mystery science

Grades K-5
Mini-Lesson + Activity: “What would happen if you didn’t have a skull?”

VIDEO TRANSCRIPT

MINI-LESSON VIDEO 1

Hi, it's Doug! Have you ever had an X-ray taken before? Maybe you've seen an X-ray of some of your teeth when you go to the dentist. Or if you're like me and you've broken a bone, you get an X-ray done and get a chance to see what part of your own skeleton looks like. Well, someone named Kien has a question about this bone right here. Let's give him a call now.

[Video Call]

- Hi, Doug!

- Hi, Kien!

- I have a question for you. What would happen if we didn't have a skull?

- Ooh, that's a great question.

The skull—it might be the most recognizable bone of our skeleton. Technically, it's not even one bone, but lots of separate bones that fuse or join together while we're still babies. And of course, the skull is a symbol that lots of people use to stand for spookiness like you see on Halloween or a pirate flag, or as a symbol that stands for death and those who have died, like you see if you celebrate Dia de Muertos. While you might find it frightening or scary to think of things like that, keep in mind a skull is not just something that a dead skeleton has, each of us has a skull in our heads right now. As living, breathing, human beings you can even feel it, so there's a

positive happy side to skulls—all the great things a skull does for us. Can you think of some ways the skull is an important part of your body? There's more than one way.

MINI-LESSON VIDEO 2

One of the best ways to figure out what the skull does is to do a little thought experiment. Just think for a moment. What if you didn't have a skull? One thing you might've thought up right away is that there would be absolutely nothing to protect your brain. Your brain is one of the most important organs in your body; you could say the most important even. It controls every other part of your body. It's where you think and process all of the information that comes from your senses. Yet the brain is an incredibly soft, mushy part of your body. Having a skull acts like a natural helmet that protects your brain from getting bumped or damaged from everyday movements you might do. But that's not the only thing your skull does for you. Think about some of the other parts of your head. Your skull has these two round holes, almost like little caves, that hold and protect your eyes. On either side of the skull are two round holes that protect all the inner parts involved in your sense of hearing. And don't forget, your skull is home to your sense of smell, as well as your mouth. That includes your tongue and your sense of taste and your teeth for grinding and chewing up food. And that's not even including the fact that it's starting from these holes in your skull that you're able to take in the air you need to breathe, as well as food and water from here. But even this isn't everything your skull does for you. When we look at a picture of a skull, like this, where we're just seeing the bone, it's really easy to forget another important thing your skull does for you. But if we add in an illustration of what sits on top of the bone—the muscles that are in your face. Oh yeah! Without a skull, none of those muscles in your face would have anywhere to sit. In fact, all of them are attached to different parts of your skull. It's these muscles that allow you to open your jaw, raise your eyebrow, smile,

frown, or show someone anything you're feeling. So, while the skull might be a symbol of death and spookiness, the skull we each have in our head is pretty awesome and useful, and that's not just true for us either—lots of animals have skulls too. Any animal that has a skeleton has a skull. Birds have skulls, reptiles have skulls, fish, amphibians, and all the mammals too. All of these animals have brains. And just like us, their skull protects their brain. That's something that all of our skulls have in common. But the skulls of animals can look really different from one another. Some are long, like this one with a beak. Some are short with huge holes for the eyes. Some are gigantic with big tusks for teeth. Some are pointy and sharp. In fact, scientists can know exactly which animal a skull came from just by looking at it closely. Learning to do that can take years of practice. But even just a few simple observations of animal skulls can teach you some really interesting things. For example, check this out. Are the eye sockets facing forward on this skull or are they on the sides of the skull? That can tell you whether it's the skull of a predator animal like a mountain lion or the skull of a prey animal, like a deer, whose eyes are on the side of its head so that it can be on the lookout for animals that might want to hunt it. Or check out this skull. Can you guess what animal this one belongs to? Here's something especially weird about this skull. It's got a snout, but notice there are no holes at the end of the snout—there are no nostrils there. So, weird! Does this animal not have a nose? It does. Look instead on the top of its skull. Now, you see two holes there? That's its nostrils. It's the skull of a dolphin. You might've heard before that dolphins have a hole in the top of their head. It's their blowhole. Dolphins are mammals. They're not fish. They have to come up to the surface of the water to breathe. So do whales, too. A whale has a blowhole as well. By looking at the skull of a dolphin or a whale, you can discover that the blowhole is actually their nostrils. They don't have nostrils at the tip of their snout. Instead, their nostrils are on the top of their heads. So, in summary, a skull is an incredibly important part of the body, both for animals and for people.

