

3rd Grade Inheritance/Variation of Traits Resources

Next Generation Science Standards:

LS3.A: Inheritance of Traits

Many characteristics of organisms are inherited from their parents. (3-LS3-1)

Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)

LS3.B: Variation of Traits

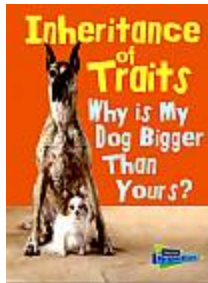
Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

The environment also affects the traits that an organism develops. (3-LS3-2)

Books:

Inheritance of Traits: Why is My Dog Bigger Than Yours by Jen Green (2014)

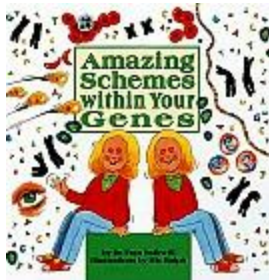
Includes bibliographical references (page 31) and index. Welcome to the show -- The world of dogs -- Ancient breeds -- Bred for speed -- The ultimate pony show -- The world of cats -- How do genes work? -- Puppies and kittens -- Best in show -- Brother and sister -- The odd puppy out -- Champion sniffers -- The world's best-trained dog. "This book about dog shows teaches the core curriculum topic of inheritance."



Guided Reading: T
32 Pages

Different Schemes Within Your Genes by Francis R. Balkwell

Discusses the structure and function of genes, their adaptations and mutations, and basic genetic processes, particularly as they occur in humans.



Guided Reading: S
31 Pages

Eye Color: Brown, Blue, Green and Other Hues by Jennifer Boothroyd (2013)

Includes bibliographical references (p. 31) and index. Discusses different eye colors and how eye color is determined by genetics.

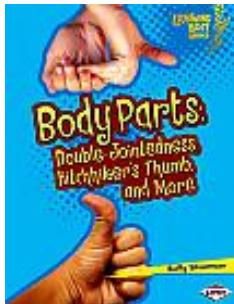


Guided Reading: M

32 Pages

Body Parts: double-jointedness, hitchhiker's thumb, and more by Buffy Silverman (2013)

Includes bibliographical references (p. 31) and index. Discusses different body and joint traits and how they are determined. Can you stretch your thumb back to your arm? Is your pinkie straight or slightly bent? What determines the way your joints bend—or don't bend?

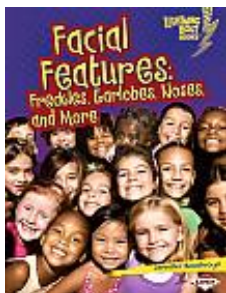


Guided Reading: M

32 Pages

Facial Features: freckles, earlobes, noses, and more by Jennifer Boothroyd (2013)

Includes bibliographical references (p. 31) and index. Discusses different facial features and how they are determined. What facial features do you have? Freckles are a common feature. So are turned-up noses and unattached earlobes. What determines your facial features?



Guided Reading: M

32 Pages

Hair Traits: Color, Texture and More by Buffy Silverman (2013)

Includes bibliographical references (p. 31) and index. Discusses different hair traits, and how the color and texture you have is determined.



Guided Reading: M
32 Pages

Unusual Traits: Tongue rolling, special taste sensors and more by Buffy Silverman (2013)

Includes bibliographical references (p. 31) and index. Traits -- Can you taste this? -- Can you do this? -- Can you smell this? Discusses traits of the senses and unusual traits like tongue rolling and how they are determined. Can you roll your tongue into a U-shape? Some people can. But other people's tongues stay flat. What determines whether you can roll your tongue?



Guided Reading: M
32 Pages

Vision: nearsightedness, farsightedness and more by Jennifer Boothroyd (2013)

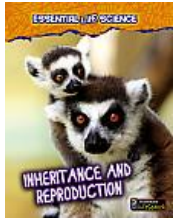
Includes bibliographical references (p. 31) and index.; Genes -- Vision -- Nearsightedness -- Farsightedness -- Color blindness. Discusses different eye disorders and how vision is determined by genetics. Do you see clearly? Do faraway objects look blurry to you? What determines how your vision works?



