

Dinosaur Communication

1-Line Summary

This demo explores the communication strategies, abilities, and limitations of dinosaurs through roleplaying with toy dinosaurs.

Background:

Language and communication are not the same. Language is a form of communication that assigns meaning to written, verbal, or gestural symbols, allowing for the transmission of complex and abstract ideas. It must be learned, and the meanings of symbols can differ from time and place due to their lack of inherent meaning. Humans have the unique ability to communicate through language, while animals have more limited forms of communication. Communication entails the transmission of signals with a known meaning. These signals are typically related to the immediate situation and are often innate or instinctual, rather than learned. Charles Hockett outlined the differences between human language and animal communication in a series of 16 design features. Basic animal communication is limited to at most 9 of the features, while humans possess all 16 of them, exclusively including displacement, productivity, cultural transmission, and duality. Animal communication has a series of functions, including such things as threatening, defense, mate competition, and group identification.

Dinosaurs are a great way to demonstrate these communicative functions, as they are very familiar to people and their diversity allows for the representation of a wide range of functions. Though they did not have language, dinosaurs communicated with one another in a variety of ways. We will never know for sure how specific dinosaurs communicated, but we can get an idea of how things worked by studying fossil indicators or even looking to modern species for examples of how animals with similar niches and abilities communicate. Their coloring and various ornamentations such as crests, frills, spikes, and feathers were likely used to distinguish different species from one another and send messages of warning. They could also create noise through vocalizations or physical movements. In some cases these vocalizations involved complex nasal systems. Other dinosaurs could move their tails at incredibly fast speeds to generate noise. These elements and more likely allowed dinosaurs to communicate with members of their own species and other species about such things as what group they did or did not belong to, territory or mate defense/challenges, and scaring off potential predators.

Readings:

Communication Design Features –

https://en.wikipedia.org/wiki/Hockett%27s_design_features

Animal Communication –

https://en.wikipedia.org/wiki/Animal_communication

<https://www.nature.com/scitable/knowledge/library/an-introduction-to-animal-communication-23648715>

Dinosaur Communication – <https://www.livescience.com/32271-how-did-dinosaurs-communicate.html>

Materials:

- Plastic dinosaurs: tyrannosaurus, triceratops, parasaurolophuses, stegosaurus, assorted other dinosaurs

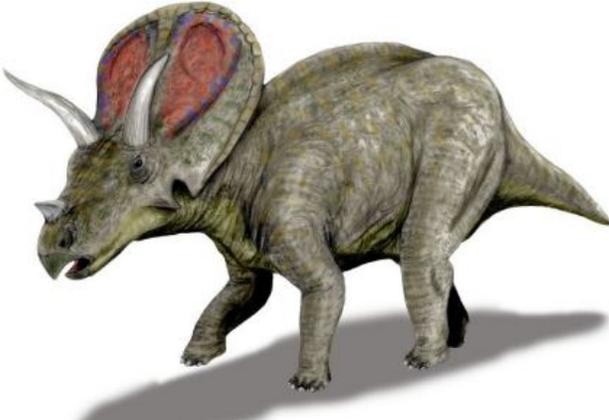
The Interaction:

The pitch – Do you want to learn how dinosaurs communicated?

Using the materials –

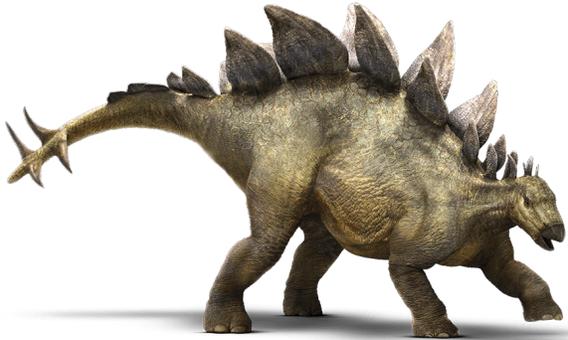
1. Let the visitors choose one of the four dinosaurs. The setup instructions below outline what materials can be used and the talking points provide different suggestions of what can be talked about. If visitors are interested they can continue choosing more of the dinosaurs.

