Flower Parts

Life Science | Engineering Design Process

Engineering Challenge

Visible Elements in Photo

- Pink hibiscus flower with five broad petals
- Yellow/cream-colored stamen (center reproductive part) with orange pollen-bearing structures
- Long, thin pistil extending upward with round stigma at the tip
- Dark green blurred background (outdoor setting)
- Veined texture visible on petals

Reasonable Inferences

- From stamen and pistil structure: The flower must position pollen-bearing parts at specific heights and angles to increase the chance of pollination by insects or other visitors; this suggests a need for structural support and accessibility.
- From petal arrangement: The broad, flat petals serve as a landing platform; this implies an engineering solution for attracting and stabilizing visiting creatures.
- From outdoor setting: The flower must withstand wind, water, and weight of visiting insects without breaking or losing function, suggesting durability requirements.

Engineering Task

K-2 Challenge:

Design and build a big flower out of paper, fabric, or pipe cleaners that a toy bug or craft figure can land on safely. Your flower needs sturdy petals that don't bend and a center that holds a small object (like a bead for pollen). Will your flower hold up if you gently shake it?

3-5 Challenge:

Design a model flower (using craft materials) with the following constraints:
- Petals must be at least 8 cm long and positioned to create a landing platform at least 5 cm wide.
- The stamen (pollen part) must extend 3–5 cm above the petals and support a 20-gram weight without bending more than 1 cm.
- The structure must remain stable when tilted 45 degrees (simulating wind or insect movement).
- Test your design with a toy insect landing on the flower. Document where it lands most easily and adjust the petal angle if needed.

EDP Phase Targeted

Ask / Define Problem — This photo shows a natural structure solving real challenges (pollination, structural support, accessibility). Students should start by observing what the flower does and asking why it's shaped this way, then identify the engineering problem: "How can we design a structure that attracts visitors, supports their weight, and keeps pollen accessible?"

Suggested Materials

- Colored paper or tissue paper (petals)
- Pipe cleaners or straws (stamen/pistil)
- Foam balls or pom-poms (pollen clusters)
- Clay or play dough (base/stem)
- Tape, string, or hot glue gun
- Toy insects, beads, or small weights for testing

Estimated Time

- K-2: One 40-minute session (observation + building + testing)
- 3-5: Two 40-minute sessions (design + build + test + redesign)

Why This Works for Teachers

This task directly supports NGSS 3-5-ETS1-1 ("Ask questions to define a design problem") and K-2-ETS1-1 ("Ask questions, make observations, and gather information about a situation people want to change") by grounding the challenge in observable nature and asking students to solve a real biological problem through engineering design.