

## Week of: June 8 – June 12

**Grade: 8**

**Content: Science**

Greetings Scientists! We hope you are safe and well with your families!

Your teachers should have been reaching out to you via your BPS email address. If you were not aware you had a BPS email address, or do not know how to access your BPS email, please follow these instructions:

### Accessing Office 365 from home

1. Using **Google Chrome**, Go to [www.bpsma.org](http://www.bpsma.org)
2. Click on the **BPS EMAIL** located at the top right of the page.
3. Enter in your username, which will look something like this: 123456@bpsma.org. A BPS username is the student's 6-digit number plus @bpsma.org. You may also refer to it as your lunch number.
4. Enter in your password. The password that you enter to login to your computer at school. If you do not know it, please email us at PARENTHD@BPSMA.ORG.

You can email your teachers and/or principal, assistant principal, associate principal, and guidance counselors by following this link: <https://www.bpsma.org/schools/learning-at-home/contact-us>. Scroll to the bottom of the page. All BPS teachers are listed alphabetically by last name. You can also type in the last name of the person you are trying to email to make searching easier.

**Logging into Clever for Amplify Science access:** You can log into Amplify Science through Clever, just as you would in your science class.

### Accessing Clever from Home

1. [Click here](#) to go to Clever.
2. Enter your username, which will look something like this: 123456@bpsma.org. Your BPS username is your 6-digit number plus @bpsma.org. Your number is also referred to as your lunch number.
3. Enter your password. The password that you enter is the same one you use to log in to your computer at school. If you do not know your password, please email us at [cleversupport@bpsma.org](mailto:cleversupport@bpsma.org) or call our support (774) 539-8217

Grade 8 students in Brockton were working in one of the following units:

- Earth, Moon, and Sun
- Force and Motion
- Light Waves

**If you have any questions, please email Dr. Michele Conners, Middle School Science Content Lead, at [micheleconners@bpsma.org](mailto:micheleconners@bpsma.org). Please include your child's first and last name and the name of the middle school he/she attends.**

**The week of June 8-June 12**, Grade 8 students will complete a lesson focused on the following Massachusetts Science standard: *Use a model to describe the process of natural selection, in which genetic variations of some traits in a population increase some individuals' likelihood of surviving and reproducing in a changing environment. Provide evidence that natural selection occurs over many generations.*

**iXL Practice:** Use the following links to access iXL Skills Practice. If you are asked to sign in, the **username** is **brocktonscience**. The **password** is **conners63**. **Do not log in with your Clever account for this iXL practice.**

[Introduction to Natural Selection](#)

[Calculate the percentages of traits in a population](#)

[Calculate the averages of traits in a population](#)

[Construct explanations of natural selection](#)

Using Google Chrome, please **log into Clever** and **go to Newsela**. You can copy this link into your browser once you are logged into Newsela: <https://newsela.com/subject/other/2000276759>

If you have trouble with any of the links, the entire assignment is also provided below, with the graphic organizers, articles and quizzes that follow.

## Inherited Traits and Survival

In this lesson, you will investigate what inherited traits are by looking at several different examples of inherited traits in humans and animals. You will start by discussing the traits shared between individuals in a family. Next, you will choose to read about 2 different traits and how these traits help the organism survive in their environments. You will summarize what you know about inherited traits using a **Web Chart** graphic organizer.

This is a paired text activity that allows for student choice. All students will read [Cute features caused by gene mutations](#).

Student will choose one additional article to read:

[Why these giraffes are white](#)

[Zebras' stripes might save them from being bitten by flies](#)

[Scientists use computers to study spot patterns on giraffes](#)

[Lizards' toe pads help them survive storms](#)

[Holding their breath for a long time is part of the Bajau people's genes](#)

The following vocabulary terms will aid in your understanding of the readings:

**Environment:** All of the living and nonliving elements in a particular (geographic) area.

**Function:** What something is used for; purpose.

**Habitat:** The place where an organism lives; habitats supply the organism with food, shelter, moisture, and temperature for survival.

**Inherited traits:** Characteristics or attributes of an organism that are passed from parents to offspring.

**Offspring:** A living organism that is made when a plant or animal reproduces.

**Species:** A group of living organisms consisting of similar individuals capable of producing offspring.

**Structure:** A body part that does a certain “job” for an organism.

**Survive:** To continue to live or exist, especially in spite of danger or hardship.

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## Activities

### Engage

What traits or physical characteristics do the people in your family have in common? What makes each person in your family unique?

### Explore

**Article Reading and Annotation:** Read and annotate the articles as follows:

For the article, [Cute features caused by gene mutations](#):

- In YELLOW, highlight information about how traits are passed from parents to offspring.
- In BLUE, highlight information about different mutations and their effects.

For your second articles (of your choice):

- In GREEN, highlight details about the trait featured in your article.
- In YELLOW, highlight information about how this trait affects an organism's ability to survive.

