

Cover Sheet for Math-eze
October 28, 2006
Bonnie Miller

The lesson plans that I created for this meeting fits the objectives from the Math-eze Workshop and the Topic of the Day – Mastering Math Vocabulary.”

The objectives of my lesson plans was to identify troublesome mathematics vocabulary and develop strategies to help students assimilate new vocabulary. I developed a unit on Dinosaurs for my classroom that I hope will be useful for my peers to use. Through these activities I have analyzed the student’s achievement data and it has increased my reflective practices.

I used several activities to introduce, review and use vocabulary math terms. What kid doesn’t love talking, looking, reading and finding out more about dinosaurs. The students identified and classified interesting facts about dinosaurs using math terms, e.g. measurement – length, height, weight, speed and shape. Some terms used in conjunction with those were tons, pounds, kilograms, feet, meters, and geometry prefixes like ‘tri’ and ‘penta’ and other geometric shape terms. We compared the dinosaur size to a semi-truck, elephants and giraffes, those are things that the students are familiar with. The students loved to measuring to see how big dinosaurs were and if they could fit in our classroom, hallway, gym or school.

Name: Bonnie Miller

Grade Level/Subject: 2nd Grade Math

Topic: Dinosaur Math adapted from Teaching Children Mathematics – Vol. 13, Number 3: October, 2006

Objectives (P.A.S.S.):

Standard 1 : Number Sense – The student will use numbers and number relationships to acquire basic facts.

1. Place Value
2. Reading and Writing Numbers
 - a. Link place value concepts to the reading and writing of numbers.

Standard 3: Number Operations and Computation- The student will compute with whole numbers less than 100.

1. Develop and apply the concepts of addition and subtraction.
 - a. Demonstrate fluency with basic addition and subtraction facts and fact families to 18.
 - b. Solve two-digit addition and subtraction problems with and without regrouping using a variety of techniques.

Standard 4: Geometry and Measurement – The student will use geometric properties and relationships to recognize and describe shapes and use appropriate units of measure in a variety of situations.

1. Geometric Properties and Relationships
 - a. Identify two-dimensional geometric shapes in everyday situations.
2. Measurement
 - a. Measure objects with nonstandard and standard units.

Instruction:

1. Introduction:

Ask students how they would describe anything about a dinosaur using Math [Vocabulary] Terms. Prompt them to use height, weight, etc.

2. Materials needed:

1. Books:
 - Triceraptops: by Richard M. Gaines ISBN: 1-57765-489-7
 - Brachiosaurus: by Michael P. Goecke ISBN: 1-57765-632-6
 - Tyrannosaurus Rex: by Richard M. Gaines ISBN: 1-57765-485-4

You can use any dinosaur books that have factual information about these

three dinosaurs. Have additional Dinosaur books for closure.

2. Tape measure – 100' with meters on the other side works best, but any length will do.
3. Paper and pencil
4. Worksheets from web sites about dinosaurs – use for Math, Art, Science and Geography.

3. Instructional process:

Divide into groups and give each group or student two pieces of paper. Read Triceratops. Have them identify any fact that involves a math term describing the dinosaur. Write those facts** on the board. E.g. 3 horns, 25 feet long. Then have them classify that term as measurement, shape [tri = triangle], time, weight, height – etc. About 5-6 terms will work, include those facts needed to complete activities listed below. Give Customary and Metric measurements on some facts.

Continue reading and identifying facts with Brachiosaurus and Tyrannosaurus Rex. Include approximately the same set of facts for each dinosaur, but include some 'wow' facts too – e.g. how long a T. Rex's toe is and how much they can lift.

**Remember that not all 'facts' will be the same in each source since they are based on available information and research that can vary.

Use one side of the paper for each dinosaur to have room at the bottom to do activities for each one.

Activity 1: Side by side: Double or nothing- Compare and contrast the length of each dinosaur. Show students that Tyrannosaurus Rex is almost double the length of the Triceratops and the Brachiosaurus is just over double the length of the T. Rex. Compare and contrast other facts of each dinosaur. I used a semi-truck's weight and length to give the students a visual description. The books also use elephants and giraffes.

Activity 2: On top of Triceratops : Triceratops had three horns on its head. How many horns would you see in a family of 3 Triceratops dinosaurs? In a family of 5 Triceratops dinosaurs? How many wheels does a tricycle have? How many sides does a triangle have? What do you think the prefix 'tri' means?

Pentaceratops is a cousin of the Triceratops. What does the prefix 'penta' mean? How many horns will a family of 3 Pentaceratops dinosaurs have? A family of 8 Pentaceratops dinosaurs. What is the name of a 5-sided figure?

Activity 3: Bigger than what? A typical Brachiosaurus measured about 85 feet [26 meters] long. Find a place to measure a distance of 85 feet in your school or on your

school playground. A long hall works great. What other objects can you identify that is about the same length? If you and your class mates were each 5 feet tall and if you lie head to toe, how many students would it take to extend the same distance?

A typical Triceratops measures about 25 feet long and 10 feet tall. Would one fit in your classroom. Measure to find out. If it is close talk about how it might have to stand on a diagonal to fit or tuck it's tale around. Would there still be room for you? Measure other locations, e.g. the hallway, gym, school building, or playground equipment.

