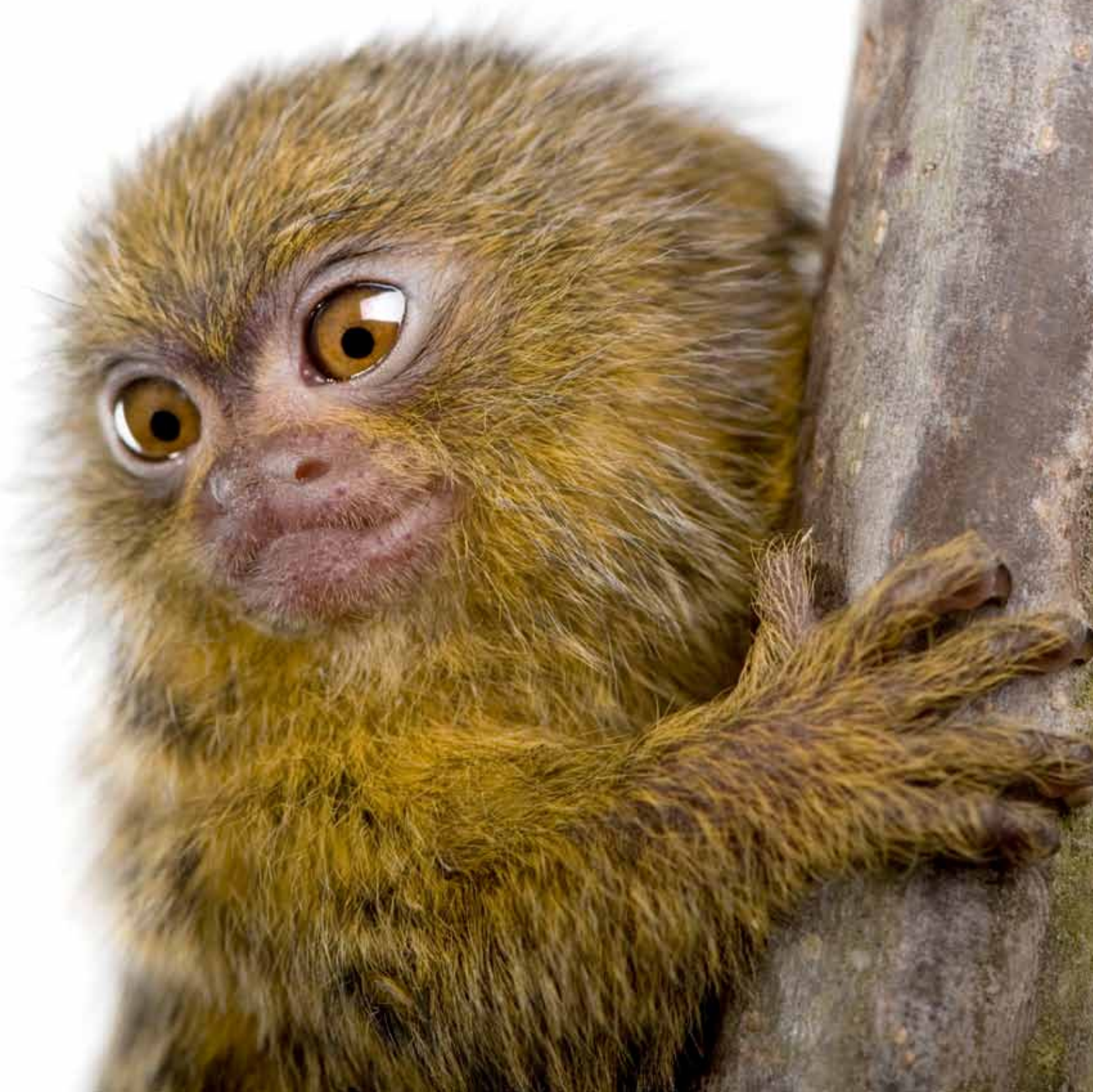


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Scripture & Science for Kids





BIG THINGS LEAP OUT OF SMALL PACKAGES

DAVE MILLER

Their existence contradicts the theory of evolution, which links frogs to life in water. They live in the thick leaf litter in low-lying parts of the rainforest of the tropical island of Papua New Guinea.