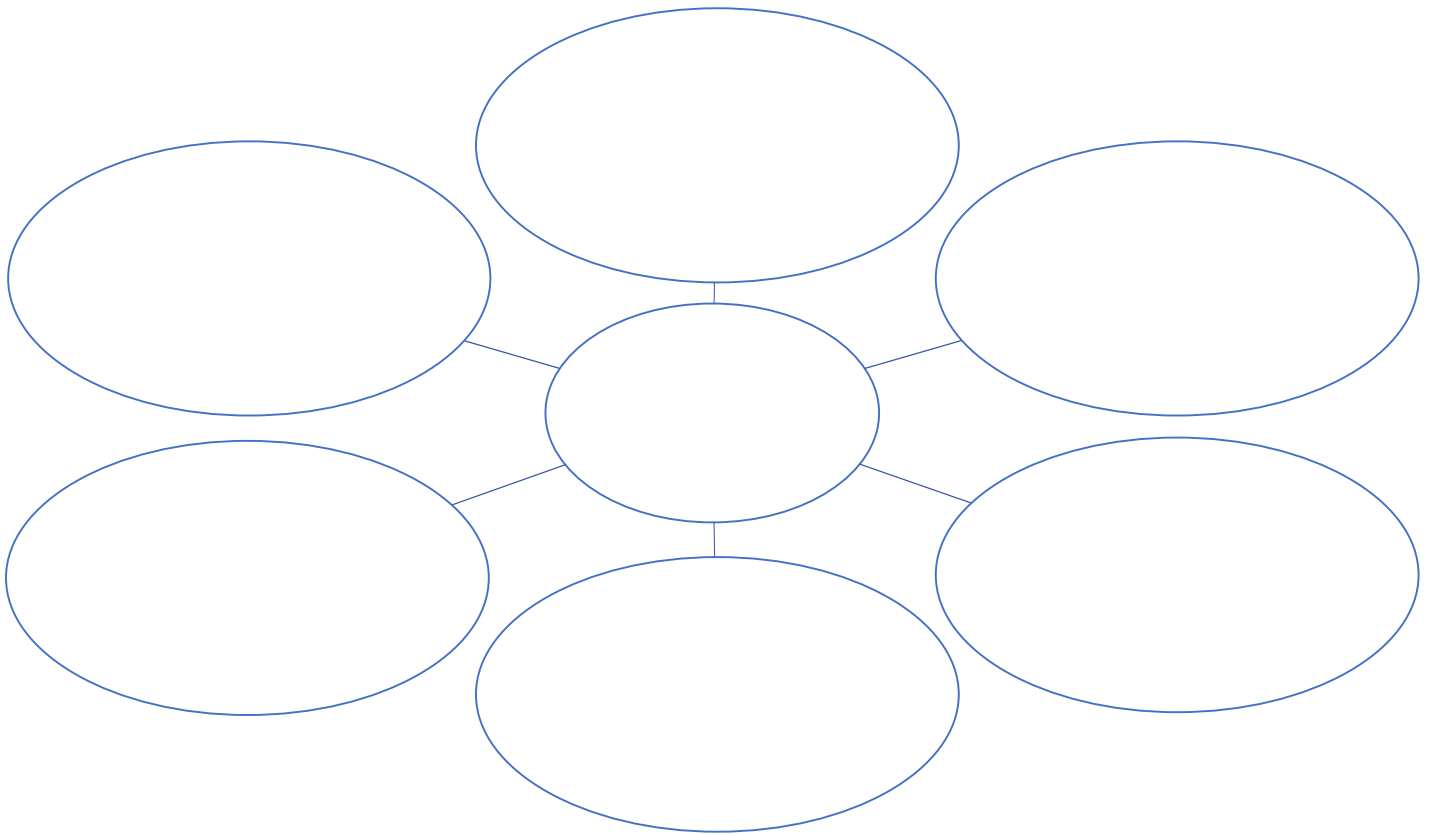
### Elaborate

Answer each of the following questions after you have read your two articles:

- What kind of traits are passed down from parents to offspring?
- Do all traits help organisms survive? Why or why not?
- Are mutations good or bad? Use evidence from your articles to help support your answer.
- Why don't children look exactly the same as their parents?
- Why don't brothers and sisters look exactly alike?

## Evaluate

Draw the Web Chart graphic organizer. In the **middle** of the graphic organizer, write the word "**Traits**". Write at least as many facts about traits as there are circles on the graphic organizer. You can customize the organizer by adding more bubbles to the graphic as well.



**Written Response:** In a 5-7 sentence paragraph, respond to the following prompt:

- What sort of traits did you inherit from your parents? How do you know?

# Cute features caused by gene mutations

By ThoughtCo.com, adapted by Newsela staff on 11.20.17

Word Count **577**

Level **730L**



Dimples can be seen when a person smiles. Photo by: Natashi Jay/Flickr.

How we look – the color of our eyes, or how tall we are – is because of our genes and DNA. Your DNA contains the information that tells your body how to grow and work. It is your body's instruction manual.

A gene is a part of DNA. These genes sometimes go through mutations, or changes. These changes are passed on from parent to child. Some mutations can lead to diseases or death. Others have no effect on us, or may even help us.