Activity 4: Not so speedy: Scientists have used the distance between each fossil footprint to estimate how fast dinosaurs moved. They estimate that dinosaurs such as Tyrannosaurus Rex could run about 25 miles per hour. About how far could T. Rex run in 3 hours. About how far could T. Rex run in 30 minutes? Compare to a distance they relate to. Talk about School Speed Zone.

Activity 5: All shapes and sizes: Look at each dinosaur. Identify parts of the dinosaurs that fit in geometric shapes. e.g. head of T. Rex is almost square, neck of Brachiosaurus is a long rectangle and it's tail is triangular. A good resource to show shapes is a 'Draw Dinosaurs' book if you have one in your library.

Additional Activity: Art – Have students draw and color a picture of one of the dinosaurs, or have a color sheet of the dinosaurs, let the students select one to color.

Additional Activity: Science – Using worksheets from various web sites answer questions on dinosaurs. Discuss what their habit might have been, what they ate, how can you tell? What did their skin look like? Was it colored? Did they lay eggs?

Additional Activity: Geography – Using the books or other information, identify where these dinosaurs lived. Ask why they think fossil remains have been found in Africa and the USA? Discuss family units.

4. Closure:

Review the facts about dinosaurs using math vocabulary. Hand out dinosaur books to each group, each student or regroup into smaller groups and let the students read and look at other dinosaurs.

Assessment:

Assess Activity 1 on participation. The other activities can be assessed on participation and answers to questions.

Modifications/Accommodations:

Lower level learners may need a more concrete idea of sizes of dinosaurs. Use lower number for dinosaur family. Upper level learners could find more interesting facts to add

to their list. They could also draw and identify polygon shapes from triangles to decagons.

Reflection:

The kids loved this activity – but then most kids love anything that involves dinosaurs. They especially liked the measuring parts. I also have a Dinosaur Floor Puzzle and Dinosaur Video- The Magic School Bus – “The Busasaurus” that I used with this unit.

All these sites will work great on a SMARTBoard. There are some interactive pages on the Enchanted Learning site.

Web sites:

<http://www.enchantedlearning.com/subjects/dinosaurs/dinos/Triceratops.shtml>

<http://www.enchantedlearning.com/subjects/dinosaurs/dinos/Trex.shtml>

<http://www.enchantedlearning.com/subjects/dinosaurs/dinos/Brachiosaurus.shtml>

This is a subscription site, but you can copy and paste then print color sheets. It also has a variety of Dinosaur worksheets. Most of them are included. There is more information on each address.

<http://www.edhelper.com>

This is also a subscription site, but it has some great lesson plans, activities and worksheets.

Just interesting sites:

<http://www.prehistory.com/tricerat.htm>

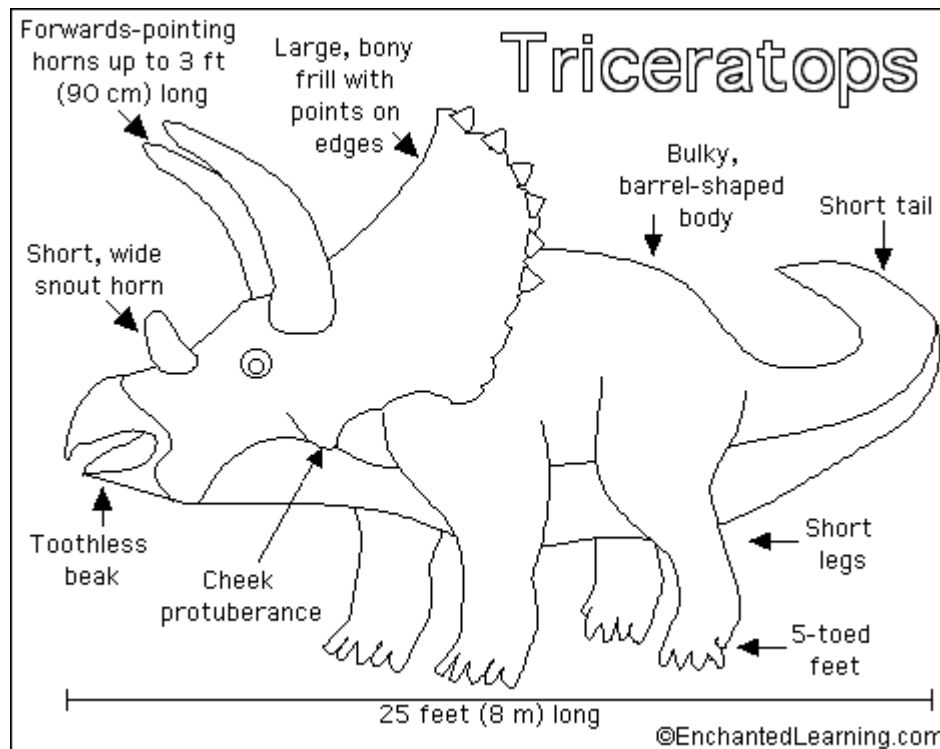
http://www.nmnh.si.edu/paleo/dino/trex_2.htm

<http://www.fieldmuseum.org/sue/>

<http://www.prehistory.com/brachios.htm>

<http://yahooligans.yahoo.com/content/science/dinosaurs/start.html>

This is a great site. The students will love it. Check out the A-Z Glossary, especially the Tyrannosaurs Rex - video clip.