Even though they are little, they can jump 30 times longer than their body length. That would be like an average third-grade boy jumping almost half a football field in one jump!

The discovery of this frog species is so recent that evolutionary scientists don't know much about it. But, already, they are noticing characteristics that point to God as Creator. They think the frogs' tiny

sizes enable them to eat incredibly small insects, such as mites, that are ignored by bigger predators and are much smaller than the insects that frogs normally eat. Wet leaf litter on the forest floor is full of tiny insects just perfect for these frogs to consume. It makes sense that God would provide all sizes of animals to handle all the connections and interactions that must exist between His creatures and plants.

As scientists continue to study this amazing frog, they will discover even more amazing details that—if they will draw the right conclusions—will point them to the Creator.

JUST THIS YEAR, SCIENTISTS HAVE ANNOUNCED A NEWLY DISCOVERED FROG SPECIES: PAEDOPHRYNE

AMAUENSIS (PEE-DOH-FRY-NEE AM-OW-EN-SIS). They think this teeny frog is the world's tiniest known vertebrate—the world's smallest animal with a spine. Averaging less than one-third of an inch (7.7 millimeters or 3/10 of an inch) in length, these frogs are able to fit in the center of a dime—with lots of room left over! Up to now, the smallest known vertebrates have been fish.

The scientists who discovered this teeny, weenie creature did so by hearing the male frog's high-pitched mating call that doesn't sound like a frog at all. Instead, the voice resembles the buzz of an insect—a sound that is especially hard for human hearing to locate. The scientists finally had to just scoop up a bunch of leaf litter, dump it into a plastic bag, and begin sifting through the contents to discover the tiny frog.

These frogs hatch out as hoppers—rather than tadpoles—and live on the ground, not in the water.



Papua New Guinea in Green



THE ZIG-ZAGGING, ZOOMING ZUNZUN

ERIC LYONS



Cuba in Green

water? Because it needs a lot of energy. And why does it need so much energy? Because Bee Hummingbirds flap their wings in flight anywhere from

80-200 times **per second**.

IT HAS A BRAIN, A HEART, A BEAK, A TONGUE, TWO EYES, TWO WINGS, TWO LEGS, EIGHT TOES, AND ROUGHLY 1,000 FEATHERS, AS WELL AS MANY OTHER BONES AND BODY PARTS. Known as Zunzun in Cuba (the bird's only known natural habitat), the Bee Hummingbird is packed full of wonderfully designed, lightweight structures—all in a body that weighs less than a penny.

The Bee Hummingbird is the smallest bird in the world at only two inches long (from beak to tail) and weighing less than .07 ounces. Since it hovers in the air while feeding on the nectar of flowers and is only 1/2-inch longer than certain bees, at first glance it is sometimes mistaken for a bee.

Bee Hummingbirds build small nests (about one inch in diameter) and lay eggs smaller than a coffee bean (less than .01 ounce). The egg of a Bee Hummingbird is 4,500 times lighter than an ostrich egg.

The Bee Hummingbird may be small, but it can put away the "groceries" (in the form of nectar and tiny insects). Everyday these tiny birds eat about half of their bodyweight in food, and drink several times their bodyweight in water. That is comparable to an 80-pound child eating 40 pounds of food and drinking about 75 gallons of water **every day**.

Why does this little bird need so much food and

The flight of hummingbirds is unlike any other bird. God created these amazingly fast-flying, zig-zagging animals with the ability to move their wings so fast, and in such a specially designed, figure-eight motion, that they are the only birds in the world that can fly sideways and backwards, as well as up and down, all the while keeping their body in virtually the same position. They are the hovering helicopters of the bird world.

Some people say that evolution must have brought about the Bee Hummingbird. Yet, this could no more happen than a tornado could sweep through a junkyard and create a perfectly functional **helicopter**. Hovering hummingbirds did not evolve their unique, helicopter-like abilities from earlier airplane-like birds, which had neither the anatomy nor the ability to hover like a helicopter. Hummingbirds were specially created by God on day five of Creation.



