

# ***What Did T. rex Taste Like?***

## **Pre-Test**

Name \_\_\_\_\_

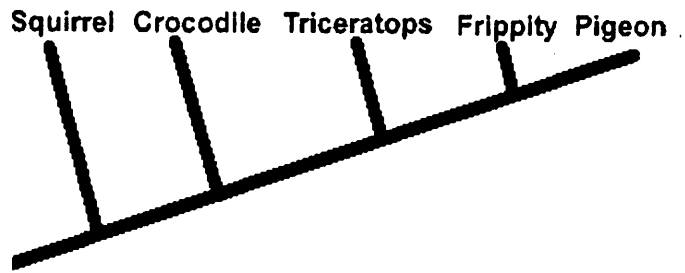
Class \_\_\_\_\_ Date \_\_\_\_\_

**Directions:** Please answer each of the following questions. If you do not know the answer, just leave it blank. You will be asked similar questions after you complete the tour so that you can see how much you have learned!

- 1. What is a cladogram?**
- 2. Draw a cladogram with a frog, cow and horse correctly placed.**
- 3. Please circle the answer that best completes this statement: A "common ancestor" is:**
  - a. one that is very commonly seen in the fossil record.
  - b. one that is shared by two or more organisms.
  - c. one that has no distinguishing features and is therefore very "common."
- 4. Read the following statements then answer the question below.**
  - A. All organisms inherit their features from their ancestors.**
  - B. Organisms resemble their most recent ancestors more closely than distant ancestors.**
  - C. Over time evolution occurs and new features appear.**

**Which of these statements are accurate?**

- a. A and C.
  - b. B and C.
  - c. All of the above.
  - d. None of the above.
- 5. Examine the following diagram and the statements that follow.**



**Statements:**

- A. Crocodiles are more closely related to squirrels than to frippities.**
- B. Frippities share a more recent ancestor with Triceratops than with Pigeons.**
- C. Frippities probably laid eggs.**
- D. All of these animals share the same ancestor.**

**Which of the statements are accurate?**

- a. A and C.
- b. B and D.
- c. C and D.
- d. A, B, C, and D.

# Brainstorming Activity

Divide students into teams (these can include any number of students).

Begin by asking your student teams to compare one of the following pairs (follow this link to a [pairs sheet](#) that can be printed, cut up and randomly distributed or picked from a hat):

- Dolphins and seals
- Butterflies and crickets
- Tigers and domestic cats
- Goldfish and sharks
- Snails and lobsters
- Oak trees and horses
- Lizards and chickens
- Roses and apple trees
- Jellyfish and sea stars
- Earthworms and gorillas
- Paramecia and salamanders

Ask the students to list as many features as they can think of that their two organisms have in common.

Ask questions:

- **Do their organisms share features because they were inherited from the same ancestor, or did their organisms evolve similar features independently?**
- **What other features could be used as a basis for comparison?**
- **Do they think their organisms are closely related to each other? Why or why not?**

Now that they are comfortable with comparing two organisms, ask them to use this same process to think about how all living things might be related.

Student teams brainstorm ideas for the following:

1. **What we know about how living things are related.**  
*Example: All mammals are more closely related to each other than any of them are to something like an insect. However, insects are also animals, so that makes them at least distantly related to mammals.*

- 2. What we think we know about how living things are related, but are not sure about.**

*Example: We think that animals are related to bacteria.*

- 3. What we want to know about how living things are related.**

*Example: How can you tell which organism is related to which? Are plants and animals related? If animals and bacteria are related, how does that work? Are mushrooms more closely related to plants or animals?*

The class then comes back together to share, discuss, and record their ideas onto a single large sheet of paper.

We strongly encourage using one or more of the [Related Activities](#) to enhance and extend the concepts emphasized in this module.

#### Terms List

**Amniotic egg:** [am knee ott ick] - an egg that can be laid on land due to the presence of a fluid-filled amniotic sac that cushions and protects the developing embryo

**Bipedal:** [bi pea dull] - describing an animal that typically walks on two legs.

**Bony skeleton:** a skeleton formed from hardened bone, not cartilage.

**Common ancestor:** an ancestor shared by two or more lineages.

**Genealogy:** [gee knee all oh gee] - a family history.

**Hypothesis:** [hi poth i sis] - a testable statement about the natural world that can be used to explain an observation and or make an inference.

**Lineage:** [lin ee edge] - any continuous line of descent; those organisms connected by heredity from ancestor to descendent.

**Most recent common ancestor:** the most recently shared ancestor of two or more lineages.

**Quadrupedal:** [qwa drew pea dull] - describing an animal that typically walks on four legs.

**Tetrapod:** [tet tra pod] - an animal having four limbs for terrestrial locomotion.

**Vertebrate:** an animal having a back bone or spinal column.

#### Features Table

As you explore Folder 4, fill in the data tables below, using a +, -, or ?.

	shark	tuna	frog	human	hare	calman	parrot	T. rex
vertebrae	<input type="text"/>							
bony skeleton	<input type="text"/>							
four limbs	<input type="text"/>							
amniotic egg	<input type="text"/>							
hair	<input type="text"/>							
opening in front of eye	<input type="text"/>							

	calman	parrot	T. rex
vertebrae	<input type="text"/>		
bony skeleton	<input type="text"/>		
four limbs	<input type="text"/>		
amniotic egg	<input type="text"/>		
hair	<input type="text"/>		
opening in front of eye	<input type="text"/>		
heel	<input type="text"/>		
bipedal	<input type="text"/>		
4 <sup>th</sup> and 5 <sup>th</sup> finger lost	<input type="text"/>		

