Harlan County Schools
NTI Days 6-10
"The Island"
Grade Level: 6

Introduction:

Any days designated as a Non Traditional Instruction (NTI) days, students will be required to complete assignments at home for these days. By completing work at home on these days, we will not have to "make up" these missed days at the end of the school year. These days will count as a full day of instruction for students and teachers.

This folder contains snow packets for these NTI days for your child to complete if school is cancelled. Please keep the folder safe at home. Every NTI day, have your child complete the work for the day that is specified by the County Board. For example, if the board specified that it is NTI day 1, look for the assignment labeled NTI day 1. Your child needs to hand in the work completed during each NTI day; therefore it is important for each student to complete each day's work.

Project:

25 years ago a group of scientists and billionaires tried to recreate the Prehistoric/Dinosaur age on an island. Their goal was to bring dinosaurs back from extinction and create a place where humans could see them. The group was successful; however, there has been no contact with the island in months. The billionaires have asked you to put a team together, investigate the island, and prepare a park for opening to tourists.

Standards:

The following Kentucky 6th educational standards are addressed throughout this project. These are not activities that you are required to complete.

ELA-Literacy.RI.6.1. Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

ELA-Literacy.RI.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

ELA-Literacy.W.6.10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

ELA-Literacy.L.6.1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

ELA-Literacy.L.6.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Science:

06-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. [Clarification Statement: Emphasis is on cause and effect relationships between resources and growth of individual organisms and the numbers of organisms in ecosystems during periods of abundant and scarce resources.]

06-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. [Clarification Statement: Emphasis is on describing the conservation of matter and flow of energy into and out of various ecosystems, and on defining the boundaries of the system.] [*Assessment Boundary: Assessment does not include the use of chemical reactions to describe the processes.*]

06-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.[Clarification Statement: Emphasis is on predicting consistent patterns of interactions in different ecosystems in terms of the relationships among and between organisms and abiotic components of ecosystems. Examples of types of interactions could include competitive, predatory, and mutually beneficial.]

Math:

Math.Content.6.G.A.1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

Math.Content.6.G.A.2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b\ h$ to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

Math.Content.6.G.A.4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Social Studies:

Grade 6 Enduring Knowledge – Understandings *Students will understand that* the use of geographic tools (e.g., maps, globes, photographs, models, charts, graphs, databases, and satellite images) and mental maps helps interpret information, analyze patterns and spatial data, and solve geographic issues in the present day.

Arts and Humanities:

MA:Cr2.1.6. Organize, propose, and evaluate artistic ideas, plans, prototypes, and production processes for media arts productions, considering purposeful intent.

Activities you need to complete start here.

Activities:

Day 6: Knowing Your Dinosaur

Choose one:

- Read the attached articles labeled "Day 1" about dinosaur facts.
- Using the internet, research five of the following dinosaurs: T-Rex, Velociraptor, Stegosaurus, Triceretops, Allosaurus, etc.

Choose two:

1. Using the template as your guide, create a profile of two different dinosaurs. Be sure to include the following info: scientific name, size and weight, period lived, diet, enemies, interesting facts, and a sketch.
2. Journal Entry: Describe the first time you saw a dinosaur. Your journal entry must be a minimum one page.
3. Create a Venn diagram comparing/contrasting two dinosaurs

4. Solve the following problem:
   The T-Rex eats 2 goats per day. Assuming your island has three T-Rex's answer the these questions:

   -How many goats were being eaten per day?
   -How many are eaten per week?
   -How many would be eaten in the month of May?

5. Solve the following problem:
   Velociraptors normally hunt in packs. Three raptors chase a deer 525 yards and catch it. Answer these questions:

   -How many total yards did the group run all together?
   -How many total feet did they run all together?
   -How many total miles did they run all together?

Day 7: Knowing Your Biome

Choose one of the following research options:

- Read the attached articles labeled "Day 2" about biome.
- Using the internet, research the biome inhabited by the dinosaurs researched on day 1.

Choose 2 of the 4:

- Journal Entry: Describe setting foot on the island for the first time. Use at least 8 (eight) adjectives to describe how you are feeling/thinking about the adventure ahead of you.
- Using the method of your choice (paragraph, t-chart, Venn diagram, etc.): Compare/Contrast two different biomes.
- Create a travel poster (with both words and images) that advertises a biome of your choice. The goal of this poster is to convince visitors to come to your biome.
- Solve the following math problem:

  Based on lab reports, laid dinosaur eggs had almost a 40% chance of hatching and surviving. Answer these questions:

  -Use this percentage to find the total number of eggs in decimal form that would survive for each species of dinosaurs.
  (Continued on next page)

-Write the fraction for eggs hatching. Reduce if possible and label all answers.

- 36 Compy eggs
- 8 Velociraptor eggs
- 16 Stegosauraus eggs
- 6 Brontosaurus eggs
- 10 Diplodocus eggs

Day 8: Planning Your Trip

Choose 3 of the 4

- Journal Entry: This wasn't an accident. Use every single letter of the alphabet at the beginning of a word in your entry.

  Example: apple, bats, creature, danger, exotic
  This does not have to be in order (but you could try). Mark off each letter at the bottom once it is used.

- Create a travel itinerary using the attached template

- Solve the following math problem:

  PreH. Park was spending $3,500 per week to raise and feed goats on the island. Half of that cost went to food, a quarter went to the medical, and another quarter went to housing them. Answer these questions:

  -How much were they spending a year to raise and feed the goats?
  -How much were they spending on medical expenses during a 10 week span?
  -How much were they spending on housing the goats over a 20 week span?

- Watch the YouTube video, "Kids Survival Kit – What to Include and How to Use It" http://youtu.be/HLbfbBlA08M After watching the video, create a list of at least five items you would include in your own survival kit and explain how they are used.

