

RESOURCES

BOOKS

American Kennel Club. *The Complete Dog Book: 20th Edition*, New York: Ballantine Books, 2006.

Fogle, Bruce. *The New Encyclopedia of the Dog*, New York: DK Publishing, 2000.

WEB SITES

American Kennel Club <http://www.akc.org/>

The Kennel Club UK <http://www.thekennelclub.org.uk/>

What is a Breed? <http://www.canismajor.com/dog/whtzbred.html>

VOCABULARY

THE RISE OF THE DOG

alpha wolf

the most socially dominant animal in a pack

evolution

the theory that various forms of life are due to successive changes in earlier forms (example: dogs evolved from wolves)

genetic mutation

a random change in a gene or chromosome that results in a new trait that can be inherited by offspring

selective breeding

the process by which animals (or plants) are bred to produce a desired trait in future generations

DOGS BY DESIGN

breed standard: guidelines for identifying the characteristics of a specific breed of dog

hormone: a product of living cells in an organism that causes a specific effect on the activity of other cells

scavenger: an animal that feeds on carcasses or garbage

sight hound: hunting dogs that identify their prey by sight

NATURE SCHEDULE

APRIL-MAY 2007

April 1	Unforgettable Elephants
April 8	Encountering Sea Monsters
April 15	Voyage of the Lonely Turtle
April 22	Dogs that Changed the World – The Rise of the Dog
April 29	Dogs that Changed the World – Dogs by Design
May 6	Sharkland
May 13	Can Animals Predict Disaster?
May 20	Murder in the Troop
May 27	Shadow Over the Sun: A Story of Eagles

Eyes on Yellowstone is made possible by Canon. It assists with important scientific research and breaks new ground in conservation, endangered species protection and the application of cutting-edge science and technology that is essential to managing park wildlife and ecosystems. Canon technology is used for education to increase access to the wonder and magic of one of the most recognizable and popular parks in the world (www.windowstowonderland.org) and raises awareness about the importance of environmental protection and conservation.

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VIDEO ORDERING INFORMATION

To purchase copies of *Dogs that Changed the World*, log on to www.questarhomevideo.com/nature

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450 West 33rd Street
New York, NY 10001
thirteen.org
pbs.org



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Canon



Corporation
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William Clay Ford, Jr.
Chairman of the Board
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Dear Educator:

Ford Motor Company is pleased to bring you this Teacher's Guide and classroom poster for **NATURE**.

The Guide provides stimulating lessons and activities for teachers and students to use as they learn more about the excitement of scientific discovery. It is for use with two **NATURE** programs airing in April that focus on the evolution of the domestic dog from the wild wolf, the amazing diversity of dog breeds, and the many ways that dogs have helped people throughout the years.

The **NATURE** series is an inspiring and exciting way for children to encounter the environment in their classrooms. Ford Motor Company has a strong legacy of caring for the environment and supporting education initiatives, including its innovative curriculum, Ford Partnership for Advanced Studies. We are proud to be associated with this outstanding program.

On behalf of all of us at Ford Motor Company, I salute your work and hope you find these **NATURE** materials a useful tool. I invite you to visit our website at www.fordvehicles.com/escapehybrid for everyday tips on how to live greener, to preserve our playground, and at www.fordpas.org for the Ford Partnership for Advanced Studies.

Sincerely,

William Clay Ford, Jr.



Canon

Canon U.S.A., Inc
One Canon Plaza
Lake Success, NY 11042-1198

Dear Teachers:

For the 17th consecutive year, Canon U.S.A., Inc. is proud to be a sponsor of **NATURE** and its accompanying Teacher's Guide and poster.

NATURE's *Dogs that Changed the World* tells the story of the remarkable impact that dogs have had on human life. The lessons in this Teacher's Guide invite your students to research the abilities and adaptations of different breeds, and to learn more about the special bond between people and dogs.

Canon is steadfast in its commitment to preserve the incredible beauty of animals and natural habitats. In the spirit of our corporate philosophy, *kyosei* — all people, regardless of race, religion, or culture, harmoniously living and working together into the future — Canon takes a socially responsible approach to business. We support social and cultural activities in response to the needs and issues of local communities.