Triceratops (meaning "Three-horned face") was a large, quadrupedal, plant-eating dinosaur with three horns on its large head. Triceratops hatched from eggs and probably lived in herds. It lived during the late [Cretaceous period](#), about 72 to 65 million years ago. Triceratops was hunted by [T. rex](#).

Diet: Triceratops was an herbivore, a plant eater (a primary consumer). It probably ate cycads, palms, and other low-lying plants with its tough, toothless beak. Triceratops could chew well with its cheek teeth (like other ceratopsians, but unlike most other dinosaurs).

Anatomy: Triceratops had three horns on its face along with a large bony plate projecting from the back of its skull (called a frill). One short horn above its parrot-like beak and two longer horns (over 3 feet or 1 m long) above its eyes probably provided protection from predators. The horns were possibly used in mating rivalry and rituals. Triceratops had a large skull, up to 10 feet (3 m) long. This dinosaur was up to 25 feet (8 m) long and was about 15 to 20 feet (4.6 to 6 m) tall; it weighed roughly 5 to 7 tons. A quadruped, Triceratops walked on four short, sturdy legs.

Fossils: Many Triceratops fossils have been found, mostly in western Canada and the western United States. [Paleontologist](#) Othniel Marsh named Triceratops from a fossil found near Denver, Colorado, USA, in 1889. At first this fossil was mistakenly identified as an extinct species of buffalo. The first Triceratops

skull was found in 1888 by John Bell Hatcher. About 50 Triceratops skulls and some partial skeletons have been found.

Triceratops

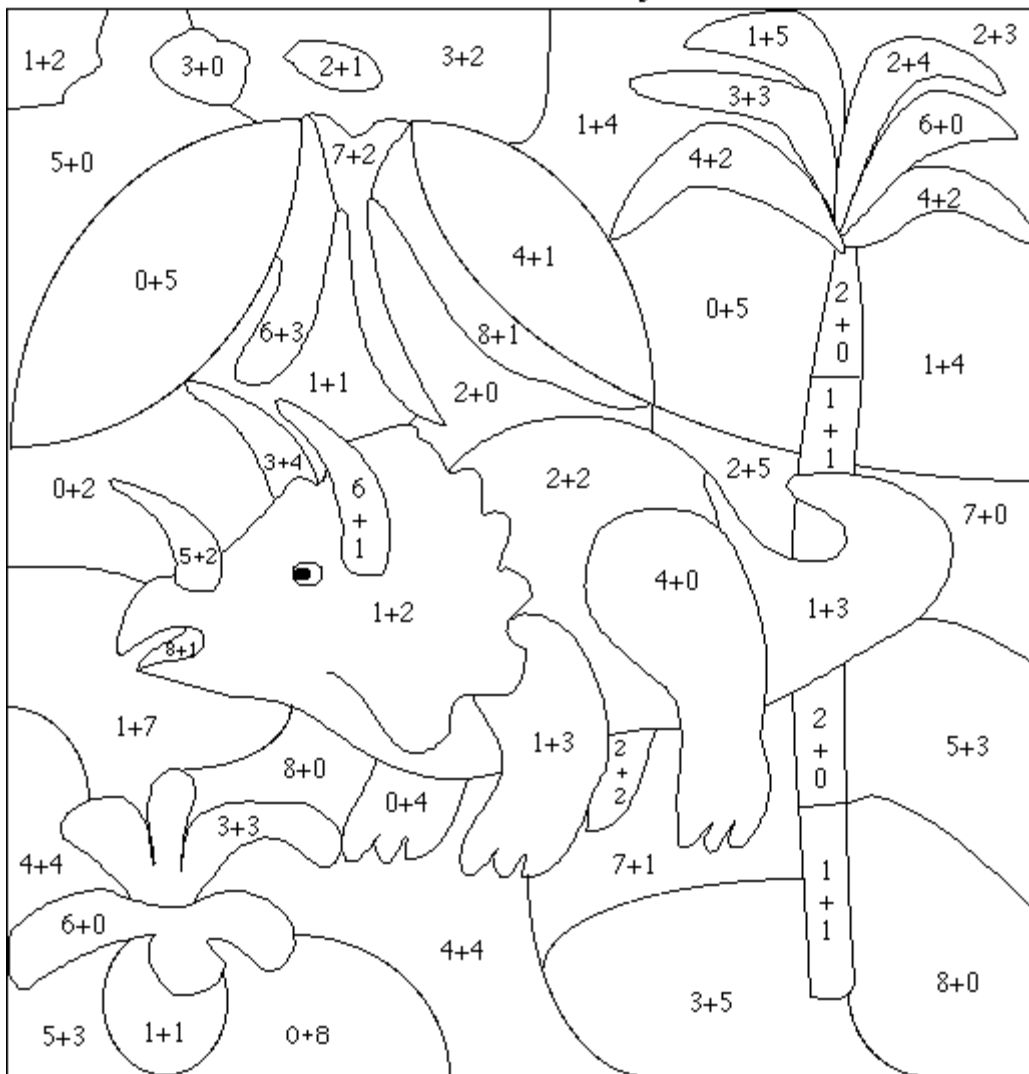
NAME _____

2=brown
3=gray

4=purple
5=blue

6=green
7=yellow

8=orange
9=red



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Name _____

Answer the following questions about dinosaurs after reading about "[Triceratops](#)" in Zoom Dinosaurs.