- Write a minimum one page action/adventure story using the island park as your setting. Be sure to use details, characters, and action to write a story you'll never forget.

Day 9: Exploring Your Island

Choose 3 of the following:

1. Journal Entry: Reaching the main complex. Include 8 (eight) compound words in this journal entry.

   Examples: backbone, downstairs, fingerprint, groundwork

2. Do the following math problems:

   Draw and label a three dimensional shape of an animal cage based on the information below:

   *Length is 100 feet
   *Width is 75 feet
   *Height is 30 feet

   -What is the perimeter?

   -What is the area?

   -What is the volume?

   -What prehistoric animal would this cage be good for? Why?

3. Answer the following math problem:

   Before the park went silent the T-rex stayed in a pen that was 300,000 square yards in size. This pen was not a square, it had eight sides as it's perimeter.

   Draw the T-Rex pen using eight sides with an area of 300,000 square yards.

   Include the perimeter length of each side of the pen (in yards).

   Remember: Area is the space inside and Perimeter is the length around.

4. Take the role of an attorney. Prepare a persuasive speech in favor of or against re-opening the park. Include at least five points that back up your claim.

5. Create an animation (flipbook, comic book, video, etc.) which would show the average person what your island looks like at each stop on your tour (include what the dinosaur looks like, what its surroundings look like, what it eats, etc.)

6. Create a map of your island. (Pencil/paper or computer)

Day 10: Opening Your Park

Choose 1 of the following:

1. Minecraft: Recreate your island in Minecraft and share it with the class. Then allow visitors from other classes to come and take a virtual tour.

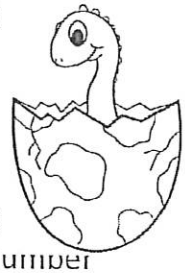
2. Create a video promoting your park. Be sure to use visuals.

3. Create a diorama: Include dinosaurs and plant life to create a model of your park. Use materials that can be found at home (shoebox, cereal box, etc.)

Day 6

Dinosaur Information

A limited list of information about some dinosaurs is listed below. Feel free to research a complete list of known dinosaurs at http://www.dinodictionary.com/index.a
http://www.sciencekids.co.nz/sciencefacts/dinosaurs.html
http://www.kids-dinosaurs.com/



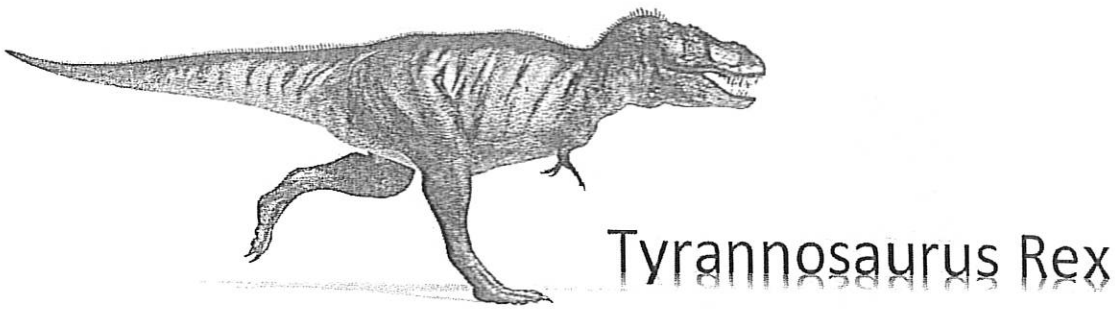
Tyrannosaurus rex

Tyrannosaurus rex is possibly the most well-known dinosaur due to its hug ferocious nature and regular appearances in popular media. Thanks to a number of well-preserved fossils, the T-Rex has been studied in detail by paleontologists all around the world.

- 'Tyrannosaurus' comes from the Greek words meaning 'tyrant lizard', while the word 'rex' means 'king' in Latin.
- Tyrannosaurus rex is often abbreviated to T-Rex.
- Tyrannosaurus rex lived in an area of the Earth that now makes up western North America.
- Tyrannosaurus rex walked on two legs, balancing its huge head with a long and heavy tail that sometimes contained over 40 vertebrae.
- Tyrannosaurus rex measured up to 13m (42ft) in length, 4m (13ft) at the hip and could weigh up to 7 tons!
- The skull of a Tyrannosaurus rex alone measured up to 1.5m (5ft) long.
- The largest tooth of any carnivorous dinosaur found to this date is that of a T-Rex. It is estimated to have been around 30cm (12in) long when including the root.
- When Tyrannosaurus rex hit around the age of 14 its body size would increase rapidly, putting on around 600kg (1300lb) a year over the next 4 years.
- Tyrannosaurus rex had small arms that were extremely powerful and featured two clawed fingers.
- Tyrannosaurus rex lived in the late Cretaceous Period, around 66 million years ago.
- Because of the lack of concrete evidence, it is difficult for scientists to work out how fast Tyrannosaurus rex could run, with estimates ranging from as low as 17kph (11mph) to as high as 70kph (43mph). Average estimates suggest a max speed of around 40kph (25mph).

- There is also strong debate about whether Tyrannosaurus rex was a predator or scavenger. It had small arms which would have made it hard to grip prey, suggesting it may have been a scavenger. On the other hand, evidence in favor of it being a predator includes its forward pointing eyes which give better depth perception and make it easier to hunt.
- In 1997 the Field Museum of Natural History in Chicago purchased an 85% complete Tyrannosaurus rex fossil skeleton (nicknamed 'Sue' after its discoverer Sue Hendrickson) for 7.6 million US dollars, making it the most expensive dinosaur skeleton to date.
- Along with Stegosaurus and Iguanodon, Tyrannosaurus rex was one of three dinosaurs that inspired the appearance of Godzilla.