In particular, Canon promotes respect for the environment and strives to maximize resource efficiency in a way that benefits both environmental conservation and economic development. We also believe in the importance of education for today's young people and that teachers like you are such an integral part of the process. Programs that we support, such as **NATURE**, often bring together both the environment and education. Here's a sampling:

- An educational and research program, **Eyes on Yellowstone**, made possible by Canon, breaks new ground in conservation and the application of cutting-edge technology essential to managing park wildlife and ecosystems (www.greateryellowstonescience.org). Teachers and students can take an e-field trip to Yellowstone National Park at www.windowstowonderland.org.
- **The Canon National Parks Science Scholars Program** develops the next generation of scientists in the fields of conservation, environmental science, and park management and encourages doctoral students to conduct innovative research on scientific problems critical to national parks. www.nature.nps.gov/canonscholarships/
- **Canon Envirothon** is North America's largest high school environmental education competition in which more than 500,000 teenagers are involved in a year-long learning process that combines in-class curriculum with hands-on field experiences. www.envirothon.org

You can learn more about us and our programs at www.usa.canon.com. Join Canon and tune in to watch **NATURE** each week so we all can learn more about the natural world.

Sincerely,

Yoroku Adachi
President and CEO
Canon U.S.A., Inc.

introduction

This Teacher's Guide accompanies the **NATURE** miniseries, *Dogs that Changed the World*.

The series explores the 15,000-year-old relationship between dogs and humans and the evolution of wolves into the wide variety of dogs we know today. *Dogs that Changed the World* will help you and your class understand how these animals have helped shape the world we live in.

Lessons in the guide use the programs as a starting point for discussions about the domestication of dogs, breeding dogs for specific traits, and the unique ways in which humans and dogs work and live together. This guide includes **teacher's pages** and **student activity masters** that can be used with any or all of the programs. **Please photocopy the pages and hand them out to students in class.**

WEB RESOURCES

In addition to using the video and this guide, please ask your students to look at the **NATURE** Web site (pbs.org/nature). It may be helpful to copy and distribute other Web addresses we've included, or to have your students do Web searches on topics we've covered in the programs.

USING NATURE VIDEOS IN THE CLASSROOM

You may wish to use questions on the Teacher's Page to spark discussion about *Dogs that Changed the World*. By posing these questions to students before they watch the video, you can help focus their viewing experience. You may stop the video periodically, so students can discuss the subject matter while it is fresh in their minds.

If you are going to use the programs in school, please **prescreen** them to find the segments you'd like to use. **Each program is one hour.** If time is limited, consider using clips that relate directly to the questions and activities that best meet your needs.

TEACHING NATURE WITH STANDARDS

National Science Education standards for Grades 5–8 apply when using these materials. <http://www.nap.edu/readingroom/books/nse/html/6d.html>

SCIENCE AS INQUIRY: Content Standard A — Identify Questions That Can Be Answered Through Scientific Investigations; Use Appropriate Tools and Techniques to Gather, Analyze, and Interpret Data.

LIFE SCIENCE: Content Standard C — Diversity and Adaptations of Organisms

HISTORY AND NATURE OF SCIENCE: Content Standard G — Science as a Human Endeavor

National Council of Teachers of English standards apply when using these materials:

Standard 8: Students use a variety of technological and information resources (e.g., libraries, databases, computer networks, video) to gather and synthesize information and communicate knowledge. For more information on the Web, go to www.ncte.org/about/over/standards/110846.htm

VIDEOTAPING RIGHTS

You have the right to tape the programs and play them for instructional purposes for one year after the programs are broadcast.

BROADCAST DATES

Most PBS stations are broadcasting *Dogs that Changed the World* on the dates below. Broadcast times and dates vary in some areas. Please check your local TV listings to confirm when your PBS station will show the programs.

- Part 1: The Rise of the Dog April 22
- Part 2: Dogs by Design April 29

The Rise of the Dog

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Dogs by Design

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Resources and Vocabulary

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THE RISE OF THE DOG

Broadcast Date: April 22, 2007

Viewing Time: One hour (brief video segments may also be used)

AT A GLANCE

Theme: Humans and dogs have had a special relationship for more than 15,000 years. Dogs are hunters, guards, companions, and much more. In fact, today there are approximately 65 million pet dogs in the U.S. This program traces the mystery of how the domesticated dog evolved from wild wolves and tells the story of how dogs transformed the human world.

OBJECTIVES

Students will:

- discuss a theory that proposes how the domesticated dog evolved from wild wolves.
- analyze some different ways that working dogs help people and examine how certain breeds are well-suited for particular tasks.

PROGRAM HIGHLIGHTS BEFORE VIEWING THE PROGRAM

Biologist Raymond Coppinger believes that garbage dumps played a key role in the story of the domestication of dogs. According to his theory, when human settlements developed, some wolves began to feed on food people threw away.