Guided Reading: M
32 Pages

Inheritance and Reproduction by Jen Green (2014)

Includes bibliographical references (pages 46-47) and index. All living things reproduce, and they pass on inherited traits to their offspring. This book explores the different ways that plants and animals produce offspring, and how they pass on traits from one generation to the next.



Guided Reading: S

48 Pages

I Look Like My Mother by Julie K. Lundgren (2013)

This book discusses how the genes and traits of a parent determine what their offspring will look like. Be it human or animal, this book goes into detail about this fascinating topic. Young readers will love the colorful photos and informative text. Supports Next Generation Science Standards. Correlated to Common Core. Includes table of contents, glossary, index, and text features.

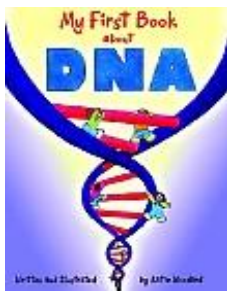


Guided Reading: S

24 Pages

My First Book About DNA by Katie Woodard (2002)

Did you know that you have DNA? Do you know what it is? Learn all about DNA, from what it looks like and where it is found to what fascinating things we can do with it. No one is too young or old to begin learning about one of the most important discoveries of our time. Discover DNA for yourself: "Why are my eyes brown? Why is my hair red? This is a resource for parents and teachers seeking to help young kids understand DNA, genes, and cells.

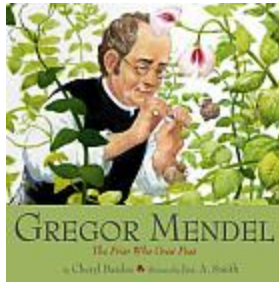


Guided Reading: L

29 Pages

Gregor Mendel: the friar who grew peas by Cheryl Bardoe (2006)

The only picture book available about the father of genetics and his pea plants. How do mothers and fathers -- whether they are apple trees, sheep, or humans -- pass down traits to their children? From observing yellow peas, green peas, smooth peas, and wrinkled peas, Mendel crafted his theory of heredity -- years before scientists had any notion of genes. Children will be inspired by Gregor's neverending search for knowledge, and his famous experiments are easy to understand as an introduction to genetics.



Guided Reading: T
33 Pages

Exploring Heredity by Ella Hawley (2013)

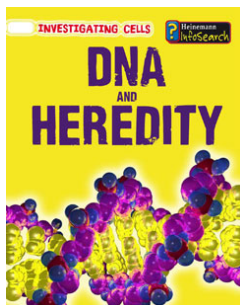
Children are often familiar with the idea of heredity from the first time a friend or relative points out they look like a sibling or parent. This book will help kids understand why animals' offspring look like their parents, as well as why they may share traits with their parents and other family members. The science behind heredity is explained in simple, age-appropriate text, while graphic organizers help to show how genes and heredity work.



Guided Reading: S
24 Pages

DNA and Heredity by Casey Rand (2011)

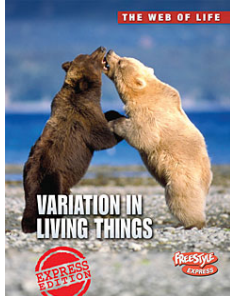
Includes bibliographical references (p. 46) and index.; What are DNA and heredity -- What is a cell? -- What is DNA? -- What does DNA look like? -- How do we get our DNA? -- How do our cells use DNA? -- What are the laws of heredity? -- Why are we different or similar? -- What happens when DNA changes? An introduction to DNA and heredity that explains how DNA and genetics determine certain factors related to health, behavior, and appearance, what introns and exons are, how cells use DNA, and what the laws of heredity mean for people.



Guided Reading: R
48 Pages

Variation in Living Things by Robert Sneddon (2012)

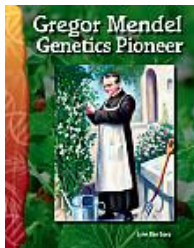
It seems obvious that a pig will never give birth to a puppy, but why should that be the case? *Variation in Living Things* explains the causes and limits of variation in species - such as blood groups and disposition to disease - and why it is so important to their survival. It tackles common confusions about the science and shows how topics are relevant to the reader.