Tyrannosaurus rex was represented in the popular Transformers toy line and animated series as Grimlock, an Autobot that could transform into a powerful Tyran[illegible]



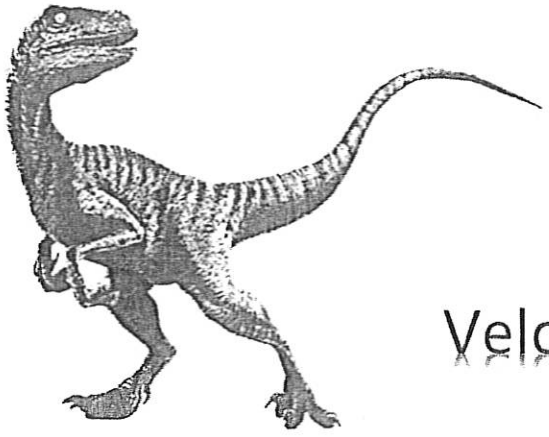
Velociraptor Facts

Enjoy our Velociraptor facts for kids and learn a wide range of interesting information about this popular dinosaur.

Although it featured some nasty looking claws, the Velociraptor was actually a lot smaller than it was portrayed in the movie Jurassic Park, more the size of a turkey than a human. Read on to find out where their fossils have been found, which NBA team is named after them and more

- The name Velociraptor means 'swift seizer'.

- Velociraptor lived in the late Cretaceous Period (around 73 million years ago).
- The Velociraptor played a large role in the Jurassic Park movies but was often shown inaccurately. Rather than being a larger, human sized dinosaur, the Velociraptor was around the size of a Turkey. It is also believed to have had feathers that were not shown in the movie portrayal.
- A fully grown Velociraptor could grow up to 2m (6.6ft) in length, 0.5m (1.6ft) in height at the hip and weigh up to 15kg (33lb).
- The Velociraptor is thought to have killed its prey with sickle shaped claws on its rear feet.
- The first known Velociraptor fossil was found in the Mongolian Gobi Desert in 1922.
- One of the most famous dinosaur fossils ever found features a Velociraptor in the middle of battle with a Protoceratops.
- The NBA basketball team based in Toronto, Canada, are known as the Toronto Raptors. Both their team name and logo are based on the popular dinosaur.



Velociraptor

Triceratops Facts for Kids

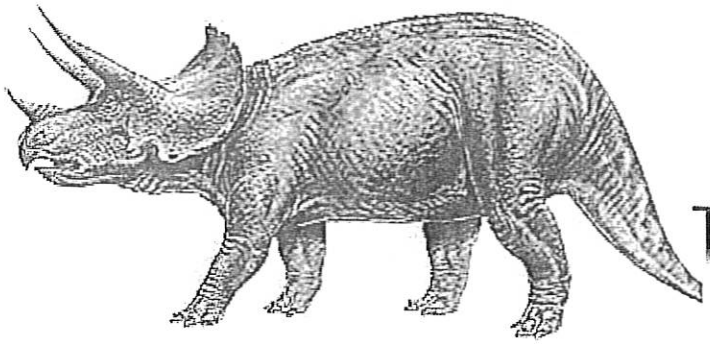
Check out our fun Triceratops facts for kids and learn all about this popular dinosaur.

The Triceratops is easily recognized thanks to the three horns found on its face as well as its large body and the unique frill around its head. Find out just how big

they were, what they ate, why they needed their horns, what US state lists them as their official dinosaur and more interesting information.

- The name 'Triceratops' comes from the Greek language, with 'tri' meaning three and 'keratops' meaning horned face.
- Triceratops lived in the late Cretaceous Period (around 65 million years ago).
- The Triceratops is one of the most easily recognizable dinosaurs due to its large body, unique frill and three horns.
- It needed its three horns to try and protect itself from the Tyrannosaurus Rex which lived during the same time period.
- It is believed that fully grown Triceratops were about 8m (26ft) in length, 3m (10ft) in height and weighed anywhere between 6 to 12 tons.
- The skull of a Triceratops alone could grow over 2m (7ft) in length.
- The Triceratops was a plant eating (herbivore) dinosaur.
- The first known fossils to be that of a Triceratops were horns attached to a partial skull, found near Denver, Colorado in 1887.
- Triceratops had anywhere between 400 and 800 teeth, although only a small percentage of these were in use at any one time as they were constantly replaced throughout its lifetime.
- Triceratops was represented in the popular Transformers toy line and animated series as Slag, an Autobot that could transform into a Triceratops form.
- The US state of Wyoming lists the Triceratops as its state dinosaur.

Triceratops pictures (http://www.sciencekids.co.nz/pictures/dinosaurs/triceratops.html)



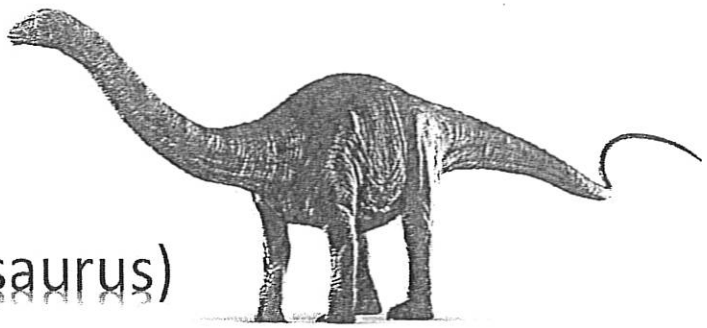
Triceratops

Apatosaurus (Brontosaurus)

Enjoy our fun Apatosaurus facts for kids. Also known as the Brontosaurus, this giant dinosaur is one of the largest animals to have walked on Earth, reaching an amazing 23m (75ft) in length and 23 tons in weight.

Learn when it lived, what it ate and lots more by checking out our cool Apatosaurus facts and information.

