

The Whole Chimpanzee

An integrated curriculum approach to teaching primate anatomy, habitat and behavior

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With this workshop presented at the ChimpanZoo Conference in Chicago, Illinois I wanted to show how the ChimpanZoo website could be used across grade levels and subject areas to introduce or reinforce conservation concepts and primate behavior and anatomy. This paper is a supplement to the first paper by this author presented at the ChimpanZoo Conference¹ in Manhattan, Kansas in 1999.

For each of the activities I have included age appropriate extensions and science or other subject area curriculum goals to help the instructor adapt the material to the needs of the students. The different subject areas I have chosen to integrate for this paper include Art, Science, Social Studies and English.

Each activity starts with an introduction background reading, then hands-on activity followed by an assessment strategy.

Lessons and corresponding ChimpanZoo Websites

- **Habitat Walk (Wild and Zoo) Living in the Wild Living in Zoos**
http://www.chimpanzoo.org/habitat_walk.html
- **Primate Grasp**
http://www.chimpanzoo.org/tool_maker.html
- **Comparing Primate Dentition**
http://www.chimpanzoo.org/dental_analysis.html
- **Mike**
http://www.chimpanzoo.org/african_notecards/chapter_20.html
- **Mike's Ingenious Idea**
http://www.chimpanzoo.org/african_notecards/chapter_21.html
- **Dr. Jane Goodall**
http://www.chimpanzoo.org/african_notecards/chapter_24.html

¹ Matthews, Eric. 1999, Effective Teaching of Primate Anatomy and Behavior in the Middle and High School Classroom. ChimpanZoo Conference Proceedings, Portland OR. The Jane Goodall Institute. p. 50-56

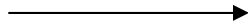
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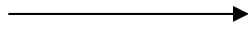
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Primate Habitat

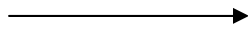
Upper Story 150 ft.



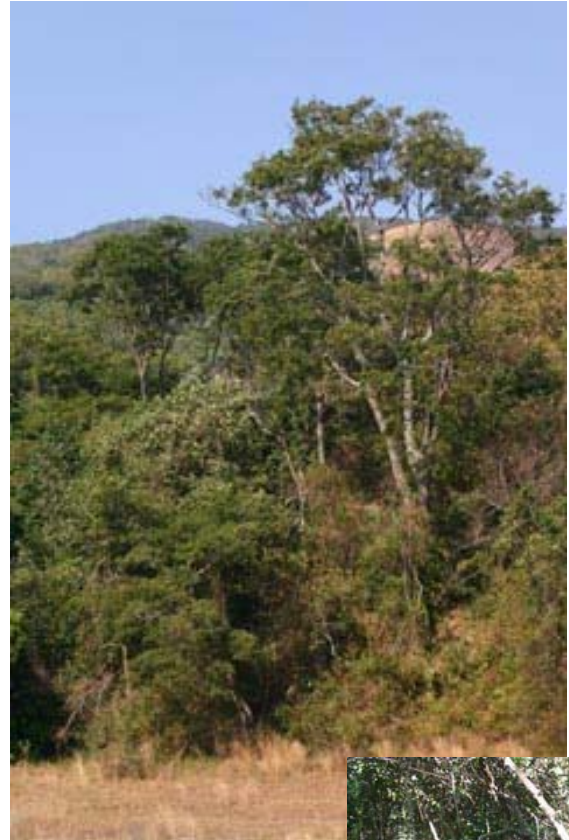
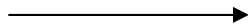
Middle Story 120 ft.



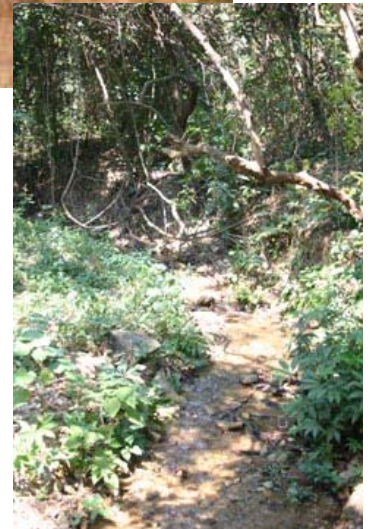
Under Story 50 ft.



