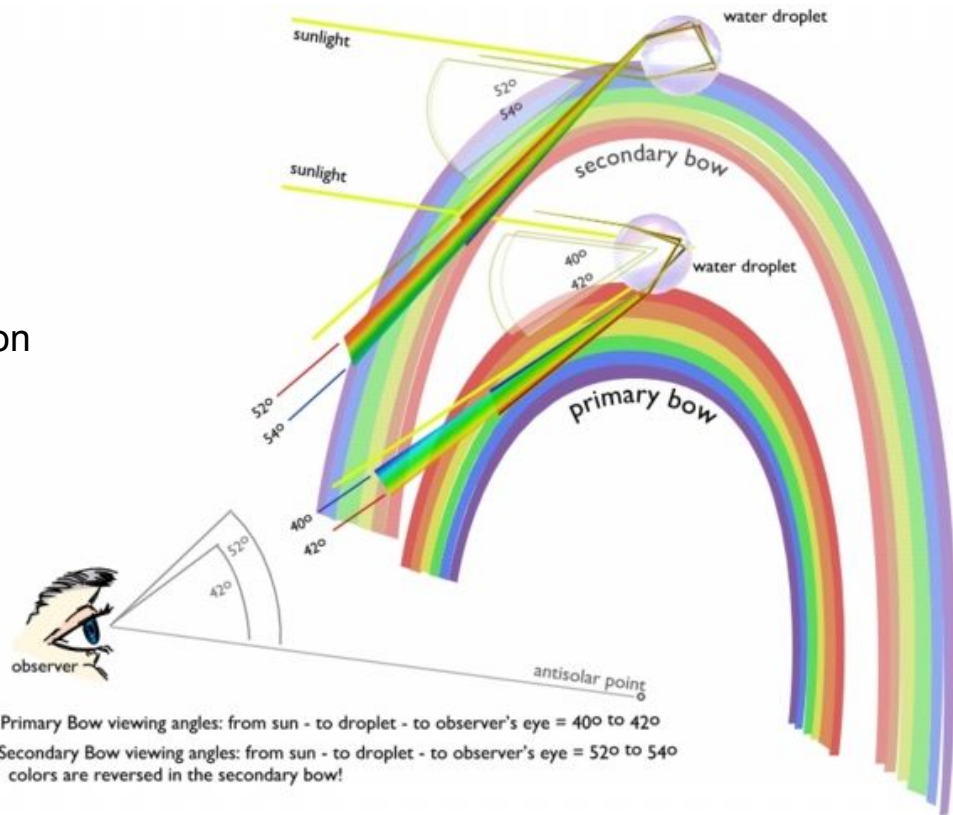


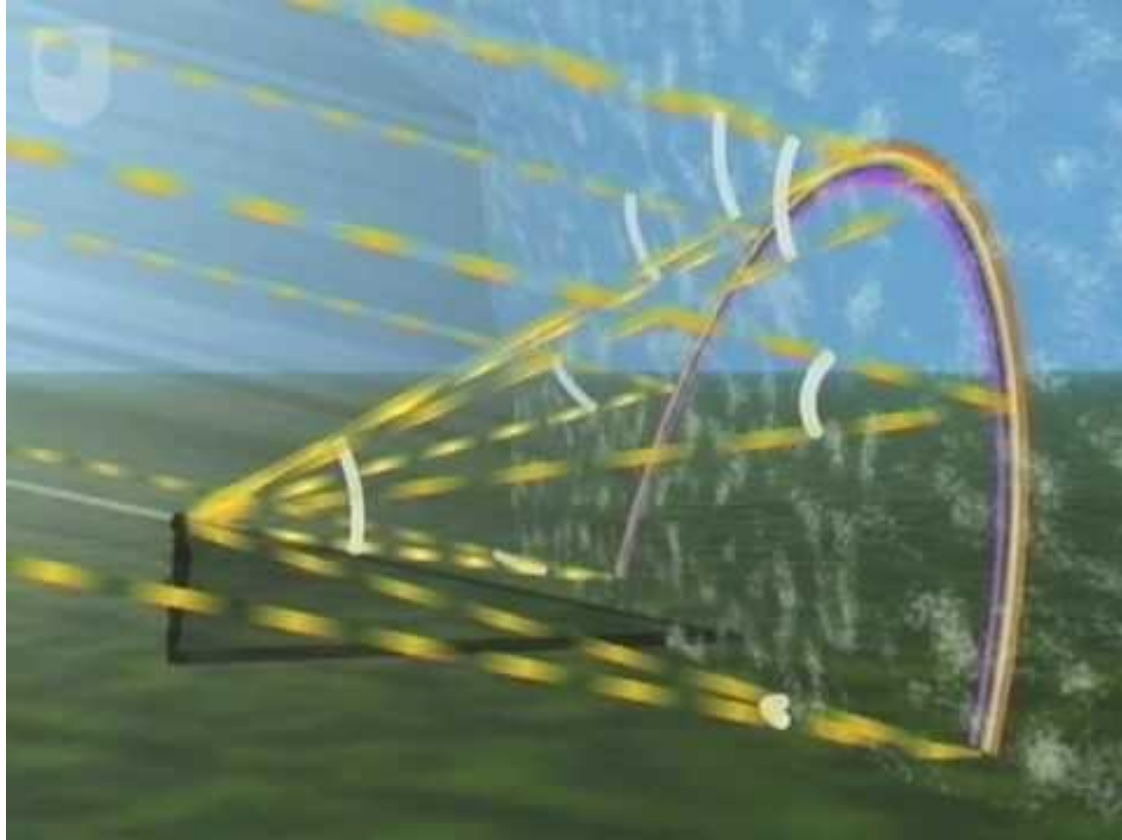
Internal Reflection



Primary Bow viewing angles: from sun - to droplet - to observer's eye = 40° to 42°

Secondary Bow viewing angles: from sun - to droplet - to observer's eye = 52° to 54°  
 colors are reversed in the secondary bow!

# Aristotle's Theory







Adult dragonflies eat just about anything that is edible and can be caught. They are a treasure for humanity because they keep mosquito populations under strict control by feasting on them when they are in abundance. Similarly, they also feed on ants, termites, butterflies, gnats, bees and other insects and tend to hunt in groups when large colonies of ants or termites are spotted.

