



Plastic-Eating Worms

In an age where plastic minimalisation is gaining significant traction, the discovery of plastic eating worms provides new hope that life has found a way. Humans create more than 300 million metric tons of plastic every year. Just under half of that is destined for landfills, and up to 12 million metric tons pollute the oceans. A new study from researchers in Spain and England have discovered that the larvae of the greater wax moth can efficiently breakdown polyethylene, which accounts for 40% of plastics.

Researches placed 100 wax worms on a commercial polyethylene shopping bag for 12 hours, and the worms devoured and degraded approximately 92 milligrams, the equivalent of 3% of the bag. To solidify their findings researches ground some worms into a paste and placed it on plastic films. After 14 hours the films had lost 13 % of their mass, suggesting that the enzymes from the worms' stomachs were the key player in causing the polyethylene to breakdown.

Jennifer DeBruyn, a microbiologist at the University of Tennessee, who was not involved in the study, says it is not surprising that an organism evolved the ability to degrade polyethylene. In comparison with previous studies, she finds the rate of biodegradation in this one exciting. The next step, DeBruyn says, will be to locate the cause of the breakdown. Is it an enzyme produced by the worm itself or by its gut microbes? Study co-author Federica Bertocchini agrees and hopes her team's findings could one day help extract the enzyme to degrade plastics in landfills, as well as those scattered throughout the ocean. But she envisions using the chemical in some kind of industrial process—not simply “millions of worms thrown on top of the plastic.”

August 2017, ScientificAmerican.com



Wax worms, such as the one shown above, can gnaw through and break down plastic.

News from the office

- **Important for bookings.** Term 3 is shaping up to be our busiest term this year. If you're planning to book an excursion here we encourage you to make your booking soon to secure your preferred date.
- New Geography programs are now available! We are offering **Water in the World** at Manly Dam & **Environmental Change and Management** at Mt Keira rainforest.
- New **Earth & Environmental Science: Modules 5 to 8** program now available at Long Reef rock platform and Collaroy Beach.
- We welcome to the Auseco team, Suzanne. Suzanne has a background in the environmental consulting sector and brings a practical skillset to outdoor education. We also welcome back Jacky! Now a mum of 3 children she is certainly kept busy but looks forward to getting back out into the field.



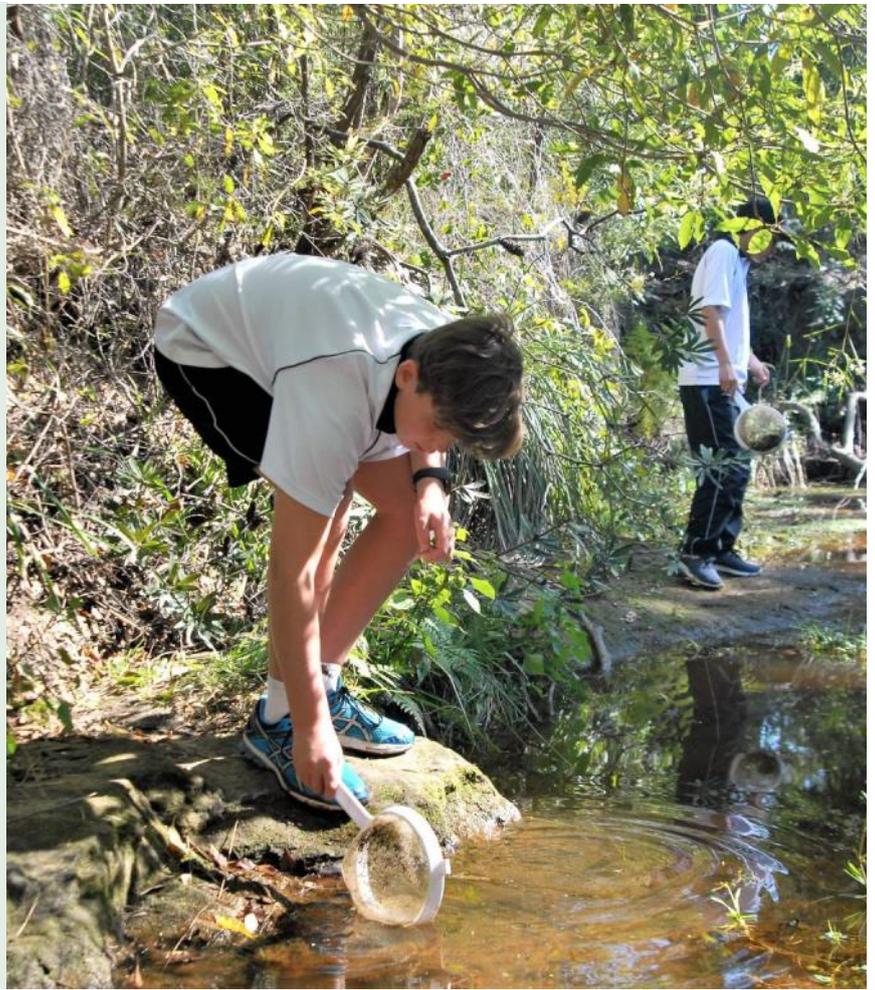
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Water in the World