Some mutations can be pretty cute. Here are four features caused by gene mutations.

## **Dimples**

Dimples are little dents that show up in the skin. Sometimes they show on a person's cheeks when they smile.

Dimples are usually passed down from parents to their children. Each parent has the mutation in their genes that cause dimples. These genes are found in certain cells of each parent. When these cells, called sex cells, come together, genes are passed down to the children.



If both parents have dimples, their children will probably have them, too. If both parents do not have dimples, their children probably won't have dimples either. Still, parents with dimples could have kids without dimples. Parents without dimples can have children with dimples.

### **Multicolored Eyes**

Some people have eyes that are different colors. Sometimes, one eye is a different color than the other eye. Or, part of one eye is a different color than the rest of the eye.

Up to 16 different genes might affect what color our eyes become. Different colors in a person's eyes are caused by a gene mutation. Usually, people who are born with different colored eyes can still see normally. But these different eye colors can also happen later in life. People can get them because of a disease.



### **Freckles**

Freckles are caused by a mutation in skin cells. These skin cells are in the outer layer of the skin. They produce a brown coloring material, called melanin. This makes our skin darker. That way, it can help to protect from harmful sunlight. Too much sitting in the sun can cause diseases, like skin cancer.

Sometimes, the skin cells can change. They gather together in big clumps in the skin. This produces more brown coloring than normal. It causes brown or red spots to form on the skin.



Freckles are often caused by genes passed down from parents. They also can be caused by sunlight hitting our skin. People with fair, light skin and blond or red hair have freckles more often. Freckles can appear on the cheeks and nose, arms and shoulders.

### **Cleft Chin**

A cleft chin is also known as a dimple chin. A cleft chin is formed very early in life. It happens when a baby is still growing inside its mother. Bones or muscles around the mouth do not join together completely. This causes a small dimple in the chin.

Parents with cleft chins often pass this gene on to their children. But just because a child has the gene doesn't mean they will get a cleft chin. Something could happen in the environment when they are developing inside their mother. This might be what made them grow differently.



## Quiz

1 Which sentence from the article MOST CLEARLY shows HOW mutations are spread?

- (A) These genes sometimes go through mutations, or changes.
- (B) These changes are passed on from parent to child.
- (C) Parents without dimples can have children with dimples.
- (D) People with fair, light skin and blond or red hair have freckles more often.

2 Read the following selection from the section "Cleft Chin."

*Parents with cleft chins often pass this gene on to their children. But just because a child has the gene doesn't mean they will get a cleft chin.*

Based on this selection, which of the following statements is TRUE?

- (A) Parents with cleft chins always pass this mutation along to their children.
- (B) Cleft chins form as a result of bones not growing properly.
- (C) Cleft chins can be harmful if they are not carefully treated.
- (D) Parents with cleft chins can have children without cleft chins.

3 Read the paragraphs from the introduction [paragraphs 1-3].

*How we look – the color of our eyes, or how tall we are – is because of our genes and DNA. Your DNA contains the information that tells your body how to grow and work. It is your body's instruction manual.*

*A gene is a part of DNA. These genes sometimes go through mutations, or changes. These changes are passed on from parent to child. Some mutations can lead to diseases or death. Others have no effect on us, or may even help us.*

Which word from the paragraphs helps the reader understand the meaning of "genes"?

- (A) look
- (B) contains
- (C) information
- (D) change

4 Read the following paragraph from the introduction [paragraphs 1-3].

*Some mutations can be pretty cute. Here are four features caused by gene mutations.*

What does "features" refer to?

- (A) how a person looks
- (B) why some people have mutations
- (C) how genes change over time
- (D) why some mutations are dangerous



# Why these giraffes are white

By Sarah Gibbens, National Geographic, adapted by Newsela staff on 11.18.19

Word Count **341**

Level **MAX**



Image 1. A rare Masai giraffe is spotted in Tarangire National Park in Tanzania. This giraffe is not albino but instead has partial pigment loss, or leucism. Photo by: Robert Muckley/Getty Images

With their elongated necks and bright bodies, it's hard to miss a white giraffe, especially when there are two.

A white female and baby giraffe were first spotted on a reserve in Kenya in 2017 by rangers at the Hirola Conservation Program. Video they posted on YouTube skyrocketed in popularity as viewers marveled over the rarity of seeing the pale animal.

While many have been quick to label the giraffe as albino, it likely suffers from a genetic condition called leucism, which inhibits skin cells from producing pigment but allows other organs, such as eyes, to be dark colored. Albinism, a congenital condition, inhibits the body from producing pigment in all organs, and animals with this condition often have pink eyes.

The condition, while rare, is not unheard of. It was seen in a giraffe calf at Tanzania's Tarangire National Park.

Despite their inability to produce colorful pigment, giraffes and other animals with leucism don't face genetic disadvantages to their survival, but their color can attract unwanted attention.

More than half of all giraffes don't make it past six months of age, according to the Giraffe Conservation Foundation. They're targeted by predators such as lions and hyenas.