They are considered a pest by apiaries because they can polish off a good chunk of the bee population before one can realize the threat looming large.

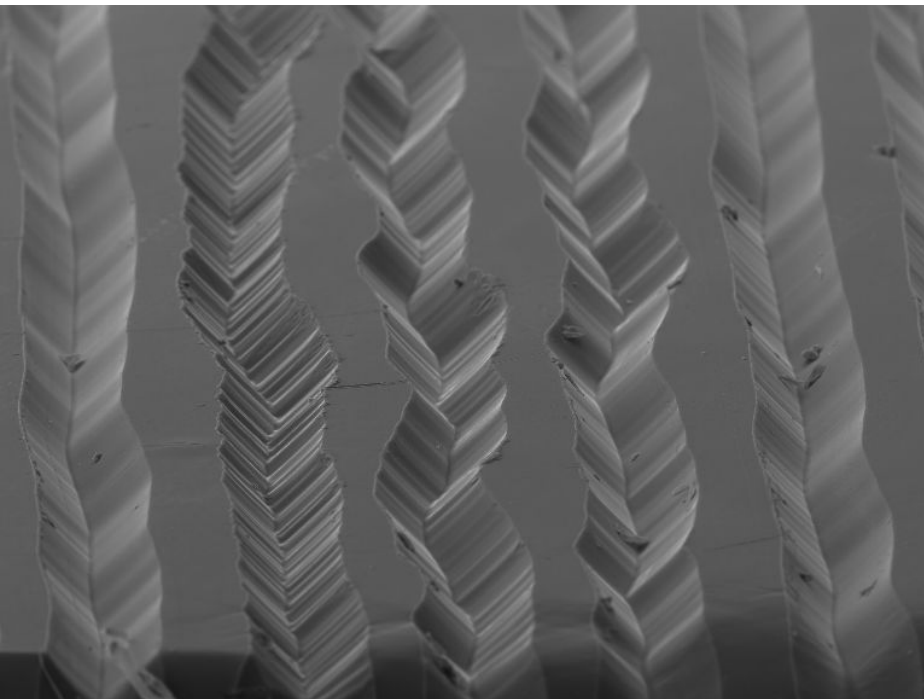
Writing about what dragonflies eat makes one wonder what would be the case if some of the older dragonfly species that have been found as fossils existed today. These fossil species belonging to the Meganeura genus were carnivorous insects with wings spreading to spans in the range of two and a half feet and made their food out of other insects and even small amphibians. If they were still alive today,



