

# Dragons

REAL MYTHS AND UNREAL CREATURES

EDUCATOR'S GUIDE  
[www.dragonsthefilm.com](http://www.dragonsthefilm.com)





Dragon mythology exists across many cultures, continents and centuries. Follow the tale of a dreamer and a scholar as they trace tales of dragons through ancient Babylon, Greece, Asia and Medieval Europe. Explore how these creatures of legend have influenced our culture, art, literature, and even our dreams.

# About the Guide

From Scandinavia to Central America, Asia and the Arctic, dragon-related myths have been a part of human imaginations for thousands of years. In fact, dragons are in the art, architecture, literature and science of virtually every culture.

Centuries-old legends surrounding dragons, not only offer up tales of heroics, terror, majesty and national pride, they also tie directly to language arts, technology, science and social studies Core Standards.

Besides complementing the viewing experience of *Dragons: Real Myths and Unreal Creatures*, this Educator's Guide offers questionnaires and hands-on activities that allow students of all ages to connect with knowledge in a deeper way.

An interactive grid depicting the correlations to the Common Core State Standards is provided at the end of the guide, along with ideas for further review materials, and details about how *Dragons 3D* came about.

The film is deemed most appropriate for students in grades 3-12. Materials and suggestions for building background knowledge about dragons can be found in this guide for K-2 teachers who wish to share the movie experience with their students.

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Special thanks to the Educator's Guide Team

**Writer/Activities**  
Remy Charest

**Standards &  
Development**  
Sarah Jung, M.Ed

**Standards  
Research**  
Ashley Cissell

**Editor**  
Anne Elizabeth Runion

**Design**  
Friendly Giant  
Marketing  
George Yee

# Dragons, Dragons Everywhere

**D**ragons are the stuff of legends and myths, but they have been a real presence in human culture since the dawn of civilization. Let's take a look at what these fantastic creatures are, and how they have been present in various parts of the world.

From the North Pole to the Gobi desert, from Medieval England to Aztec Mexico, humans have been telling stories about dragons for a long time. The stories are very different, from country to country, from one era to the next. From national symbols to reviled creatures, they can be seen in a lot of different ways.

## A mythical ride through the ages

Images of dragons are found everywhere in art and architecture. Dragons



are present in many buildings and churches in Rome. They were a symbol of the Borghese, a Roman family that was very powerful around the 17th century. In China, spectacular Nine Dragon walls are impressive reminders of the era when dragons represented the emperors. Dragons were also featured on the Ishtar Gate, a spectacular entrance to the inner city of Babylon in the 6th century BC.



In the natural world, humans everywhere have used the name "dragon" for some of the most impressive creatures and places. One of the most beautiful and spectacular kinds of sea

horses is called the Seadragon. One of the largest and most fearsome reptiles in the world is the Komodo Dragon; while a fantastic-looking lizard from Australia, with the ability to change colors like a chameleon, is known as the Bearded Dragon. In the opposite way, dinosaur bones may also have inspired stories about dragons. In China, some paleontologists ask local populations about the location of "dragon bones" to help them make new discoveries.

## Keeping the legends alive

In Asia, many places are also named after dragons, like the Yulong River, the Huanglong Valley and the spectacular Halong Bay ("long" is Chinese for "dragon"). You can even find dragons in the landscape of South Africa where the Drakensberg or Dragon Mountain was named that way because its line of tall cliffs resemble the spine of a gigantic dragon. In the Northern sky, one of the constellations that covers the most space is Draco (the dragon), a long string of stars located close to the Little Dipper (Ursa Minor).



Tadpole Galaxy in Constellation Draco. Photo courtesy NASA

# What is a Dragon?

**D**ragons come in all shapes and sizes. Some are about the size of a human being. Some are gigantic creatures able to destroy buildings and crush armies. Some even cause earthquakes. Some live in the water, some breathe fire, some hide underground, and others fly through the air while others combine features of different animals.

