

# Amazing *feats of* Aging

## TEACHER'S GUIDE





## Teacher's Guide

Step right up and see the ***Amazing Feats of Aging!*** Explore the mysteries of why and how animals (including humans) age in this colorful, carnival-themed exhibition.

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This guide was developed at OMSI in conjunction with ***Amazing Feats of Aging***, an OMSI exhibit.



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### Funded by



Department of Health and Human Services • National Institutes of Health

Supported by a Science Education Partnership Award (SEPA) from the National Center for Research Resources

This project was supported by grant number R25 RR16247, from the National Center for Research Resources, National Institutes of Health. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of NCRR or NIH.

## **Exhibit Description**

This highly interactive exhibit explores aging across the animal kingdom, healthy aging, and aging of the brain. Major themes and components include:

### **Mysteries of Aging Revealed**

The introductory exhibits focus on understanding the significance of aging as a demographic, biological, and personal phenomenon. Visitors can analyze aging cells in the body, explore why and how we age, and identify strategies for healthy aging.

### **Introductory Panel**

What *is* aging? Is aging a disease? Gradual or sudden? Universal or individual? A loss or a gain? Environmental or genetic? Irreversible or preventable? Explore these questions through colorful flip panels that address what aging is and what it is not.

This activity is also found on the *Amazing Feats of Aging* web site. (8–adult)

<http://www.oms.edu/visit/life/aging/intro.cfm>

### **Age Machine**

Come face to face with the reality that time changes your appearance. Sit at this computer station and record a black and white picture of your face. Then, using customized software, watch your face “age” up to 25 years! (8–adult)

### **Free Radical Attack**

What causes us to age? Learn about a major cause of aging—free-radical damage inside cells. Watch a video that describes this process and play a game that simulates an energy production pathway inside a cell’s mitochondria. Your goal is to minimize free-radical damage by guiding the “free radical” balls to “repair” holes and away from the “damage” holes. (8–adult)

### **Longer and Longer Lives**

Watch balls whiz up clear tubes to form a graph of the changes in U. S. life expectancy over time. You control air currents to create a graph of the male and female life expectancy from 1850 to 2000. Compare the gains in life expectancy over time and consider how this trend could affect you in the future. (6–adult)

### **A Sticky Situation**

What causes us to age? Feel the “before” and “after” affects of collagen cross-linking, a process that contributes to aging. Stretch collagen fibers in older and younger models to compare differences in springiness and stretchiness. Create your own older or younger collagen model by adding or removing cross-links. (6–adult)

### **What Can We Do About Aging?**

Peek into eight different viewers to see displays of choices you can make to promote healthy aging. Actions include: (1) eat more fruits and vegetables, (2) floss your teeth, (3) protect yourself from the sun, (4) stop or avoid tobacco exposure, (5) increase your physical activity, (6) maintain a healthy weight, (7) challenge your brain, and (8) socialize with family and friends. This activity is also found on the web site. (6–adult)

<http://www.oms.edu/visit/life/aging/healthy.cfm>

### **You Are Many Ages**

Find out which cells in your body are “younger,” “older,” and “oldest”! Compare the relative age of your skin, bones, and brain. Discover which cells are most damaged by aging, which need a steady supply of “building material” to stay healthy, which are at higher risk for cancer, and which are easier or harder to repair. (6–adult)

### **The Wild World of Aging**

Each species has its own story to tell about the aging process. Visitors can compare life spans of long-lived species, explore the physiological effects of aging on different animals, and consider what our study of other species reveals about healthy aging in humans. Young children are especially drawn to exhibits on the aging of animals and can even put on a puppet show!

### **Amazing Aging Animals**

Explore how aging varies greatly among six animals: giant tortoise, roundworm, elephant, human, bowhead whale, and quahog clam. Learn which animal has the longest life span, which one shows no signs of physical decline as it ages, which animal’s life span has been extended six times longer, and more! (6–adult)

### **Banded Mongoose Puppet Theater**

Play with puppets in a little theater to act out a story about the bond between young and old banded mongooses in East Africa. The puppeteers listen to a recording and see the story in pictures, then act it out with puppets for other visitors. Younger visitors find out how animals take care of each other. (3–adult)

### **Animal Families**

Do animals spend time with their elders? Select from a variety of animals: lion, elephant, orca, chimpanzee, polar bear, penguin, bat, turtle, and human. Discover which animals interact with older and younger generations. (3–adult)