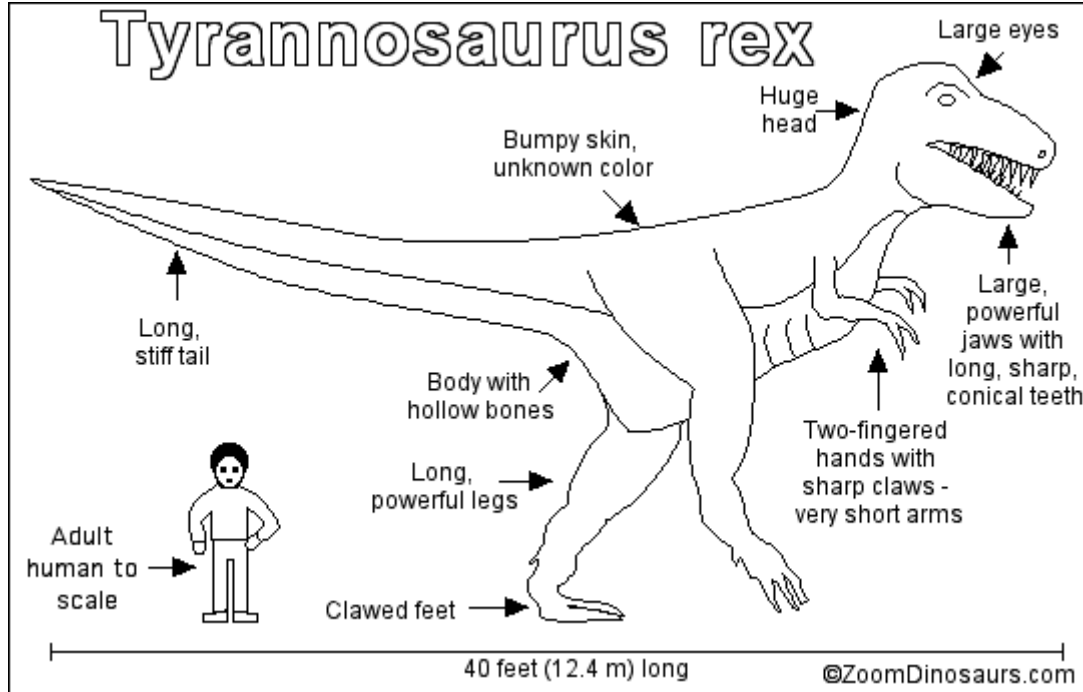
1. Did Triceratops eat meat or plants? _____
2. How many horns were on Triceratops' head? _____
3. What is the name of the large, bony structure that grew from the back of Triceratops' head? _____
4. How many legs did Triceratops walk on? _____

5. Who named Triceratops? _____
6. What geologic period did Triceratops live in?

7. How long was Triceratops? _____
8. Did Triceratops have a long, whip-like tail?

9. Is there any evidence that Triceratops lived in herds?

10. When did Triceratops go extinct? _____



Tyrannosaurus rex (meaning "Tyrant lizard king") was a huge, fierce, meat-eating dinosaur that lived during the late [Cretaceous period](#), about 85 to 65 million years ago. This [theropod](#) dinosaur probably lived in forests, where its prey (large, plant-eating dinosaurs) could find plenty of food. *Tyrannosaurus rex* was named by paleontologist Henry Fairfield Osborn in 1905.

Diet: *T. rex* ate large dinosaurs, like [Triceratops](#). This is known because [fossilized *T. rex* dung](#) was found containing crushed *Triceratops* bones.

Anatomy: *Tyrannosaurus rex* was up to 40 feet (12.4 m) long, about 15 to 20 feet (4.6 to 6 m) tall, and it weighed roughly 5 to 7 tons. A biped, it walked on two long hind legs. It had very short arms that each had two clawed fingers. The bird-like hind feet each had three large toes, all equipped with claws. *T. rex*'s jaws were up to 4 feet (1.2 m) long and had 50 to 60 thick, conical, bone-crunching teeth that were up to 9 inches (23 cm) long.

Fossils: Dozens of *T. rex* fossils have been found in western North America and Mongolia. Fossilized specimens of *T. rex*'s rough, scaly skin have been found. It was bumpy, like an alligator's skin, and has been described as a "lightly pebbled skin." Fossilized footprints and fossilized dung have also been found.