The common thread for all dragons, besides the fact that they are imaginary creatures, is that they are all reptiles in one way or another. Whether they look like snakes, lizards or dinosaurs, their main features are those of the reptilian family.

## All kinds of dragons

If they have always been reptilian, dragons have very different personalities and roles to play in their part of myths and stories. Here are some examples:

- **Guardians of treasures.** In the German story of Siegfried, originally inspired by the Norse Sigurd, the dragon is an evil creature hiding a precious treasure. That storyline is echoed in many other stories from the Middle Ages to the 20th century from the Anglo-Saxon tale of Beowulf to J.R.R. Tolkien's *The Hobbit*.
- **Forces of nature.** In Chinese legends, dragons are often referred to as the cause of earthquakes when they stir underground. They are also seen as responsible for controlling water and rainfall. Scandinavian legends also mention the Midgard Serpent, a mighty creature that encircled the Earth and caused it to tremble when it moved. The Midgard Serpent is also referred to as the "Jormungandr."
- **Creation myths.** Dragons and related creatures are also present in many stories of creation. Tiamat, one of the gods involved in creation myths from Sumer and Babylon, is often portrayed as a dragon. Pangu, the Chinese creator of the universe, is also represented that way. Australian Aboriginal people also have myths about the Rainbow Serpent, who acts as a bridge between Heaven and Earth.
- **Terror in the countryside.** The presence of a dragon near a village or town is another recurrent theme in stories from all over the world. Some Japanese legends, for example, generally involve a brave warrior that slays the creature and puts an end to the terror. The stories, like that of "Maud and the Wyvern" in England, or the one about St. George and the dragon include this theme. According to some accounts, the terror revolving around dragons still persisted in the 18th century.
- **Water monsters.** Though the European tradition commonly associates dragons with fire, there are many stories about dragons that live in water and attack humans from rivers, lakes, and seas. From the Loch Ness monster to the African Mokele Mbembe and the Unktehi of South Dakota, the stories of terrible reptilian water monsters are also common around the world.

These are only a few of the representations of dragons in legends and stories. There are endless variations on this theme, showing just how important this creature is in cultures and minds.





# Dragons as Symbols

**D**ragons also take on a deeper meaning as symbols of natural forces or human character, and often as national symbols. Many countries' or cities' coats of arms or flags feature a dragon, including the flags of Wales and Bhutan, the coat of arms of the City of London, and the coat of arms of the city of Ljubljana in Slovenia. In China, the costumes of the emperors featured lavish representations of dragons, and the Chinese people are sometimes referred to as the descendants of dragons.

## Capturing our imaginations

Dragons were used as symbols of military strength. The prow of Viking ships featured the head of a dragon, to convey the might of the warriors on board. Army regiments in France, England, Germany, and Sweden were called Dragons (or Dragoons). Although they may not have been quite as common in the Middle Ages, helmets and swords featuring dragons are very popular in the medieval-inspired fantasy worlds of role-playing. Because of the legend depicting him as a dragon slayer, St. George, the patron saint of England, has become a symbol of valor and military distinction in that country.

From these powerful images, the idea of fighting and slaying a dragon has also become a symbol at a personal level. Slaying the dragon means triumphing over personal hardship and adversity, reaching a difficult goal, or overcoming your own fears. A powerful image, since dragons are portrayed as dangerous creatures.

## Why are dragons important?

Few creatures, real or imaginary, hold the place that dragons do in human imagination. Present on every continent, described by the mythologies of almost every culture, used as symbols of national pride or personal challenge, they are a unique presence around the globe. As you'll discover in the following pages, the almost universal presence of dragons makes them such an important figure in so many ways.



Japanese Ryujin

# What's Your Dragon?

A few questions to find out what your group knows and likes about dragons.  
(Appropriate for all grades K-12)

- 1) What do you know about dragons?
- 2) Do you know a story about dragons?
- 3) Do you have dragon toys, games, or books at home?
- 4) What is a dragon like, in your opinion?
- 5) Do you like dragons? Why?
- 6) Do you have a favorite kind of dragon?
- 7) Do you think dragons are good or bad?
- 8) Would you like to see a dragon in real life?
- 9) Do you think that dragons exist or existed?