Guided Reading: P
48 Pages

Gregor Mendel: Genetics Pioneer by Lynn Van Gorp (2008)

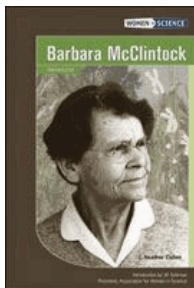
Includes index. Discusses the life and work of Gregor Mendel, an Austrian monk who studied heredity in plants and is considered the father of genetics.



Guided Reading: S
32 Pages

Barbara McClintock: Geneticist by J. Heather Cullen (2003)

Includes bibliographical references (p. 113-114) and index. Presents the life and career of the geneticist who in 1983 was awarded the Nobel Prize for her study of maize cells. Contents: A life in science -- Family life -- Learning lessons at Cornell -- Is this a career? -- Free to do research -- Jumping genes at Cold Spring Harbor -- In the spotlight -- A legacy for the future.



Guided Reading: n/a
122 Pages

Digital Resources

Databases: (To access these databases remotely, ask your librarian for your school's username and password.)

World Book Web:

*The World Book Web is a suite of online research tools that includes encyclopedia articles, primary source collections, educator tools, student activities, pictures, audio, and video, complemented by current periodicals and related Web sites. Most all of these World Book Web research tools include options where text can be read aloud to the user. All Ithaca elementary school libraries currently subscribe to **World Book Kids**, **World Book Student**, **World Book Discover**, **World Book Timelines** and **World Book Classroom: Early World of Learning**. For specific training in how to use these amazing tools consult Worldbook's training website or ask your school's librarian. <http://www.worldbookonline.com/training/>*

World Book Kids has an article called "Gene" which aligns with Next Generation Science Standards for 3rd Grade. You can use this link to access the article on day and night: <http://www.worldbookonline.com/kids/article?id=ar830719> OR you can simply type "gene" in World Book Kids and choose the first article.

Gene

Genes are chemical instructions inside cells. They direct how a living thing grows and functions.

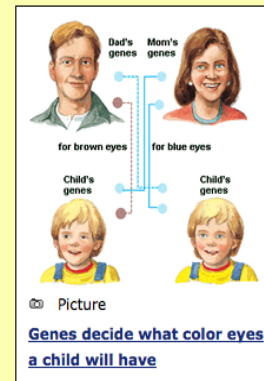
Genes determine what shape an animal will be. They also give an animal its instincts. Genes tell a plant how to make roots, leaves, and flowers. They also direct how plants function. Genes tell a developing human embryo how to make arms, legs, and organs such as the heart. Genes determine what color a child's eyes and hair will be.

Living things get genes from their parents. Most get half of their genes from one parent and half from the other.



Living cells have many thousands of genes. The genes lie on tiny, threadlike structures called *chromosomes* <<KROH muh sohmz>>. Each gene is located in a specific place on a certain chromosome. In many living things, the chromosomes are in a part of the cell called the *nucleus*.

Genes are made of a chemical called *DNA*. The letters *DNA* stand for *deoxyribonucleic acid*.


DNA is shaped like a long, twisted ladder. The "rungs" of the ladder are made of chemicals called *bases*. A pair of bases forms each rung. Most genes consist of several thousand base pairs. The gene's instructions are "written" in the sequence of base



World Book Discover includes an article on heredity and one on genetics.

-  **Heredity**
Heredity is the passing of certain traits (characteristics) from one
-  **Genetics**

World Book Discover has a lower reading level than World Book Student, but higher than World Book Kids.



Home | My Research

Search

Search All Search Images Advanced Search

Article content

Lexile[®] Measure: 820L

Introduction

Other languages

translate this text into:

Arabic GO

Please Note: This translator will not produce a perfect translation but should adequately convey the general sense of the original.