In the comment section of the Hirola Conservation Program's video, viewers also voiced concerns that widely circulating images of the animals and their location could make them more susceptible to poaching.

Following the birth of a white giraffe in their refuge, the Tarangire National Park took care to ensure the giraffe was safe from poachers. Hirola has not announced any such security.

Hirola noted in a blog post that this was the first time many of the community rangers had seen a white giraffe. They anecdotally wondered if the genetic condition is becoming more common, but no studies revealed whether this could be true.

Giraffes aren't the only animal to make headlines for unique, white fur. Earlier this month, a rare white moose was seen in Sweden walking through tall grass. White lions and white penguins have also been spotted with similar pigment conditions.

## Quiz

1 Read the following central idea statements.

1. *In Kenya, scientists discovered two white giraffes, which have a congenital condition called leucism.*
2. *While white giraffes are not the only white animals that exist, their condition places them in more danger from predators.*
3. *Scientists question whether the genetic condition leucism is becoming more widespread.*
4. *There are subtle differences between albino giraffes and giraffes with leucism.*

Which two options MOST accurately reflect the central ideas of the article?

- (A) 1 and 2
- (B) 1 and 4
- (C) 2 and 3
- (D) 2 and 4

2 Read the following summary of the article.

*After two white giraffes were found in Kenya and diagnosed with the condition leucism, scientists acted irresponsibly by leaving them at risk of being killed by animal predators.*

Is this an objective and accurate summary? How do you know?

- (A) Yes, because it reflects the central ideas of the article and does not make any personal judgments.
- (B) No, because it does not include the difference between giraffes with leucism and albino giraffes.
- (C) No, because it is not objective and makes a judgment about how the scientists acted.
- (D) No, because it includes a false detail about the behavior of the scientists.

3 Which of the following ideas did the author develop the LEAST in this article about white giraffes?

- (A) the similarities and differences between albino giraffes and giraffes with leucism
- (B) the common predators that target white giraffes
- (C) the similarity of white giraffes to other white animals such as lions and penguins
- (D) the reason people were intrigued by the two white giraffes in Kenya

4 What role do congenital skin conditions play in giraffes' chances of survival?

- (A) Giraffes with congenital skin conditions are rare and are thus more likely to be given protection.
- (B) Congenital skin conditions can inhibit the body from developing normally, lowering chances of survival.
- (C) Hunters such as lions and hyenas are intimidated by white giraffes' congenital skin condition and will not pursue them.
- (D) Congenital skin conditions can attract more attention from poachers and predators, making survival less likely.



# Zebras' stripes might save them from being bitten by flies

By The Guardian, adapted by Newsela staff on 03.06.19

Word Count 441

Level 590L



Image 1. Zebras cluster together in Botswana. Photo by: Paul Martiz/Wikimedia

Why do zebras have stripes? Scientists think they might have the answer. They say the pattern seems to confuse flies. The stripes make it harder for flies to bite zebras.

A group of scientists wrote a new study. They studied horses, zebras and horses dressed as zebras. The team said the study showed stripes might help to stop insects. The study also helped find out why.

Martin How helped write the study. He is a scientist at the University of Bristol in England. He and the other scientists watched the horseflies. They watched how the flies acted around nine horses and three zebras.

## **Horseflies Favor Horses**

Horseflies buzzed around the animals about the same. Landing was different, though. Fewer flies landed on zebras than horses.

The flies would get close to the zebras. Then they could not fly how they wanted. They would move too quickly. It seemed they could not direct themselves, How said. The flies would turn away or run into the zebra, he said.

The scientists wanted to know why. It could have been the stripes. It could have been something else, though. It could have been that zebras and horses smell different, for example. So the scientists put black, white and zebra-striped coats on seven horses. The flies touched and landed on the zebra coat far less often. The black or white coat did not make the same difference.



The stripes did not confuse flies from far away, the scientists said. Instead, they had an effect when the flies got close. It might happen because the flies cannot see very well.

How said that from about 6 feet away, a zebra would just look like a gray horse to a fly. It may be that the insects suddenly notice the stripes when they get close. That could confuse them.

### **"Pretty Nasty Diseases"**

How said that zebras have developed in parts of the world where flies carry "pretty nasty diseases." It can be very bad to get bitten by flies there, he said. Horses are different. They have lived in different environments. Diseases from flies cause less danger there, he said.

He added that this might not be the full story, though. Scientists think stripes could have other uses. They could help zebras hide. They could even be part of the way that zebras communicate with each other.

How said people who enjoy the outdoors could learn from zebras. People can wear patterned shirts and body paint, he said. It could help to avoid nasty insect bites.

## Quiz

- 1 How might horseflies hurt zebras in their habitat?
- (A) by bringing dangerous diseases
  - (B) by sucking all their blood out
  - (C) by sitting on zebra stripes
  - (D) by chasing zebras around
- 2 Which sentence from the article states a MAIN idea of the entire article?
- (A) The team said the study showed stripes might help to stop insects.
  - (B) Horseflies buzzed around the animals about the same.
  - (C) He added that this might not be the full story, though.
  - (D) How said people who enjoy the outdoors could learn from zebras.