Without a skull, not only would you have no protection for your brain, but you'd also have no home for so many of your senses or for the muscles that control all of your facial expressions. That's all for this week's question. Thanks, Kien, for asking it. Now, after this video's done playing, my friends and I here at Mystery Science have created a special activity where you can learn more about your own skull and create a paper skull mask. I hope you'll try it. Have fun and stay curious!

ACTIVITY: GRADES K-2

ACTIVITY INTRODUCTION VIDEO

In today's activity, you'll make a paper model of your skull—the bone inside your head. Now even though your skull is hidden beneath your skin and muscles, you can find out a lot about it by using your sense of touch. We'll go on a little tour of your own skull. That way, you'll get to feel what you can't see. And while you're at it, you'll get to build a paper skull. When you're done, you can wear your paper model as a mask and scare your friends. I'll show you how to get started, step by step.

ACTIVITY STEP 1

Before you make your mask, you're going to go on a tour of your own skull. Gently feel your head and your face with the tips of your fingers. Notice, where is it hard? That's bone. Where is it soft? What else do you notice? Take a few moments to do this. Now, be careful when you feel

around your eyes. I'll put a timer on screen, in case it's helpful. Okay, if you're ready to go to the next step, click the arrow on the right.

ACTIVITY STEP 2

Your skull is made of two big bones—your cranium and your jaw. The top part of your skull is called your cranium. It has the important job of protecting your brain. Go ahead and put your hand on top of your head and feel your cranium. As you do this, let's sound out the word cranium together. Cra-ni-um. Cranium. You say it.

ACTIVITY STEP 3

Your cranium is a hard bone, but there are holes or openings in it. Did you notice any soft spots when you felt your head and face? These are where the holes are in your skull. Discuss.

ACTIVITY STEP 4

Here are some things we noticed. There are seven holes, or openings, in your head: your eyes, your nostrils, your ears, and your mouth. These two dark holes on the cranium are your eye sockets, bony cups that protect your eyes. To feel the eye sockets in your own skull, put your fingers on your eyebrow and feel for a bump of bone. Then, gently trace the bony circle around your eye down to the top of your cheek and back up again to where you started.

ACTIVITY STEP 5a

Take a look at the cranium in this photo. It's all bone and teeth—all the hard stuff. It doesn't have a nose and it doesn't have ears. Wiggle your nose and wiggle your ears. Then discuss.

ACTIVITY STEP 5b

Here are some things we noticed. The tip of your nose is bendy, so are your ears. They're all made of soft stuff called cartilage. Remember, the skull is just the hard stuff. So the only part of your nose and ears that you can actually see on a skull are the holes that connect them to your brain.

ACTIVITY STEP 6

We're going to look at one last hole in the skull—your mouth. The bottom part of your skull is your jaw. When you open your mouth, you move your jaw. Move your jaw along with the video.

ACTIVITY STEP 7

Now that you know your skull a little better, get these supplies to make your mask. Write your name on your Skull printout.

ACTIVITY STEP 8

It's time to make your mask. Let's start with the teeth. The skull on your paper has all of its teeth, but you might be missing some, so, to make your mask look more like you, use a pencil to shade in any teeth you're missing, like this.

ACTIVITY STEP 9

Now, it's time to give your paper skull holes just like a real skull. Let's do the nose first. Fold our paper on the center line. Then, cut along these two lines. Afterward, unfold it and flatten the sheet like this.

ACTIVITY STEP 10

A mask needs holes for you to look through. Fold the paper along this line. Then, cut along the dotted lines on each black circle, like this. Unfold and flatten the sheet to make sure your mask looks like this.

ACTIVITY STEP 11

To make your skull mask stiff we're going to fold on all these lines. So turn the paper over, and fold down the corners like this. Run your fingernail over each fold to make a good crease. Next, fold down the top. And finally, fold in each of the sides. You'll end up with a mask that looks like this.

ACTIVITY STEP 12

Hold up your skull mask and look through the eye holes. Show it to a friend and share what you learned about the skull today. Have fun and stay curious!

ACTIVITY: GRADES 3-5

ACTIVITY INTRODUCTION VIDEO

In today's activity, you'll make a paper model of your skull—the bone inside your head. Now, even though your skull is hidden beneath your skin and muscles, you can find out a lot about it by using your sense of touch. We'll go on a little tour of your own skull, that way you'll get to feel what you can't see. And while you're at it, you'll get to build a paper skull with a jaw that moves. When you're done you can even wear your paper skull as a mask. To scare your friends, simply open your skull's mouth and say boo! I'll show you how to get started, step by step.