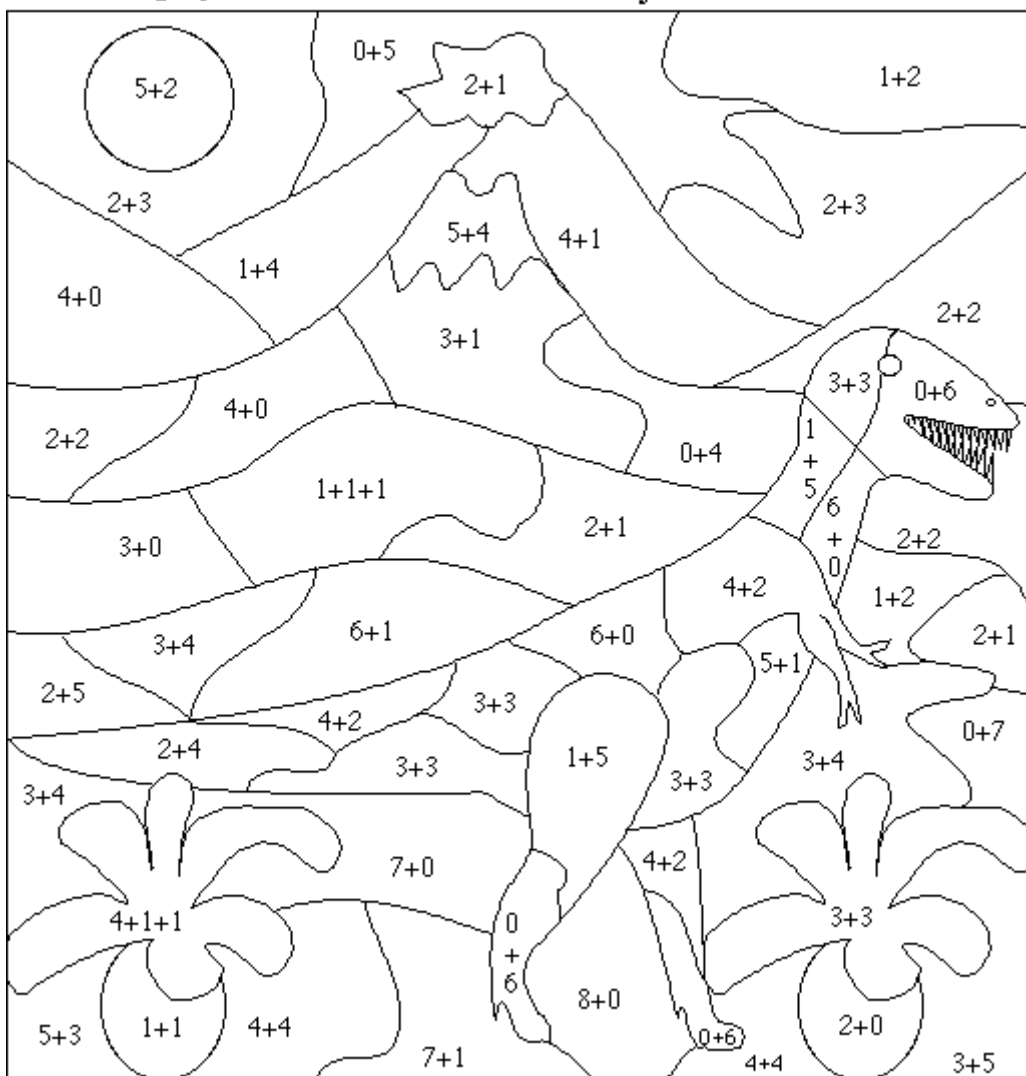
Tyrannosaurus rex NAME

2=brown
3=gray

4=purple
5=blue

6=green
7=yellow

8=orange
9=red



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WORD HUNT #3

How many 2-, 3-, and 4-letter words can you make using the letters from the following word?



TYRANNOSAURUS

1.	11.
2.	12.
3.	13.
4.	14.
5.	15.
6.	16.
7.	17.
8.	18.
9.	19.
10.	20.

T. rex

Fill in the blanks below using the word bank.

Word Bank:

Triceratops bone jaws animals 40	meat-eating arms powerful Earth dinosaurs	extinction fossilized fingers forests years
--	---	---

Tyrannosaurus rex was a huge dinosaur that lived from about 85-65 million _____ ago. It was a _____ dinosaur, a carnivore. It walked on two _____ legs and had tiny _____, each with two _____ . T. rex was about _____ feet (12.4 m) long. Its _____ alone were about 4 feet (1.2 m) long.



Tyrannosaurus rex probably lived in _____, where its prey (plant-eating _____) lived. This giant ate large dinosaurs, like _____. This is known because bits of Triceratops _____ have been found in _____ T. rex waste.