## Features Table

As you explore Folder 4, fill in the data tables below, using a +, -, or ?.

	shark	tuna	frog	human	hare	caiman	parrot	T. rex
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bony skeleton								
four limbs								
amniotic egg								
hair								
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	caiman	parrot	T. rex
vertebrae			
bony skeleton			
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4 <sup>th</sup> and 5 <sup>th</sup> finger lost			

**Special Assignment:  
Solving T. rex's Identity Crisis**

**Purpose:**

	calman	parrot	T. rex
color vision	+	+	
warm blooded	0	+	
feathers	0	+	
being to young	+	+	
scaly skin	+	+	
melanin pigment in skin	+	+	
amniotic egg	+	+	
few glands in skin	+	+	
hole in hip socket	0	+	
3-chambered heart	+	0	
4-chambered heart	0	+	

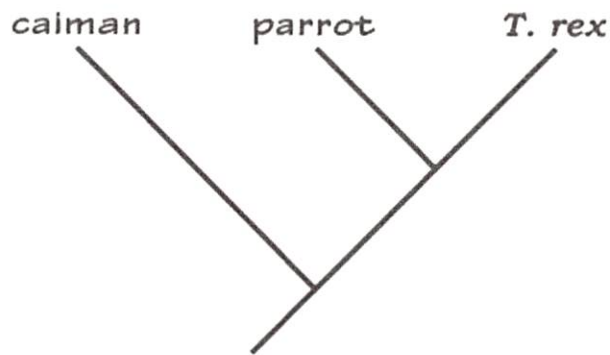


Your teacher will provide you with the Cladogram and Additional Data. Following any further directions from your teacher, you will be ready to complete this Special Assignment.

## Cladogram and Data Table Special Assignment

### Cladogram

Below is a simple cladogram indicating the proposed relationship among the caiman, parrot, and *T. rex*.



### Additional data

This data table indicates the presence or absence of eleven additional features for the caiman and the parrot. Notice that the information about the *T. rex* has not been filled in. You will need to make that determination based upon what you have learned.

Use the cladogram and data on inherited features to make hypotheses about what *T. rex* was like.

## Materials needed:

- [Cladogram and Additional Data](#)
- Your completed Features Table

## Instructions:

Examine the questions below. For at least two of the questions:

1. Decide if it is possible to answer the question with the data provided (the cladogram and data tables).
2. If it is not possible, what information is needed to be able to answer the question?
3. If it is possible, what kind of hypothesis would you make? What is the evidence for your statement? In your justification, make sure that you include information about common ancestors and shared inherited features. What other evidence would you look for that would support or refute your hypothesis?

What other kinds of questions might be answered using the cladogram and data tables?

## Questions:

- Did *T. rex* have an amniotic egg?
- Was *T. rex* warm-blooded or cold-blooded?
- Could *T. rex* have had feathers?
- Did *T. rex* have color vision?
- How many chambers were there in *T. rex*'s heart?
- Did *T. rex* sing to its offspring?

# What Did *T. rex* Taste Like?

## Post-Test

Name \_\_\_\_\_

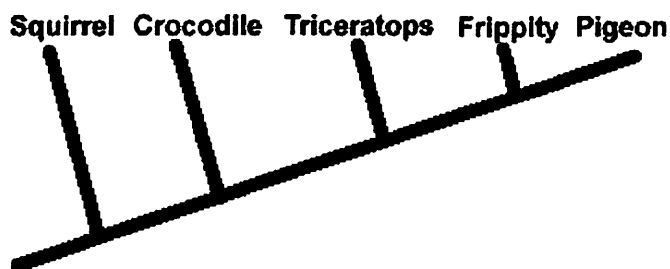
Class \_\_\_\_\_ Date \_\_\_\_\_

**Directions:** Please answer each of the following questions.

1. What is a cladogram?
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4. Read the following statements then answer the question below.
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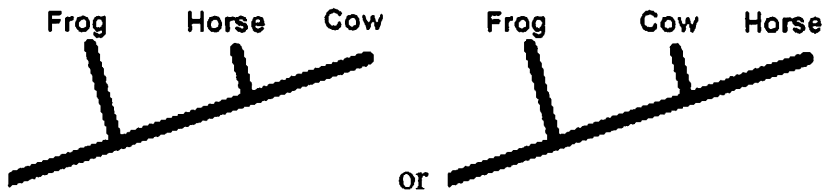
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# Pre + Post Test Key

## 1. What is a cladogram?

A cladogram is a branching diagram that illustrates evolutionary relationships between groups of organisms.

## 2. Draw a cladogram with a frog, cow and horse correctly placed.



## 3. Please circle the answer that best completes this statement: A "common ancestor" is:

b. one that is shared by two or more organisms.

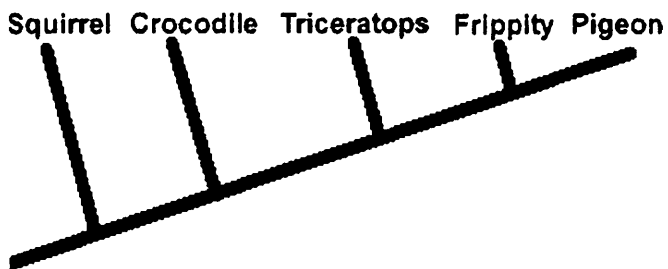
## 4. Read the following statements then answer the question below.

- A. All organisms inherit their features from their ancestors.
- B. Organisms resemble their most recent ancestors more closely than distant ancestors.
- C. Over time evolution occurs and new features appear.

Which of these statements are accurate?

c. All of the above.

## 5. Examine the following diagram. Which of the following statements are correct?



c. C and D are correct.