- The Apatosaurus is also well known as the Brontosaurus. Confusion was caused when bones of the giant dinosaur were first discovered back in 1877 by Othniel Charles Marsh. After naming the new dinosaur Apatosaurus (meaning deceptive lizard), he later found a larger set of bones and incorrectly thought they were a new species which he then named Brontosaurus (meaning thunder lizard). It turns out that the second set of bones were just the adult version of the Apatosaurus. The name Brontosaurus caught on and it wasn't until recently that the original and technically correct name Apatosaurus has gained widespread use among the public.
- Apatosaurus lived in the Jurassic Period, around 150 million years ago.
- The Apatosaurus is one of the largest animals to have ever walked on Earth, averaging around 23m (75ft) in length and a weight of over 23 metric tons.
- According to studies, it took an Apatosaurus only around 10 years to reach its full size.
- Apatosaurus had long whip-like tails that counter balanced their long necks.
- Apatosaurus was a plant eating (herbivore) dinosaur.
- Apatosaurus was represented in the popular Transformers toy line and animated series as Sludge, an Autobot that could transform into an Apatosaurus form.



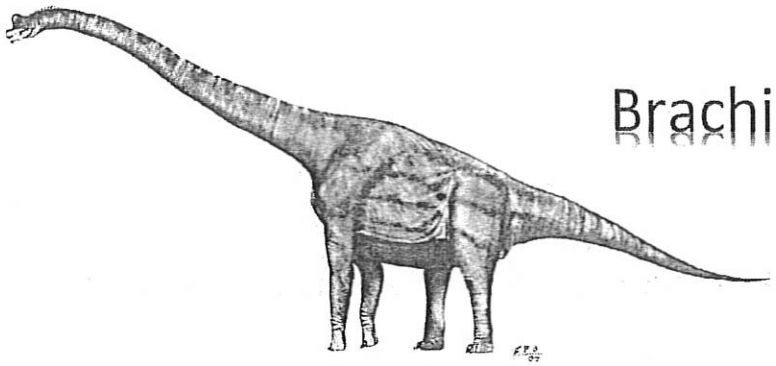
Apatosaurus (Brontosaurus)

Brachiosaurus Facts for Kids

Check out our cool Brachiosaurus facts for kids. The Brachiosaurus was a huge dinosaur that ate between 200 and 400 kilograms (440 and 880 pounds) of plants every day! It had a relatively small tail compared to other Sauropods, reached around 26 metres (85 feet) in length and even had an asteroid named after it.

Read on and enjoy all our fun facts and interesting information about the Brachiosaurus.

- The Brachiosaurus is a type of dinosaur known as a Sauropod, they are famous for reaching incredible sizes. Other members of the Sauropod family include the Diplodocus and Apatosaurus.
- The name Brachiosaurus comes from Greek words meaning 'arm' and 'lizard'. The name refers to the interesting nature of Brachiosaurus legs which were longer at the front than the back.
- Brachiosaurus lived in North America.
- The first fossils were found in the Colorado River of the United States of America in 1900. Elmer Riggs first described the giant dinosaur in 1903, calling it "the largest known dinosaur".
- The Brachiosaurus had a long neck, a small head and a relatively short tail compared to other Sauropods.
- The Brachiosaurus walked on all four legs.
- The weight of Brachiosaurus has been estimated between 30 and 45 metric tons.
- The length of Brachiosaurus is believed to have been around 26 metres (85 feet).
- The Brachiosaurus was a herbivore (plant eater), that feed on foliage high above the ground.
- It is estimated that Brachiosaurus ate between 200 and 400 kilograms (440 and 880 pounds) of plants every day!
- It wasn't until 1994 that the original Brachiosaurus fossils found by Elmer Riggs were shown in a museum.
- An asteroid found in the main asteroid belt of the Solar System was named after the Brachiosaurus.
- Brachiosaurus featured in the movie adaptation of Michael Crichton's well known book, Jurassic Park.



Brachiosaurus

Carnotaurus Facts for Kids

Check out our cool Carnotaurus facts for kids and learn what made this dinosaur so unique and interesting.

With a name like Carnotaurus you might have guessed that this dinosaur was a meat eater, it also weighed around 2000 kg and had unique eyes that faced forward, rather than to the side like most other dinosaurs. Read on and enjoy more facts and information about the Carnotaurus.

- The name Carnotaurus means 'meat eating bull'....eek! The name refers to the horns found above its eyes, which are similar to bull horns.
- Carnotaurus lived around 66 million years ago, before the mass extinction event that occurred at the end of the Cretaceous Period.
- Carnotaurus lived in an area of South America known as Patagonia. They were discovered in 1985 by a famous Argentine paleontologist named Jose Bonaparte.
- Estimates suggest that the Carnotaurus was around 8 metres (26 feet) in length and weighed somewhere between 1500 and 2500 kg.
- Unusually for a dinosaur, Carnotaurus eyes faced forward.
- Carnotaurus had very small arms and fingers that did not move.
- Carnotaurus featured in the 2000 Disney animated movie called 'Dinosaur'.

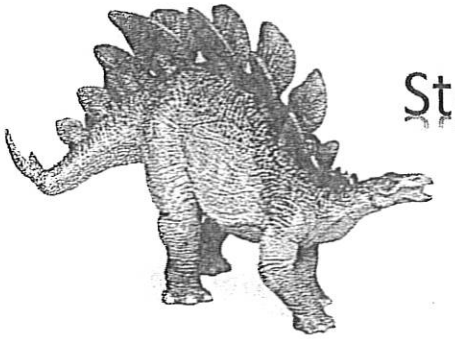
The Carnotaurus was mentioned in Michael Crichton's book The Lost World, which was the sequel to Jurassic Park.

Stegosaurus Facts for Kids

Learn more about the Stegosaurus with our fun facts and information for kids.

