

The Newtons'  
**WORKSHOP**  
**STUDY GUIDES**

*“The DNA Decoders”*

*Episode 7*  
*Genetics*

**W**elcome to the unique world of Grandpa Newton's workshop, where kids can experience exciting new adventures in God's world. Each episode is power packed with science learning and exploration...the world as you've never seen it before. The quirky and lovable Newtons are certainly not your ordinary set of grandparents. In each adventure, the Newtons show their devotion to God and unusual ways to uncover more about God's incredible world. And you are invited along!

**"My frame was not hidden from you when I was made in the secret place. When I was woven together in the depths of the earth, your eyes saw my unformed body. All the days ordained for me were written in your book before one of them came to be." (Psalm 139:15-16)**

## **Exploring with the Newtons**

"I'm a victim of my relatives," bemoans Trisha. Her need for glasses prompts a visit to the Newtons' family tree. "Why do I have to be different?" Before long, a trip to Grandpa Newton's Workshop is just what the doctor ordered.

What is this whole heredity thing? Skin color, eye color, foot size, all physical traits. How does it work? With the help of ABC blocks, Morse code, semaphore flag signals, and a cleverly rigged workshop contraption, Grandpa walks the kids through an unforgettable workshop adventure. In the end, Trisha's need for glasses is yet another reminder of God's careful design of all living things.

As you watch the video, look for the answers to these thought-provoking questions.

- Why do people have different colors of skin, hair, and eyes?
- How is Morse code like heredity?
- What is the difference between heredity and genetics?
- Describe how a chromosome transports coded messages.

## **For Thought—and Action**

**"He who began a good work in you will carry it on to completion until the day of Christ Jesus." (Philippians 1:6b)**

The field of genetics has affected many areas of our daily life. A few areas include agriculture, industry, medicine, and food processing. Genetic engineering techniques involve the manipulation of the DNA of organisms. This highly technical procedure has allowed researchers to produce drought-resistant crops, has aided in the cleanup of toxic spills, and has helped create new cancer therapies, insulin products, antibiotics, and vaccines. But where is this leading? Many believers fear the scientific community may be misusing this technology, especially in the area of cloning. What do you think? Look at what the Bible has to say. You may want to discuss this with your family as well as your pastor or Sunday school teacher.

# More to Explore

**“I praise you because I am fearfully and wonderfully made; your works are wonderful, I know that full well.” (Psalm 139:14)**

The unique design of mankind is certainly evidence of God’s greatness. As Trisha, Tim, and Megan discovered, God left no small detail unnoticed in His plan for the distinguishing characteristics of each human being. Scientists have spent hundreds of years of research trying to understand more about inheritable characteristics. Gregor Mendel, an Austrian monk, and William Bateson, an English biologist, did work that forever impacted the field of genetics. Mendel is known as the “father of genetics” because he identified the basic principle of heredity. Bateson also made many significant contributions to the field. The life and work of these two scientists would be fascinating to study further.

## Eagle Eye

Were you watching with a watchful eye? Test your knowledge!

Why did Grandpa use alphabet blocks to teach the kids? Did you discover what “semaphore” is? What year was DNA discovered? The human body cell nucleus contains \_\_\_\_\_ pairs of chromosomes.

If you miss it the first time . . . rewind, watch it again. See what new facts you discover the second time around.

## Devotional Reflection

**“Now faith is being sure of what we hope for and certain of what we do not see. This is what the ancients were commended for.” (Hebrews 11:1-2)**

A look back at her family tree allowed Trisha to see where heredity had dealt her the need for glasses. More importantly, Trisha saw that she inherited more than physical qualities from her family. The legacy of faith was passed down through the members of her family. Although people have no control over the genes they receive, the choice to acknowledge God as Creator and the author of our faith is available to all people. As believers, we are grafted into a much larger family

tree—the family of God.

# Words to Know

## Chromosomes

Threadlike bodies found in a cell nucleus that carry genes in a line. Chromosomes were created by God to carry the messages of His design. There are 46 chromosomes in the human body—23 pairs. Each one may carry thousands of genes, somewhat like a string of important beads.

## DNA

Abbreviation for “deoxyribonucleic acid.” DNA is the class of nucleic acids found mainly in the nucleus of cells. DNA is responsible for transmitting hereditary characteristics and for the building of proteins. A combination of several chemicals, DNA is known to carry the actual code of life.

## Genetics

The science of heredity, dealing with similarities and differences passed from parents to their offspring.

## Heredity

The transmission of genetic characteristics (traits) from parents to offspring.

## Traits

Inheritable characteristics such as eye color, hair color, skin color, and other physical attributes.

## After Thoughts

### (Post-Viewing Suggestions)

**“Praise the Lord, O my soul; all my inmost being, praise his holy name.” (Psalm 103:1)**

After being introduced to the fields of heredity and genetics, you may enjoy tracking your inherited characteristics through your family tree. Track hair and eye color, height, etc. Ask relatives to assist you in your research. You might want to describe your findings in a journal. Interview your grandparents on both sides of the family. Complete a family tree of your extended family. You may want to ask the relatives you interview to tell you their favorite Scripture passage. List these ref-

erences by their names on the family tree. Your completed family tree and journal will become a treasure in the years to come.

If you enjoyed this video, look for these other great videos for the whole family from your friends at Moody: "The Moody Science Adventures-The Wonder of You," and "The Wonders of God's Creation-Human Life."