### **Older Males or Older Females?**

Compare the life expectancy of males and females of different species. You control air currents to create a graph of male and female longevity for humans, gorillas, siamangs, orcas, pilot whales, and Guinea pigs. Discover how gender influences life expectancy in humans and other species. (6–adult)

### **Older or Younger?**

Can you recognize the many signs of aging in animals? Examine teeth, bones, hair, mobility, and growth rings of various species to determine which animals are younger and which are older. Compare older and younger dogs, rockfish, horses, gorillas, rats, and roundworms. Part of this activity is also found on the web site. (3–adult)

<http://www.oms.edu/visit/life/aging/comparative.cfm>

### **Longevity Parade**

Line up nine animal cutouts (mouse, rabbit, bat, tiger, zebra, hippopotamus, elephant, human, and orca) in order from smallest to largest. Then, line them up again from shortest to longest record life span. Discover which animals live longer, why larger animals generally live longer than smaller ones, and which smaller animals are exceptions to this rule. (3–adult)

### **The Amazing Aging Brain**

A healthy brain is central to healthy aging. Visitors can examine the changes that occur in the brain over time, distinguish between the effects of disease and healthy aging on the brain, and identify choices that enrich and nurture the brain throughout life.

### **Amazing Lifelong Learning**

How many everyday items from the past 100 years can you identify? The items in this colorful collage are arranged chronologically in different decades. How much do you know, and how far back in time can you go? Consider how much more life experience and knowledge you gain with age. (6–adult)

### **Can Older Brains Learn New Tricks?**

Design an environment for an older “cage potato” rat that will keep its brain healthy and stimulate brain growth. You are challenged to furnish a two-story house by choosing from a variety of items. Discover how exercise, novel challenges, and social experiences enrich the brain. Apply your discoveries to activate your own brain growth! (3–adult)

### **The Healthy Aging Brain**

How does a healthy brain change with age? Compare PET scans and MRIs of healthy brains. What differences do you see between a healthy 27-year-old and a healthy 87-year-old brain? Discover that normal aging of the brain does not impair important functions. Part of this activity is also found on the web site. (9–adult)

<http://www.oms.edu/visit/life/aging/brain.cfm>

### **Think Fast!**

Test your response time at this computer game and compare your results to different age groups. Your task is to quickly and correctly match number symbol pairs to a constant set of numbers and symbols. Discover how response time changes with age and some of the trade-offs between brain gains and losses as you age. (6–adult)

### **What About Alzheimer’s Disease?**

Explore diagrams, models, photographs, and microscope slides to learn how Alzheimer’s disease affects the brain. Find out how the disease is diagnosed, what causes the disease, which parts of the brain are affected, and what happens to an afflicted person. (9–adult)

## Your Visit

Educational research (yes, you can get a Ph.D. studying field trips) has identified the following recommendations for making the most of your field trip.

•**Student knowledge of field trip setting and agenda is important.**

Studies suggest that children in a novel environment initially focus their attention on learning about the setting rather than the instructional material. Prior information about the trip agenda (how we will get there, where we will park, what we will see, what we can buy, where we will eat, etc.) will enhance your students' educational experience. In one study, this kind of information enhanced learning more than prior information about the subject of the exhibit (of course, both are valuable)!

•**Prepare students with pre-visit activities.**

See the Classroom Activities section of the guide for ideas related specifically to the exhibit. Pre-visit activities can also include vocabulary words, reading and writing assignments, classroom projects, and related activities found in existing textbooks and recommended resources.

•**Follow-up with post-visit activities.**

Post-visit activities help to connect the museum experience to the classroom. Exhibits at the museum may spark curiosity or interest, which can be taken advantage of back in the classroom.

•**Help us evaluate your museum experiences.**

Your feedback is vital for our evaluation and improvement of our exhibits and other educational offerings. Please share your comments with us during your visit.

## Active Learning Log

The active learning log may be copied and used by individual students or by small groups. For small groups, direct the students to work as a team to complete the activities. For younger children or non-readers, adult chaperones can assist with reading and recording responses. Remember to supply pencils!

•**Hint 1:** If you hand out worksheets to a large group, tell some to start in the middle and some at the end. If an exhibit is crowded, visit one of the other suggested exhibits to explore.

•**Hint 2:** Customize your worksheets for your class. Cut and paste from any of the activity pages to make a worksheet just for your class.

• **Hint 3:** Provide students with a writing surface (clipboard, notepad, etc.) with a pencil attached to it.