- Part of a group of dinosaurs known as Stegosauria, the Stegosaurus was a large dinosaur that featured unique bones and plates along its spine. Read on and find out where the Stegosaurus lived, what its name means, how fast it could run, the size of its brain and lots more interesting information. The Stegosaurus is the most famous dinosaur from a group of dinosaurs known as Stegosauria. They were all herbivores (plant eaters) and featured rows of unique bones that developed into plates and spines along their back and tail.
- The name 'Stegosaurus' comes from the Greek words 'stegos' meaning roof and 'sauros' meaning lizard.
- The Stegosaurus was alive in the late Jurassic Period (around 150 million years ago).
- Stegosaurus fossils have been found in western North America and more recently in Portugal, indicating that they lived in Europe as well.
- In terms of size, the Stegosaurus was large and heavily built. On average, a fully grown Stegosaurus was around 9 metres (30ft) in length, 4 metres (14ft) in height and up to nearly 5 metric tons in weight.
- Although the Stegosaurus body was large, the size of their brain was only around the size of a dog's.
- Researchers believe that due to the nature of Stegosaurus legs, they had a maximum speed of around 7kph (5mph).
- The 17 plates found along the back of the Stegosaurus arose from the skin rather than being attached to the skeleton. The largest plates were around 60cm (2ft) tall and 60cm (2ft) wide.
- The Stegosaurus also featured tail spikes that reached around 60cm (2ft) to 90cm (3ft) in length.
- Along with Tyrannosaurus rex and Iguanodon, Stegosaurus was one of three dinosaurs that inspired the appearance of Godzilla.
- Stegosaurus was represented in the popular Transformers toy line and animated series as Snarl, an Autobot that could transform into a Stegosaurus form.

The US state of Colorado lists the Stegosaurus as its state dinosaur.



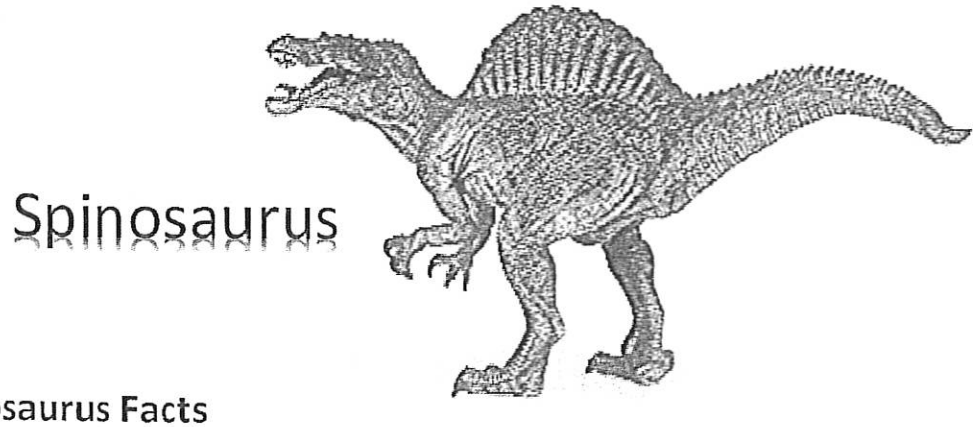
Stegosaurus

Spinosaurus Facts for Kids

Check out these cool Spinosaurus facts for kids and learn about what might have been the largest meat eating dinosaur ever!

- The name Spinosaurus refers to the huge spines that grew from its back, reaching over 1.5 metres (5 feet) in length. Read on to find out more interesting information about the Spinosaurus, including when it lived, where its first fossils were found and how much it weighed. The Spinosaurus lived around 100 million years ago in what is now North Africa.
- The name Spinosaurus means 'spine lizard'.
- Fossils of the Spinosaurus were first found in Egypt around 1910.
- The Spinosaurus was larger than the Tyrannosaurus Rex and may have been the largest carnivorous (meat eating) dinosaur ever.
- Studies estimate that it was around 15 metres (49 feet) in length and weighed anywhere between 7 to 20 tons.
- The Spinosaurus featured distinctive spines which grew over 1.5 metres (5 feet) long.
- The Spinosaurus had a long, thin skull.
- While the Spinosaurus usually walked on two legs, studies suggest that it may have occasionally crouched on all four.

Spinosaurus featured in the popular movie Jurassic Park 3.

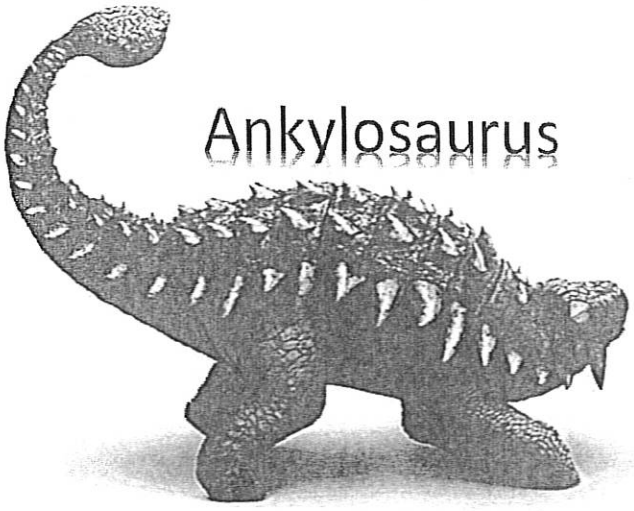


Ankylosaurus Facts

Check out our cool Ankylosaurus facts for kids and have fun learning more about this amazing dinosaur.