A Bat the Size of a BEE



KYLE BUTT

IMAGINE GOING OUT

INTO YOUR YARD JUST BEFORE DARK AND SEEING A LITTLE FLYING BEE WHIZ RIGHT IN FRONT OF YOU. As it whips back around to make another pass, you realize it is not a bee. Its body is about the size of a bumblebee, but it has fur, and pointy ears, and a nose that looks like a pig. You realize it is a bat. That might happen to you if you lived in Thailand, because that is where the tiny bumblebee bat is found—one of the world's smallest mammals.

As you might have guessed, the bumblebee bat gets its name from the fact that its body is about the size of a bumblebee. It weighs about two grams, which is .07 ounces—about the weight of a dime. The bat's real name is Kitti's hog-nosed bat. It got its "real" name from the fact that a man named Kitti Thonglongya was the first to discover the bat in 1973. It got its "middle" name—hog-nosed—because its nose looks like a pig snout.

This micro mammal is an insectivore, which means that it eats insects. Bumblebee bats live in groups that number between 10 and 500. During the day, they hang upside down in limestone caves. At night, they fly out and eat insects off of bushes, or catch them in the air. Scientists estimate that there are only about 4,000 left in the wild.

When we study about these bitty bats, we also learn some things about God. First, we learn that God enjoys giving humans a variety of creatures to study and watch. Not only did God create the massive elephant, but He designed the bumblebee bat as well. Another thing we learn is that God is very smart. Only God could create such a marvelous, mini, micro, minuscule, miniature, minute mammal like the bumblebee bat.



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SHREWBOT

KYLE BUTT



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THE ETRUSCAN PYGMY SHREW IS A CONTENDER FOR THE SMALLEST MAMMAL IN THE WORLD.

It weighs about .063 ounces, which is a little less than the bumblebee bat. But it has a slightly longer skull than the bat. So some people say the shrew is smaller based on its weight, and others say the bat is smaller because of its tiny head. Either way, both these critters are tiny. But the tiny size of the shrew does not take away from its amazing design. Since this little creature cannot see well, it must rely on its whiskers to navigate and find food. The whiskers of the tiny shrew are highly sensitive and work very well. In fact, the shrew's whiskers work so well that researchers have been studying them in an attempt to build robots with similar technology.

Very smart engineers who build robots have been working on a new machine they call Shrewbot. Shrewbot is a small robot fitted with whiskers. The engineers studied the Etruscan shrew's whiskers and used them

as a model for their robot. The main advantage of this "touchy" technology is that the robot does not rely on vision. Because the robot uses its whiskers instead of eyes, it can go into dark places where other robots cannot go. The people who made the robot think it might be helpful to firemen, because it could go into smoky rooms.

When scientists copy designs in nature, it is called biomimicry. We often write about biomimicry in *Discovery* magazine. Each new instance of this practice helps us see the intelligent design within the natural world. If brilliant scientists find complex, working designs in nature that are better than man-made designs, then the Designer of the natural world must be more intelligent than any human designer. Isn't it neat how one of the world's smallest mammals provides such a "big" piece of evidence for the existence of God—the Intelligent Designer?

The Kitti's Hog-nosed bat Weighs about two grams or about the weight of a dime.