## Active Learning Log

### **Amazing Feats of Aging**

Every animal has its own story to tell about aging. As you explore the exhibit, look for the following animals and write down something you learned about how it ages.

Dog \_\_\_\_\_

Elephant \_\_\_\_\_

Giant Tortoise \_\_\_\_\_

Orca \_\_\_\_\_

Rat \_\_\_\_\_

Roundworm \_\_\_\_\_

Rockfish \_\_\_\_\_

Bat \_\_\_\_\_

{Visit: *Older or Younger, Animal Families, Amazing Aging Animals, Older Males or Older Females, Longevity Parade, Intro Panel* and check the *Amazing Posters*}.

Describe a process in the body that is thought to cause aging:

\_\_\_\_\_

{Visit: *Free-Radical Attack or A Sticky Situation*}.

### **Longer and Longer Lives**

What was the average U.S. life expectancy for (circle one) males or females in:

	1850?	1900?	1940?	2000?
My prediction				
Answer				

Why are these numbers growing?

\_\_\_\_\_

### **What Can We Do About Aging?**

Describe two things you can do to promote healthy aging. Why is this choice good for your body?

\_\_\_\_\_

\_\_\_\_\_

### **You are Many Ages**

Where are the oldest cells in your body found?

\_\_\_\_\_

Where are the youngest cells?

\_\_\_\_\_

### **Aging Brain**

How does a *healthy* brain change with age?

Name some rewarding changes, ways that brains improve as they grow older:

\_\_\_\_\_

Name some challenging changes, ways that brains decline as they grow older:

\_\_\_\_\_

## Active Learning Log/Answer Key

The responses below draw from all the examples found in the exhibition. Some exhibits may not be available during your visit.

### ***Amazing Feats of Aging***

Every animal has its own story to tell about aging. As you explore the exhibit, look for the following animals and write down something you learned about how it ages or its life span.

Dog: Some older dogs have gray hair, their bones may be more jagged, and some may develop cataracts from collagen cross-linking.

Elephant: Older elephants move more slowly and their teeth wear out. Elephants go through six sets of molars in a lifetime. Each set wears out from heavy use after about 10 years. When the last set is gone, the elephant will starve to death. Elephants live in family groups led by the oldest female. Mature elephant matriarchs are more successful leaders because of their long experience.

Giant Tortoise: Tortoises show little sign of aging and keep growing and reproducing throughout their long lives. Giant tortoises may live longer than 150 years!

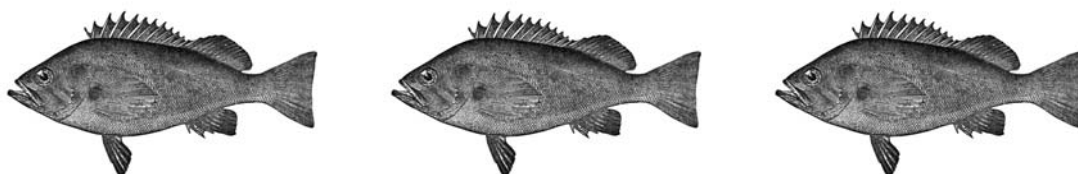
Orca: Record lifespan is about 80 years. A female orca may live for decades after her fertility ends at around age 40. Orcas live in family groups called “pods.”

Rat: Older rats have rougher fur. Challenging environments enhance the brain function of middle-aged rats.

Roundworm: Older worms slow down and lose muscle. The average life span is about 2 weeks. Altering its genes and removing its reproductive system have extended its lifespan six times longer.

Rockfish: The record life span is 205 years. Life span is recorded by growth rings on otoliths, small, hard structures that form in the inner ear.

Bat: Record life span is about 32 years. Vampire bats live in family groups and elderly bats may be fed by other bats. Bats show no age-related hearing loss. {Visit: *Older or Younger, Animal Families, Amazing Aging Animals, Older Males or Older Females, Longevity Parade, Intro Panel, and check the Amazing Posters*}.



Describe a process in the body that is thought to cause aging:

Free-radical damage: Free radicals are harmful by-products of energy production. The damage they do inside cells is considered a major cause of aging.

Collagen cross-linking: Microscopic “globs” of sugar stick to collagen molecules to form cross-links between them. As we age and develop more and more cross-links, structures in our bodies become less flexible and less functional. Cross-linking of collagen is considered a major cause of aging.

{Visit: *Free-Radical Attack* or *A Sticky Situation*}.