- The Ankylosaurus was a big dinosaur that featured huge plates of body armor to protect itself from attackers, and if that wasn't enough it also had a massive tail club that was strong enough to break bones. Read on for more interesting facts and information about the Ankylosaurus. The name Ankylosaurus means 'fused lizard'.
- Ankylosaurus lived at the end of the Cretaceous Period (around 66 million years ago). They were one of the last dinosaurs remaining before the large extinction event that occurred around this time.
- The Ankylosaurus was a large dinosaur. Scientists estimate it reached a length of around 9 metres (30 feet) and a weight of around 6000 kg (13000 lb).
- Ankylosaurus were herbivores (plant eaters) and had small teeth relative to their body size.
- The signature feature of Ankylosaurus was its body armor. Huge plates of bone were embedded into the skin which helped protect the Ankylosaurus against attackers. Similar body armor is found on a crocodile or armadillo.

The Ankylosaurus had a massive tail club that it could use to generate a large amount of force, potentially breaking the bones of another dinosaur while defending itself.



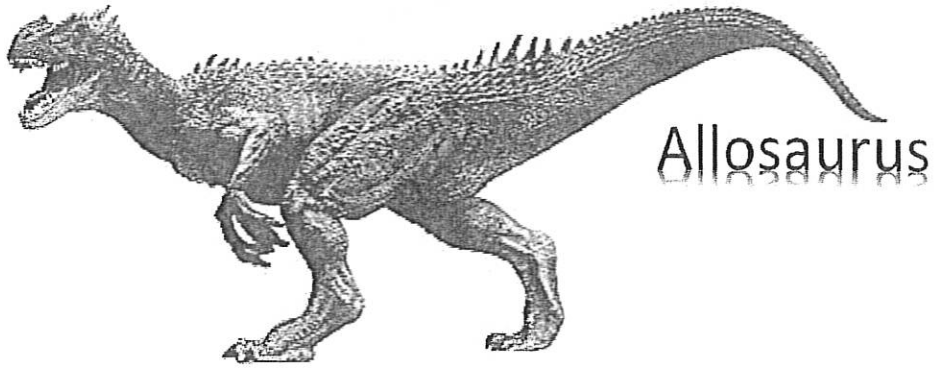
Allosaurus Facts for Kids

Check out our cool Allosaurus facts for kids. The Allosaurus was a large dinosaur that lived around 150 million years ago. It was a carnivore with big, sharp teeth

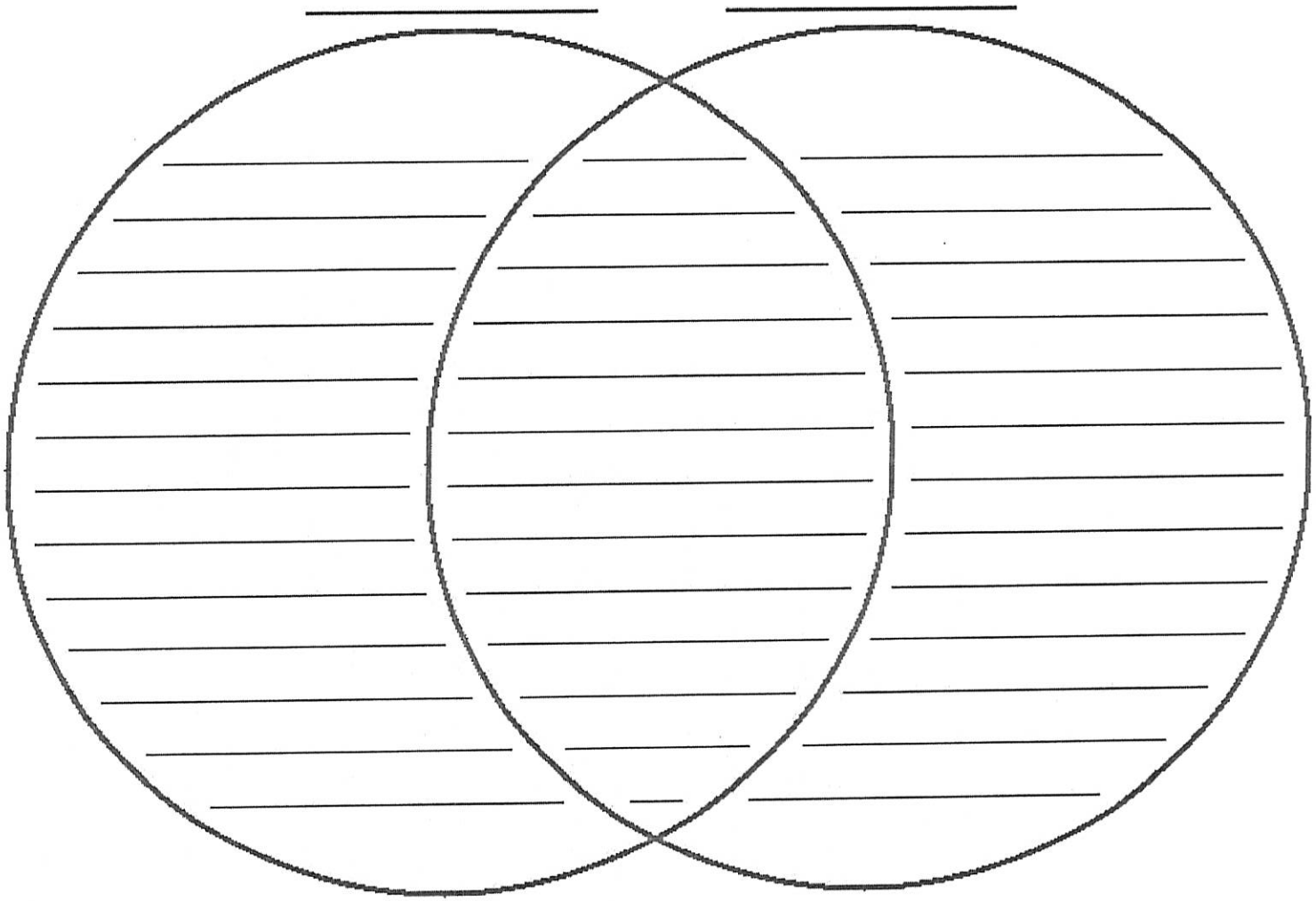
and there is even evidence to suggest that it attacked the much heavier Stegosaurus.