# Dragons Around the World



*Myths about dragons are found all over the planet. Here are a few examples.*

## Alaska

The Inuit in this region tell the story of the Tizheruk or Pal-Rai-Yuk, a giant reptilian sea-monster that could take people from the water's edge without being noticed. It is interesting to note that there are no reptiles in that cold region of the world. Stories about such "sea serpents" are found all along the Pacific Coast of North America, however.

## South Dakota

The Lakota tell stories about a terrifying water monster called Unktehi, who caused great floods and other terrible things to the people. According to some researchers, stories of Unktehi may be tied to discoveries of ancient dinosaur fossils like the horned head of *Dracorex hogwartsia* (see p.10). Terrible water monsters like these are found in many native stories throughout North America.

## Mexico

One of the main deities of the civilizations that lived in Central America before the arrival of Europeans was a feathered serpent known as Quetzatcoatl by the Aztecs and Kukulcan by the Maya. This feathered snake was a central part of religions in this part of the world, often in relation with fertility.

## England

The legend of St George and the dragon remains one of the best-known legends in Great Britain. It has become the classic blueprint for the story of the brave knight rescuing a damsel in distress from a dragon. St George, the patron saint of England, was actually born in what is today's Turkey, and his story is told in many countries from the Middle East to Scandinavia.





## Germany

There are numerous dragon-related legends in German folklore and mythology, a country that is also a rich source of fossils of dinosaurs and flying reptiles like pterodactyls. The most famous is probably that of Siegfried (or Sigurd) and the dragon Fafnir, where the dragon is the guardian of a treasure. Dragons guarding treasures have become a popular storyline.

## Greece

Dragons intervene in many myths from ancient Greece. Hercules slayed the serpent-like dragon Ladon who guarded the Garden of the Hesperides, as well as a multi-headed creature called the Lernaean Hydra. The hero Jason searched for the Golden Fleece guarded by a sleepless dragon, and also defeated an army of warriors born from dragon's teeth that he had sown into the ground.

## Mesopotamia

The fertile valleys around today's Iraq were a cradle of ancient civilization, and the source of one particularly powerful dragon myth. In Sumerian and Babylonian myths of creation, the goddess Tiamat, often represented as a dragon, is slain by her grandson Marduk and then her body is used to create heaven and earth. In some versions of the story, she is not a dragon herself, but gives birth to dragons and other dangerous creatures.

## China

Representations of dragons in Chinese culture are as old as Chinese civilization itself. They were used as symbols of imperial power for almost four thousand years, and are also presented as fearsome but benevolent creatures who controlled natural phenomena like rains and earthquakes. They are still central to Chinese customs like the New Year celebrations.



# Dragons and Dinosaurs



Jörmungandr

*Many legends told around the world have some basic truth at their core. Even though they are mostly imagined, there is usually a connection to what humans found in the real world around them.*

**I**n the case of dragons, many scientists agree that the stories are most likely related to the discovery of fossilized remains of dinosaurs.

Many dry regions on practically all continents of the world have ancient fossils appear regularly on the surface of the ground. Erosion by wind or water bring these old bones to the surface, something that constantly leads to new discoveries by paleontologists, the scientists who study prehistoric life.

## *The stuff legends are made of*

These types of discoveries still happen today in places like the Gobi desert in China, the badlands of many states in the Prairies, or Patagonia in Argentina, to name a few places.

It's easy to think that our distant ancestors would have seen similar things, leading to legends about giant reptilian creatures in all those regions.

Thousands of years ago, when someone stumbled on the remains of enormous, unknown creatures, they had to find some kind of explanation. Without a scientific basis for understanding what they were finding, they tried to imagine what the creatures could have looked like, and how they could have behaved. This is how myths of dragons and many other fantastic creatures like griffins, giants, and monsters may have come about.

