

# Species Report Card

1 What organism are you exploring. Can you name it and draw it?

Dragonfly (*Anisoptera odonata*)

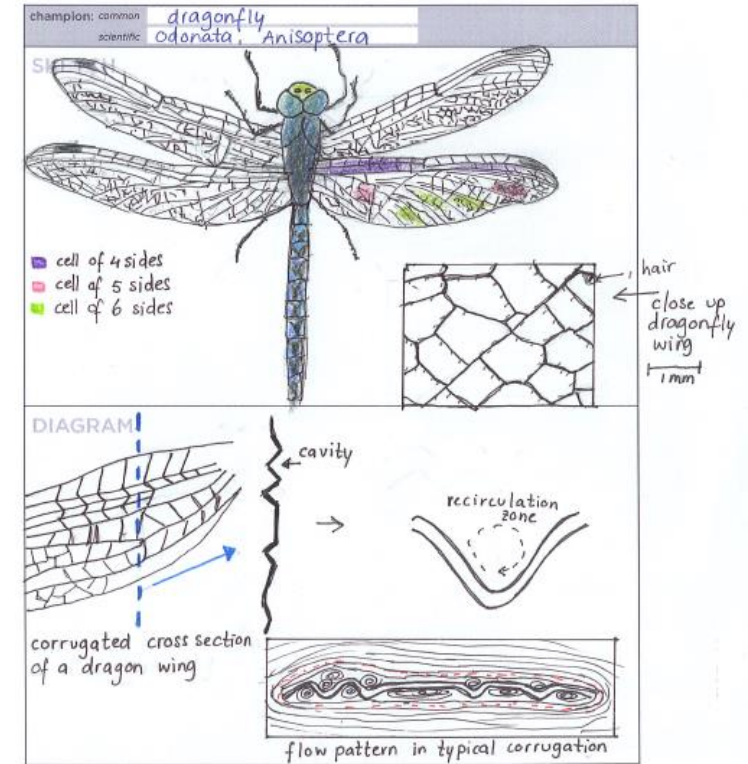
2 What Function does this organism perform which you are interested in? (What does it do?)

Optimize structure to withstand force and provide lift.

3 Describe the strategy this organism uses to deliver the Function you are interested in. (How does it do it?)

Dragonfly wings achieve efficient structural performance through a non-linear variation of pattern, corrugations and varied material properties throughout the structure. Numerous small veins spread across the wing provide both strength and flexibility to handle different forces. The leading edge consists primarily of rectangular frames for stiffness, whereas the trailing surface is largely formed of hexagons for more flexibility.

Corrugated wing profiles give the dragonfly a lifting capacity. Air circulates in the cavities between the wing folds, which create small whirlwinds resulting in low pressure, less drag and increased lifting capacity.



4 How could this be used to solve your challenge? (translate your strategy into a design principle)

- use nonlinear variation of pattern, corrugations and varied material properties throughout the structure for efficient structural performance.
- use shape and variation to determine stiffness and flexibility needed to address tensile force.
- use corrugated profiles and edges to enhance lifting capacity and reduce drag.