- Read on to find out more interesting information about what the Allosaurus looked like, where its fossils have been found, what its name means and much more. Allosaurus lived around 150 million years ago in the late Jurassic Period.
- The name Allosaurus means 'different lizard'.
- Allosaurus was first described by Othniel Marsh in 1877 and become one of the first well known dinosaurs. Marsh also named and gave the first description of the Apatosaurus (Brontosaurus) in that same year.
- Most Allosaurus fossils have been found in the Morrison Formation, a distinctive band of sedimentary rock found in the western United States.
- Allosaurus had a large skull and walked on two legs.
- Its body and head were balanced by a long and heavy tail.
- Like the Tyrannosaurs rex, the Allosaurus had short arms. It had three fingers that were each tipped with sharp, curved claws.
- Research suggests that the average length of an Allosaurus was around 8.5 metres (28 feet) and that it weighed around 2.3 tons.
- Allosaurus was a carnivore (meat eater) and featured big, sharp teeth that had edges like saws. They were active predators and there is evidence that they attacked Stegosaurus.
- In 1991 a 95% complete skeleton of an Allosaurus was found in Wyoming, United States. Nicknamed 'Big Al', the Allosaurus skeleton (along with a further skeleton nicknamed 'Big Al Two') greatly helped scientists further the study of Allosaurus.

The Allosaurus is a popular dinosaur that has featured in many books, documentaries and films, including Arthur Conan Doyle's 1912 book 'The Lost World' and the BBC television series called 'Walking with Dinosaurs'



Name : _____ **Venn Diagram**



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BIOMES (DAY 7)

There are 9 land based biomes and 5 water based biomes. General information about 3 land based biomes is provided below.

Rainforest

LOCATION: There are two types of rainforest biomes: temperate and tropical rainforests. Temperate rainforests are found along coasts in temperate regions. The largest temperate rainforests are on the Pacific coast in North America, stretching from Alaska to Oregon. Other temperate rainforests are found along the coast of Chile, the United Kingdom, Norway, Japan, New Zealand, and S. Australia. Tropical rainforests are generally found between 30°N and 30°S latitudes, covering 6 - 7% of the Earth's land surface. Tropical rainforests can be found around the world: In Central and South America; in Western Africa, eastern Madagascar, and the Zaire basin; and in Indo-Malaysia along the west coast of India, Assam, Southeast Asia, New Guinea, and Queensland, Australia.

WEATHER: Rainforests are important because they help maintain global weather patterns and rain. Water that evaporates from trees falls in other areas as rain.

Tropical rainforests are lush and warm all year long! Temperatures don't even change much between night and day. The average temperature in tropical rainforests ranges from 70 to 85°F (21 to 30°C). The environment is pretty wet in tropical rainforests, maintaining a high humidity of 77% to 88% year-round. The yearly rainfall ranges from 80 to 400 inches (200 to 1000 cm), and it can rain hard. It can downpour as much as 2 inches (5 cm) in an hour!

Temperate rainforests are also wet, but not as rainy as tropical rainforests. It rains about from 60 - 200 inches (150 - 500 cm) each year, while the other moisture comes from the coastal fog that lingers on the trees. The fog provides about 7 - 12 inches (18 - 30°C) of rain each year. Temperate rainforests are a lot cooler than tropical rainforests, but the temperatures are still mild. They often have two distinct seasons: one long wet winter, and a short drier summer.

PLANTS: One type of plant often found in a rainforest is an epiphyte. Epiphytes are plants that live on the surface of other plants, especially the trunks and branches. They often grow on trees to take advantage of sunlight in the canopy. In temperate rainforests common epiphytes are mosses and ferns, while in

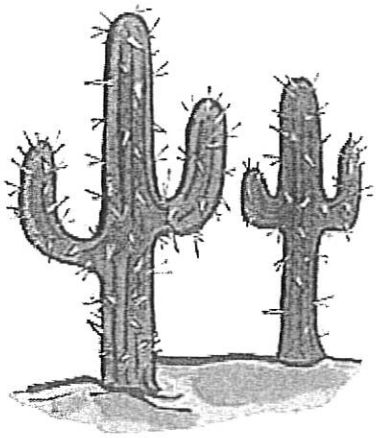
tropical rainforests there are many kinds of epiphytes, including orchids and bromeliads. There are more than 20,000 varieties of orchids found in the rainforest.

There are about 10 -2 0 species of trees in temperate rainforests that are mostly coniferous, meaning they have needles. Trees in temperate rainforests can live much longer than humans, some live for up to 1000 years! Tropical rainforests have a bigger variety of trees, hundreds of species in fact! These trees are mostly broadleaf trees and have a shorter lifespan. They usually live for 50 - 100 years.

Most trees in tropical rainforests have thin, smooth bark. They don't need thick bark to keep them from drying out because the rainforest is so wet. Also, smooth bark makes it difficult for other plants, such as epiphytes, to grow on the tree surface. Trees often have buttresses, large branching ridges near the base, for support because their roots are often shallow and they grow tall to reach the sunlight. Prop roots also help support trees in shallow soils. Many plants in the rainforests have adapted leaf shapes that help water drip off the plant to avoid too much moisture, which might make bacteria and fungus grow.