### **Longer and Longer Lives**

What was the average U.S. life expectancy for (circle one) males or females in:

	1850?	1900?	1940?	2000?
My prediction				
Answer	38–40 years	48–51 years	63–67 years	75–80 years

Female life expectancy is the larger number.

Why are these numbers growing?

Advances in medicine and public health to control and prevent disease made these gains in life expectancy possible.

### **What Can We Do About Aging?**

Describe two things you can do to promote healthy aging. Why is this choice good for your body? **Advice from exhibits:**

#### **Eat more fruits and vegetables.**

Fruits and vegetables are rich in antioxidants, substances that protect you from free-radical damage. Free radicals are destructive by-products of energy production. The damage they do inside cells is considered a major cause of aging.

#### **Take care of your teeth.**

Taking care of your teeth actually benefits your overall health. Infections that develop in your mouth may spread to other sites in your body and lead to heart disease, stroke, or accelerated aging.

#### **Protect yourself from the sun.**

Sun exposure accelerates skin aging and increases your risk of skin cancer. The ultraviolet rays in sunlight damage cell structures, so too much sun may have other harmful effects on the body.

#### **Stop or avoid tobacco exposure.**

Toxins in tobacco products damage cells, cause cancer, accelerate aging, and increase risks of many serious diseases.

### **Increase your activity.**

Exercise reduces stress, improves brain function, and reduces your risk of disease. In your cells, exercise leads to more efficient energy production and less free-radical damage.

### **Maintain a healthy weight.**

A healthy weight decreases your risk of cancer, heart disease, diabetes, and accelerated aging. Excessive weight is associated with inefficient energy production and an increase in harmful free radicals within cells.

### **Challenge your brain.**

Novel challenges and new experiences keep your brain active and encourage the growth of new connections between brain cells.

### **Connect with friends and family.**

Social ties enhance our positive experiences and support us in stressful times. Researchers have found that socially isolated people have higher levels of stress. Psychological stress is associated with greater risks of illness and death.

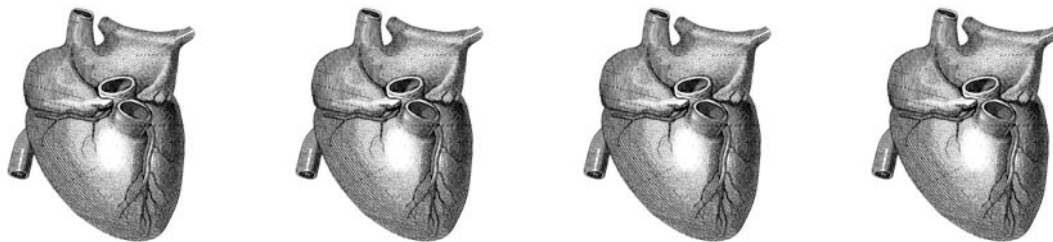
### ***You Are Many Ages***

Where are the oldest cells in your body found?

One place is your brain. Your brain and nerve cells and heart muscle cells are rarely replaced.

Where are the youngest cells?

Some of your skin cells are replaced daily. The cells lining your digestive tract and your red and white blood cells are also replaced frequently.



### ***Aging Brain***

How does a *healthy* brain change with age?

Name some rewarding changes, ways that brains improve as they grow older:

Your accumulated knowledge, experience, and vocabulary increase significantly with age. You may make better decisions, and mental health generally improves with age. In general we are more forgiving, less easily frustrated, and better at coping with stress.

Name some challenging changes, ways that brains decline as they grow older:

Your response time becomes slower and information processing is slower with age.

## **Ideas for Classroom Activities**

### **Animal Research Project**

Choose an animal and research its experience of aging. How long does it live? What changes and challenges does it face as it ages? How does its experience compare to human aging? Does it live in a family group with older and younger animals or on its own as an adult?

Some long-lived or interesting animals (that are also found in the exhibition) are: tortoises or turtles, whales, elephants, rockfish, ocean quahog, and bats (for their size).

### **Life Span Comparison**

Ask each student to pick a different animal and research its life span. Draw pictures of each animal and display them in order from longest to shortest life span. Add a picture of a person to represent human life span. Where do we fit in?

### **Grandparents Day**

Read books about grandparents and grandchildren (see book list). Write letters to grandparents or older friends for a favorite memory, recipe, or movie. "What do you remember about when you were my age? What games did you play? What were your favorite foods?"