ACTIVITY STEP 1

Before you make your mask you're going to go on a tour of your own skull. Gently feel your head and your face with the tips of your fingers. Try to notice, where is it hard? That's bone. Where is it soft? What else do you notice? Take a few moments to do this. Be careful when you feel around your eyes. I'll put a timer on the screen, in case that's helpful. Okay, if you're ready to go to the next step, click the arrow on the right.

ACTIVITY STEP 2

Your skull is made of two parts—the cranium, and the jaw. The cranium protects your brain. But there are holes in your cranium so that information from the world around you can travel to your brain through some of your senses. Discuss.

ACTIVITY STEP 3

Here are some things we noticed. There are seven holes or openings in your head. You've got your eyes, your nostrils, your ears, and your mouth. These two dark holes on the cranium are your eye sockets, bony cups that protect your eyes. To feel the eye sockets in your own skull, put your fingers on your eyebrow and feel for a bump of bone, then gently trace the bony circle around your eye, down to the top of your cheek, and back up again to where you started.

ACTIVITY STEP 4a

Feel your nose. Then take a look at the cranium in this photo. Your cranium is bone and teeth—all the hard stuff. Discuss.

ACTIVITY STEP 4b

Here's what we noticed. The tip of the nose is bendy. It's made of soft stuff called cartilage—it's not bone. So that's why you see a hole in the cranium where your nose should be. That hole allows smells to travel to your brain.

ACTIVITY STEP 5a

Okay, you found holes in the cranium for your eyes and nose. But what about your ears? Take a look at this picture of the cranium from the side. Discuss.

ACTIVITY STEP 5b

Here are some things we noticed. Ears are bendy, just like the tip of your nose. They're both made of soft stuff called cartilage—it's not bone. So that's why you see a tiny hole in the cranium where your ears should be. That hole allows sounds to travel to your brain.

ACTIVITY STEP 6

We're going to look at one last hole in the skull—your mouth. The bottom part of your skull is your jaw. When you open your mouth, you move your jaw. Move your jaw along with the video.

ACTIVITY STEP 7

Now that you know your skull a little better, get the supplies you need to make your mask. Each person needs two printouts because your skull is made of two pieces—the cranium, and the jaw.

ACTIVITY STEP 8

Watch the video. Notice that the top teeth are on the cranium and the bottom teeth are on the jaw. Find the teeth on your printouts, and use your pencil to outline each tooth on the jaw and the cranium. If you're missing any teeth, blackout those teeth on the printout so that your skull mask will look more like your own skull.

ACTIVITY STEP 9

Now it's time to make your mask. Fold the cranium sheet on the center line, like this. Cut out the nose hole. Then, cut on the lines to make three slits—one for the mouth, and two more to hold the jaw in place. Last, you'll cut off the corner and the side strip.

ACTIVITY STEP 10

To make the holes for your eye sockets, fold the paper again on this line. Cut out the eye sockets, then unfold and flatten the sheet like this.

ACTIVITY STEP 11

To make the mask stiff, you're going to fold on these lines. Turn the paper over, fold down the corners, then fold down the top, and fold in the sides. Run your finger over each fold. You'll end up with something that looks like this.

ACTIVITY STEP 12

Now it's time to make your jaw. Cut on the dotted lines like this. Don't forget the lines on either side where it says “Boo”.

ACTIVITY STEP 13

To make the jaw open and close, you need to make a handle. First, fold on the lines. Fold A onto B, then fold that onto C. Finally, fold C onto D. Repeat this on the other side.

ACTIVITY STEP 14

Now we're going to add the jaw to the cranium. We're going to fold here, right above the black box that says “Boo”. So flip the jaw over and fold down. Now, we'll lift up the part between these two slits, like this. Then, slide the handle through, like this.

ACTIVITY STEP 15

Now let's connect the jaw to the cranium. Push up the cranium slightly, so that you can see the slit right below the teeth. Then, push the part that says “Boo” through like this. It should look like this when you're done.

ACTIVITY STEP 16

This skull mask doesn't work exactly like a real skull. Discuss.

ACTIVITY STEP 17

To see how your jawbone actually moves when you open your mouth, watch this video. Discuss.

ACTIVITY STEP 18

Now you have a mask that looks like your own skull. You can use it to scare your friends or show it to a friend and share what you learned about the skull today. Have fun and stay curious!