Tropical rainforests are so big that they are divided into four zones. The top layer of the rainforest is called the emergent layer. Giant trees grow here that are much taller than the trees below. The next layer is the canopy. It contains trees standing 60 to 150 feet (18 to 45 meters) tall. Their branches form a canopy, like a big beach umbrella that shades the forest floor. Thick, woody vines are found in the canopy. Over 2,500 species of vines grow in the rainforest. Some vines, called lianas, are sometimes as big around as a person! They climb the trees in the canopy to reach for sunlight. The next layer, the understory, is a dark, cool area below the canopy, but above the ground. The understory is shaded from much of the sunlight by the canopy. The forest floor is the bottom layer of the rainforest. This is the area where fallen, decomposing plants and trees lay on the ground. Many insects live here. Temperate rainforests have all of these zones except the emergent layer. The tallest trees in the temperate rainforest canopy grow to be about 300 feet (90 meters) tall.

DESERT



LOCATION: Although few animals and plants are adapted to the extremely dry desert life, the desert is a vital biome. The desert is important because it covers about a fifth of the earth's surface! There are both hot and cold deserts. Antarctica is the largest desert in the world, while the Sahara in Africa is the largest of the hot deserts. There are also deserts close to Santa Barbara, such as the Mojave the Colorado Desert which encompass parts of Southern California. In North America, there are four major hot, dry deserts, including the Mojave and the Great Basin. Outside the U.S. hot, dry deserts are found in the Southern Asian realm, South and Central America, Ethiopia and Australia.

Another type of desert is the coastal desert, for example, the Atacama Desert in Chile of South America. And then there are cold deserts. That sounds pretty silly! If deserts are supposed to be hot, how can there possibly be a cold desert? Well these deserts are in places like Antarctica and Greenland where vegetation is sparce, just like the more commonly known hot, dry deserts.

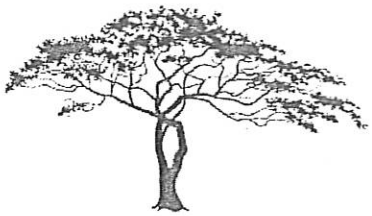
WEATHER: Weather is not the same in all deserts. The seasons in hot and dry deserts are usually very hot during the summer and warm during the rest of the year. During winter these deserts get little rainfall. Rain is often light, or in short concentrated bursts. Most of the time evaporation rates are faster than rainfall rates. Sometimes the rain evaporates before even hitting the ground. This is the reason for the dry characteristic of this type of desert. Coastal deserts are in moderately cool to warm areas. Coastal deserts usually have cool winters followed by fairly long, warm summers. The temperature in the winters is generally 41°F (5°C) or below. In the summer the weather heats up to between 55° and 75°F (12 and 24°C). Average rainfall is usually 3 - 5 inches (8 - 13 cm). The Atacama is the Earth's driest desert. In the Atacama 1 millimeter or more of rain falls every 5-20 years. Cold deserts have short, moist and moderately warm summers, and long cold winters like one could expect in Antarctica. The winter temperature ranges from -5°F to -110°F (-20.5 to -79°C), and in the summer it can be a nice, balmy, 32°F (0°C). The coldest day recorded in Antarctica was -113°F (-80.5°C)!

PLANTS: Deserts plants have many adaptations to survive in such a dry environment. They are good at storing and finding water. Some plants have seeds that can stay dormant in the sand for a long time, until there is enough rain for them to grow. In hot deserts, you'll often find Cacti. Cacti are great at storing water. With their waxy coating, water can't escape and their spines protect them from being desert dinner. Their roots are shallow, and widely spread so that any rain can be absorbed immediately! Some other plants you might find in the hot desert are creosote bush, sagebrush, and ocotillo. Coastal deserts house a variety of plants. These plants must adapt to minimal rainfall by having extensive root systems that come up to the surface to absorb any possible rainfall, and go far down to absorb any water saturated in the ground. These plants also have very thick leaves that can absorb and store water whenever it is available. The plants that live in coastal deserts include salt bush, rice grass, black sage and chrysothamnus. Plants can even live in cold deserts, but you won't find as many here as in other types of deserts. Plants in cold deserts include algae, grasses, and plants with spiny thin leaves. Usually these plants grow only in the summer.

SAVANNA

LOCATION: Savannas are comprised mostly of grasses and a few scattered trees. They cover half the surface of Africa, large areas of Australia, South America, and India. That is a lot of the earth's surface! Savannas can result from climate changes, soil conditions, animal behavior, or agricultural practices. Humans create savannas by burning grasslands and cutting down trees so they can plant crops. Large animals, like elephants, can turn a forest into a savanna by knocking trees down, stripping the bark from the trees, and tramping on tree seedlings.

WEATHER: An important factor in the savanna is climate. The climate is usually warm and temperatures range from 68° to 86°F (20 to 30°C). Savannas exist in areas where there is a 6 - 8 month wet summer season, and a 4 - 6 month dry winter season. The annual rainfall is from 10 - 30 inches (25 - 75 cm) per year. During the dry season, lightning often strikes the ground, igniting the dry grasses that cover the savanna.



PLANTS: The savanna is dominated by grasses such as Rhodes grass, red oats grass, star grass, lemon grass, and some shrubs. Most savanna grass is coarse and grows in patches with interspersed areas of bare ground. You

won't see many trees in the savanna because of little rainfall. Occasionally, you'll find individual trees or small groves of trees. These mostly live near streams and ponds. The Acacia tree is an interesting plant in the savanna. It has an umbrella shape, with branches and leaves high off the ground that giraffes like to eat. Baobab trees also live in the savanna. They deal with dry conditions by storing water between the bark and meat of the tree.

Travel Itinerary

Day 8

Type of Travel		Cost	Total
Travelers	1		
	2		
	3		
	4		
	5		
Time/Days			
Extra Resources Needed			

The most important part of a mission is getting there. You've got to figure out how you plan to travel to your destination.

Objective: Create a travel itinerary.

Will you take a plane, boat, or helicopter?

If you have loads of supplies to bring, what will be the best way to travel?

How long will the travel take?

Are you planning on bringing items back? Will that affect how you travel?

Use these questions to create your itinerary.

Include:

-Cost
-Time
-Resources needed