### **Aging Stereotypes vs. Accomplishments**

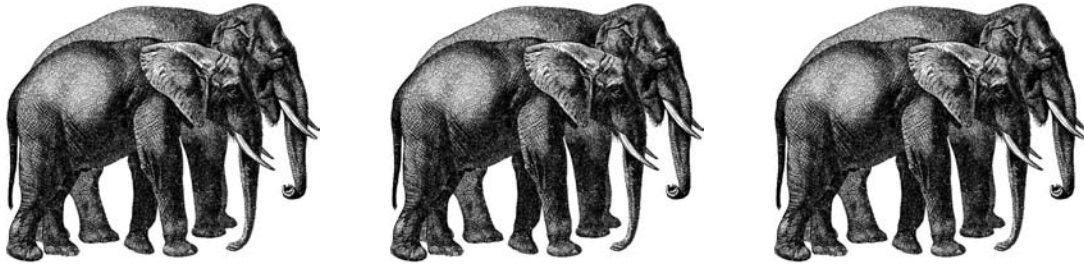
Collect and display "over-the-hill" birthday cards or other items that stereotype aging as a negative experience. Ask students to describe what the cards are saying about growing older.

Collect examples of the accomplishments of older persons. Ask students for examples from their friends, relatives, and grandparents. Find pictures of accomplished older people in magazines or newspapers or on the Internet. A list of accomplished elders is found on the following page.

### **Positively Aging Curriculum**

A detailed and well-researched curriculum on aging for middle school students can be found at the Positively Aging website. <http://teachhealthk-12.uthscsa.edu/>

The Positively Aging® and MORE Curricula Programs  
General Clinical Research Center MSC 7891  
The University of Texas Health Science Center at San Antonio  
7703 Floyd Curl Dr.  
San Antonio Texas 78229-3900  
210-567-4398 (phone)



### A Few Accomplished Elders

**Anna Mary Robertson Moses**, also known as Grandma Moses, was a famous artist during the mid-nineteen hundreds who produced over a thousand paintings. What is unusual about her is that she didn't start painting until she was in her seventies. She lived to be 101 and continued to create art throughout her life.

**Pablo Picasso** is one of the most famous painters from the twentieth century. He influenced art styles, created hundreds of paintings, and pursued new techniques for his art. He was still active in his later years. At 84 he sculpted a model for the Chicago Civic Center. Picasso died at the age of 91.

**Mary Higgins Clark** is a best selling suspense novelist who is still writing books into her seventies. She has produced over 23 best sellers and her next book is on the way.

**Barbara Cartland**, who lived to be 99, has published over 575 books. Besides being a best selling romance author she also wrote scripts for a movie and was a television personality. She was still publishing works in her late nineties.

**Oscar Swahn** is the oldest Olympic gold medallist. He won his first medal when he was 60. He competed in the single and team running deer shot events and took golds in both. He continued to compete in the shooting events and won the silver medal in the running deer double-shot team event when he was 72.

**Benjamin Franklin** is one of the most famous men in American history. Most notably known for his work as an inventor, he was also a scientist, a statesman, a printer, a philosopher, a musician, and an economist. He lived to be 84 and led a very active life. At 81 he was elected president of the Pennsylvania Society for Promoting the Abolition of Slavery and served as delegate to the Constitutional Convention.

**Thomas Edison**, who lived to be 84, was a prolific inventor whose ideas paved the way for technology that we now use everyday. He invented the incandescent light bulb, the phonograph, and the motion picture camera. At 82 he was making programs for radios on long-playing discs.

**Leroy “Satchel” Paige** was still playing major league baseball at age 62. He was famous enough to draw crowds and good enough to pitch nine inning shutouts. He started his career late in life, age 42, but that did not stop him from playing for 20 years and being inducted into the Baseball Hall of Fame.

**Philip Rabinowitz** was the oldest competitive walker at 93. He took up karate at 70 and was jogging until he was 88. He obviously still leads an active lifestyle and enjoys an active mind. He was in a 14-kilometer race at age 97.

**Jack Mackenzie** joined a ski expedition to the geographic North Pole at the age of 77 years, 10 months, and 13 days, reaching the pole on April 28, 1999. He is the oldest person to ski the North Pole.

**Herbert Kirk** graduated from college at age 96. He was going to college in 1917 when World War I intervened. In his 80s, he decided to achieve his dream of finishing college. The biggest challenge he had was reading the small print of university textbooks. He is the oldest person to ever graduate from Montana State University.