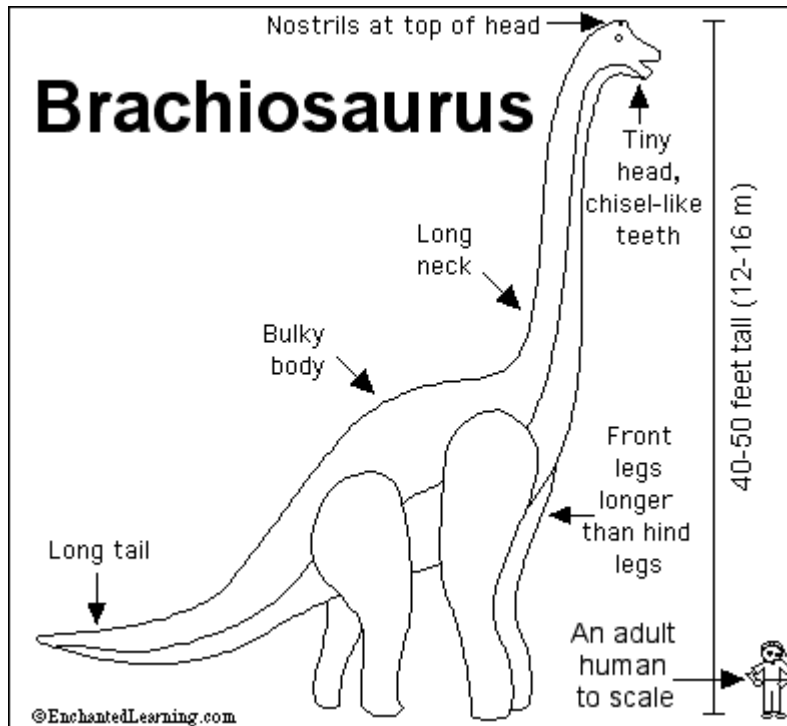
T. rex was one of the last of the dinosaurs to live on _____. It died out during the K-T _____, a major mass extinction event in which many different types of _____ and plants died out.



Word-Unscramble #1

Can you unscramble the following words to answer the questions about T. rex?

UNSCRAMBLE THE WORDS	YOUR ANSWER
1. EEHTT Tyrannosaurus rex had over 60 of these and they were sharp.	
 2. GESG T. rex hatched from these.	
3. TEAM T. rex ate this.	
4. SWAJ These were huge on T. rex, over 4 feet long.	
5. SMAR These were tiny on T. rex.	
6. GFISNER T. rex had two of these on each arm.	
7. LATI T. rex used this for balance when running and turning.	
 8. GNIK Rex means this.	
9. SADIURNOS T. rex was one of the largest meat-eating one of these.	
10. ROTHEPOD T. rex was this type of dinosaur; this group includes two-legged meat-eaters.	



Brachiosaurus was a huge, plant-eating dinosaur that had a giraffe-like stance. It is one of the tallest and largest dinosaurs yet found, and may have lived in Earth-shaking herds. This giant sauropod lived during the middle to late [Jurassic period](#), about 156-145 million years ago.

Anatomy: Brachiosaurus walked on four legs and, like the other Brachiosaurids and unlike most dinosaurs, its front legs were longer than its hind legs. Brachiosaurus was about 85 feet long (26 m). It had a claw on the first toe of each front foot and claws on the first three toes of each rear foot (each foot had five toes with fleshy pads). Like other Brachiosaurids, it had chisel-like teeth, its nostrils were on the top of its head, and it had large nasal openings indicating that it may have had a good sense of smell. This plant-eater had 26 teeth on its top jaw and 26 on the bottom for a total of 52 teeth towards the front of the mouth.