- 3 What did the study find about how stripes affect flies?
- (A) Stripes don't affect flies on zebras.
  - (B) Stripes attract flies to zebras.
  - (C) Stripes confuse flies about to land.
  - (D) Stripes kill flies if they land.

- 4 Read the paragraph from the section "Horseflies Favor Horses."

*The scientists wanted to know why. It could have been the stripes. It could have been something else, though. It could have been that zebras and horses smell different, for example. So the scientists put black, white and zebra-striped coats on seven horses. The flies touched and landed on the zebra coat far less often. The black or white coat did not make the same difference.*

What is the main idea of this paragraph?

- (A) Scientists had many zebras and horses involved in their recent study.
  - (B) Scientists were able to put black and white coats on seven horses.
  - (C) Scientists thought that zebras might have a different smell than horses.
  - (D) Scientists saw few flies land on horses that were made to look like zebras.
- 5 How did scientists test the effect of zebra stripes on flies?
- (A) Scientists put a zebra in a lion coat.
  - (B) Scientists put a lion in a zebra coat.
  - (C) Scientists put a zebra in a horse coat.
  - (D) Scientists put a horse in a zebra coat.
- 6 According to the section "Horseflies Favor Horses," why do zebras' stripes confuse flies?
- (A) because flies cannot pick which color to bite
  - (B) because flies cannot see well until they are close
  - (C) because flies like to smell zebras more than horses
  - (D) because flies like to bite gray horses best

7 What might happen to a zebra without stripes?

- (A) It might not be able to eat.
- (B) It might not be able to hide.
- (C) It might not run as fast.
- (D) It might eat more grass.

8 Why do scientists want to learn more about zebras' stripes?

- (A) because they want to know how to stop flies from biting horses
- (B) because they want to make new clothing that will protect people
- (C) because they think stripes could help zebras hide or communicate
- (D) because they think stripes might cause zebras to get serious diseases



# Scientists use computers to study spot patterns on giraffes

By How Stuff Works, adapted by Newsela staff on 11.02.18

Word Count **418**

Level **570L**



Image 1. A 5-day-old baby giraffe stands by its mother, Denisa, in their compound at the Safari Park zoo in Ramat Gan, Israel, July 15, 2009. Photo by: David Silverman/Getty Images

Giraffes have very long necks. They are so tall that they reach high into the trees. They are covered in big spots. Ever wonder why a giraffe has spots? Could it be for camouflage? When animals have camouflage, they are able to blend in with things around them. It helps with hiding from enemies.

Can giraffes really hide? Everyone can see these giant animals walking around Africa, right?

## **Baby Giraffes Need Camouflage**

Sure, everyone can see fully grown giraffes. They are the tallest animals on the planet. It's the baby giraffes that need camouflage. Scientists did a new study. They found that giraffes get their spot patterns from their mothers. These spot patterns help young giraffe survive.

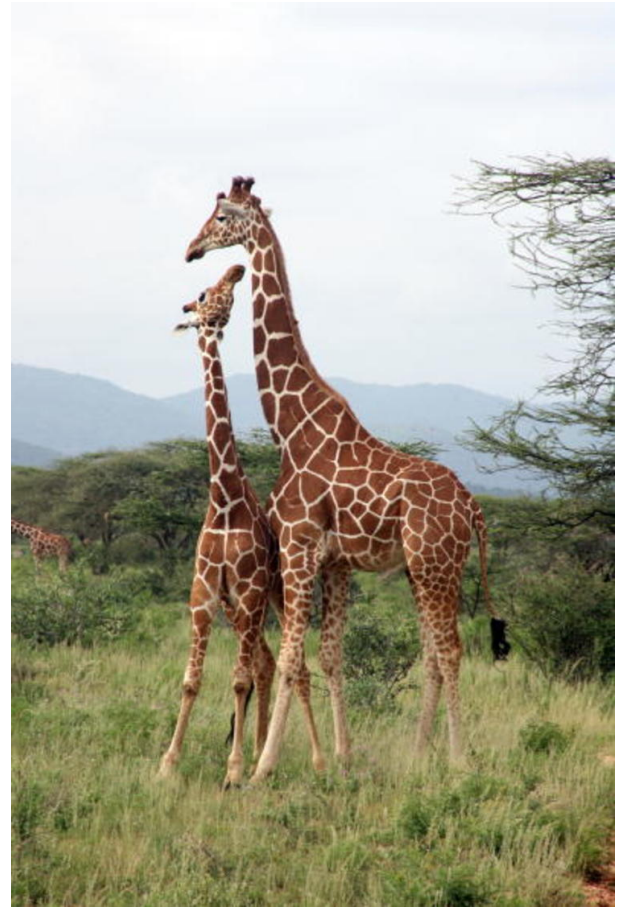
Camouflage is just one reason for the spots. Derek E. Lee is a scientist. He led the study. He said they do not really know what the spots are for. They might indeed be camouflage, but they could also help keep the giraffes' body warm or cool. They might help giraffes tell one another apart.