Shrub Layer 0-25 ft.



Living in the Wild



The tropical rain forest consists of four layers: shrub, under story, middle story and upper story. Few primates live in the upper story: to do so they must leap from crown to crown, which only a few primates are physically suited. The majority of the primates inhabit the middle and under stories.

It is at those levels that primates are able to find enough food, and are able to travel without an excessive amount of leaping.

Chimpanzees feed about six hours per day. Their diet includes fruits, leaves, flowers, seeds and bark. Chimpanzees are not vegetarians. Sometimes they eat insects, bird eggs and small mammals.

The diet of an Olive baboon is similar to chimpanzees... They too eat a wide variety of fruits, insects and small animals. They are not as particular with their diet as chimpanzees, as they also like to try new things, like human food.

Colobus monkeys live in the upper story of the forest canopy. They are leaf eaters, which mean they have to spend a lot of time digesting their food. They eat for about three hours a day and rest for seven.

Living in Zoos



Not all chimpanzees live in their natural habitat. About 500 chimpanzees live in zoos in the United States alone.

Zoos are beginning to design more suitable and natural looking exhibits for chimpanzees in captivity. They have improved their diet over the years to be appropriate for their digestive systems, and are given enrichment objects for mental stimulation.

Activities

Grades K-3

- 1 Have students draw or paint a picture of where they think a great place for a monkeys and apes to live, try to include:
 - a) Enrichment: places for the animal to exercise and play
 - b) A source of food and shelter

Grades 4-5

2. Create a diorama of an environment for a primate of their choice using criteria from above. Students will write a report that primate. The report will include specifics about the habitat and its importance to the primate.

Grades 6-12

3. in a field next to the school. Students will block off a square meter grid on the ground and will record biotic and non biotic factors and where they are placed on that grid.
4. If school is in an urban area take students for an urban walk around the neighborhood. Students will analyze the urban environment by gathering data that could be taken in the form of photographs, drawings, graphs or notes they will focus on human as well as non human biotic factors and non biotic factors of the immediate environment.

Primate Grasp

All primates have the 5 digits characteristic of mammals and nails on their hands and feet. All primates have opposable thumbs, but to different degrees according to their physical makeup, means of locomotion and eating habits.



Precision grip



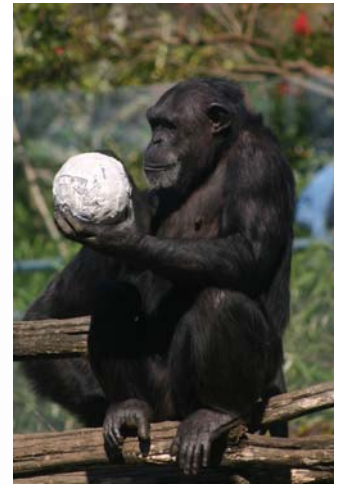
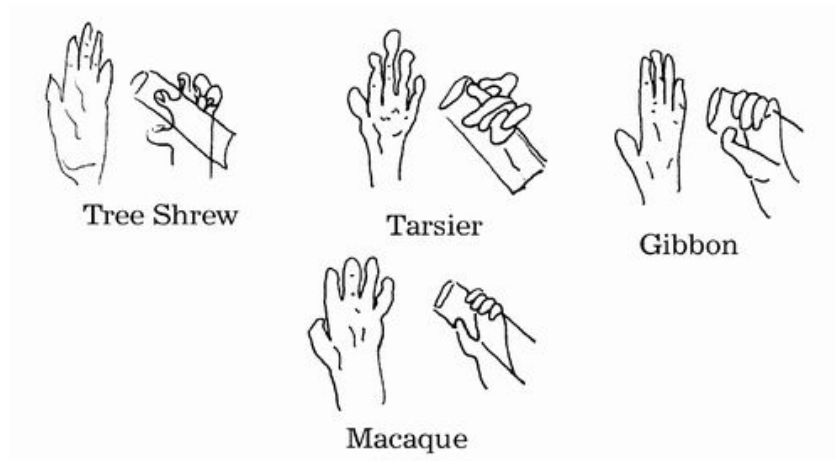
Power grip



Chimpanzees are the only other primates aside from humans that capable of precision grip. A Chimpanzees grip is different from humans because chimpanzees have a shortened thumb and elongated fingers.