Content standards

This World Book article aligns with New York Learning Standards

[View Learning Standards](#)

Back

Tools

- Print
- Save to My Research
- Double-click a word to define it.
- E-mail Article
- Save article
- Enable read-aloud toolbar
- Highlight search term in text

Genetics

Genetics is the study of *heredity* <<huh REHD uh tee>>. Heredity is the process by which a parent passes on qualities to a child. Scientists called *geneticists* <<juh NEHT uh sihsts>> study how genes work. Genes are the basic units of heredity and are in the cells of all organisms. For example, each of the cells in the human body has about 20,000 to 30,000 genes. Genes are mainly responsible for how people look. For example, they are why some people have blue eyes, curly hair, or big feet.

In a cell, genes are found in the structure of *chromosomes* <<KROH muh sohmsz>>. Chromosomes are strings of a chemical called DNA. In humans, each cell has pairs of chromosomes, which have genes for the same qualities.

People have 46 chromosomes (23 pairs) in most cells. The cells involved in reproduction have 23 chromosomes each. When these cells from the mother and father get together, the new baby has its own set of 46 chromosomes.

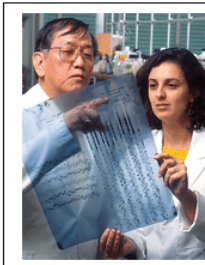



Image
Scientists discussing genetics



Home | My Research

Search

Search All Search Images

Article content

Lexile[®] Measure: 820L

Introduction

Other languages

translate this text into:

Arabic GO

Please Note: This translator will not produce a perfect translation but should adequately convey the general sense of the original.

Content standards

This World Book article aligns with New York Learning Standards

[View Learning Standards](#)

Back

Tools

- Print
- Save to My Research
- Double-click a word to define it.
- E-mail Article
- Save article
- Enable read-aloud toolbar
- Highlight search term in text

Heredity

Heredity <<huh REHD uh tee>> is the passing of certain *traits* (characteristics) from one generation to another. Heredity involves all *organisms* (living things), including plants, animals, and microbes.

You resemble your parents because you inherited certain traits from them, such as hair color or nose shape. All organisms are made up of cells. A part of the cell called a *gene* carries a trait. Genes are made of a chemical called *DNA*. It is a complicated *molecule* (combination of atoms) shaped like a long twisted ladder. Genes are like blueprints for building a house. But they carry information on building cells, tissues, organs, and bodies. An organism's genes lie on tiny, threadlike structures called *chromosomes*. In human beings and most other organisms, the chromosomes are in a part of the cell called the *nucleus*. All living things get genes from their parents. You got half of your genes from your mother and half from your father.

Scientists say that heredity and the *environment* (everything that makes up the surroundings of an organism) help each other make a person who they are. You might have inherited the talent to play the piano. But you will not be able to play unless you take lessons and practice. The talent needed to play is

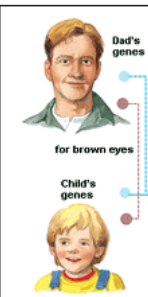


Image
Genes decide w a child will hav

Brainpop: Brainpop is a database that provides a 3-6 minute video on informational topics followed by a comprehension quiz. The database includes activities and lesson plans as well. It is geared towards grades 4-8.

Whether or not your school subscribes to Brainpop, there are several free videos available on the subject of heredity and DNA. Search Brainpop for “Gene” to return these results. Notice the

two free videos. Some videos in Brainpop aren't grade level appropriate for third grade, but several like “Heredity” could definitely be useful if teacher-led.

