I Will Survive—Extinction Madness

Adaptation

Adaptation describe how organisms interact with and are affected by their ***environment***. Adaptations can be biological or they can describe the way that an organism changes their environment to suit their needs. An example of a biological adaption would be polar bears and many other animals that live in artic environments being white. It is likely that many of these animals originally had more than one kind of color, but since the ones that blended into their environment had an advantage and mated more frequently, over time the species adapted to their environment. This type of adaptation is called ***natural selection***.

The other way that organisms adapt to their environment, is to actually change their environment. The most obvious example of this is humans. Humans change themselves and their environment to better survive. In cold climates, humans wear heavy layers of clothing in order to protect their skin from the elements and help them maintain the proper internal temperature to survive. Humans cut down trees, move dirt, and use the materials to build things that help them adapt better to their environment. They are not the only animals that do this. Birds build nests, ant lions build traps to catch their prey, and snakes burrow holes into the ground. All of these are adaptations of the environment that make it possible or easier for organisms to survive.

Extinction

Extinction is when a species fails to adapt to their environment, and all of the individuals within that species die off. Extinction can occur suddenly, or can take a long time to happen. There are many different ways that an animal can become extinct.

Key Vocabulary

Adaptation—A change made by a living organism that helps it survive

Environment—The area in which an organism lives

Natural Selection—The gradual adaptation of an entire species based on beneficial traits passed on to offspring

Extinction—A species ceasing to exist.

Natural Disaster—An event with negative impact to the environment not caused by human interaction.

Habitat—The region in which an organism lives

Climate Change—A change in weather and temperature patterns

Fossil Record—The information from all fossils that geologists use to try to determine what life was like on earth in the past.

Strata—layers of sedimentary rock

Natural disasters can cause extinction by altering the environment in such a way that an animal is no longer able to survive. Examples of natural disasters that could cause extinction would be floods, meteor strikes, wildfires, earthquakes, and volcanos. Some animals are very sensitive and have very limited ***habitats***. For example, there are salamanders and newts that can only be found in one specific swamp in one specific location. If a hurricane, earthquake, or flood were to disturb their environment, they may be unable to adapt and would become extinct.

Predators can also cause extinction. Sometimes, when a predator adapts to be better able to catch its prey, or a new predator moves into a geographical area, they can create extinctions. Man is the best adapted predator. Many animals have been killed by humans which has caused them to be brought close to extinction. Some of these are due to man's attempts to adapt to his environment (farmers hunt wolves to stop them from killing their livestock) and some are due to sport (Rhinos and elephants are hunted for ivory, which is a luxury that has nothing to do with survival.)

Climate change can also cause extinctions. During ice ages, reptiles and other cold-blooded animals have a hard time adapting to the cold conditions, and freeze to death. Climate can also affect the environment, in much the same way that a natural disaster can.

Geological Extinctions

Mass extinction events are normally what geologists use to define different eras of geological history. Scientists use the ***fossil record*** to determine extinction events. When geologists look at fossils, they are looking at them like detectives would look at a crime scene. It's impossible for geologists to prove what they find, but by putting together as much information as possible, they are able to make a good guess. For example, when they find fossils of Wooly Mammoths in North Dakota, Canada, and Greenland, but cannot find any in Colorado or New Mexico, geologists can guess that the mammoths lived in more Northern latitudes. They can't prove this, since it's possible that the mammoths just weren't fossilized in the Southern sites, but since other animals were fossilized at a similar time, it makes sense to think that the mammoths lived more in the north.

Geologists do the same thing with extinctions. When they find evidence in rock layers, called ***strata***, that an organism lived, they can look for similar organisms that are still alive today. If they are unable to find any, then they can assume that the organism has gone extinct. Geologists then look for the dates of the youngest strata where they can still find evidence of that organism, and using that information, they can approximate the date of extinction for that organism.

