. Test: Can your bee toy stay on the flower when you tilt it gently?

3-5 Challenge:

Engineer a model flower that:

- Has a landing platform (petal cluster) at least 3 cm wide that supports a small toy bee without tipping
- Features a textured center (using sandpaper, velcro, or bumpy material) that traps and transfers "pollen" (salt or glitter) to the bee's body
- Remains stable when tilted 30 degrees (to simulate wind or uneven landing)

Success criteria: Pollen transfers to the bee after 3 landings, and the flower stays upright. Test and redesign until both goals are met.

EDP Phase Targeted

Ask / Define Problem — This photo captures a real-world need: flowers must be structurally sound and accessible for pollinators to land, feed, and transfer pollen. Students begin by observing why the flower's shape and texture matter, then define the engineering challenge of creating a reliable pollinator landing system. This anchors the entire design process in observable biology.

Suggested Materials

- Colored paper or tissue paper (purple, green)
- Pipe cleaners or craft wire (bee body/legs)
- Sandpaper, velcro, or textured fabric (flower center)
- Salt, glitter, or sand (pollen simulant)
- Tape and glue
- Small plastic or foam base (flower stem/support)

Estimated Time

45–60 minutes (single session) or Two 30-minute sessions (design day + test & redesign day)

Why This Works for Teachers

This task directly addresses NGSS 3-5-ETS1-1 (Define a simple design problem reflecting a need or a want) by having students identify the structural and functional requirements of a flower through observation, then engineer a solution that mimics nature's pollination strategy.