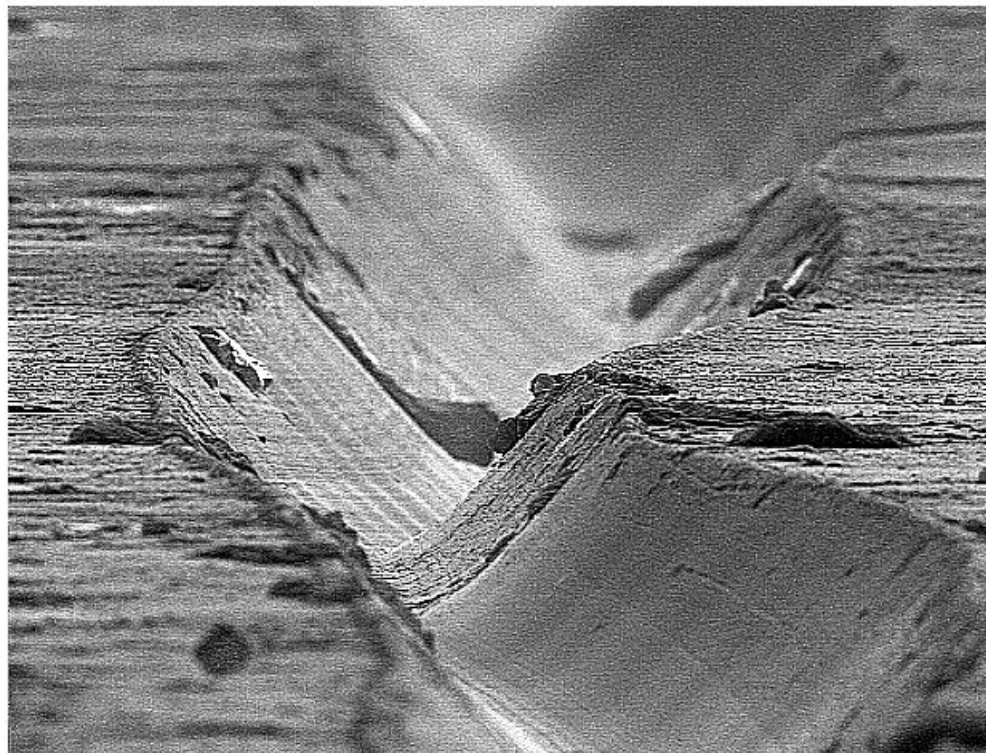
# Tech Tool-Google Classroom

Simplifies creating, distributing, collaborating, sharing and grading assignments in a paperless way. All with staying organized and with no excuses like “Oh... I left it in my locker...”



