



# Flying Dragonfly

Channel your inner entomologist as you construct a device that mimics a dragonfly's flight path. Then, learn all about the magnificent dragonfly and the insect's special flying abilities!

## TEKS:

SCI 7.11: The student knows that populations and species demonstrate variation and inherit many of their unique traits through gradual processes over many generations.

SCI 7.11 A: The student is expected to examine organisms or their structures such as insects or leaves.

SCI 7.12: The student knows that living systems at all levels of organization demonstrate the complementary nature of structure and function.

SCI 7.12 A: The student is expected to investigate and explain how internal structures of organisms have adaptations that allow specific functions such as gills in fish, hollow bones in birds, or xylem in plants.

## Materials:

- Empty cereal box or piece of cardstock
- Hole punch
- Pen or pencil
- Ruler
- Scissors
- Straw or wooden dowel
- Tape

## Experiment/How To:

1. Use scissors to cut an approximately 8 x 1.5-inch rectangle out of an empty cereal box or piece of cardstock.



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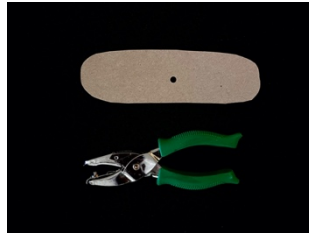
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- Use scissors to round both ends of this rectangle so that you have a long, oval shape.



- Use a hole punch to punch a hole in the center of the rectangle. This will act as your dragonfly's propeller or "wings."



- Place a straw or wooden dowel through the hole you just punched. Approximately one inch of the straw or dowel should stick out from the top of the propeller.
- Use tape to secure the propeller onto the straw or dowel. You have now created your dragonfly!



- Head outside to fly your dragonfly. Rapidly spin the straw or dowel between your hands and launch it away from you.
- What types of modifications could you make to your flying dragonfly device to improve its flying ability? Does spinning it faster or slower help? What happens if you change the shape or angle of the propeller? Or what if you added a *second* propeller on top of the first?

### STEM Connection:

Have you ever seen a dragonfly in real life? If so, you may have noticed that their flight patterns look pretty crazy! Dragonflies were one of the first species of winged insects to exist on the planet. They have been around for 300 million years and there are now over 5,000 species of dragonflies. Modern-day dragonflies are pretty small and have wingspans of just one to four inches. However, we've discovered fossils of ancient dragonflies that had wingspans of over two feet!

One of the most noticeable things about a dragonfly is its flying skills. Birds and bats have only one set of wings and tend to fly smoothly in one direction. In contrast, dragonflies have *two* sets of wings. Because of this, they are superfast and can fly in all directions—even backward!

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Dragonflies twist their wings at all different angles which allows them to change direction rapidly and capture prey as tiny as gnats. Scientists were so impressed with the insects' abilities that they modeled the design of some propellers, wind turbines, and even helicopters after dragonfly wings. Check out the three photos below. The first one is of a dragonfly, the second a helicopter, and the third our flying dragonfly device. What similarities and differences do you notice between these three photographs? How can you use these observations to help improve the design of your flying dragonfly?



One last thing. If you've never seen a dragonfly flying in real life, there is some great news. Dragonflies are most active in the summertime, so head outside and see if you can find one to observe!

### Career:

*Entomologists* study insects' habitats and how insects evolve. They develop ways to control harmful insects and insect-borne diseases. Entomologists also discover and study new species of insects and the interactions between insects and humans. Some entomologists work out in the field collecting and recording while others work in a laboratory or classroom.

### Resources:

<http://almostunschoolers.blogspot.com/2011/05/folk-toy-fridays-hand-propeller.html?m=1>

<https://en.wikipedia.org/wiki/Bamboo-copter>

<https://www.wired.com/2007/12/gallery-helicopter/>

<https://picklebums.com/bamboo-helicopter/>

[https://www.huffpost.com/entry/nature-technology\\_b\\_841987](https://www.huffpost.com/entry/nature-technology_b_841987)

<https://www.smithsonianmag.com/science-nature/14-fun-facts-about-dragonflies-96882693/>

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