

- 1859 - Charles Darwin published *On the Origin of Species*
- Culmination of his life's work
- Outlined theory of the evolution of species by natural selection
- Species change over time due to natural selection, creating new and different species
- Natural selection is also known as *survival of the fittest*

# Voyage of the HMS *Beagle*

- The majority of Darwin's theories came from his voyage on the HMS *Beagle*
- Set out in 1831 - journey lasted five years
- Sailed around South America and Australasia carrying out surveying work
- Darwin took detailed notes of what he saw and collected many specimens



# Darwin's finches

Large cactus finch



Vegetarian finch

Medium ground finch

Common cactus-finch

# Theory of Natural Selection

- Wide range of variation between individuals
- Must compete for limited resources (e.g. food, light, mates)
- Some may have characteristics enabling them to survive and reproduce more successfully
- ‘Successful’ characteristics are passed to offspring
- Over time, more individuals will have these ‘successful’ characteristics
- Those that are less well adapted and compete less successfully will die out, leaving only the ‘fittest’ to survive



# Darwin's finches - activity

We are now going to explore how the finches helped Darwin to formulate his theory of natural selection.



Small ground-finch

# Darwin's finches – the results

1. Were some beak types more successful at feeding than others?
2. Was there any preference for different food types amongst the different species in Round 1?
3. Did all birds survive the drought in Round 2?



Vegetarian finch

# Darwin's theory

- Originally, small numbers of finches were blown onto the Galapagos Islands by storms
- Darwin noticed each species of finch had particular adaptations to life on its specific island - habitat and food
- Depending on the food available, birds with a particular beak shape were more successful than others



Mangrove finch



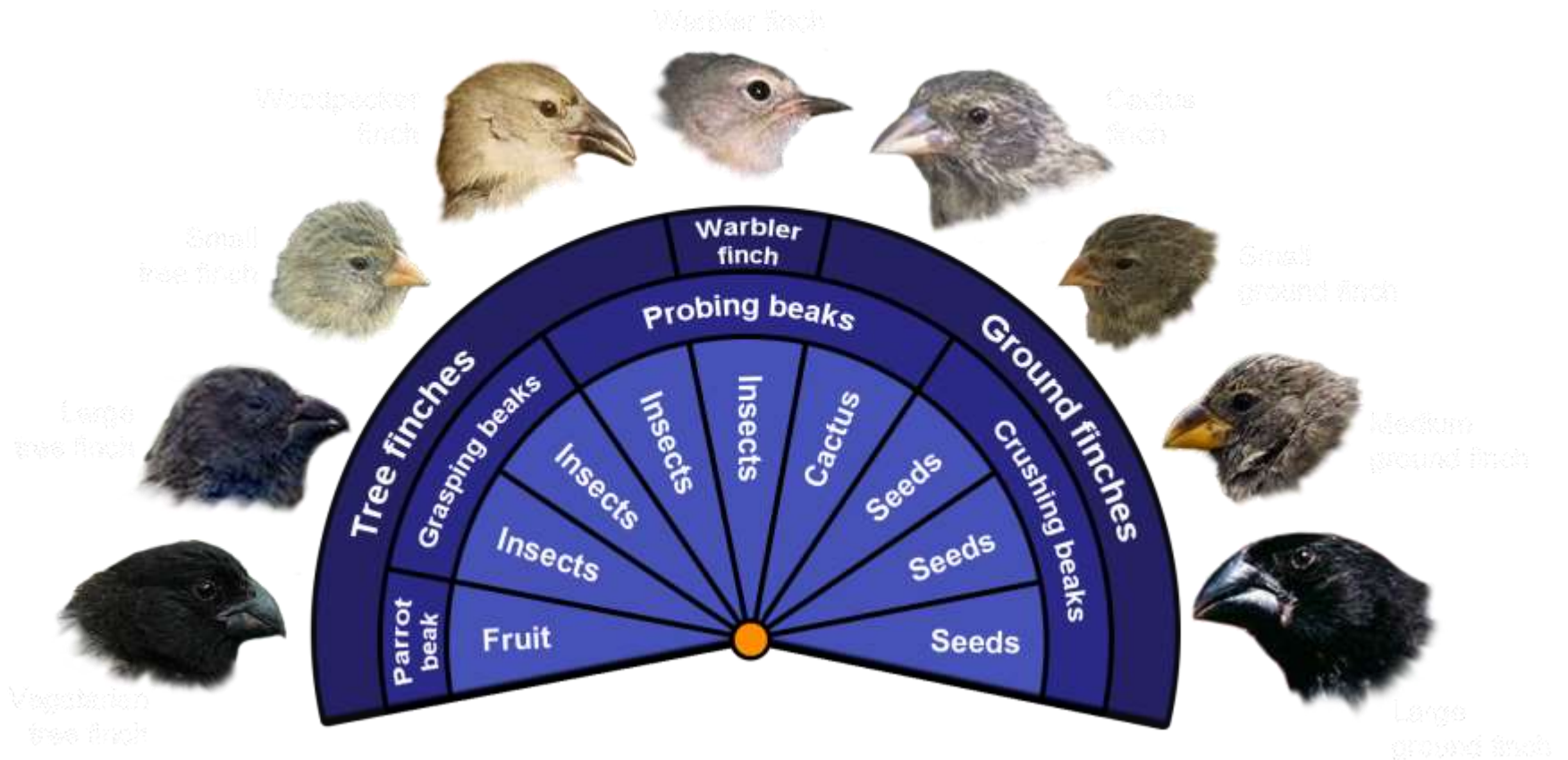
Medium ground finch

# But why?

- In the original populations, the natural variation in beak shape was due to differences in the genes
  - different alleles code for different beak shapes
- Due to the differences in the environment (e.g. food types available), alleles for certain beak shapes would be selected for
- This is because the more successful individuals survived long enough to breed and pass on their genes, producing young



# Darwin's finches



# Evolution on islands

- On many islands, there are unique species found nowhere else in the world

- These are known as 'endemic species'

- Endemic species evolve in isolation from species on the mainland - separated by a geographic barrier

- Islands that are further away from the mainland are likely to have more endemic species



Blue latan palm

- Darwin's finches - evolution on a small scale
- Change in available food means finches with some beaks survive while others die out
- This is natural selection
- There are many different 'pressures' which can influence evolution - change in habitat, predators, mate preferences
- Apply this on a worldwide scale....



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