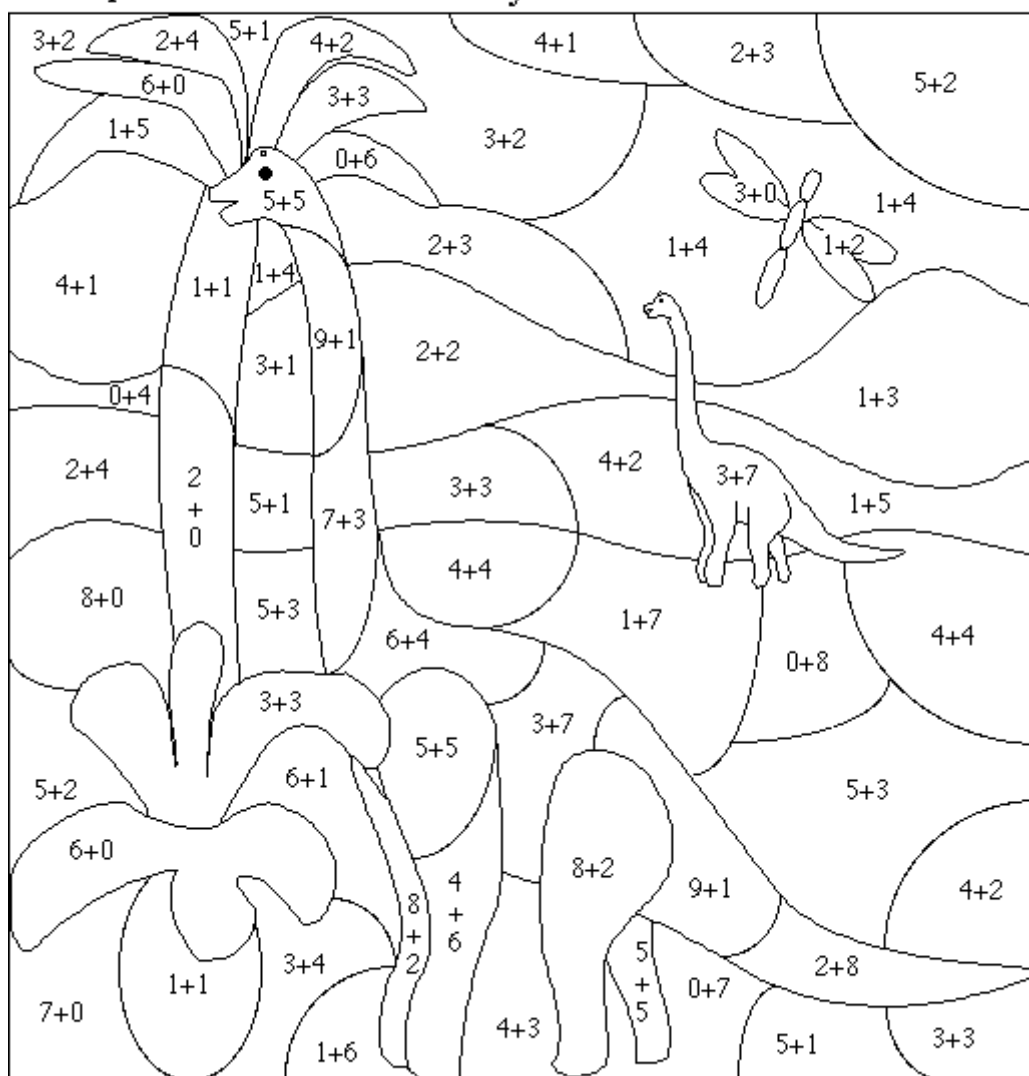
Fossils and Name: Brachiosaurus was first found in the Grand River Valley, in western Colorado, USA, in 1900. This incomplete skeleton was described by paleontologist Elmer S. Riggs, who named Brachiosaurus in 1903. In 1909, Werner Janensch found many Brachiosaurus fossils in Tanzania, Africa. Many Brachiosaurus fossils have been found, in North America and Africa.

Brachiosaurus

NAME _____

2=brown
3=pink4=purple
5=blue6=green
7=yellow8=orange
9=red

10=gray



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Name _____

Answer the following questions about dinosaurs after reading about "Brachiosaurus" in Zoom Dinosaurs.

1. What does the name Brachiosaurus mean? _____

2. Was Brachiosaurus a plant-eater or a meat-eater? _____

3. Which were longer - Brachiosaurus' front legs or its hind legs? _____

4. About how tall was Brachiosaurus? _____

5. Did Brachiosaurus have any claws on its feet? _____

6. Did Brachiosaurus chew its food or swallow it whole? _____

7. What geologic period did Brachiosaurus live in? _____

8. When was the first Brachiosaurus fossil found? _____

9. Did Brachiosaurus babies hatch from eggs or were they born live? _____

10. In order for Brachiosaurus to pump blood up to its head, did it need a very powerful heart or very powerful lungs? _____



Word-Unscramble #9

Can you unscramble the following words to answer questions about Brachiosaurus?

UNSCRAMBLE THE WORDS	YOUR ANSWER
<p>1. LESTALT Brachiosaurus is one of the _____ dinosaurs ever found.</p>	
<p>2. LATL Brachiosaurus was up to 50 feet _____ .</p>	
<p>3. RARE Unlike most other dinosaurs, Brachiosaurus' front legs were longer than its _____ legs.</p>	
<p>4. DUQARUDPE Brachiosaurus was a _____, it walked on four legs.</p>	
<p>5. LAVEES Brachiosaurus was an herbivore, it ate _____ .</p>	
<p>6. ADHE Brachiosaurus had nostrils on the top of its _____ .</p>	
<p>7. GESG Brachiosaurus may have hatched from _____ .</p>	
<p>8. HHIG Brachiosaurus stood with its head held _____ , in a giraffe-like stance.</p>	
<p>9. JASSURCI Brachiosaurus lived during the _____ period, along with many other enormous sauropods.</p>	
<p>10. SHRED Brachiosaurus may have lived in groups called _____ .</p>	

Name _____



Date _____

Dinosaur Month

(Answer ID # 0891019)

Complete and show your work.

<p>1. Brandon read a book about dinosaurs. The book said that an Apatosaurus might grow as long as seventy-seven feet. An adult blue whale might be ninety-three feet long. How much longer could a blue whale be than the largest Apatosaurus?</p>	<p>2. Ashley made a mural for her classroom. She cut out pictures of dinosaurs and glued them to the mural. She drew trees, bushes, lakes, and rivers on the mural. It took her a very long time to finish the mural. It took her 2 hours and 10 minutes just to draw the bushes! If she started drawing the bushes at 10:00 a.m., what time did she finish the bushes on her mural?</p>
<p>3. Kevin collected models of dinosaurs. He found a T-Rex model that was almost three feet tall! The price of the model was \$15. If he gives the clerk \$20 for the model, how much money will he get back?</p>	<p>4. Christopher and Destiny drew a picture of a dinosaur on the school parking lot. The picture was as big as the real dinosaur! They used four boxes of sidewalk chalk to color in the dinosaur. Each box had thirteen pieces of chalk. How many pieces of chalk did they use to color in the dinosaur?</p>
<p>5. Jessica had many stuffed animals. Her favorite animals were the dinosaurs. She had five pink dinosaurs, four blue dinosaurs, twelve red dinosaurs, one purple dinosaur, and two green dinosaurs. How many dinosaurs did Jessica have in all?</p>	<p>6. Luis brought a bag of gummy dinosaur candy to share with his friends. There were 27 blue dinosaurs and 18 green dinosaurs in the bag. If Luis and his two friends divide the candy equally, how many blue dinosaurs and how many green dinosaurs will each of them get?</p>