He also ran in the Portland 26-mile marathon a week before his 102nd birthday. Herbert played tennis until he was 89—he gave it up then because age-related vision changes made it hard to see the ball. When he gave up playing tennis, he took up running!

### Vocabulary List

These words are found in the exhibition and their definitions relate to their use in the exhibits. It is not necessary to understand all this vocabulary to learn from the exhibits, so choose whatever is appropriate for your students.



### **General Aging**

1. **antioxidant:** a substance that prevents free-radical damage in cells. Free radicals are harmful by-products of energy production inside cells. Antioxidants change free radicals into less harmful forms.
2. **cartilage:** a part of the skeleton that is more flexible than bone and not as hard. Your ears are supported by cartilage.
3. **cell:** the basic unit of all living things. Your body is made of about 100 trillion cells.
4. **centenarian:** a person who has lived 100 years.

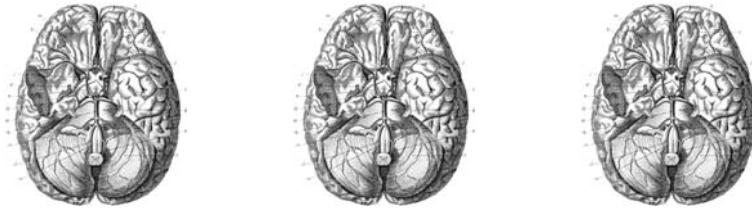
5. **collagen:** the most common protein in your body. It is a strong fiber that provides structure and support. Collagen is the major component of your skin, bones, teeth, blood vessels, cartilage, tendons, and ligaments.
6. **cross-linking:** microscopic “globs” of sugar stick to collagen molecules to form cross-links between them. As we age, we develop more and more cross-links and structures in our bodies become less flexible and less functional. Cross-linking of collagen is considered a major cause of aging.
7. **diabetes:** a disease in which the body does not produce or properly use insulin. Insulin is a hormone that is needed to convert sugar, starches, and other food into energy needed for daily life.
8. **free radical:** a highly reactive, harmful by-product of energy production inside cells. Free-radical damage is considered a major cause of aging.
9. **gene:** a unit of “instructions” for a specific inherited characteristic. Genes are found inside each cell. Studies of identical twins show that only 25% of our health and longevity is based on our genes.
10. **infectious disease:** a disease caused by germs that invade the body.
11. **life expectancy:** the average number of years a person born in a particular year is expected to live. Human life expectancy has been increasing for more than a century.
12. **ligament:** a strong tissue that connects bones or holds organs in place inside the body.
13. **menopause:** a normal end of reproductive cycles in late midlife. Of animals studied, only humans, orcas, and pilot whales exhibit this pattern of reproduction ending in midlife.
14. **mitochondrion (mitochondria, pl.):** specialized structures inside of cells that produce energy for the cell. Each cell in your body contains hundreds of mitochondria.
15. **molecule:** the smallest building block a substance can be broken down into without changing into something else. A molecule is made of two or more atoms that are joined together.
16. **protein:** an important building block of living things. Proteins are essential to the structure and function of cells.
17. **tendon:** a tough, strong tissue that connects bone to muscle.
18. **tissue:** a group of similar cells in the body that work together for a particular function. Examples are muscle tissue and nerve tissue.
19. **ultraviolet:** an invisible form of radiation that causes tanning, sunburn, and premature aging in exposed skin.



### Aging Animals

1. **baleen:** feeding structures in the mouths of filter-feeding whales. Baleen whales feed on small animals that they filter through their baleen plates and fringes.

2. **great ape:** a group of large primates closely related to humans including chimpanzees, gorillas, and orangutans.
3. **mammal:** a warm-blood animal that produces milk to feed its young.
4. **matriarch:** the elder female leader of a family or other group.
5. **mollusk:** a large group of invertebrate animals that have soft bodies and often produce a protective shell. Examples are clams, oysters, mussels, squids, snails, and slugs.
6. **otolith:** a small, hard structure that forms in the inner ear. Otoliths help animals, especially fish, balance and orient themselves. In fish, otoliths keep growing throughout life.
7. **premolar:** one of the permanent teeth between the canine teeth and the molars.
8. **roundworm:** a type of worm that is not segmented. Most are free-living, but some are parasites.
9. **siamang:** a large black lesser ape found in Sumatra.
10. **survival advantage:** a consistent tendency of one group to live longer than another. In most species females have a survival advantage compared to males.