Giraffes have dark gray skin under their fur. Their skin has no spots at all. The spots on their fur are different shapes and sizes. They can be round or blobby. They can have sharp or smooth edges. Each giraffe has its own spot pattern. The spots stay the same during the giraffe's life. That allows scientists, and giraffe moms, to tell the animals apart.

### **Larger, Uneven Spots Might Be Good For Baby Giraffes**

The scientists found that certain kinds of spots are passed from mom to baby. A giraffe could have spots with smooth edges. Its baby would have the same smooth spots. The scientists saw that some babies had larger spots. These spots were more uneven. These baby giraffes survived the first months of life. Babies without these spots had a harder time.

This is a new finding to add to an old study. A scientist studied giraffes many years ago. Her name is Dr. Anne Innis Dagg. She watched a group of giraffes in a zoo. She studied their spots. She studied the shape, number, area and color. She saw that the spots were passed down from mother to baby. The latest study used computers. A computer program compared 11 characteristics of wild giraffe spots. Computers could help study other animals patterns, too. They could look at cheetah spots or zebra stripes.



## Quiz

1 Besides camouflage, what is another important reason for giraffes' spots?

- (A) to help giraffes communicate with each other
- (B) to tell the age of the giraffe
- (C) to help giraffes tell one another apart
- (D) to measure the size of the giraffe

2 Read the first paragraph of the article.

*Giraffes have very long necks. They are so tall that they reach high into the trees. They are covered in big spots. Ever wonder why a giraffe has spots? Could it be for camouflage? When animals have camouflage, they are able to blend in with things around them. It helps with hiding from enemies.*

Which question is answered by this paragraph?

- (A) Why is camouflage important for giraffes?
- (B) How did giraffes get their long necks?
- (C) Where do giraffes hide from their enemies?
- (D) Who is studying giraffes and their spots?

3 Which statement describes giraffes' spots?

- (A) They will always be similar to their mothers.
- (B) They help giraffes stay warm in winter and cool in summer.
- (C) They change as giraffes get older because they don't need camouflage anymore.
- (D) They can be seen on the grey skin underneath the fur.

4 Read the section "Baby Giraffes Need Camouflage."

Select the detail that explains how giraffes' spots help scientists and other giraffes to tell them apart.

- (A) Sure, everyone can see fully grown giraffes. They are the tallest animals on the planet.
- (B) He led the study. He said they do not really know what the spots are for.
- (C) Giraffes have dark gray skin under their fur. Their skin has no spots at all.
- (D) Each giraffe has its own spot pattern. The spots stay the same during the giraffe's life.

5 If a mother giraffe has spots with smooth edges, what kind of spots will her baby MOST LIKELY have?

- (A) similar spots with smooth edges
- (B) similar spots with sharp edges
- (C) smaller spots with smooth edges
- (D) smaller spots with sharp edges

- 6 Read the section "Larger, Uneven Spots Might Be Good For Baby Giraffes."  
Which sentence from the section states a MAIN idea about giraffe spots?
- (A) The scientists found that certain kinds of spots are passed from mom to baby.
  - (B) The scientists saw that some babies had larger spots.
  - (C) A computer program compared 11 characteristics of wild giraffe spots.
  - (D) They could look at cheetah spots or zebra stripes.
- 7 A computer program has been created using what scientists have learned about giraffes and their spots. What could this computer program be used for?
- (A) to help animals camouflage themselves better
  - (B) to help baby animals survive
  - (C) to find out if other animals in the wild have a good chance for survival
  - (D) to find out if other animals get their colors and patterns from their mothers also
- 8 The MAIN idea of the section "Baby Giraffes Need Camouflage" is that there could be a few different reasons for giraffes to have spots.  
Which key detail from the section supports this idea?
- (A) Scientists did a new study. They found that giraffes get their spot patterns from their mothers.
  - (B) Camouflage is just one reason for the spots. Derek E. Lee is a scientist. He led the study.
  - (C) They might indeed be camouflage, but they could also help keep the giraffes' body warm or cool. They might help giraffes tell one another apart.
  - (D) The spots on their fur are different shapes and sizes. They can be round or blobby. They can have sharp or smooth edges.

# Lizards' toe pads help them survive storms

By Associated Press, adapted by Newsela staff on 08.08.18

Word Count **482**

Level **520L**



Image 1. In this 2017 photo provided by Colin Donihue, an anoles lizard hangs onto a pole during a simulated wind experiment in the Turks and Caicos Islands. Photo by Colin Donihue via AP

WASHINGTON, D.C. — Lizards can be pretty sticky in high wind. A group of scientists wanted to know why.

In 2017, Hurricanes Irma and Maria hit the Caribbean. The hurricanes uprooted trees and destroyed houses. The storms were very destructive. Yet, many lizards did just fine. A group of scientists wanted to understand which reptiles survived. They also wanted to know why.