## *Mythic inspiration*

Myths can also inspire scientists in their work. For instance, a recent discovery made the relation between dragons and dinosaurs come full circle. In 2004, three amateur paleontologists discovered a 66-million year-old skull with a long muzzle and spiked horns that looked a lot like classic images of dragons from China or Europe in the Middle Ages. The old skull was named *Dracorex Hogwartsia*, after the dragons in the famous Harry Potter series by J.K. Rowling. Rowling said she was delighted at the connection between the dragons she imagined and the real world of dinosaurs.

NOTE: Questions for the activity on the following page were written for students in grades 5-12 to complete individually. For younger students, this quiz can be used to encourage conversation and recall of the information.

**Answers: 1-e, 2-c, 3-d, 4-b, 5-a, 6-a, 7-b, 8-b**

# Do You Know Your Dragons and Dinosaurs?

## Activity

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1. Where have dinosaur fossils been discovered right on the surface of the ground?

- a) The Gobi Desert, in China
- b) The Badlands of South Dakota
- c) The Neuquen region of Patagonia
- d) The Sahara desert
- e) All of the above

2. What does *Dracorex* *Hogwartsia* mean?

- a) Dragon raised on a hog farm
- b) Dragon from high places
- c) Dragon-king of Hogwarts
- d) Dragon with ridges and large warts

3. Besides dinosaurs, what other animals may have inspired legends about dragons?

- a) Crocodiles
- b) Snakes
- c) Turtles
- d) a & b
- e) a & c
- f) b & c

4. True or false: Traditional Chinese dragons had wings.

- a) True
- b) False

5. Besides dragons, what other mythical creatures may have been inspired by the discovery of ancient fossils?

- a) Giants
- b) Elves
- c) Gnomes
- d) Unicorns

6. True or false: North American natives had legends about dragon-like creatures.

- a) True
- b) False

7. What are the scientists who study ancient fossils called?

- a) Antiquarians
- b) Paleontologists
- c) Fossilologists
- d) Archeologists

8. True or false: All dinosaurs, like dragons, were huge creatures.

- a) True
- b) False





# Dragons: Good and Bad



***Dragons have been portrayed both as benevolent and terrifying creatures. Beyond legends, however, how much does this idea of good and bad apply to animals***

**I**n much of Europe, legends about dragons portray these creatures as evil. They terrify the countryside, ask for sacrifices, and wreak all kinds of destruction on the world around them. It takes a courageous, selfless hero to kill the beast and save the people from danger.

Asia, meanwhile, sees dragons as positive forces, and were symbols of imperial power, especially that of emperors. Dragons were still considered mighty and should not to be crossed, as their anger could generate natural catastrophes, but they are generally portrayed as good and helpful. Today, their representation persists in celebrations of the Chinese New Year or on dragon kites, both associated with good times. Also still occurring in this culture, the Chinese celebrate the year of the dragon every 12 years.

## ***It isn't easy being a legend***

Seeing a creature as good or evil often depends on your point of view. For example, deer are generally seen as nice, peaceful, beautiful animals. However, if you ask a farmer whose fruits or vegetables are being eaten by the deer living in the surrounding woods, you may get a very different answer. Sharks have one of the worst reputations in all the animal kingdom.

However, this may have more to do with movies like *Jaws* and the spectacular nature of shark attacks than with the actual character of these underwater predators. Ants are fascinating to watch until they build their colonies in the walls of your old wooden house.

One of the most famous examples is, of course, the wolf. Fairy tales and legends show the big bad wolf blowing houses down, eating grandmothers, and planning to hurt people. However, a different point of view is found in the famous legend of Romulus and Remus, the twin brothers presented as the founders of Rome, who were brought up by a she-wolf after being abandoned in the wild. In nature, however, wolves are not as aggressive as legends would put it, generally avoiding the presence of man. As predators, they also play an important role in controlling populations of deer and other herbivores, preying first and foremost on weak and old animals. They are, in other words, part of the cycle of nature, a balancing presence for ecosystems. Can that be called either good or evil?