### Aging Brain

1. **Alzheimer's disease (AD):** a progressive disease that disrupts the way the brain works, causing a decline in mental abilities.
2. **basal ganglia:** clusters of nerve cells inside the brain that control movement.
3. **cerebral cortex:** the outer area of the brain involved in reasoning, memory, language, and other important thought processes.
4. **cerebrospinal fluid:** fluid that fills spaces in the brain and spinal cord.
5. **gray matter:** the highly folded outer surface of the brain where information processing takes place.
6. **hippocampus:** a center for memory inside the brain. The hippocampus is critical in laying down new memories.
7. **Magnetic Resonance Image (MRI):** MRIs create detailed pictures of brain structures as "slices" through the brain. They can clearly show various types of nerve tissue.
8. **plaques:** abnormal structures that are found in Alzheimer's disease-affected brains. Plaques are found outside of brain cells.
9. **Positron Emission Tomography (PET):** a brain-imaging scan that produces a map of brain activity. In PET scans active brain areas appear red and yellow, and inactive areas are blue.

10. **stroke:** a stroke or brain attack occurs when a blood vessel in the brain is blocked or broken. When a brain attack occurs, it kills brain cells in the immediate area.
11. **subarachnoid space:** the space around the outside of the brain.
12. **tangles:** abnormal structures that are found in Alzheimer's disease-affected brains. Tangles are found inside of brain cells.
13. **ventricles:** hollow spaces inside the brain that are filled with cerebrospinal fluid.
14. **white matter:** an area of nerve fibers found beneath the gray matter. It serves as a communication channel for the information-processing gray matter.



### Resources/Websites

#### General Aging

<http://www.omsi.edu/visit/life/aging/index.cfm>

*Amazing Feats of Aging*

The companion website for the exhibition.

<http://www.nia.nih.gov/>

National Institute on Aging

Links to NIA exercises and national directory for older people (lists hundreds of organizations on all age-related issues).

<http://www.secretsofaging.org/>

*Secrets of Aging*

Website for the exhibit on aging created by the Museum of Science, Boston  
Many good links and activities.

<http://www.pbs.org/stealingtime/>

*Stealing Time*

Website of the PBS special on the biology of aging.

<http://www.igrandparents.com/default.asp>

iGrandparents

Fun ideas for grandparents and grandchildren.

<http://www.aarp.org/>

American Association of Retired Persons (AARP)  
News, issues, membership, and links to many other age-related sites.

<http://www.asaging.org/>

**American Society on Aging**  
**Baltimore Longitudinal Study and general aging information.**

<http://www.thelivingcentury.com/>

**The Living Century**  
**Stories and information about the oldest living citizens of the U.S.**

<http://teachhealthk-12.uthscsa.edu/>

Positively Aging  
Curriculum on aging for middle school and high school students.

## **Healthy Aging**

<http://www.beeson.org/Livingto100/default.htm>

Living to 100  
A lifestyle quiz that determines your chance of living to 100.

<http://realage.com/>

RealAge  
A resource for all kinds of ideas for healthy aging.

<http://www.surfingforlife.com/>

Surfing for Life  
The story of surfers in their 60s, 70s, 80s, and 90s!

<http://www.elderhostel.org/welcome/home.asp>

Elderhostel  
**Information for learning and travel courses for seniors.**

<http://www.shapeup.org/>

Shape Up America!  
Fitness and weight loss programs.

## **Aging Brain**

<http://www.mc.uky.edu/nunnet/>

The Nun Study  
A longitudinal study of aging and Alzheimer's disease.

<http://www.alz.org/>

Alzheimer's Association

Resource-filled website with information about all aspects of Alzheimer's, including legal, medical, and social issues.

<http://www.pbs.org/wnet/brain/episode5/>

*The Secret Life of the Brain*

Episode 5 of this PBS series explores the aging brain.

<http://www.darwinfoundation.org/Restoring/index.html>

Dana Web site

The site for brain information!

<http://faculty.washington.edu/chudler/ninety.html>

Neuroscience for Kids

This web site has many interesting pages on the aging brain.

## **Aging of Animals**

<http://www.orcalab.org/index.htm>

Orca Lab

An orca research site in British Columbia.

<http://www.batcon.org/>

Bat Conservation International

Information about bats from all over the world.