The scientists were from Harvard University in Boston. They used a surprising tool. It was a leaf blower! This tool is usually used to blow leaves and grass cuttings into a pile. The scientists used it to try different wind speeds. They wanted to know what happens to the lizards.

First, the scientists put 47 of the Caribbean critters on a pole. Next, they turned on the leaf blower. Finally, they aimed it at the lizards.

## Hanging On In Strong Wind



For the lizards, the strong wind didn't make a difference. The scientists turned up the power. It got tougher for them to hold on. At a wind speed of 102 miles per hour, the lizards grabbed the pole with their front feet. Their tails and back legs flapped in the wind like a flag. Winds that heavy can knock down buildings. Still, the lizards kept hanging on!

The scientists turned up the leaf blower. The wind speed was 108 miles per hour. The lizards couldn't hold on any longer. They all landed gently into a net. No lizard got hurt.

Colin Donihue is a scientist at Harvard. He led the team.

### **Bigger Toe Pads**

What was the lizards' secret? They had traits that helped them hang on. They had bigger toe pads. They also had longer front legs and smaller back legs.

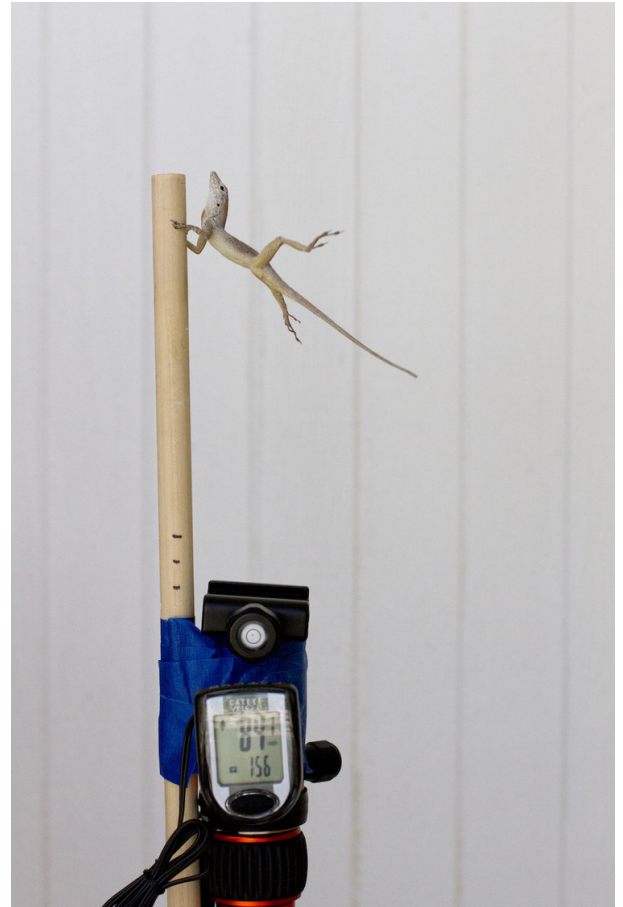
The scientists think that the lizards on the islands are changing. There are more hurricanes than there were in the past. Lizards with the traits that help them hang on are more likely to survive the storms. They will pass on those traits.

Donihue was very lucky. He was studying Caribbean lizards before the storms. He and his team were able to return after the storms were over. They could see which lizards had survived.

Those toe pads were key. The island lizards have bigger toe pads than Central American lizards. The Central American lizards live inland. They are not affected by hurricanes as much as island lizards.

The study shows one way that hurricanes affect animals, said Tracy Langkilde. She is a scientist at Pennsylvania State University.

Donihue said the lizards were pretty good at holding on. He was impressed!



## Quiz

1 Read the paragraph from the introduction [paragraphs 1-4].

*In 2017, Hurricanes Irma and Maria hit the Caribbean. The hurricanes uprooted trees and destroyed houses. The storms were very destructive. Yet, many lizards did just fine. A group of scientists wanted to understand which reptiles survived. They also wanted to know why.*

What is the MAIN idea of the paragraph?

- (A) In 2017, many terrible storms destroyed houses and trees.
- (B) Many lizards died during Hurricanes Irma and Maria.
- (C) Scientists wanted to learn why certain lizards are able to survive storms.
- (D) Scientists used a leaf blower to learn more about lizards.

2 Read the section "Bigger Toe Pads." The MAIN idea is that lizards on islands have bigger toe pads to help them survive.

Which key detail from the section supports the MAIN idea above?

- (A) They had traits that helped them hang on.
- (B) They will pass on those traits.
- (C) He was studying Caribbean lizards before the storms.
- (D) They are not affected by hurricanes as much as island lizards.

3 Which event happened FIRST in the article?

- (A) Scientists put 47 Caribbean lizards on a pole.
- (B) Hurricanes Irma and Maria hit the Caribbean.
- (C) Scientists aimed a leaf blower at the lizards.
- (D) The lizards fell off the pole.