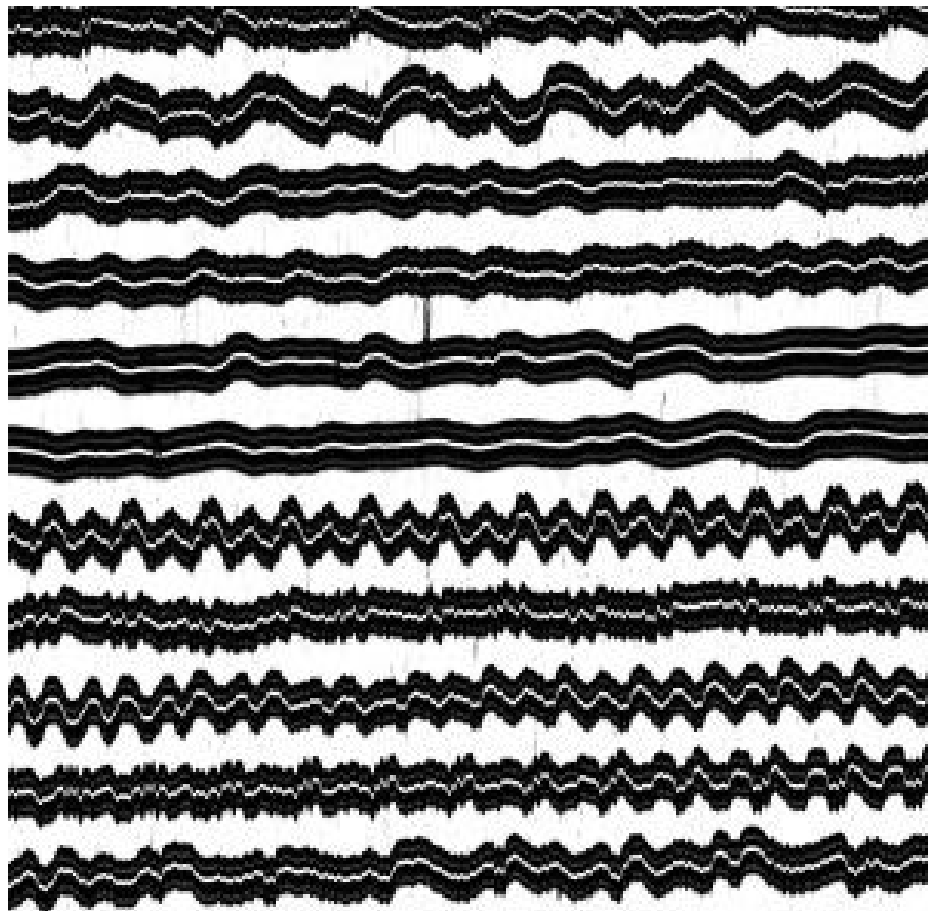


SEM HV: 20.00 kV	WD: 18.92 mm	200 $\mu$ m	VEGA3 TESCAN
SEM MAG: 247 x	Det: SE		
View field: 878.6 $\mu$ m	Date(m/d/y): 01/28/14		45rpm Vinyl



x1000 20  $\mu$ m 20kV 28mm  
512 x 480 R2.TIF

Grooves Stretched Out



# World of Wonder

# Bees

Dream STEAM Team: Kasia Garga

There are approximately 25,000 species of bees worldwide, with about 4,000 species living in the United States. Some bees—such as honey bees and bumble bees—live in social colonies, but most are solitary. Bees play a large ecological role and are important to many processes in nature.

# Background: Recent Beezness Problem

- Bee nest in our apartment
- Bee nest in my in-law house
- Bee nest at my parent's house
- Bee nest in bird feeder



**BEES everywhere**

# Interesting Myths about Bees

## **Bee Myth #1: All Bees Make Honey**

Only **honey bees** and **stingless bees** make enough honey to make it worthwhile for us to raid their food stores. There are less than ten species of honey bee and less than 450 species of stingless honey bee. Bumble bees, another approximately 260 species, may have a teaspoon or two of honey in their nests. So, overall, **less than 5% of bee species make honey**.

## **Bee Myth #2: All Bees Sting**

The sting is a modified egg-laying apparatus. Consequently, **only female bees** can have the necessary equipment to sting. But even the females of many bee species cannot sting. In most of the bees that do not sting, the sting apparatus is mostly still present, but it does not work. In a few instances most of the sting apparatus has disappeared altogether.

## **Bee Myth #3: Bees Live in Complex Societies**

Honey bees and stingless bees live in perennial societies with a complex division of labour. Not only do they have queens and workers, but workers are often specialized to perform specific tasks such as looking after the young, ejecting the dead or defending the nest.

## **Bee Myth #4: Bees Live in Hives**

Only social bees live in hives. 10 percent of bee species are social, and only a small percentage of them build hives. Most bees are solitary, living in individual nests tunneled in the soil or in tree trunks

## **Bee Myth #5: Bees Work Hard**

The statement “busy as a bee” is certainly true of honey, bumble and stingless honey bee workers. Male bees do little or no work in the nest and females of most solitary bees may work for only a couple of weeks. Individuals of some bee species do no nest construction and collect no food. These are the cuckoo bees that lay their eggs in the nests of other bee species. There are also socially parasitic bees that invade the nests of social bees and replace the queen, using the deposed monarch’s daughters as slaves to rear their offspring.

# Resources

1. <http://www.readersdigest.ca/home-garden/gardening/5-myths-and-truth-about-bees/6/>
2. <https://www.terminix.com/blog/bug-facts/11-bee-facts-and-myths>