ACTIVITY PAGES



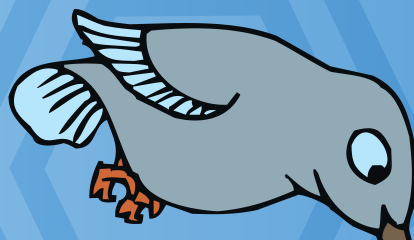
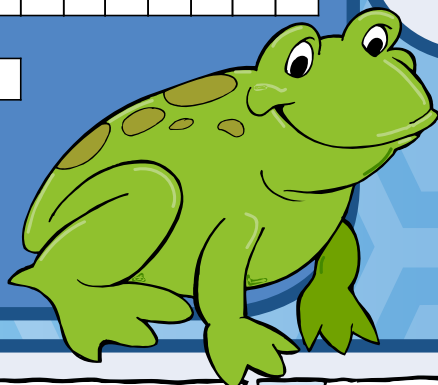
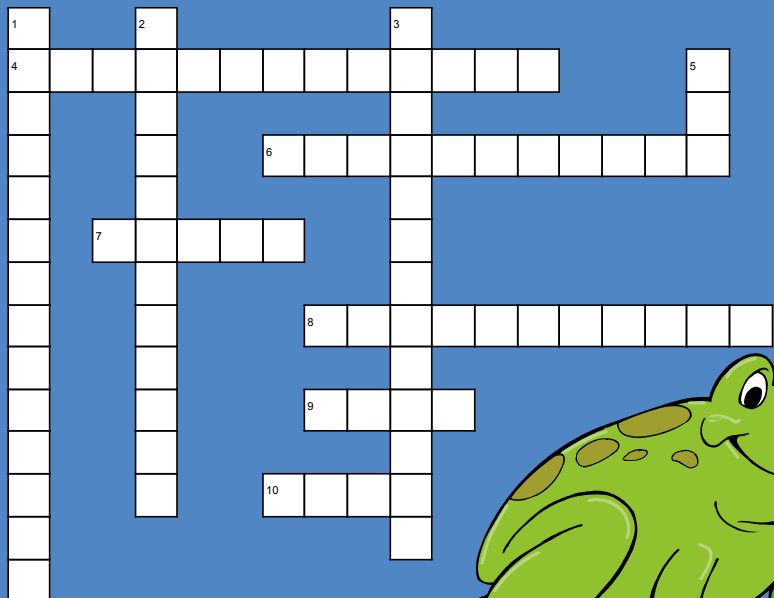
CROSSWORD CHALLENGE

Across:

- This shrew relies on its whiskers to navigate
- The hovering helicopter of the bird world
- This specially designed organ in the pygmy marmoset allows swallowed tree sap to sit in the intestines longer while it is broken down and digested.
- Animals with a spine
- Paedophryne amauensis* is a _____
- The day of Creation on which God made birds and bats

Down:

- Zunzun
- A small flying mammal with a nose that looks like a pig snout
- Mainly eats tree sap
- The infinite, intelligent Designer



TRUE OR FALSE

- Bee Hummingbirds flap their wings in flight anywhere from 80-200 times per second.
- Paedophryne amauensis* can jump 30 times longer than its body length.
- During the day, bumblebee bats fly out and eat insects off of bushes, or catch them in the air.
- The pygmy marmoset's specially designed teeth, digestive tract, neck, and facial markings show that this little guy was made with purpose and intent in mind—proving that there must be a God Who can make such an amazing creature.
- The egg of a Bee Hummingbird is 4,500 times heavier than a robin's egg.
- Pygmy marmosets team up and attack predators like a mob.
- The tiny bumblebee bat lives in Thailand.
- Etruscan pygmy shrews have very good eyesight.

FILL IN THE BLANKS

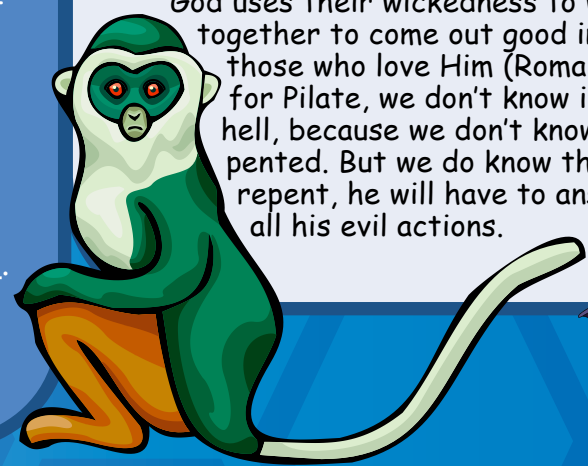
- The _____ is the smallest monkey in the world.
- When scientists copy designs in nature, it is called _____.
- Very smart engineers studied the Etruscan shrew's whiskers and used them as a model to make the _____.
- Paedophryne amauensis* lives in _____.
- The pygmy marmoset lives in South America and spends much of its time in _____.