*Dragons 3D: Real Myths and Unreal Creatures* portrays the many faces and stories of the age-old mythological creature, good and bad, told and retold throughout generations and cultures.

# I've Got a Reputation

What animals do you like or dislike and why? Answer the questions below and try to see if all animals have good and bad sides.

1. Name an animal that you don't like.
2. Explain why the animal you chose can be considered bad.
3. Do you believe it is actually bad? Why?
4. What are the good things about this animal?
5. Name an animal that you like.
6. Explain why the animal you chose can be considered good.
7. Do you believe it is actually good? Why?
8. What are the bad things about this animal?

# Myths and Fabrications

*Dragon myths may be based on actual findings of ancient bones, but sometimes stories about strange creatures are complete fabrications or even downright deceptions.*

While stories about dragons may come from dinosaur bones and other fossils found around the world, other mythological creatures also have been inspired by some element of reality. Interpreting old bones and other remains can be a difficult task. Many reports and legends about fantastic creatures may well have been attempts to describe or explain something unknown.

In other cases, myths and legends can reflect how human imagination interacts with the world around us. In Michigan, a giant sand dune is called Sleeping Bear Dune, because its shape does resemble that of a sleeping bear. And there is a native legend about how that bear got there. In a similar way, we connect stars as constellations and see lions, giraffes and fish in the sky.



## Are the tales true?

Sometimes, however, people had an interest in creating hoaxes and fabrications. One famous story is that of the fur-bearing trout found in the collections of the Royal Museum of Scotland. The fantastic fish was brought back to Scotland by a woman who had bought a specimen mounted on a wooden plaque from a trip to Canada. It is, in fact, made from rabbit fur attached to parts of a trout. And it was obviously an effective way for someone to make money off a gullible stranger.



Another example is that of the narwhal, an arctic whale that bears a single spiraled tusk extending up to nine feet (2.7 meters) from its upper jaw. In medieval Europe, these impressive tusks were regularly sold as the horns of unicorns. All for a very high price, of course.

As we learn more about dinosaurs and other ancient creatures, it's easy to see that reality can be just as impressive as fiction. But humans have always liked a good story, whether it's true or false. Just as long as people don't tend to pass fiction for fact.



# Create Your Own Mythical Creature



*Using your imagination (and elements from actual animals), invent your own legendary beast, and tell everyone its story.*

## 1. Think about your creature

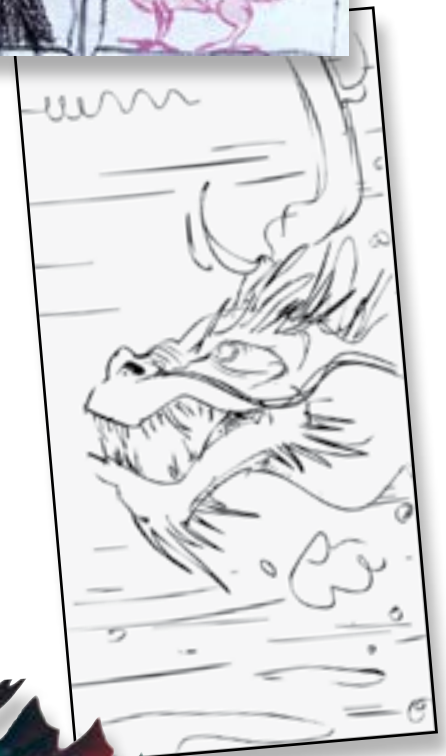
Do you imagine it to be big or small? Reptile, mammal or bird – or all of the above? Predator or peaceful herbivore? The sky's the limit (or maybe the bottom of the ocean).

## 2. Provide visuals

To help people know your creature, give it a visible form. Drawing it or painting it is a good option. You could also make a collage of photos of animal parts (a lion's head, an elephant's body and the wings of an eagle? Why not?). Using modeling dough, papier maché or clay, you could also create a 3D model of your creature, and paint it with your choice of colors.