4 How have island lizards changed because their homes are hit by more hurricanes?

- (A) They have moved inland to escape the hurricanes.
- (B) They have grown bigger toe pads to help them survive.
- (C) They are able to hold on to poles for longer periods of time.
- (D) They are learning how to land gently in nets.



# Holding their breath for a long time is part of the Bajau people's genes

By Nicola Davis, The Guardian, adapted by Newsela staff on 04.25.18

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Image 1. A Bajau diver hunting fish on the reef. Photo by: Melissa Ilardo

The Bajau people in Southeast Asia are amazing divers. They can hold their breath for long periods of time while diving to hunt fish. Scientists have finally figured out how they do it. The secret is evolution.

The Bajau people are able to dive up to 200 feet underwater with none of the usual diving tools. All they bring are weights and handmade wooden goggles. They take a single breath of air and dive in.

While the Bajau people's talents have long been known, the reason for this skill was unclear. The skill could be the result of practice. It could also be the result of changes rooted in the Bajau people's DNA. DNA is found in the cells of our bodies. It holds the information that tells the body how to grow and work. DNA is passed on from parents to children.

Now experts say they know why the Bajau people are so good at diving. The answer is in their genes. A gene is a section of DNA that tells a specific part of the body how to grow and work. Over time, the Bajau people's genes have changed.

The Bajau have large spleens, for example. The spleen can store oxygen-carrying red blood cells. This helps people hold their breath for longer. The genes for a larger spleen have passed from one Bajau parent to the next Bajau child many, many times over the years. That's why they can hold their breath underwater for so long.

### **Solving The Bajau Mystery**

Dr. Melissa Ilardo is a scientist. She helped write the study about the Bajau people. She and her team revealed how they solved the mystery using a clue from seals. It turns out types of seals which can dive for longer have larger spleens than other seals.

The team of scientists measured the spleens of 43 Bajau people. They also measured 33 people from a neighboring group of farming people, the Saluan.

The Bajau people's spleens were about 1.5 times larger than the Saluan people's spleens.

The team notes the trend was true whether each Bajau person was a diver or not. It was true even when factors like age and height were taken into account.

The scientists tested the Bajau people's genes. Certain versions of genes are more commonly found in Bajau people than would be expected. Many of these genes seem linked to changes that could help people handle low-oxygen conditions.

### **Genes That Affect Spleen Size**

Among them is a form of a gene linked to a larger spleen size. This is important for diving. People experience something called the "diving reflex" when our heads are underwater. The diving reflex causes the spleen to get shorter and tighter. A large spleen means even more oxygen-carrying red blood cells can be pumped through the body. It allows people to stay underwater for longer.

Another gene changes how much blood gets sent to the hands and feet. This leaves more blood for organs such as the brain, heart and lungs.

The team also discovered that these helpful forms of genes are not the result of chance. They are changes related to evolution. Evolution is an idea, or theory, about the way that living things have developed over millions of years. The changes that make the Bajau good divers are brought about by how and where the Bajau people live.

Stephen Stearns is a scientist at Yale University in Connecticut. He was not involved in the study. He said the study shows more proof of recent evolutionary changes in humans populations. Other examples include genes to help us eat and drink dairy products. These forms of genes showed up when people started keeping dairy animals like cows.

Stearns said the next step is to find out when the Bajau's genes began to change. "We know that the Bajau have been leading this lifestyle for at least a thousand years," he said. We're not sure when they started it, though. It could have been even earlier.



## Quiz

- 1 One MAIN idea of the article is that the Bajau people's genes allow them to dive for long periods of time.  
What is another MAIN idea of the article?
- (A) Scientists discovered that certain versions of genes are more commonly found in Bajau people than would be expected.
  - (B) Scientists discovered that having a larger spleen is part of what helps the Bajau people hold their breath for so long.
  - (C) Scientists said the study of the Bajau people shows more proof of recent evolutionary changes in human populations.
  - (D) Scientists said that certain types of seals that are able to dive for longer times have larger spleens than other seals.
- 2 Read the sentence from the section "Solving The Bajau Mystery."
- The Bajau people's spleens were about 1.5 times larger than the Saluan people's spleens.*
- HOW does this sentence support the article's MAIN idea?
- (A) by indicating that the Bajau and Saluan people live near each other
  - (B) by illustrating why scientists are worried about the Bajau people
  - (C) by explaining what scientists found that makes the Bajau people different
  - (D) by elaborating on the size of the spleens of most Saluan people
- 3 What effect does the "diving reflex" have on the spleen?
- (A) It causes the spleen to help people eat and drink more dairy products.
  - (B) It causes the spleen to send less blood to the hands and feet while under water.
  - (C) It causes the spleen to grow larger so people can store more oxygen.
  - (D) It causes the spleen to tighten and release more red blood cells into the body.
- 4 What is the relationship between evolution and genes?
- (A) Evolution makes parents have different genes than their children do.
  - (B) Evolution is an idea about how people's genes change over many years.
  - (C) Evolution causes people to change, while genes make them stay the same.
  - (D) Evolution is the study of animals, while genes are the study of people.