Dear Digger Doug,

I am sure you would agree that God had it in mind for Jesus to die all along. I am sure you also agree that if Pilate had released Jesus, God would have found some other way for Him to die. Therefore, was it Pilate's fault that He died, and did he go to hell for it?

—Alyssa, Bedford, TX.

Dear Alyssa,
You have asked a very important question. If God uses people's evil actions to accomplish His purpose, does He punish them, even though good came from their evil deeds? The answer is, "yes." God does punish people for their wicked deeds even though He can use their wickedness to bring about good. Judas is a good example of this. In Matthew 26:24, Jesus said: "The Son of Man goes as it is written of Him, but woe to that man by whom the Son of Man is betrayed! It would have been good for that man if he had not been born." Notice that Jesus said that He was going to die "as it is written," which meant the prophets had foretold His death and it was part of God's plan. But also notice that He said: "woe to that man by whom the Son of Man is betrayed!" The word "woe" means that the person will have sorrow and suffering. Judas, the man who betrayed Jesus, was going to be punished for his wickedness. The reason for this is that God never **causes** a person to be wicked. He never tempts a person to do wrong (James 1:13). But since He knows what everyone will do, He can work His plans around their wicked deeds. He does not want anyone to choose to do wrong (1 Timothy 2:4). But since many people do choose to do evil, God uses their wickedness to work all things together to come out good in the end for those who love Him (Romans 8:28). As for Pilate, we don't know if he went to hell, because we don't know if he ever repented. But we do know that if he did not repent, he will have to answer to God for all his evil actions.





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EVEN **Tiny Guys** Like to **MONKEY AROUND**

JEFF MILLER

THE SMALLEST MONKEY IN THE WORLD, THAT WEIGHS ABOUT AS MUCH AS A SMALL APPLE, IS THE PYGMY MARMOSET.

The pygmy marmoset lives in South America and spends much of its time in trees. Although it is typically only 5.4 inches long, don't let its size fool you. This little guy can leap over 16 feet.



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While it likes to eat certain insects, especially grasshoppers, it mainly eats tree sap. Its lower teeth have been perfectly designed to allow it to gnaw into trees and stimulate sap flow from the tree. Its digestive tract has also been specially designed by God. The pygmy marmoset has an enlarged cecum (SEE-come), which allows the tree sap to sit in the intestines longer while it is broken down and digested.

As you might expect, since this monkey is so small, it is hunted by many other animals, including predator birds, large cats, and climbing snakes. However, it is not without a defense system. God designed its neck so that it can turn its head 180 degrees (humans can turn their heads around 140 degrees),

which helps it see predators that are sneaking up on it. Pygmy marmosets also team up and attack predators like a mob—loudly squeaking, whistling, trilling, and clicking at them until they retreat.

Adult pygmy marmosets have tails that are longer than their bodies and that have black rings like those on a raccoon. The fur on their faces sweeps back over their heads, and white marks can be seen on either side of their mouths and on their noses. Zoologists believe that these markings help the marmosets to see the facial movements of other marmosets, helping them to communicate with each other in the dark, dense forests of South America.

Some people want you to believe that the pygmy marmoset came about accidentally—as a result of random mutations. However, its specially designed teeth, digestive tract, neck, and facial markings show that this little guy was made with purpose and intent in mind—proving that there must be a God that can make such amazing, tiny creatures.

ANSWERS



CROSSWORD CHALLENGE: Across: 4. Eurasian pygmy; 6. hummingbird; 7. cecum; 8. vertebrate; 9. frog; 10. five. Down: 1. bee hummingbird; 2. bumblebee bat; 3. pygmy marmoset; 5. God. TRUE OR FALSE: 1-T; 2-T; 3-F; 4-T; 5-F; 6-T; 7-T; 8-F. FILL IN THE BLANKS: 1. pygmy marmoset; 2. bioministry; 3. Shrewbat; 4. Papua New Guinea; 5. trees.

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