Lesson: “Can you predict what an animal's babies will look like?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

Hi. It's Jay from the Mystery Science team. When I was a kid, my friend had a dog named Ona. This is Ona. One day, my friend came up to me really excited. She said, guess what? Ona is going to have puppies. She's going to be a mother. The puppies had a father too. This is their dad, Otis. I couldn't wait for the puppies to arrive. I'd seen other puppies before, but they all look so different. Some puppies look like this, others look like this, and others look like this. What will Otis and Ona's puppies look like? I wonder what you think.

EXPLORATION VIDEO 2

You probably know one thing already. Otis and Ona's babies will be puppies. Dogs have puppies. Cats have kittens. Birds have chicks, and so on. I mean, you know that birds don't hatch baby horses from their eggs, and cats don't have baby elephants. Maybe you also guessed that Otis and Ona's babies will have things like fur, wet noses, paws, and tails, all the usual dog stuff. These things are called traits. A trait is anything you can observe about a living thing. Because Otis and Ona's babies will be dogs, we know they'll have all the traits that make a dog a dog. But what will those traits look like? That's the mystery. Like, these two dogs both have tails, but this one has a tiny, curly tail, and this one has a big, long, straight tail. This dog's ears are floppy, but this dog was born with pointy ears that stick up. This dog has short black fur.

This dog has fluffy orangey fur. This dog has curly brown fur. There are so many different ways a trait can look. Take a second to compare Otis and Ona. Which traits are similar? Which traits are different?

EXPLORATION VIDEO 3

Otis and Ona have lots of traits that are the same. They both have tails, fur, four paws, and two ears. Those are all traits we expect to see in a dog, but even so, Otis and Ona look different. Otis is light brown all over and Ona is gray and brown and white with black spots. Otis has short fur and Ona has long fur. Otis has pointy ears, and Oona has floppy ears. Even though Otis and Oona have many of the same traits, they have differences in their traits too. So what does that mean for the traits their puppies will have? No one will know exactly what Otis and Ona's puppies will look like until they're born, but we can guess what they might look like based on what we know. Another way of saying that is predict. We can predict what the puppies will look like. We know the puppies will have fur, but what kind of fur will these puppies have? Will the puppies have fluffy, multi-colored fur like Mom? Short brown fur like Dad? Neither? I wonder what you think.

ACTIVITY INTRODUCTION VIDEO

In today's activity, you're going to predict what a puppy will look like. To help us figure out what Otis and Ona's puppies might look like, you'll first observe two other dog parents, Archie and Bella. Archie is the dad, and Bella is the mom. There are lots of differences between Archie and Bella's traits. So will the puppies have floppy ears like Archie or pointy ears like Bella? To figure this out, you'll draw a possible puppy. Your possible puppy is a prediction of what one of Archie and Bella's puppies might look like. You'll play a game using a coin to find out what your

possible puppy will look like. For example, if the coin lands like this, your possible puppy will have floppy ears. But if the coin lands like this, then your possible puppy will have pointy ears. The coin decides. Will the puppies look like their dad? Their mom? Both? You'll have to see what happens. We'll show you how to get started step by step.

ACTIVITY STEP 1

In today's activity, you'll work with a partner. You'll each draw a possible puppy of your own, but you'll work together to discuss your ideas. When you're done with this step, click the arrow on the right.

ACTIVITY STEP 2

Get your supplies.

ACTIVITY STEP 3

Before we start to draw our possible puppy, let's first color the fur and the eyes of each parent dog so they look like the images you see on the screen. Use your crayons to color the dad's eyes brown and the mom's eyes blue. Then use your crayons to color the dad's fur yellow and the mom's fur brown. Your coloring doesn't need to be perfect. It's okay if you color outside the lines. I'll set a timer for three minutes in case that's helpful. If you're ready, go to the next step.

ACTIVITY STEP 4

Let's take a moment to carefully observe the traits of the parent dogs, Archie and Bella. Discuss with your partner. What differences do you notice between Archie and Bella's traits? Try to find as many as you can.