Name Teacher Key

Date _____

Dinosaur Month
(Answer ID # 0891019)

Complete and show your work.

<p>1. Brandon read a book about dinosaurs. The book said that an Apatosaurus might grow as long as seventy-seven feet. An adult blue whale might be ninety-three feet long. How much longer could a blue whale be than the largest Apatosaurus?</p>	<p>2. Ashley made a mural for her classroom. She cut out pictures of dinosaurs and glued them to the mural. She drew trees, bushes, lakes, and rivers on the mural. It took her a very long time to finish the mural. It took her 2 hours and 10 minutes just to draw the bushes! If she started drawing the bushes at 10:00 a.m., what time did she finish the bushes on her mural?</p>
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Answer Key	
<p><u>1</u> 16 feet longer <u>2</u> 12:10 p.m. <u>3</u> \$5 <u>4</u> 52 pieces of chalk <u>5</u> 24 dinosaurs <u>6</u> a) 9 blue dinosaurs</p>	



Dora's Dinosaur

By Brenda B. Covert



¹ Dora's room wasn't pink. Dolls didn't sit on her bed. Dora didn't want girl stuff in her room. She wanted dinosaur stuff. Dora loved dinosaurs.

² Dora's bed had a soft dinosaur on it. Her walls had dinosaur posters on them. Dinosaur books were stacked on her desk. She loved to see what dinosaurs looked like when they were alive. She loved to see their bones put back together.

³ One day Dora's family took a trip. They drove to the state of Colorado [kall-uh-RAH-doe]. They joined a team of dinosaur hunters. Dora was very excited! The leader of the team said that everyone could dig for dinosaurs! The children could dig too!

⁴ They had one week to look for dinosaurs. Then Dora's family would go home. Dora wanted to start digging!

⁵ A nine-year-old girl found very big claws. Dora did a happy dance. She watched as the adults worked to get the claws out of the dirt and rock. They worked slowly. No one wanted to break those fossils.

⁶ By the week's end, the team had found lots of fossils. Dora dug up some big teeth. Her brother found a large leg bone. The team leader was happy. Even if Dora's family went home, the rest of the team could stay and dig. They knew where to find the rest of the dinosaur bones.

⁷ "You were a big help," the man told Dora and her family. "Thank you for taking part in our dinosaur dig."

⁸ "Thank you for making my dream come true!" Dora said. She shook his hand.

⁹ As they drove away, Dora took a dinosaur tooth out of her pocket. She was glad the team leader let her keep this one. She would put it in a safe place at home. Someday maybe Dora would have more fossils to go with it. She liked to dream big.

Name _____



edHelper.com

Date _____

Dora's Dinosaur

<p>1. If Dora had a bedspread, what do you think would be on it?</p> <p><input type="radio"/> A Hearts</p> <p><input type="radio"/> B Flowers</p> <p><input type="radio"/> C Dolls</p> <p><input type="radio"/> D Dinosaurs</p>	<p>2. What was Dora's dream?</p> <p><input type="radio"/> A To have dinosaur toys</p> <p><input type="radio"/> B To have a pet dinosaur</p> <p><input type="radio"/> C To find dinosaur bones</p> <p><input type="radio"/> D To own a dinosaur tooth</p>
<p>3. Where did Dora's family go?</p> <p><input type="radio"/> A To Colorado</p> <p><input type="radio"/> B To the desert</p> <p><input type="radio"/> C To the store</p> <p><input type="radio"/> D On vacation</p>	<p>4. What could Dora do in Colorado?</p> <p><input type="radio"/> A Dance</p> <p><input type="radio"/> B Help</p> <p><input type="radio"/> C Dig</p> <p><input type="radio"/> D Hunt</p>
<p>5. What are fossils?</p> <p><input type="radio"/> A Dinosaurs</p> <p><input type="radio"/> B Very old remains</p> <p><input type="radio"/> C A kind of claw</p> <p><input type="radio"/> D Tools for digging</p>	<p>6. What did a nine-year-old girl find?</p> <p><input type="radio"/> A A dinosaur</p> <p><input type="radio"/> B Claws</p> <p><input type="radio"/> C Some teeth</p> <p><input type="radio"/> D A leg bone</p>
<p>7. Dora found _____.</p> <p>_____</p>	<p>8. Dora stole one of the dinosaur teeth.</p> <p><input type="radio"/> A True</p> <p><input type="radio"/> B False</p> <p><input type="radio"/> C True</p> <p><input type="radio"/> D False</p>