

# VIDEO - "GALAPAGOS: BEYOND DARWIN"

## PART 1: INTRODUCTION

(1) Where are the Galapagos Islands located?

\* PACIFIC OCEAN 600 MILES WEST OF SOUTH AMERICA.

(2) Who was the first scientist to set foot on the Galapagos?

\* CHARLES DARWIN IN 1835.

(3) Why are scientists so enthusiastic about exploring the Islands?

\* THEY CAN LEARN ABOUT THE EVOLUTION OF LIFE.

(4) What was the name of Darwin's ship?

\* THE BEAGLE

(5) List some of the unusual organisms found in the Galapagos.

\* GIANT TORTOISE, BIRDS, PENGUINS, FUR SEALS, SEA LIONS, LAND IGUANAS and SEA IGUANAS

(6) Who presents the biggest opposition to Darwin's Theory of Evolution?

\* CHURCHES ~ CONTRADICTING RELIGIOUS BELIEFS

## PART 2: TOOLS OF THE TRADE

(7) What are some of the special features that make the submersible state-of-the-art?

\* ACRYLIC PILOT SPHERE WITH CONTROL PANEL

\* 35mm CAMERA WITH LASER AIM FOR SHARP FOCUS PHOTOGRAPHY

\* MANIPULATOR ARM SYSTEM

\* SUCTION TUBE and LOWER WORK PLATFORM FOR SAMPLES

\* VIDEO CAMERA WITH LIGHTS and LASER.

(8) How does the sub keep contact with the research vessel?

\* WITH SONAR and ACOUSTIC SIGNALS

(9) What is the scientists' biggest fear when exploring underwater?

\* CRUSHING WATER PRESSURE.

### PART 3: THE WORLD THAT DARWIN NEVER SAW

(10) What makes the following organisms different from similar species found elsewhere?

- Sea cucumber - LIVES IN WATER COLUMN CLOSER TO SURFACE, NEVER TOUCHES BOTTOM, VERY FRAGILE
- Telescope fish - SWIMS VERTICALLY, TELESCOPIC EYES, LONG TAIL

### PART 4: FIRES OF CREATION

(11) How were the Galapagos Islands formed?

- \* REMAINS FROM VOLCANIC ERUPTIONS.

(12) How were new species introduced into the Galapagos after the volcanic eruption?

- \* BY AIR AND WATER.

(13) Why do organisms on the Galapagos tend to be darker in color compared to their Caribbean ancestors?

- \* CAMOUFLAGE WITH LAVA BACKGROUND.

- \* FADE FROM SIGHT IN ORDER TO AMBUSH PREY.

(14) Why has the Giant Tortoise developed two shell shapes?

- \* SHELL SHAPE DEPENDS ON AVAILABILITY OF FOOD

DOMED

- \* BROWSE FOR FOOD ON GROUND

SADDLEBACK

- \* LIFT NECK TO NIBBLE ON CACTI

(15) What is so unusual about the Giant Tortoises' niche?

- \* THEY OCCUPY A NICHE NORMALLY INHABITED BY LAND-DWELLING MAMMALS NOT REPTILES. TORTOISES ARE THE PRIMARY HERBIVORE ON THE ISLAND.

(16) What are "sea mounts"?

- \* UNDERWATER MOUNTAINS THAT WERE ONCE PART OF THE GALAPAGOS ISLANDS BUT HAVE SUNKEN.

## PART 5: A HOLE 12,000 YEARS DEEP

(17) What caused the huge caves found within the Islands?

\* HUGE TUBES HOLLOWED OUT BY LAVA DURING THE VOLCANIC ERUPTIONS.

(18) Why did many scientists believe looking for fossils in the caves was silly?

\* FOSSILS ARE FORMED IN SEDIMENTARY ROCK.

(19) What caused the rich fossil sites within the caves? \* OWL VOMIT

(20) What has caused the extinction of some species no longer found on the Islands?

\* HUMAN INVASION

(21) How can scientists use a tortoise shell fossil to track evolutionary change in the species?

\* USE DNA TO MATCH UP WITH CURRENT SPECIES TO SEE IF GENETIC CHANGE HAS TAKEN PLACE.

## PART 6: BUILDING THE RECORD

(22) Why are deep-sea creatures colored with bright hues of red, orange and yellow?