During the 1950s, geneticist Dmitri Belyaev selectively bred foxes for tameness and discovered that after just a few generations, the descendants of the tamest foxes began to look and behave almost like dogs.

Geneticist Peter Savolainen uses DNA evidence to propose a theory that all dogs originated in a single area in East Asia thousands of years ago — then migrated with humans around the world.

In the Arctic, Inuit hunters depend on the speed and endurance of sled dogs that navigate the landscape, transport heavy loads, and sense weakness in the ice as they're traveling.

Ask students if they know the expression "a dog is a man's best friend," then brainstorm some ways that dogs help people. Write responses on the board. A possible list might include: guard dogs protect people or property; seeing-eye dogs aid people who are blind; hunting dogs help track wild animals; search and rescue dogs find missing people; sled dogs help people travel in snowy climates; dogs at airports sniff out smuggled drugs; and so on.

Turn the discussion toward dog senses versus human senses. First, consider smell. Ask students why they think dogs love sniffing sidewalks, hydrants and trees. One answer is that dogs can smell faint scents we cannot. Second, compare a dog's sense of hearing with ours. Dogs not only hear distant sounds we cannot detect, but they can pick up some high-pitched sounds that we could never hear. Dogs and people are also very good at reading each other's body language. How does this good communication help the bond between dogs and humans?

Show three photos of very different-looking dog breeds, such as a Chihuahua, a Saint Bernard and a greyhound. (A good source for these photos: www.akc.org) Ask students to vote if they think these three dogs came from the same ancestor or different ancestors. After tallying the votes, explain that based on fossil evidence, scientists have figured out that every dog breed in the world today probably came from the same kind of animal: the wolf.

Show two photos of a wolf — a full body shot and a close-up of its head. Ask students to compare and contrast the wolf's physical appearance with that of the three dogs you presented earlier.

How did modern dogs evolve from wild wolves? Did early humans gradually "domesticate" dogs? Or did dogs take the lead in developing this inter-species relationship? Explain that no one knows for sure. But according to a new theory, the key to the first human-wolf friendships was...the garbage dump! Help students brainstorm what human "garbage" might have looked like 14,000 or 15,000 years ago. It probably contained tossed-away bones with scraps of meat on them...something very tempting to a hungry wolf. Inform students to be on the lookout for scavenger-like behavior in this program.



DISCUSSION QUESTIONS

- What are some ways that humans and dogs work together?
- How do you think the domesticated dog evolved from the wolf? What steps might have been involved?
- How are a dog's senses different from those of people?

FUN FACTS A study in the U.K. showed that the sound of a barking dog was better at scaring off thieves than a burglar alarm. The Doberman breed of domestic dog was named after a German tax collector whose last name was Doberman. When this man made his rounds to collect money, he sometimes needed an intimidating dog to protect him as he asked reluctant people to pay their taxes.



STUDENT ACTIVITY PAGE THE RISE OF THE DOG

WHAT TO DO
How do different breeds of dogs help people? Learn more by using reference books or the Internet to complete this chart. Be sure to add your own choice at the end of the list!

TYPE OF DOG (Breed)	WAYS THIS BREED HELPS PEOPLE	ADAPTIONS THAT HELP THIS BREED DO ITS JOB (specialized senses, body type, fur thickness, etc.)
 <p>INUIT SLED DOG</p>	<p>Survival in Arctic climates</p> <ul style="list-style-type: none"> travel: pulling sleds protection: barking if polar bears nearby hunting: sniffing out seals hidden under the ice 	<p>Thick fur</p> <p>Strong muscles / endurance</p> <p>Strong sense of smell</p>
 <p>GOLDEN RETRIEVER</p>	<p>Seeing-eye dog; provides guidance for blind people</p>	<p>Loyal</p> <p>Not easily distracted</p>
 <p>DOBERMAN PINSCHER</p>		
 <p>IRISH SETTER</p>		
 <p>GERMAN SHEPHERD</p>		
 <p>BORDER COLLIE</p>		
 <p>Your Choice Here</p>		

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DOGS BY DESIGN

Broadcast Date: April 29, 2007




Viewing Time: One hour (brief video segments may also be used)

AT A GLANCE







Theme: For many centuries, some types of dogs were bred for specific jobs such as herding, hunting and guarding. Today, some dogs use their superior senses and skills to help people address modern problems. The dog is the most varied species on the planet, with approximately 400 breeds of many different shapes, sizes and temperaments. A number of breeds face problems today, as our choices affect their future.