## 3. Tell a story

Mythical creatures need mythical stories to keep them in our minds. Give your creature a life of its own by telling its story. Tell us what it does, where it lives, and what it eats. You can even create a whole adventure involving it. If it's a really good story, maybe it will even become a legend.



**Dragons**

REAL MYTHS AND UNREAL CREATURES

# The Inner Dragon



Chinese White Dragon

## Got Herpetophobia?

If legends about dragons are so common, it may have to do with humans' deep-rooted fear of reptiles.

Why is it that dragons, those great, terrifying reptiles, are present in so many stories from around the world? One likely explanation is humans' old and profound fear of reptiles.

Scientists have found that this fear, known by the scientific name of herpetophobia, is extremely prevalent. In fact, it is deeply rooted that our brains are wired to react strongly at the sight of creatures such as snakes and alligators. A fear of reptiles was healthy and life-saving for our distant ancestors as they sought to survive in a dangerous environment.

If we have evolved to be hard-wired in our perception of reptiles, it shouldn't be surprising that reptiles play an important role in some of the fundamental stories that have shaped cultures around the world. Dragons, dinosaurs and other scary reptiles are sure to hit the spot with audiences at a very basic level.

## Master the monsters of your mind

The fear of reptiles also explains the symbolism surrounding the idea of triumphing over a dragon. Beyond the physical act of slaying the beast, this struggle against a formidable foe also represents a victory over one's fears and limitations. Although dragons don't exist in real life, we can become heroes of a different kind by winning over our inner dragons and becoming a better, stronger person in the process.

Reptiles are not always scary creatures. Like insects, they may be getting a bad reputation well beyond their actual nature. Most snakes, after all, are not aggressive and would rather hide away peacefully than bite humans. Iguanas and geckos are rather quiet creatures as well. And as we sometimes forget, the slow-paced turtles are also part of this vast family of animals who live in a great variety of environments. Like all creatures, they have a part to play in the balance of our ecosystems.

Answers: 1- b, 2- c, 3- d, 4- d, 5- e, 6-c

# Do You Know Your Reptiles?

## Activity

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- 1) True or false: All snakes are poisonous?
  - a) True
  - b) False
- 2) Which of the following animals is NOT a reptile?
  - a) Turtle
  - b) Snake
  - c) Salamander
  - d) Crocodile
  - e) Iguana
- 3) Reptiles are cold-blooded. What does that mean?
  - a) They can live in very cold environments
  - b) They need to live in very hot environments
  - c) They have no feelings, making them great predators
  - d) They need to use external sources of heat to keep their bodies warm.
- 4) When did reptiles first appear on Earth?
  - a) Over 300,000 years ago
  - b) Over 3 million years ago
  - c) Over 30 million years ago
  - d) Over 300 million years ago
- 5) Where do reptiles live?
  - a) In fields
  - b) In forests
  - c) In freshwater
  - d) In saltwater
  - e) All of the above
- 6) How many species of reptiles have been identified in the world?
  - a) 600
  - b) 2,500
  - c) 8,000
  - d) 5,000



# Overcoming Your Fears

## *What Slithers Through Your Mind?*

**I**f reptiles often evoke fear, they also generate all sorts of other feelings and impressions in people. To us, other animals can also represent a great range of qualities when we see them as playful, powerful, careless or hard-working.

In a group discussion, ask what words come to mind when you say lizard, snake, turtle, alligator or iguana, and discuss the qualities associated with the creatures. Do the same with birds, insects, or mammals.

Other questions can be asked to push the discussion of our perception of animals:

- What animals do you admire? Give reasons why.
- What's a good animal to represent a sports team? A school? A country?
- What animal do you identify with and what are the qualities you like about it?

As you go along, you may find out just as much about humans as you do about animals.