\* SUNLIGHT IS FILTERED AND THESE COLORS FADE OUT ALLOWING THE SPECIMENS TO BLEND IN WITH THEIR SURROUNDINGS. (PROTECTIVE ADAPTATION)

(23) List some underwater creatures found in shallow water.

\* SEA LIONS, TORTOISE, HAMMER-HEAD SHARKS, FISH, BARACUDAS, WHALE SHARKS, STING-RAYS

## PART 7: ON THE SHOULDERS OF GIANTS

(24) What do scientists do with captured specimens?

\* PRESERVE THEM

\* TAKE TISSUE SAMPLES

\* LOG INFORMATION INTO COMPUTER FILES

(25) What were some of the problems with the information Darwin recorded during his visit to the Galapagos?

\* MISLABELING

\* NOT NOTING PLACE OF HABITAT

(26) What western religious beliefs were challenged by the findings of Charles Darwin?

\* WORLD WAS CREATED IN A DAY.

\* HUMANS DID NOT EVOLVE FROM ANIMALS.

\* GOD CREATED ALL SPECIES AND THEY WOULD NEVER CHANGE.

(27) How did Darwin introduce his findings from the Galapagos Islands to the public?

\* DARWIN PUBLISHED A BOOK IN 1859 ENTITLED, ON THE ORIGIN OF SPECIES.

## PART 8: DR. DIRT'S DIVE

(28) What percent of the terrestrial and marine species found on the Galapagos cannot be found anywhere else in the world?

\* 20 - 30%

(29) What limitations did Darwin encounter when collecting his data?

\* HE WAS UNABLE TO EXAMINE THE ISLANDS BELOW THE SURFACE.

## PART 9: "INTRODUCED SPECIES"

(30) What does the phrase "introduced species," mean?

\* NEWCOMERS THAT UPSET THE ECOLOGY OF A PRESTINE PLACE.

(31) How does the Ecuadorian government aid in the conservation of the Galapagos Islands?

\* REGULATES TOURISM

\* 0% OF LIVABLE AREA IS SMALL

\* 15 MILE NATIONAL PARK AREA FROM LAND

(32) What are the three main causes of "habitat disturbance" on the Islands?

\* TOURISTS

\* ILLEGAL FISHING

\* INTRODUCED SPECIES LIKE CATS, DOGS, RATS, PIGS

## PART 10: BIRD'S EYE VIEW

(33) Why are Galapagos species so tame?

\* THEY HAVE EVOLVED IN THE ABSENCE OF MAMMALIAN PREDATORS - FEAR FADES AWAY

<sup>34</sup> (36) Adaptations found among species on the island are usually caused by <sup>what</sup> ~~why~~ environmental condition? Give an example.

\* ADAPTATIONS ARE USUALLY DESIGNED FOR FEEDING.

\* SWALLOW TAILED - FEED AT NIGHT  
\* GULL  
\* FINCH - BEAKS  
\* HAWK - SHORT OR LONG SNOUTS  
\* FISH - LONG SNOUTS  
\* MARINE IGUANA - <sup>SHORT</sup> SNOUT & TAIL

<sup>35</sup> (37) What is "Natural Selection"?

\* NATURE SELECTING MODIFICATIONS

<sup>34</sup> (38) How is the Marine Iguana an example of Natural Selection?

\* ORIGINALLY DESIGNED FOR LAND - HAS ADAPTED TO WATER - SHORT SNOUT

<sup>31</sup> (39) What is a "species"?

SUNBATHING |  
L LONG TAIL  
L SALT SPRAYS

\* A POPULATION THAT REPRODUCES ONLY WITHIN ITSELF PRESERVING ITS DISTINCT IDENTITY.

## PART 11: EPILOGUE

(40) List some of the most recent specimens to be discovered in the Galapagos Islands.

<sup>38</sup> \* SCORPIAN FISH, OCTOPUS, DEEP SEA MEDUSA, BAT FISH, SEA CUCUMBERS, TUBI FISH

<sup>39</sup> (41) What did the ~~bat~~ <sup>BARN OWL</sup> cave findings reveal?

\* 12 ~~NEW~~ SPECIES FOUND - 2 NEW  
\* A SEVERE CHANGE IN PREHISTORIC CLIMATE HAD A HUGE IMPACT ON THE EVOLUTION OF MANY SPECIES.

<sup>40</sup> (42) Why is evolution the key to life?

\* GIVES US AN IDEA WHERE WE CAME FROM AS WELL AS OTHER ORGANISMS

\* GIVES US A PEAK INTO THE FUTURE