Activity

Primate Grasp



Objective:

Students will become familiar with the differences in grasping power of the hands and feet of various primates.

Science Content Standards:

- *Describe the characteristics, structure, and functions of organisms.*
- *Describe and analyze diversity of species, natural selection, and adaptations.*

Materials:

1. One toilet paper role for each student
2. One hammer, a piece of scrap wood, and a few nails for each student

Procedure:

1. Using the drawings above, have the students hold a toilet paper role according to each primate listed.
2. Have the students try to drive nails in a piece of scrap wood by holding the hammer as in each example. Which of the grasps were the easiest and the hardest to drive a nail?
3. What if you had no opposable thumb? Tape your thumb next to your palm, pick up a pencil and try to write your name?

Activity

Comparing Primate Dentition

Science Benchmarks; Grade 10

- Use concepts and processes of structure and function.
- *Describe the characteristics, structure, and functions of organisms*
- *Analyze scientific information to develop and present conclusions*
- *Describe the principles of natural selection and adaptation*

TEETH:

Incisors; used for seizing, stripping, and puncturing

Canines; used in gripping and puncturing (size is larger in males)

Premolars & Molars; used for grinding

LOWER JAWS:

Rounded Angle: Apes and Humans

Sharp Angle: Primitive Primates and New and Old World Monkeys

DENTAL FORMULA

When calculating formula, count the number of teeth on one half of the jaw and multiply that number by two

UPPER JAW Incisors+Canines+Premolars+Molars x 2 = Total

LOWER JAW + Incisors+Canines+Premolars+Molars x 2 Number of Teeth

Upper& Lower Dental Formulas

PRIMITIVE PRIMATES	2143 x2= 40
PROSIMIANS	2133 x2= 36
NEW WORLD MONKEYS	2133 x2= 36
MARMOSETS	2132 x2= 32
OLD WORLD MONKEYS	2123 x2= 32
APES and HOMO SAPIENS	

In most primates the canine teeth are much longer than the other teeth. In humans the size of the canines are reduced and the ends are blunt. Short canines allow for increased side to side movement of the jaw

Using the information below and the photographs on the following pages; classify and give the dental formulas for each of the following primates as either: primitive, prosimian, New World Monkey Old World Monkey, Ape, or Human.

Dental Formulas and Primate Classification

- 1. _____ 2. _____
- 3. _____ 4. _____
- 5. _____ 6. _____
- 7. _____ 8. _____

What would the possible diet of #3 be?

What would the possible diet of #5 be?

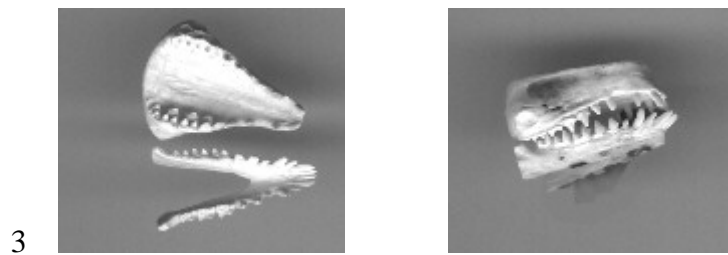
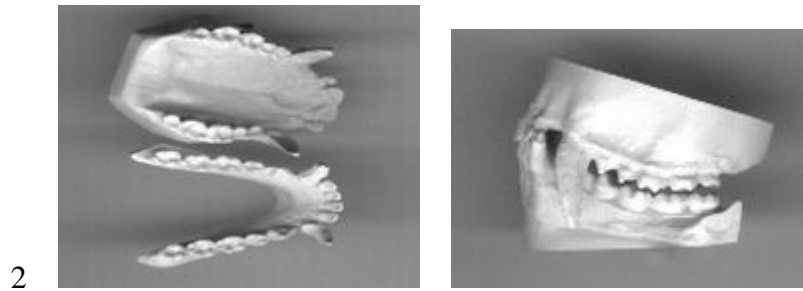
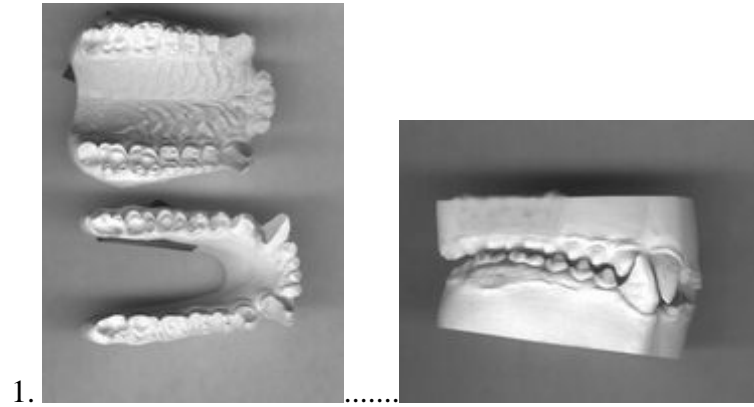
Describe the differences between the male and female of the following species #1:

Describe the shape of the jaw (rounded, somewhat rounded, or sharp) for the following primates:

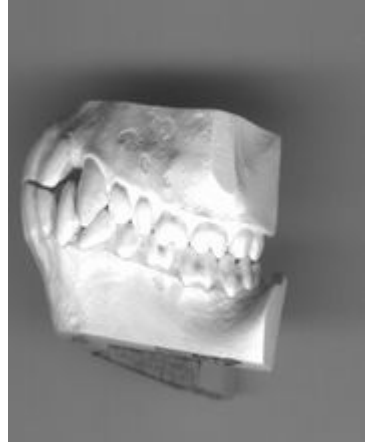
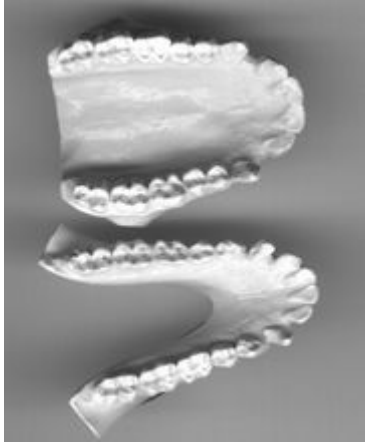
Ape _____ Human _____ Monkey _____

Suggest a reason why ape and human jaws are shaped the way they are and why monkeys have a slightly different shape.

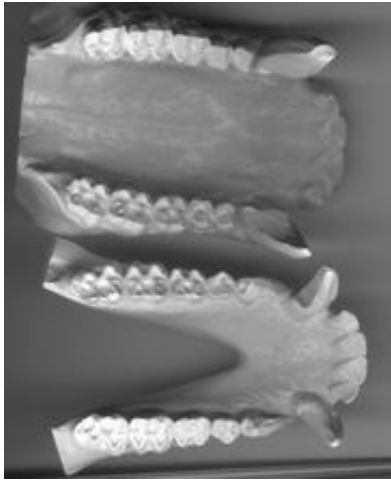
Primate Dentition Photographs



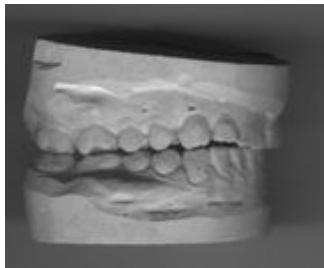
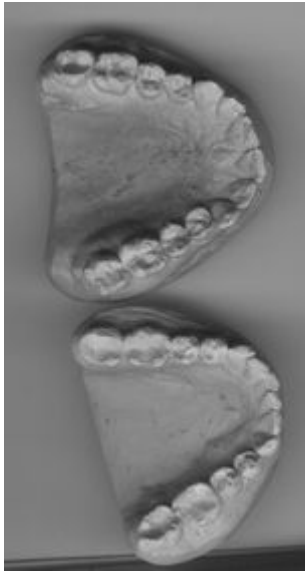
4.