Dinosaur	Tyrannosaurus rex
Photo	
Communicative Function	Prey defense/threatening
Setup	<ul style="list-style-type: none"> • 2 Tyrannosaurus rexes • 1 other dinosaur Setup a prey defense scenario with the other dinosaur as the T. rex's prey.
Question	How would you tell the other T. rex to back off from your food?
Talking Points	<ul style="list-style-type: none"> • T. rex can seem threatening by roaring loudly, showing off its large teeth and claws, or taking a threatening stance. • Tie it back to people by talking about how we aren't limited to simple sounds like growls. • Modern animal comparison: lion
Dinosaur	Triceratops

Photo	
Communicative Function	Mate competition
Setup	<ul style="list-style-type: none"> • 2 Triceratopses Have the the visitor's Triceratops face off with yours in a confrontation scenario.
Question	How would you show off to the other Triceratops?
Talking Points	<ul style="list-style-type: none"> • A triceratops can signal that it is impressive with its horns and large, colorful frill (the bony plate at the top of its head). • These actions help it attract mates or show of its physical strength to competitors. • Tie this back to people by asking how we signal that we are tough or a good mating choice. Talk about dressing in certain ways, such as in business clothes to seem confident and accomplished, or nice outfits for dates. • Modern animal comparison: peacock

Dinosaur	Parasaurolophus
Photo	
Communicative Function	Group identification
Setup	<ul style="list-style-type: none"> • 2 Parasaurolophuses

	<ul style="list-style-type: none"> • 4+ other dinosaurs <p>Give the visitor a Parasaurolophus. Set up the other Parasaurolophus and several other dinosaurs in a grouping.</p>
Question	Which one of the dinosaurs belongs to the Parasaurolophus's group?
Talking Points	<ul style="list-style-type: none"> • Parasaurolophus's coloring can be used to identify it as a member of a particular group. • The crest on its head was part of its nose and it could breathe through it. Like air through a trumpet, it would make a loud noise. These noises were unique to the crest shapes of different species, and thus they could be used to identify other members of a parasaurolophus's species. • Tie this back to people by asking how we identify members of our families or field trip groups. Talk about wearing matching t-shirts or looking similar. • Modern animal comparison: elephant, bird songs

Dinosaur	Stegosaurus
Photo	
Communicative Function	Defense mechanism
Setup	<ul style="list-style-type: none"> • 1 Stegosaurus • 1 other dinosaur (smaller, no defense mechanisms) • 1 Tyrannosaurus rex <p>Setup another dinosaur next to the visitor's Stegosaurus and bring over a T. rex</p>
Question	Which is the T. rex more likely to eat, the Stegosaurus or the raptor?
Talking Points	<ul style="list-style-type: none"> • The stegosaurus's plates make it seem tougher than it really is and help protect it from predators by making it a more difficult meal.

	<ul style="list-style-type: none"> • Tie this back to people by asking how we make ourselves look tough. Talk about things like clothing and appearances that allows us to ward off unwanted attention. • Modern animal comparison: porcupine, turtle
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2. If visitors are looking for an extra challenge, ask them how dinosaurs would communicate more complex phrases such as “see you next week,” or “I miss that tree we used to eat from.” This is a great way to talk about the differences between true language and communication and how the communication abilities of animals are limited.

Messages:

Critical take home: Communication is something that all animals do, and it is not the same as language.

But wait, there’s more: Animals communicate through physical traits such as coloring, ornamentation, and imposing features, as well as other methods such as vocalization and behavior. These different features allow them to say a lot without language.

And still more: They communicate about such things as threats, mate competition, group identification, and defense. These functions are evolutionarily significant and thus all animals have developed ways to communicate them.

And one more thing: Many of the communication methods we believe the dinosaurs used are based on the way we observe modern animals communicating. Because they face similar demands, animals respond to communicative tasks in similar ways. We can also observe these communication methods in modern animals too.

Homework:

Tell visitors to look at the way modern animals communicate. They can observe their pets or other common animals like birds doing many of the same behaviors dinosaurs did.

Make the Link:

This demo is a great linguistics connection with the AMNH Dinosaur exhibit as visitors can think about how the different dinosaurs they will see in the exhibit interact with each other.

Animal Sounds is a good demo to connect to this one, as it looks at one of the ways modern animals communicate.

Target Audience:

This demo works well with many ages. Younger visitors find the opportunity to play with the dinosaurs enjoyable and are typically successful at completing the activity. Older visitors can be challenged to think deeper about the communication abilities and limitations of dinosaurs, and may find some of the facts that they did not know interesting.

This is a great activity for getting the whole family involved. Ask parents to chose a dinosaur as well – they are usually happy to and it gets them involved in the activity, rather than having them just watch from the sidelines.