<http://wormworld.ucsf.edu/>

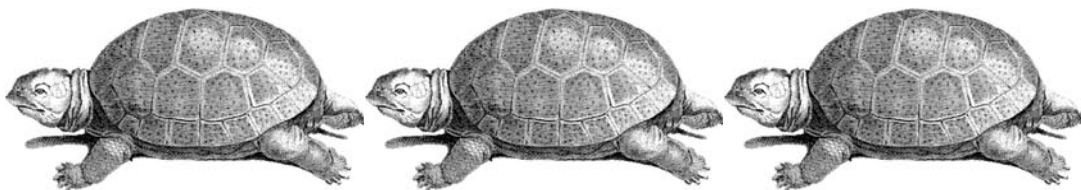
Wormworld

The Kenyon Lab at UCSF, a site for researching the genetics of aging in roundworms (*C. elegans*).

<http://www.darwinfoundation.org/Restoring/index.html>

Restoring the Tortoise Dynasty

A site on the survival of giant tortoises on the Galapagos Islands.





## Resources/Books

### **Books about Grandparents and Elders**

This rich topic is well represented in children's libraries. Here are a few favorites.

Fox, Mem, *Wilfrid Gordon McDonald Partridge*, Kane/Miller Book Publishers, 1985, c1984.

A small boy tries to discover the meaning of "memory" so he can restore that of an elderly friend.

Franklin, Kristine L., *The Gift*, Chronicle Books, 1999.

Although some in town consider the Fish Woman a witch, a young boy goes fishing with her and not only catches, and gives away, his first salmon, but gets to see a pod of whales up close.

Franklin, Kristine L., *The Old, Old Man and the Very Little Boy*, Atheneum, Maxwell Macmillan Canada, Maxwell Macmillan International, 1992.

As he listens to Old Father's stories each day, a little boy asks if his friend has ever been young, but, only after he has grown old himself, does he understand Old Father's answer.

Mead, Alice, *Junebug and the Reverend*, Farrar Straus and Giroux, c1998.

Having moved out of the housing project and into a new home along with his mother and sister, ten-year-old Junebug discovers that bullies are everywhere and that the elderly can make great friends.

Waddell, Martin, *My Great Grandpa*, Putnam, 1990.

A girl describes her special times with her great-grandfather, who may be slow and weak but still travels to places in his mind where no one else can go.

Wallis, Velma, *Two Old Women: An Alaska Legend of Betrayal, Courage and Survival*, Harper Perennial, c1993.

Two old women are abandoned by their tribe and must survive on their own.

Wild, Margaret, *Our Granny*, Ticknor & Fields Books for Young Readers, 1994. While grannies come in all shapes and sizes "our granny" is unique.

Wild Margaret, *Remember Me*, Whitman, 1995.

Although she may forget many things, Ellie's Grandma remembers all the special times the two of them have shared.

Williams, Laura E., *Torch Fishing with the Sun*, Boyds Mills Press, 1999.

Young Makoa must have faith in the strength of his aging grandfather.

Winch, John, *Keeping Up with Grandma*, Holiday House, 2000.

When Grandma decides that it is time to have fun outdoors, Grandpa has a few problems keeping up with her.

Wyse, Lois, *How to Take Your Grandmother to the Museum*, Workman Pub., published in association with the American Museum of Natural History, c1998.

A young girl takes her grandmother on an outing to the natural history museum.

Uchida, Yoshido, *The Wise Old Woman*, M.K. McElderry Books; Maxwell Macmillan Canada; Maxwell Macmillan International, c1994.

An old woman demonstrates the value of her age when she solves a warlord's three riddles and saves her village from destruction.

### **Books about Aging**

Farber, Norma, *How Does It Feel to be Old?* Dutton, c1979.

Old age explains to youth some of the thoughts and feelings, advantages and disadvantages that accompany being old.

Rice, David L., *Lifetimes*, Dawn Publications, c1997.

This beautifully illustrated book explores the diversity of life spans in nature from the one-day life of a mayfly to the age of the universe. A teacher's guide to *Lifetimes* is also available from the publisher.

Seuss, Dr., *You're Only Old Once: A Book for Obsolete Children*, Random House, c1986.

A classic tale of the ups and downs of growing old.

### **Activity Books**

Hunter, Dette, *38 Ways to Entertain Your Grandparents*, Annick Press, c2002.

A book of games, crafts, and recipes for kids and grandparents to do together.

Love, Ann, *Kids and Grandparents*, Kids Can Press, 2000.

A collection of more than 90 games, crafts, recipes, and activities for children to do with their grandparents.

Book summaries are adapted from the Multnomah County Library web site.

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