ACTIVITY STEP 5

Before you start to draw your possible puppy, you need to know how the coin cup works. So watch this entire step before you do anything. First, we make sure that the coin is in the cup. Then, we carefully place one hand over the opening like this. Next, shake the cup for five seconds. When we hear time's up, we stop shaking and look inside the cup. Okay. Now that you know what to do, we'll practice together in the next step.

ACTIVITY STEP 6

Let's practice. Make sure the coin is in the cup. Carefully use your hand to cover the opening. Now, get ready to shake the cup. You'll have five seconds. Ready, set, shake. Okay. Time's up. Now put the cup down and look inside. You'll either see a face on the coin like this or you won't see a face. Our penny has a shield like this, but you might see something different on your coin. Now look at your puppy parents' worksheet and find pictures that look like your coin. These pictures will help you draw your possible puppy. Go to the next step to see how this works.

ACTIVITY STEP 7

First, we'll explore the ears. Archie has floppy ears and Bella has pointy ears. What kind of ears will your possible puppy have? Let's use your coin cup to find out. Make sure the penny is inside the cup. Cover the opening with your hand. Ready, set, shake. Okay. Time's up. Look inside the cup. Circle floppy if you see a face on your coin. Circle pointy if you don't see a face on your coin. Then go to the next step.

ACTIVITY STEP 8

Okay. Now it's time to start drawing your possible puppy. If your coin showed a face and you circled floppy on your worksheet, use your pencil to draw floppy ears like this. If your coin showed a shield and you circled pointy on your worksheet, use your pencil to draw pointy ears like this. Go ahead and add ears to your puppy now.

ACTIVITY STEP 9

Now let's look at the tail. Find where it says tail on your worksheet. Your puppy might have a curly tail like dad or a straight tail like mom. Make sure the penny is in the cup and cover the opening with your hand. Ready, set, shake. Okay. Time's up. Look inside the cup. Then on your worksheet, circle the side of the penny you see. If your coin showed a face and you circled curly, draw a curly tail like this. If your coin didn't show a face and you circled straight, draw a straight tail like this.

ACTIVITY STEP 10

Now let's see what color eyes your possible puppy will have. Find where it says eyes on your worksheet. Your puppy might have brown eyes like dad or blue eyes like mom. Make sure the penny is in the cup and cover the opening with your hand. Ready, set, shape. Okay. Time's up. Look inside the cup. Then on your worksheet, circle the side of the penny you see. If you circled brown, color your puppy's eyes brown. If you circled blue, color your puppy's eyes blue.

ACTIVITY STEP 11

Okay. Now let's figure out your puppy's fur color. Find where it says fur on your worksheet. Your puppy might have yellow fur like dad or brown fur like mom. Make sure the penny is in the cup and cover the opening with your hand. Ready, set, shake. Okay. Time's up. Look inside the cup. Then, on your worksheet, circle which side of the penny you see. If you circled yellow, color your puppy's fur yellow. If you circled brown, color your puppy's fur brown.

ACTIVITY STEP 12

Now let's see what kind of spots your possible puppy will have. Find where it says spots on your worksheet. Your puppy might have big spots like dad or little spots like mom. Make sure the penny is in the cup and cover the opening with your hand. Ready, set, shake. Okay. Time's up. Look inside the cup. Then on your worksheet, circle which side of the penny you see. If you circled big, add some big black spots to your puppy. If you circled little, add some little black spots to your puppy.

ACTIVITY STEP 13

Okay. Now that you have a possible puppy, let's compare your puppy to all the other puppies in your class. You can stay seated or stand up. Make sure that you can see your possible puppy drawing. Once everyone is ready, go to the next step.

ACTIVITY STEP 14

Follow along with me and show what your puppy drawing looks like. First, show me what kind of ears your puppy has. If your puppy has floppy ears like dad, make floppy ears like this. If your

puppy has pointy ears like mom, make pointy ears like this. Take a look around the room to see what everyone has. Okay. Go ahead and put your hands down. Now, show me what kind of tail your puppy has. If your puppy has a curly tail like dad, make a curly tail like this. If your puppy has a straight tail like mom, make a straight tail like this. Look around the room to see what everyone has. Okay. Go ahead and put your hands down again. Last one. Show me what kind of spots your puppy has. If your puppy has big black spots like dad, make a big circle like this. If your puppy has little black spots like mom, make a little circle like this. Take a look around the room. Okay. Great job. Go ahead and take a seat.