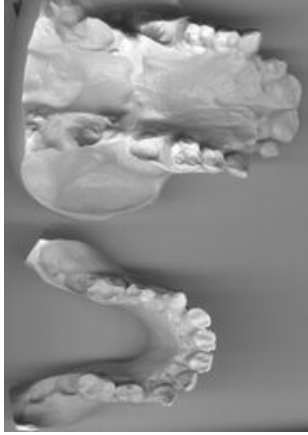
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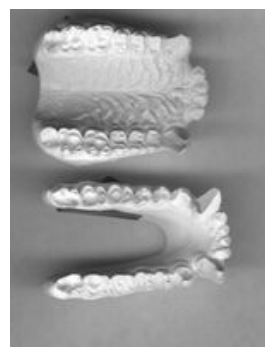
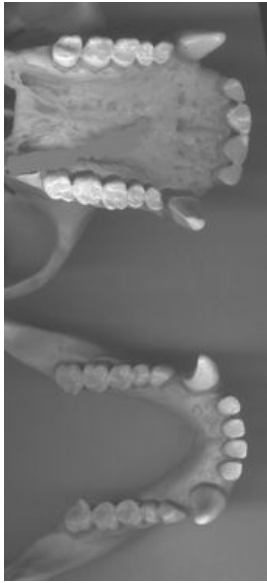
6.



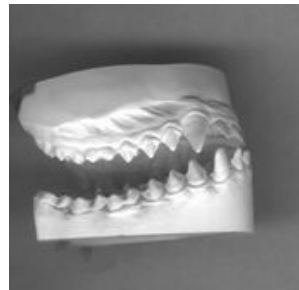
7.



8.



Male Species #1



Female Species #1

Comparing Primate Dentition Key

Species	Sex	Dental Formula	Category
1. Howler Monkey	Male	2133	New World Monkey
2. Gibbon	Female	2123	Lesser Ape
3. Tree Shrew	Male	2143	Primitive
4. Rhesus Monkey	Female	2123	Old World Monkey
5. Baboon	Male	2123	Old World Monkey
6. Human	Male	2122*	Homo Sapiens
7. Orangutan	Male	2122**	Ape
8. Chimpanzee	Male	2123	Ape

* Wisdom teeth removed

** Juvenile

Activity

Teacher Page Reading: Grade 10 Mike

Reading Content Standard's):

- *Demonstrate literal comprehension of a variety of printed materials.*
- *Demonstrate inferential comprehension of a variety of printed materials.*
- *Draw connections and explain relationships between reading selections and other texts, experiences, issues, and events.*
- *Analyze the author's ideas, techniques, and methods and make supported interpretations of the selection.*

Materials Needed:

From **ChimpanZoo Website** at www.chimpanzoo.org

- **Mike:** http://www.chimpanzoo.org/african_notecards/chapter_20.html
- **Mike's Ingenious Idea:**
http://www.chimpanzoo.org/african_notecards/chapter_21.html
- **Dr. Goodall's biography**
http://www.chimpanzoo.org/african_notecards/chapter_24.html

Procedure:

Have students read from the website selections and answer the following questions:

1. Draw a cartoon which shows the main ideas or plot of the section you just read.

Answers will vary

2. Place the ideas or events in sequential order.

Answers will vary, but should include:

- Mike was batting a gasoline can around, it made loud noises, which intimidated his fellow chimpanzees
- Mike practiced and found out that two tin cans could make more noise and really intimidate the chimpanzees in his group.
- Mike won over the alpha male role by mental capabilities, rather than physical strength.
- Mike reigned over 14 adult males
- Eventually, an aggressive adult male, Humphrey challenged Mike and won alpha status.

3. Tell about a movie, book or actual event with a similar theme. Explain how they are related.

Answers will vary

4. Think about characters in the story. How are any of them the same type of character that you have met in other stories?

Answers will vary

5. Authors work with words. Look back at the story and how this author used words to make you see, feel and understand the message.