English White and Welsh Red Dragons

# Find Out More



*Explore the world of dinosaurs and mythology*

## Books

**Ernest Ingersoll, *Dragons and Dragon Lore*, London, Dover Books, 2005, 224 pages.**

A study of the presence of dragons in legends all over the world, including the oldest creation stories from Ancient Egypt and Mesopotamia.

**Adrienne Mayor, *Fossil Legends of the First Americans*, Princeton, NJ, Princeton University Press, 2005, 488 pages**

Folklorist and historian Adrienne Mayor explores the way Native American discoveries of dinosaur

fossils were the source for some of their most powerful myths, including some dragon-like “water monsters.”

**Joseph Nigg, *The Book of Dragons and Other Mythical Beasts*, New York, Barron’s, 2002. 128 pages.**

An illustrated, educational look at some of the main dragon legends from around the world aimed at younger audiences.

## Websites

### **Mythic Creatures: Dragons, Unicorns and Mermaids**

Lots of educational resources at the website of the American Museum of Natural History about the origins of legendary creatures from all over the world.  
<http://www.amnh.org/exhibitions/mythiccreatures/>

### **Dragons, Between Science and Fiction**

Quebec Museum of Civilization’s companion web site to an exhibit presented in Europe and North America.  
<http://www.mcq.org/dragons/en/>

### **Animal Planet – Dragons**

A special section of the television network’s web site dedicated to the mythical beasts, including a series of interesting vignettes on the various types of dragons and dragon-related myths. <http://animal.discovery.com/convergence/dragons>

### **Strange Science: Dragons and Dinosaurs**

A series of historical representations of both dinosaurs and dragons, with discussions as to the origins of each of these images.

<http://www.strangescience.net/stdino2.htm>

### **ABC Teach**

Downloadable word search, coloring page, vocabulary, clip art and other dragon paper games. Just type “Dragons” into the search field.

<http://www.abcteach.com>



# The Making of *Dragons: Real Myths and Unreal Creatures*

*Dragons are imaginary creatures, but making movies for the giant screen brings them to life in a very real way.*

When you combine the evolution of modern computer graphics with the power of the giant screen, you get an incredible opportunity to make audiences experience things that never existed - or no longer exist – as if they were real.

The team behind *Dragons: Real Myths and Unreal Creatures* has a particular talent for bringing creatures to life in a stunning way. Director Marc Fafard and Visual Effects Supervisor Martin L'Heureux previously worked together on the very successful giant screen movie *Dinosaurs: Giants of Patagonia*, which brought back to life the largest creatures ever to have walked this Earth.

This experience with bringing giant reptiles to the screen has helped them turn drawings and paintings of completely imaginary creatures into something that moves realistically – and sometimes breathes fire – on the screen. Even though dragons are purely the stuff of legends, they still have to look believable to make the movie experience complete.

## Imagination in three dimensions

Using the 3D capacities of giant screen theaters helps make the dragons more realistic. To produce this effect, filmmakers rely on the fact that our eyes are both facing forward. Having both eyes up front - unlike most dinosaurs or birds, for instance – means that we have a good sense of depth and distance.

Thanks to this ability called stereoscopy, it's easy for us to evaluate how far things are from us and how they stand relative to one another. Losing one eye can create problems for a person as the ability to see is greatly reduced.

This is why you must wear special glasses to see 3D movies. The glasses have two different lenses that act as a filter, so that each eye only perceives one of the two images.

For example, in IMAX® theaters, the glasses use polarization. Polarization is the way light waves can move about vertically or horizontally. Polarized sunglasses use this principle to reduce glare and blinding from the sun. They only let one type of wave come through. In IMAX® 3D, one eye sees a horizontally polarized image and the other, a vertically polarized image, which our brain then assembles into a convincing three-dimensional image.

So when you see a big dragon breathing fire toward you, don't worry. It's just your brain playing tricks on you. But a very convincing trick!