The screenshot shows the BrainPOP SEARCH interface. At the top, there is a search bar with the text "What are you looking for?" and the word "gene" entered. Below the search bar, it says "TOPICS (9 Results)". The results are displayed in a grid of cards, each with an icon and a title:

- CLONING**: IS ONE OF YOU ENOUGH? (Icon: two identical figures)
- ASEXUAL REPRODUCTION**: THERE'S MORE THAN ONE WAY TO HAVE KIDS! (Icon: a cell with a plus sign)
- TWINS**: SEEING DOUBLE? (Icon: two identical figures)
- GENDER DETERMINATION**: ARE YOU A BOY OR A GIRL? OKAY, BUT WHY? (Icon: a female symbol)
- DNA**: THE BODY'S BLUEPRINT! (Icon: a DNA double helix)
- HEREDITY**: YOU HAVE YOUR MOTHER'S EYES! (Icon: a pair of chromosomes with 'Tt' and 'tt' labels)
- RNA**: SAY HELLO TO DNA'S LITTLE FRIEND! (Icon: a blue RNA strand)
- GENETICS**: YOU HAVE YOUR FATHER'S EYES AND YOUR MOTHER'S SMILE! (Icon: a pair of chromosomes)
- GENETIC MUTATIONS**: A TINY CHANGE CAN BE A BIG DEAL. (Icon: a DNA double helix with a starburst)
- BRAINPOP JR.**: SEARCH FOR K-3 TOPICS (Icon: BrainPOP Jr. logo)

The screenshot shows the BrainPOP HEREDITY video player interface. At the top, there is a navigation bar with icons for Science, Cellular Life & Genetics, and Heredity. The main content area features a video player with a hand holding a piece of paper that reads:

Dear Tim and Moby,
My parents both have brown eyes, but mine are blue.
What's going on??
Tyra

On the left side, there are buttons for "ZOOM MOVIE", "LESSON IDEAS", and "HELP". On the right side, there is a "RELATED TOPICS" section with icons for Genetics, Genetic Mutations, Gender Determination, and DNA. At the bottom, there are buttons for "QUIZ", "ACTIVITIES", "Q&A", and "GAMEUP".

Websites:

Lesson Plan and Online Activity: Inheritance

<http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&ResourceID=657>

Create aliens with different traits and breed them to produce offspring. Determine which traits are passed down from parents to offspring and which traits are acquired. Offspring can be stored for future experiments or released.

Lesson Plan: Effect of Environment on New Life Form

<http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&ResourceID=397>

Using the scientific method, control the environmental conditions for a fictional alien organism in order to learn how the organism responds to changes in conditions. Sunlight, water, and temperature can be varied to determine their effects on the shape of the aliens.

Lesson Plan: Growing Plants

<http://www.explorellearning.com/index.cfm?method=cResource.dspDetail&ResourceID=615>

Investigate the growth of three common garden plants: tomatoes, beans, and turnips. You can change the amount of light each plant gets, the amount of water added each day, and the type of soil the seed is planted in. Observe the effect of each variable on plant height, plant mass, leaf color and leaf size. Determine what conditions produce the tallest and healthiest plants. Height and mass data are displayed on tables and graphs.

Inherited Traits Lesson Plan

<http://web.archive.org/web/20070116174426/http://www.dmns.org/NR/rdonlyres/BEED062C-06CD-400E-86B6-5B9C99C67655/0/InheritedTraitsInventory.pdf>

Students will: observe a variety of inherited traits, compare observed traits with other students in the class, develop a data table to show their results, identify dominant and recessive traits, learn that dominant traits are not always the most common.

Bill Nye Genetics Episode

http://www.youtube.com/watch?v=dPk_V1KkMuU

Seven minute video on basic genetics focusing on cells.

Genetics Mini-lesson

<http://www.exploringnature.org/db/detail.php?dbID=22&detID=2290>

This lesson designed for 4th grade and up can be modified for third graders to learn about dominant, recessive and mixed-hybrid traits.

Inherited and Observable Traits Lesson Plan

<http://www.teachervision.com/tv/printables/geneticsbeginnerext.pdf>

In this lesson, students will review inherited and observable traits, use this knowledge to poll their classmates, and create a frequency table from this gathered data.

iPad apps:

Gene Screen - by Cold Spring Harbor Laboratory

Cost: Free

Learn about recessive genetic traits and diseases and how some are inherited. Produced by the DNA Learning Center.

Cells - by Kids Discover

Cost: \$3.99

This Kids Discover interactive magazine has a chapter on DNA unraveled and Hand-Me-Down Genes.