When geologists find numerous organisms that all seem to have gone extinct at the same time, they can begin to guess that those organisms were all pushed to extinction by a large global event which created a "domino effect." Much like a crime scene investigation, geologists try to put together the clues that they find in a way that makes the most sense.

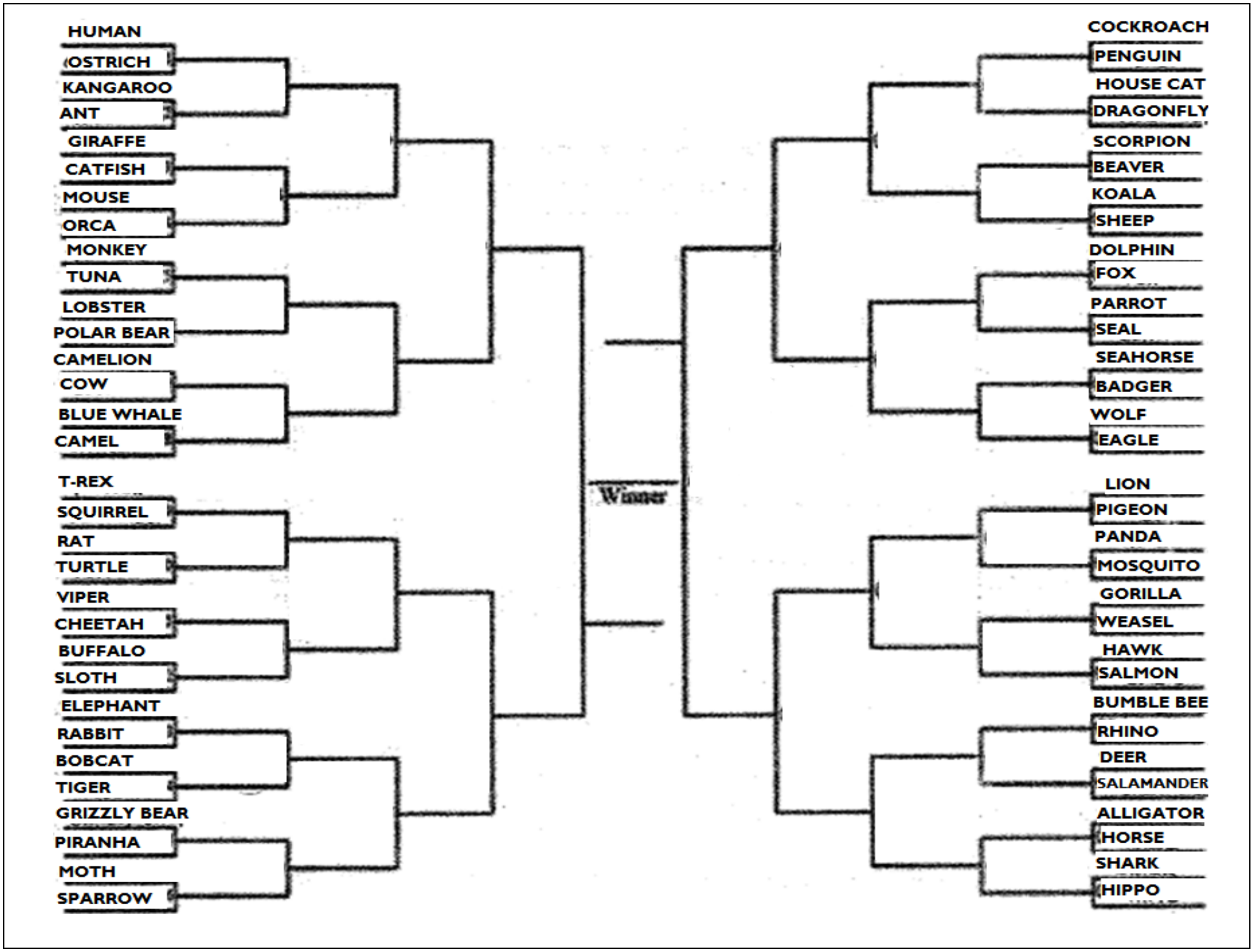
There are other extinctions that are much easier to determine. Some animals we have reliable accounts from humans that the animal used to live, but cannot find a living animal anymore. For example, the Dodo bird was a large bird that used to live in the Indian Ocean Region. Based on human accounts, and geological evidence, we estimate that it went extinct at some point in the 17th century.