OBJECTIVES





Students will:

-  discuss how a bloodhound's anatomy gives it a keen sense of smell.
-  compare and contrast different dog breeds' appearance and behavior.
-  research and write an oral history about a particular dog.

PROGRAM HIGHLIGHTS

-  The desert in Jordan has little vegetation and temperatures that can reach over 120 degrees. Yet the Saluki dog thrives in this environment. This breed of dog can sprint up to 40 mph, and helps the Bedouin people hunt for hares.
-  Tiny Pekingese dogs were extremely popular in China for thousands of years because of their connection to Buddhist beliefs. The Pekingese became popular in England in the 1860s, when Queen Victoria had one as a pet.
-  The recent trend for breeding dogs for appearance has led to some breeds being prone to certain genetic diseases.
-  Historian David Hancock describes how the bulldog has changed since the mid-1800s. Originally used by butchers to control livestock in the slaughterhouse yard, bulldogs eventually became popular pets.
-  According to biologist Susan Crockford's theory, hormones can sometimes play a more important role than genetics in the growth and development of dog breeds.
-  A 13-year-old boy with Type 1 diabetes relies on a German shepherd named Delta to tell him when it is time to take his insulin. At Amersham Hospital in England, researcher Carolyn Willis teaches dogs to detect the smell of cancer.

DISCUSSION QUESTIONS

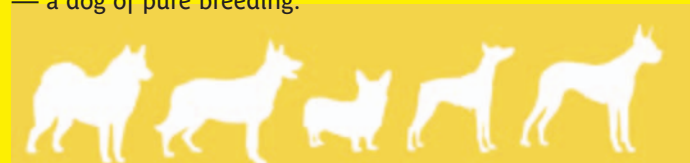
-  What characteristics have people bred into particular dogs to help us with hunting, guarding and herding?
-  What are some ways that the Saluki dog's body is well-designed for quick travel in the desert?
-  Why is the bulldog today so different from the bulldog from the 1800s?
-  What is your favorite dog breed, and why? (Don't forget to include mixed breeds as an option!)

BEFORE VIEWING THE PROGRAM

Hold up five small, identical, opaque containers, such as 35 mm film canisters, clearly labeled 1 through 5. Explain that each one contains a particular smell. (Note: Soak cotton balls with the scent.) Tell students to take out a piece of paper and pencil, and write the numbers 1 to 5 in a list. Let them know that they are going to get to smell each container, and then write down what they think they smell. Open each container one at a time and walk around the classroom, letting each student sniff it, and write his or her response on the paper. Do not let the students look inside the containers—they must only use their sense of smell. Remind students to keep their predictions to themselves. Then one at a time, ask a few students to say what they think the scent is. Write these answers on the board, next to the appropriate number. For this experiment, some possible scents include: onion, lemon, pizza sauce, peppermint extract, vanilla extract, garlic "juice" squeezed from a clove, cinnamon, orange blossom perfume, chocolate chips, and so on. Afterward, discuss which smells were easy to figure out, and which were trickier.

Ask students if they would have been able to do this experiment if the scents were weeks old. Show a photograph of a bloodhound. Explain that this breed of dog probably would have been able to track the scents after a long period of time because of its amazing sense of smell. Share some facts about a bloodhound's sense of smell, such as: Its sense of smell is so powerful that it can follow a scent trail several weeks old. The sense of smell takes up 40 times more brain space in bloodhound's brain than in the human brain.

Explain that bloodhounds got their name from "blooded hound" — a dog of pure breeding.



STUDENT ACTIVITY PAGE DOGS BY DESIGN

Tails and Tales: A Dog Story

Interview a dog owner, and create an oral history of a particular dog. You are encouraged to include photographs, videotape, and any other resources to create a vivid description of this dog's temperament, history, and "personality."

Then — you will research and create a 5–10 minute presentation about this dog to the class, or share with other classes in your school.



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Use this questionnaire as a starting point for your interview. Feel free to make up your own questions, too.

Dog's Name:

Breed:

[if "mixed breed," try to identify which breeds are the most dominant]

How long has the owner had the dog?

Why did the owner select this particular dog (breed)?

What are some examples of the dog's superior sense of hearing?

(You are looking for stories)

Is this the first dog the owner has ever had?

How does the owner describe the dog's personality?

What gives the dog the most pleasure?

What frightens the dog?

Do some research on the particular dog breed, then write down if the dog you are featuring seems to "fit in" with the breed's temperament, ability, etc.