Answers will vary but could include: terrifyingly, smacking, slapping, erupted, banging, intimidating, and brainy

6. Identify a phrase, why you included it, and why it is effective.

Answers will vary but could include:

- *gasoline can dribbling*
- *running madly down the path with hair erect*
- *Mike became the first alpha male ever to employ his brain rather than his brawn to govern his community*

All show quite vividly, Mike's ascendancy to alpha status

7. What did the story or selection tell you about the author and her way of looking at life?

Answers will vary

8. Authors often write pieces that are a “product of their time”. How is this true of the author or piece?

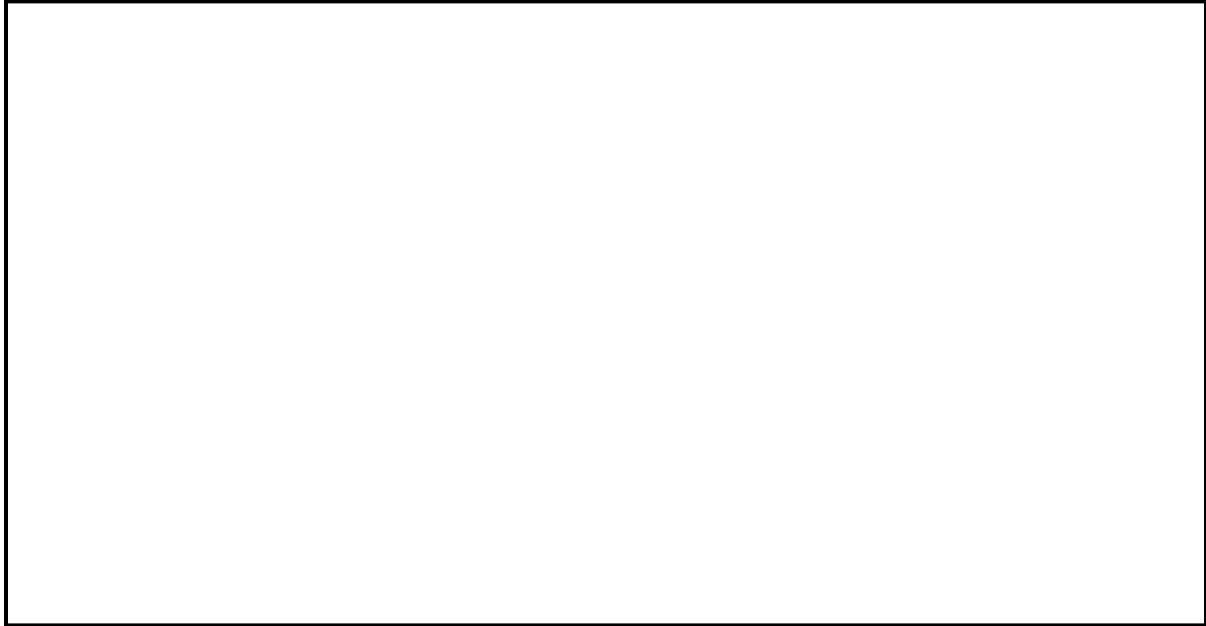
- 9.

Answers will vary

Student Page Reading: Grade 10 Mike

Read the selections Mike and Mike's Ingenious Idea

1. Draw a cartoon which shows the main ideas or plot of the section (s) you just read.



2. Place the ideas or events in sequential order. Label 1-5

___ Mike practiced and found out that two tin cans could make more noise and really intimidate the chimpanzees in his group.

___ Eventually, an aggressive adult male, Humphrey challenged Mike and won alpha status.

___ Mike won over the alpha male role by mental capabilities, rather than physical strength.

___ Mike reined over 14 adult males

___ Mike was batting a gasoline can around, it made loud noises, which intimidated his fellow chimpanzees

Tell about a movie, book or actual event with a similar theme. Explain how they are related.

4. Think about characters in the story. How are any of them the same type of character that you have met in other stories?

5. Authors work with words. Look back at the story and how this author used words to make you see, feel and understand the message.

6. Identify a phrase, why you included it, and why it is effective.

7. What did the story or selection tell you about the author and her way of looking at life

8. Authors often write pieces that are a “product of their time”. How is this true of the author or piece?

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