Conservation Efforts

In the modern world, people try to save animals from extinction. Human hunting, land development, and natural disasters continue to have negative effects on certain species of plants and animals. Some human conservation efforts include passing laws that protect certain species and their habitats. Zoos, parks, and nature preserves also work with biologists to try to help species recover. Animals' conservation status is normally broken down in order to determine how serious the threat is that it may reach extinction. There are some animals that are totally extinct in the wild, and only exist in zoos and laboratories. The highest threat level for animals that still live in the wild is Critically Endangered. There are also Endangered and Vulnerable species. Some organizations like the World Wildlife Foundation (WWF) work to raise awareness and money to help preserve species from extinction.

Reading Comprehension Questions

1. What are the two ways that animals adapt to their environment?
2. Why do natural disasters put certain animals at a higher risk for extinction than others?
3. How do geologists use fossils to determine where they think extinct animals used to live?
4. How can geologists use fossils to determine when they think mass extinction events occurred?
5. What different ways do humans use to try to save species from extinction?


HUMAN
OSTRICH
KANGAROO
ANT
GIRAFFE
CATFISH
MOUSE
ORCA
MONKEY
TUNA
LOBSTER
POLAR BEAR
CAMELION
COW
BLUE WHALE
CAMEL
T-REX
SQUIRREL
RAT
TURTLE
VIPER
CHEETAH
BUFFALO
SLOTH
ELEPHANT
RABBIT
BOBCAT
TIGER
GRIZZLY BEAR
PIRANHA
MOTH
SPARROW
Winner
COCKROACH
PENGUIN
HOUSE CAT
DRAGONFLY
SCORPION
BEAVER
KOALA
SHEEP
DOLPHIN
FOX
PARROT
SEAL
SEAHORSE
BADGER
WOLF
EAGLE
LION
PIGEON
PANDA
MOSQUITO
GORILLA
WEASEL
HAWK
SALMON
BUMBLE BEE
RHINO
DEER
SALAMANDER
ALLIGATOR
HORSE
SHARK
HIPPO

Directions: Draw a cartoon that shows how the described extinction event affected one of the competitions from your March Madness Adaptation Brackets on the previous page.

Extinction Event Round #1 (Round of 64): A volcano has killed 85% of the vegetation on the only island your animal lives on....

Extinction Event Round #2 (Round of 32): A large predator has moved into your animal's habitat...

Extinction Event Round #3 (Sweet 16): Global Warming has caused many of the polar ice caps to melt. The salt content of the oceans has been diluted, sea levels have risen, and the change in climate has changed every ecosystem except deserts (which have just become hotter)…

Extinction Event Round #4 (Elite 8): Mankind has gotten into a nuclear war. Radiation levels are high in many parts of the world.

Extinction Event Round #5 (Final 4): Global cooling has caused an ice age….

Extinction Event Round #6 (Championship): A meteorite has struck the earth. The impact did not directly hit any of the organisms, but has had numerous impacts to the climate of the earth. A dust cloud has spread over the entire earth, which has blocked out the sun……..

1. **What traits made it easier for certain animals to survive?**

2. **What traits made certain animals "easy targets"?**

3. **Were predators, herbivores, or omnivores the most adaptable animals? Why do you think this is?**

4. **Did every event affect every animal?**

5. **Is there a consensus among the class about the "ultimate" survivor?**

6. **Which animals surprised you? (They survived longer than you thought they would, or they died faster than you thought they would.)**

I Will Survive

PROMPT: Using the information that you have learned from this activity, evaluate the following question:

What is more likely to cause the mass extinction which ends the current geological era, man-made events or a natural disaster?