ACTIVITY STEP 15

Give your puppy a name and write it here on the worksheet. Then, discuss this question. All the possible puppies in your class have the same two parents, but do all the puppies in your class look the same?

ACTIVITY STEP 16

Let's go back to the traits of the parent dogs. Put the parents next to your puppy. Discuss and then circle the answer on your worksheet. Does your possible puppy look a lot like dad, a lot like mom, or a bit like dad and a bit like mom?

ACTIVITY STEP 17

You've done a great job exploring what Archie and Bella's puppies might look like. Now let's go back to the original dog parents we met, Otis and Ona. I wonder if you have some new ideas. Discuss, what do you predict Otis and Ona's puppies might look like? Why do you think that?

WRAP-UP VIDEO 1

In the activity, you explored what the possible puppies of two very different dogs might look like. Some of your possible puppies looked more like Dad, some looked more like Mom, but they all had some traits that were similar to Mom and some traits that were similar to Dad. Are you ready to meet Otis and Ona's puppies? Take a look. Like the puppies you predicted in the game, each of Otis and Ona's puppies has some traits that are similar to their dad and some traits that are similar to their mom. For example, this little puppy is named Chester. Chester has pointy ears like his dad, but has multicolored, shaggy fur like his mom. He looks a bit like his dad and a bit like his mom, but not exactly like either one. And if you look at Chester next to his brothers and sisters, you might notice something else. He doesn't look exactly like them either. You probably noticed this with the puppies you made in the game too. Even though you started with the same dad and the same mom and went through the same process to predict traits, each puppy ended up a little different from the others. That's because each puppy has a slightly different mix of traits that are like Dad or like Mom. Chester has pointy ears like Dad and shaggy fur like Mom. But Chester's brother, Herring, has short fur like Dad and colorful spots like Mom. And their sister Beatrice has pointy ears and short tan fur, all like Dad. In our game, we looked at just a few traits puppies can have, like the shape of their ears or the color of their fur. But puppies have so many different traits that make them who they are. Some of these traits are big and noticeable, like brown fur or yellow fur, but some can be super small and hard to see like a tiny freckle. But no matter how a puppy looks, if you compare them to their dad and mom, you'll still see some traits that are similar and some that are different. But what about other animals? Do other animals look like, but not exactly like their moms and dads? Let's explore this with cats. This kitten is named Marianne. This is Marianne's dad, and this is Marianne's mom. And

here are her brother and sister, Lenny and Lillia. What do you think? Does Marianne have any traits that are similar to those of her dad or her mom? Does she have any traits that are different? How about her brother and sister?

WRAP-UP VIDEO 2

Marianne has many traits that are similar to those of her parents, but she also has traits that are different from each one. She definitely looks a lot like her dad. They have the same orange stripy fur. But she doesn't look exactly like dad. Check out that white fur on her chest. Just like puppies, kittens have a lot of traits that are similar to their dad or mom, but they don't look exactly like either one. And check out Marianne's brother and sister. They each have some mix of dad's traits and mom's traits, but look how different they are from one another. These unique differences in traits, big and small, are called variations. And it turns out, all animals have variations in their traits, even wild animals. Variations can sometimes be tougher to spot in wild animals, but they're still there. Take a look at these giraffes. This is a mother giraffe with her baby. They look so similar, right? The baby looks like a mini version of her mom. But if you look really, really closely at their brown and white patterns, you'll see they are not exactly the same. The shape of the baby's pattern of white and brown is unique, like a fingerprint. No two living things on Earth are exactly alike. Every baby, every brother and sister, even every twin, everyone has variations that make them unique. Every dog you meet, every squirrel you see at the park, every bird you spot out the window. Each one is a unique, once-in-a-universe individual. So pay attention. See if you can notice the tiny spot, or the fluffy feather or the colorful streak that makes each creature you see unique, and take care of them. They are truly one of a kind. Have fun and stay curious.