



### > Darwin's bicentenary

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### > Black jellybeans and natural selection

2009 is the big year for Darwin and evolution. It marks 200 years since Darwin's birth and 150 years since the theory of natural selection was developed by both Charles Darwin and Alfred Russel Wallace. 150 years ago, the idea that animals and humans evolve wasn't new – Darwin's grandfather Erasmus wrote a very classy [scientific poem](#) about it.

What won renown for Darwin and Wallace was their theory on the mechanism behind evolution, natural selection. In his magnum opus, *On the origin of species by means of natural selection*, Darwin added background evidence from 20 years of research on variation amongst species, particularly in barnacles on rocky sea platforms. We think that a more appetising study than barnacles in the study of natural selection are jelly beans.

Jelly beans and desk drawers can be great examples of natural selection in action. Periodically, I buy packets of pens and empty them into the top drawer of my desk. Predators, in the guise of my family, come and take ONLY THOSE PENS THAT REALLY WORK. Over time, the only pens that survive in the harsh world of the desk drawer are the faulty pens. Were they to breed, and pass down inherited traits of dry ink and broken nibs, the world of the desk drawer would soon be populated solely by faulty pens.

More about evolution:  
<http://www.pbs.org/wgbh/evolution/>



Image courtesy Brandon Dilbeck

### > Jelly bean evolution activity

#### You will need

one cup per student  
enough jelly beans for about 10 per student  
plastic ice cream tub

Separate the jelly beans into black and coloured. Calculate the percentage of black jelly beans by dividing the number of black jelly beans by the total jelly beans and multiplying by 100. Write down your result. If you like, you can create a graph of jelly bean colours. Dole out cups and five jelly beans for each student. Students pick out only two of their favourites from these five (yes, they can eat them, or just put them aside). Return the remaining three jelly beans to the ice cream tub with the rest of the jelly beans. Repeat this three times. Each student (predator) should have preyed on six jelly beans. Count up the remaining beans, and calculate again the percentage of black beans. If you like, graph your results.

#### What was your result?

Black beans have a great survival strategy, as many people dislike the aniseed taste (check the web, there are forums and groups dedicated to the subject!). The natural selection in this case is the students' preference for non-black beans. More black jelly beans therefore survive predation, or selection, by students. Luckily, like pens, black jelly beans are unable to pass down their traits to the next generation!

### > How did life begin?

How did life begin? Check out this experiment for upper secondary to observe how the simple reaction of protein and carbohydrate can create life-like forms.  
Evolution & the Nature of Science Institutes activity: [Creating coacervates](#)

### > Video: Evolution of block creatures by artificial natural selection

### Strut out in science style!

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### Darwin quotes:

"The natural history of this archipelago is very remarkable: it seems to be a little world within itself."

*Charles Darwin, 1835, on visiting the Galapagos Islands*

### Another quote

"You will perhaps wish my barnacles and species theory al Diabolo [to the Devil] together, but I don't care what you say; my species theory is all gospel."

*Charles Darwin. Letter to Sir Joseph Hooker, 1848*

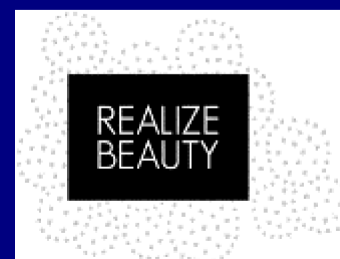
### Yet another quote

"No one ought to feel surprise at much remaining as yet unexplained in regard to the origin of species and varieties, if he makes due allowance for our profound ignorance in regard to the mutual relations of all the beings which live around us. Who can explain why one species ranges widely and is very numerous, and why another allied species has a narrow range and is rare? Yet these relations are of the highest importance, for they determine the present welfare, and, as I believe, the future success and modification of every inhabitant of this world."

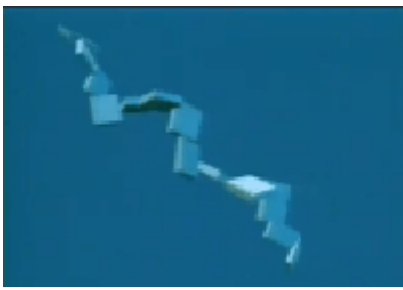
*Charles Darwin, Introduction, On the Origin of Species, 1859*

### Cosmetic Science

This company is dedicated to dispelling myths around cosmetic science.



### Garden out of control?



[Click here for the video](#)

> **And that's not atoll!**



Image courtesy

<http://www.absolute.astronomy.com/>

Did you know? Darwin made copious notes on geology during his famous voyage around the world in the *HMS Beagle*. He also developed a geological theory of the evolution of coral atolls explaining how volcanic oceanic islands erode to form coral atolls. Watch an animation and read more here.

<http://www.absoluteastronomy.com/topics/Atoll>

> **More experiments**

[Check out a simple erosion model](#)

[Or make your own volcano](#)

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