## **NOTES:**

The Newtons'  
**WORKSHOP**  
**STUDY GUIDES**

*“The Pollution Solution”*

*Episode 8*  
*Ecology*

**W**elcome to the unique world of Grandpa Newton's workshop, where kids can experience exciting new adventures in God's world. Each episode is power packed with science learning and exploration...the world as you've never seen it before. The quirky and lovable Newtons are certainly not your ordinary set of grandparents. In each adventure, the Newtons show their devotion to God and unusual ways to uncover more about God's incredible world. And you are invited along!

**“Before the mountains were born or you brought forth the earth and the world, from everlasting to everlasting you are God.” (Psalm 90:2)**

## Exploring with the Newtons

Water, water running everywhere. . . . Mom, Tim, and Trisha receive quite a shock when the household water supply mysteriously dries up. Dad definitely makes his point about wasting water as the family sits down to breakfast. The morning's "wake-up" call sheds a whole new light on natural resources. Whose earth is this? How are people caring for the planet that God created as their home? Can resources like water actually run out? Grandpa challenges Tim and Trisha to a competition unlike any other—to find out who can produce the smallest amount of waste.

Look for the answers to these thought-provoking questions:

- Where does most of the waste produced by people go?
- What does the word "ecology" mean?
- How does the ocean food chain help to break down toxins (poisons)?
- What percentage of the earth's water supply is fresh water?

## For Thought—and Action

**“Stop and consider God's wonders.” (Job 37:14b)**

Mom put it best when she asked, "How do our habits affect our habitat?" What kind of legacy will you leave behind on earth for future generations? A planet well cared for . . . or a planet struggling to survive?

The earth-wise decisions you make today certainly will reap a reward for other people. Where can you begin? Did you know that more than two gallons of water are wasted if you let the water run while brushing your teeth? Only 1% of the world's water supply is fresh water. . . . Now, that's something to think about. After viewing this episode of Newtons' Workshop, identify some ways in which you can become a better "space sharer" on earth. Perhaps you can create a water conservation chart for your family.

## More to Explore

**“The earth is the Lord's, and everything in it, the world, and all who live in it.” (Psalm 24:1)**

Tim and Trisha discovered there was a lot about God's great earth they didn't know. They found out about the responsibility of caring for their earthly home. What do you know about your own habitat? Do you

know where the water comes from when the faucet is turned on at your house? How is waste disposal handled in your community? With a little investigation, you can discover a lot about your own habitat!

Go to your local library and ask for assistance, or call your local government offices. Some communities even offer tours of their water treatment facilities. You may be able to participate in a local recycling program. There is always more to explore right in your own backyard.

## Eagle Eye

Were you watching with a careful eye? Test your knowledge!

Grandpa is up to his usual zany antics, always looking for a new way to teach the kids. Painting the bookshelves helped Grandpa teach Tim and Trisha about \_\_\_\_\_. Was that a fish that popped out of the toaster? What was the point?

If you miss it the first time...rewind, watch it again. See what new facts you discover the second time around.

## Devotional Reflection

**“Ask the Lord for rain in the springtime; it is the Lord who makes the storm clouds. He gives showers of rain to men, and plants of the field to everyone.” (Zechariah 10:1)**

Since the beginning of time God has taken care of the basic needs of His people. In return they trusted Him and praised Him. How often do we take for granted the goodness of the Earth that God has bestowed upon us? Do we praise Him for our world? People have not always made the best choices in caring for their planet. As good stewards of this great gift, we have a responsibility to care for the Earth. Many Bible verses praise and thank our Creator for this marvelous planet we call home. Spend some time reading through these in your quiet time with God. You might want to begin with these wonderful passages: Genesis 1, Job 36:24, Psalm 119:27, Psalm 145:5, Isaiah 6:3, and Hebrews 1:10.

**“God’s voice thunders in marvelous ways; he does great things beyond our understanding.” (Job 37:5)**

## After Thoughts (Post-Viewing Suggestions)

Tim and Trisha rose to the challenge that Grandpa placed before them. A little friendly competition helped them to think about the wastes they may have been carelessly producing. Are you up to facing this kind of a challenge? Think about this! Most garbage, about 73%, is buried in landfills. Only 13% is recycled, and another 14% is burned. So, what can you do? Think about raising awareness in your family and community. You can encourage recycling by helping to provide specific containers for paper and plastics at large events. Helping others to be wise stewards of the earth begins by example. So the next time you use just one side of a piece of paper, remember—approximately a third of waste material thrown away is paper!

## Words/People to Know

### Biodegradable

Materials such as food wastes and tree leaves that can be broken down into simpler substances by organisms such as bacteria and fungus.

### Ecology

Ecology comes from the Greek words “Oikos” meaning house and “logy” meaning the study of. It is the study of the “house” where we live—the earth. Ecology involves the scientific study of the relationships of living things to one another and to their environment.

### Habitat

A physical place, such as a desert, forest, single tree, or even a manmade house, where a plant or animal lives.

## **Landfill**

A type of open waste dump where wastes are deposited in thin layers and covered by layers of earth. Some landfills use plastic liners between the layers of waste. Landfills that are not correctly designed do not protect the environment.

## **Recycling**

The process by which glass, plastic, paper, and other wastes are transformed into new products that can be used again.

## **Toxic Waste**

Waste substances that are poisonous or harmful to life, such as pesticides and other chemical pollutants.

## **Waste**

Unwanted substances that result from human actions or commercial production.

## **Water Cycle**

The continual circulation of water through the land and into the oceans. The sun's heat evaporates water from bodies of water and the soil. Water vapor condenses to form clouds, then falls as either rain or snow. Animals take in some of the water when eating or drinking and return it to the earth through breathing, sweating, and excretion.

If you enjoyed this video, look for these other great videos for the whole family from your friends at Moody: "The Wonders of God's Creation-Planet Earth" and "The Moody Science Classics-Journey of Life."

## **NOTES:**