# Parallax at Your Fingertips

*To create a sense of depth, 3D filmmakers rely on a phenomenon called parallax. To see how it works, just raise your thumb.*

Stretch your arm in front of you with your thumb raised up. Look at your thumb with both eyes opened. Then, look with only your left eye open. Now do the same with only your right eye open. You will see your thumb seems to change position relative to objects behind it.

Repeat the exercise folding your arm halfway back, then bringing your thumb only a few inches from your nose.

As you bring your hand closer to your face your thumb seems to move farther from side to side when you switch from one eye to the other. Focusing at the same time on the thumb and the background becomes more and more difficult.

It's the same way in 3D movies. The two images of an object at the forefront will be projected farther apart on the screen than distant objects. This allows our brain to "read" the objects as being closer or further from us, even as the special glasses allow us to assemble the two projections into a single image.



English White Dragon



# Common Core State Standard: Reading

Grade Level	3	4	5	6	7	8	9-10	11-12
<b>LITERATURE</b>								
<b>Key Ideas &amp; Details</b>	RL.3.1	RL.4.1	RL.5.1					
	RL.3.2	RL.4.2	RL.5.2	RL.6.2		RL.8.2		
	RL.3.3	RL.4.3	RL.5.3	RL.6.3	RL.7.3	RL.8.3	RL.9-10.3	RL.11-12.3
<b>Craft and Structure</b>	RL.3.4	RL.4.4	RL.5.4			RL.8.6	RL.9-10.4	
				RL.6.5			RL.9-10.5	
	RL.3.6		RL.5.6				RL.9-10.6	
<b>Integration of Knowledge &amp; Ideas</b>	RL.3.7	RL.4.7	RL.5.7	RL.6.7	RL.7.7	RL.8.7		RL.11-12.7
		RL.4.9	RL.5.9	RL.6.9	RL.7.9	RL.8.9	RL.9-10.9	RL.11-12.9
<b>INFORMATIONAL TEXT</b>								
<b>Key Ideas &amp; Details</b>	RI.3.1	RI.4.1	RI.5.1	RI.6.1		RI.8.1		
	RI.3.2	RI.4.2	RI.5.2		RI.7.2	RI.8.2		RI.11-12.2
	RI.3.3	RI.4.3	RI.5.3	RI.6.3	RI.7.3	RI.8.3	RI.9-10.3	RI.11-12.3
<b>Craft and Structure</b>	RI.3.4	RI.4.4	RI.5.4		RI.7.4	RI.8.4	RI.9-10.5	RI.11-12.5
	RI.3.6		RI.5.6			RI.8.6		
<b>Integration of Knowledge &amp; Ideas</b>	RI.3.9	RI.4.9	RI.5.9	RI.6.9	RI.7.9	RI.8.9	RI.9-10.8	RI.11-12.7

# Common Core State Standards: Reading - Social Studies & Science

*			
Grade Level	6-8	9-10	11-12
<b>HISTORY/SOCIAL STUDIES</b>			
Key Ideas & Details		RH.9-10.1	
	RH.6-8.2	RH.9-10.2	RH.11-12.2
		RH.9-10.3	
Craft and Structure	RH.6-8.4	RH.9-10.4	
		RH.9-10.6	RH.11-12.6
Integration of Knowledge & Ideas	RH.6-8.7		RH.11-12.7
	RH.6-8.8	RH.9-10.8	
<b>SCIENCE</b>			
Key Ideas & Details	RST.6-8.1	RST.9-10.2	RST.11-12.2
	RST.6-8.2	RST.9-10.2	RST.11-12.2
Craft and Structure	RST.6-8.4	RST.9-10.4	RST.11-12.4
	RST.6-8.5		RST.11-12.5
Integration of Knowledge & Ideas	RST.6-8.9	RST.9-10.8	RST.11-12.7

\* For more details, Social Studies and Science standards, please refer to your local State Standards

All standards cited in the electronic version of this Guide are clickable through to their listing on the CCSS website.  
For more information please visit <http://www.corestandards.org>

# Dragons

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