mystery science

# Grades K-5
# Mini-Lesson + Activity: “Why do our skeletons have so many bones?”

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# VIDEO TRANSCRIPT

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## MINI-LESSON VIDEO 1

Hi, it's Doug! These are my favorite pajamas. They're awesome. They're even realistic—check this out. This is a model of the human hand, and there are the pajamas, right there. It's pretty detailed, isn't it? Someone named Gideon has a question about skeletons. Let's give him a call.

**[Video Call]**

-Hi, Doug!

-Hi, Gideon!

-I have a question for you. Why do our skeletons have so many bones?

-That's a great question.

We do have a lot of bones. Scientists have counted them and found out that there are more than 200 bones in our body. But before we can answer why there are so many, think about this: Why do we even have bones at all? I mean, what good are bones? What do they do for your body?

## MINI-LESSON VIDEO 2

Well, when thinking about what bones do, funny enough, it might be helpful to think about a building like a skyscraper. When people make a building, first they start with some kind of steel

or wooden beams. They create a structure, something that's in the shape of the building, and only once they've done that do they add the walls, the windows, the roof, and so on. Sometimes we even call this the skeleton of a building. Your skeleton is no different. The bones are like the steel beams of a building. They give your body its structure. Now imagine for a second if you had no bones at all. What would happen? Think about it. You'd just flop over. You'd look like this. There'd be nothing to hold you up. So, that's what bones do for us. They give us a structure. But why so many bones? Why do we have over 200 bones in our body? Take your hand, for example. You can see in this X-ray of a hand there are a lot of bones. Just in the top part of one finger, there are three bones. What's the point of that? Use your imagination again. Imagine if your finger had only one bone in it. What would go wrong? You can see there'd be nowhere for your finger to bend—you couldn't bend your finger. Each of the places on your body where you can bend something, that's called a joint. So you see, by having more than one bone in each finger, that allows your finger to bend. Now think of all the places on your body that can bend. Your neck, your legs, your arms. You see, if you didn't have so many bones in your body, you wouldn't be able to move in so many ways. So in summary, without bones, our body would have no structure. You literally couldn't stand up. And by having so many bones, that allows our bodies to bend in many places. Without that, we wouldn't be able to move. Now, after this video is done playing, my friends and I here at Mystery Science have created a step by step activity that combines science with art. I hope you'll try it. Have fun, and stay curious.

## ACTIVITY INTRODUCTION VIDEO

In today's activity, you're going to create a picture that shows the bones in your hands. It's a picture that will let light shine through if you hang it up in a window. Now, you can't see your bones, so how are you going to know where they are? You can figure it out by paying attention

to all the places where your hand can bend: all the joints. I'll show you how to observe your hand to find the bones inside. I'll also show you an X-ray of a hand, the kind of picture that doctors use to see someone's bones. Let's follow the steps to get started.

## ACTIVITY STEP 1

Before we start drawing, move your hand and think about the bones inside of it. Curl your fingers. Make a fist. What do you notice? See if you can feel your bones in your fingers and palms. Now, just take about a minute to do this. I'll put a timer on the screen. When you're ready to go to the next step, click the arrow on the right.

## ACTIVITY STEP 2

What did you notice?

## ACTIVITY STEP 3

Cover your desk with a tablecloth or newspaper to keep it clean.

## ACTIVITY STEP 4

Get your supplies. You'll get more supplies later.

## ACTIVITY STEP 5

Put your hand and the top of your arm on your paper. Then, spread your fingers wide and trace your hand and wrist in crayon, like this. Now, be sure you do the tracing using the hand that you write with.

## ACTIVITY STEP 6

When you bent your fingers earlier, you might have noticed that in all the places where your fingers bend, there are little wrinkles on the skin. That's how you can tell where the finger joints are. On your paper, make marks beside each finger joint, right next to the wrinkles, like this. Now don't forget your thumb. Then, draw a line across the fingers to mark each joint. It should look something like this when you're done.

## ACTIVITY STEP 7

Make a fist. Find your knuckles. Maybe you notice that each knuckle is the end of a finger bone. That's a joint. Line up your fist on the tracing. Mark each knuckle with a line, like this. Don't forget your thumb.

## ACTIVITY STEP 8

Now you're going to put in your finger bones. Draw each finger bone, like this. Leave space at each joint, but don't forget to draw the two bones in your thumb too.

## ACTIVITY STEP 9

Your hand also bends at the wrist. That's another joint. Bend your wrist on your paper, like this. Mark the bend with a line. Your palm bones were kind of hard to feel in your hand, but look at this X-ray. Your palm bones go from each finger to the wrist. Draw your five palm bones.

## ACTIVITY STEP 10

Look at this X-ray to see the bones in your wrist. They fit together like a jigsaw puzzle. It's hard to see them all in the X-ray, but there are eight small bones in your wrist. Go ahead and draw a circle for each one.

## ACTIVITY STEP 11

Look at the X-ray to see the bones of your arm. Draw those two bones on your paper.

## ACTIVITY STEP 12

Use the crayon to color in the areas around the bones, like this. Now, it doesn't have to be perfect. It will look something like this when you're done.

## ACTIVITY STEP 13

Now you're going to make light shine through the bones, just like it does in an X-ray. Go ahead and get these last supplies.

## ACTIVITY STEP 14

Dip the Q-tip in oil, and wipe away some of the oil on the side of the container, like this, so that some of it comes off. Then, color in a few bones. You'll want to do this until all the bones have oil on them. Now, you don't want too much oil, so it's important that you wipe some off your Q-tip every time you dip it. I'll show you. This is too much oil. This is too little oil. And this is just right.

When you've finished, check the back of your picture. There should be a dark line for each bone where the oil soaked through.

## ACTIVITY STEP 15

Put the hand aside and give it some time to dry. Then hang it up in a bright window. There are your bones for all to see. Great job. Now, for older students who want to do more, there's an activity extension for you. Go to the next slide.

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# EXTENSION ACTIVITY FOR GRADES 3-5

## EXTENSION ACTIVITY STEP 1

You've seen what your bones look like. Now, I've got a mystery for you. Take a look at these bones. They're part of an animal that has bones like the ones in your hand. What animal do you think these belong to?

## EXTENSION ACTIVITY STEP 2

Now you can see the animal's entire skeleton. Does this give you a better idea?

## EXTENSION ACTIVITY STEP 3

All right, are you ready? I'm going to reveal the answer. You were looking at this part, the wing of this creature. It's a bat. You and a bat might have more in common than you think. Go ahead and get a worksheet and something to color with. Then, look closely and answer the questions.