



Teachers Activity Kit

"The Extinction Game"

A 90 minute lesson in life history
Grades K-3

DESCRIPTION

Students will learn the basics of evolution and extinction through analysis of select animal groups present during the Mesozoic Era and interactive play.

OBJECTIVES

Students Will:

- Gain an understanding of the terms: extinction, evolution, and adaptation
- Compare and contrast the characteristics of the major animal groups of the Mesozoic Era and today
- Be introduced to the geologic time scale
- Describe the special adaptations that make one group successful over another

MATERIALS LIST

Scissors, marker pens, pencils, crayons, reference book on dinosaurs, index cards or paper, empty coffee can, photographs/illustrations of crocodiles, turtles, birds, mammals, pterosaurs, and assorted dinosaurs.

PART ONE

GOAL: Identifying Key Characteristics of Major Animal Groups

ACTIVITY: Divide the class into 10 small groups (give each group a number). Instructor will provide photographs or illustrations of modern day crocodiles, birds, turtles, lizards, mammals, and a variety of dinosaurs at each table. The students working in teams will then analyze the key characteristics that make each animal unique (for example: birds have feathers, lay eggs, toothless beaks, varied diet, etc.). These characteristics are then written down and a group spokesperson is chosen. The group spokespersons will then read out their list of characters and the entire class will then discuss the results. Instructor makes corrections or suggestions where appropriate.

PART TWO

GOAL: Understanding Geologic Timescale / History of Mesozoic Life

ACTIVITY: Display for the students the geologic time scale. Indicate to them the age of the earth, the age of the dinosaurs, and when humans show up in the fossil record. Define for them the terms evolution, extinction, and adaptation. Explain to the students how certain adaptations can give a group of animals an advantage under a certain set of ecological conditions but that the same adaptation may not give a group of animals an advantage given a different set of ecological conditions. (Example: animals with a thick layer of feathers or fur might do well in a cool, wet climate, but if the climate dries and becomes very warm, their numbers in that area may decrease. If drastic and global changes occur, they may even go extinct.). Explain in more detail the Mesozoic Era (245 – 65 million years old), and have students draw a small timescale showing the three periods: Triassic 245-210 mya, Jurassic 210-145 mya, and Cretaceous 145-65 mya.

PART THREE

GOAL: Understanding Major Animal Groups of the Mesozoic – Adaptation and Survival

ACTIVITY: Building the Game Cards (*Option - Instructor can make the cards in advance to save time*). While still in 10 small groups, give each student 3 index cards. On the back of each card, have them write Triassic on the back of the first, Jurassic on the back of the second and Cretaceous on the back of the third.

(*The number of game cards depends on the total number of students participating in the activity.*). The students then take the card marked Triassic and have each group write the name of an animal (see below) and draw its picture.

TRIASSIC CARDS WRITTEN AS FOLLOWS: Groups 1 and 2- crocodiles, Group 3- turtles, Group 4- mammals, Group 5- Pterosaurs, Groups 6 and 7- Prosauropod dinosaurs ("Plateosaurus"), Group 8- Coelurosaurs (A) ("Coelophysis"), Group 9- Coelurosaurs (B) ("Dilophosaurus"), Group 10- Ornithischians- ("Hypsilophodon"). This should give you a Triassic set of cards that the teacher may now collect.

Next, have them repeat the procedure with the Jurassic and then the Cretaceous:

JURASSIC CARDS SHOULD BE WRITTEN AS FOLLOWS: Group 1-3 Sauropods ("Apatosaurus"), Groups 4-6- Ornithopods ("Camptosaurus") Group 7 Allosaurs ("Allosaurus"), Group 8- Stegosaurs ("Stegosaurus"), Group 9- turtles, and group 10- birds.

CRETACEOUS CARDS SHOULD BE WRITTEN AS FOLLOWS: Groups 1-3 duckbilled dinosaurs, Groups 4-6- Ceratopsians ("Triceratops"), Group 7- birds, Group 8- mammals, Group 9- raptors, Group 10- Tyrannosaurs.

After this the teacher should have a complete set of Triassic, Jurassic, and Cretaceous cards. Keep each set of period cards separate.

PART FOUR

GOAL: Understanding Major Animal Groups of the Mesozoic – Adaptation and Survival

ACTIVITY: Rules of the game: There are three rounds of play during the extinction game; Triassic round, Jurassic round, and Cretaceous round. Each round has 3 phases: a story telling phase, select a card phase, and a play phase. At the start of each round, the instructor describes the environmental and geologic conditions that existed during that period. The 1st set of cards (Triassic), are placed into an empty coffee can and mixed up. Each student then draws a card without looking. The instructor then yells "Let the Triassic begin", and the students get to act out the characters of the animal on the card they have drawn. Let them play like this for a few minutes. The instructor then yells, "The Triassic period has ended!" Students quickly gather around the instructor. Instructor asks "Where are my crocodiles". The crocodiles raise their hands. The instructor informs the crocodiles that they have survived the Triassic/Jurassic boundary, and that they are doing quite well. The students keep their crocodile cards. This continues with the other students, calling out the name of each animal and telling them whether they survived, went extinct, or evolved. Animals that have gone extinct then draw from the 2nd set of cards (Jurassic). The three phases (story-telling, drawing (if necessary), and play) are repeated for each round.

EXAMPLE: The class goes outside to the playground. Students gather around the instructor. Instructor tells them the following: "We now step back in time to the Triassic Period over 210 million years ago. The climate here in Colorado is very dry. The Rocky Mountains do not yet exist. Here, in this environment all sorts of animals lived. The dinosaurs evolved around this time. They started out as crocodile-like animals and eventually became dominant. Mammals were here too, but they were often very small. Etc. etc.... Draw your card!" (Results below)

TRIASSIC	JURASSIC	CRETACEOUS	END CRETACEOUS
Crocodile	Survives	Survives	Survives and becomes very successful
Turtle	Survives	Survives	Survives and becomes very successful
Mammals	Extinction of many but does survive in smaller forms	Survives	Survives and expands
Pterosaurs	Survives	Survives	EXTINCT
Prosauropods A	EXTINCT		
Prosauropods B	EVOLVE to Sauropods	Sauropods Extinct	
Coelurosaurs A	EVOLVE to birds	Survives as birds	Survives as birds
Coelurosaurs B	EXTINCT		
Ornithopods	EVOLVES - Iguanodon	EVOLVES - Duckbills	EXTINCT
Sauropods		EXTINCT	
Allosaurs		EXTINCT	
Stegosaurs		EXTINCT	
Birds		Survives	Survives and expands
Duckbills			EXTINCT
Ceratopsians			EXTINCT
Raptors			EXTINCT
Tyrannosaurs			EXTINCT

Recommended Reading

1. Barrett (2001), *National Geographic Dinosaurs*. National Geographic Society
2. Lambert, Naish, and Wyse (2001), *The Dinosaur Encyclopedia*. DK Publishing

At the Rocky Mountain Dinosaur Resource Center:

The RMDRC is dedicated to bringing teachers and students some of the most exciting prehistoric specimens of North America. Many of our exhibits will aid teachers in their preparation for the "Extinction Game". Our gift shop, Prehistoric Paradise www.prehistoricparadise.com , has books, videos, specimens, posters, and replica casts for sale that would assist in classroom education. Please visit our website at www.RMDRC.com for more information.