In this new Stage 4 Geography program, students investigate water on a global and regional scale, water distribution, the water cycle and water vulnerability. Comparisons between water supply & water sustainability in Australia are made, including a visit to a historical Aboriginal engraving site.

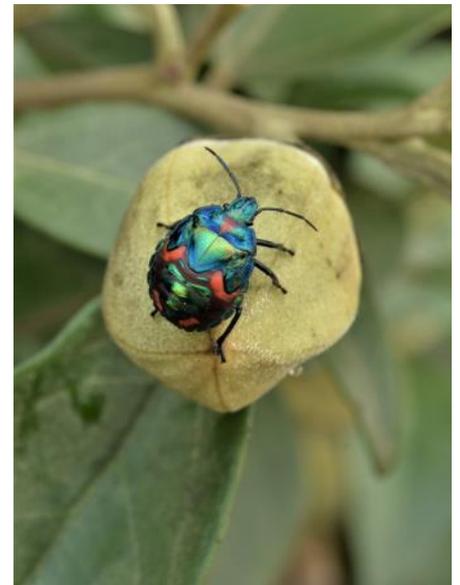
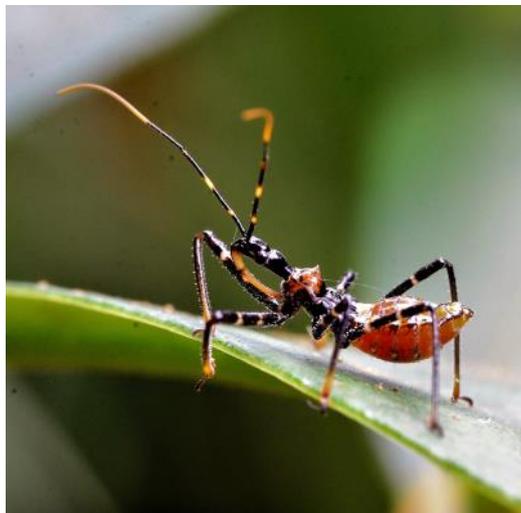
Water pollution comparisons are undertaken between a relatively unpolluted creek and polluted creek. Tests include soil and water pH, and water turbidity. A creek animal catch compliments the day and allows students to learn about indicator species for pollution levels. Historical aerial photos, satellite images and topographic maps are utilised to develop map reading skills.

Sample worksheets are available from the office. Get in touch with Connie to request one.



Let's talk about bugs

Bugs are an incredibly important and common group of insects that are seen around Sydney and environs. Often confused with beetles they differ in two main ways. They have sucking mouthparts and two pairs of functional wings whereas beetles have chewing mouthparts and one functional pair of wings and a hard protective pair of forewings called elytra. The young bugs normally go through a number of developmental stages called instars which are often brightly coloured. The young bugs feed on the leaves and stems sucking up plant juices. Some like the predatory, wingless assassin bug below middle, possess a long proboscis which they plunge into other insects to suck up body liquids. The shield bugs seen on citrus are an important pest of citrus in Australia. Most bugs possess scent -producing glands to deter predators.



Photos by Don Miles, from left to right:: Harlequin bug (juvenile), Assassin bug, Harlequin bug (adult)