

# Hello Adventurer!

## Welcome to Adventure 2 - The Skeletal System.

In this workbook, you will learn about Russia in the early and mid-20th Century and your body's Skeletal System. There will be information to read, activities to complete, and quizzes to take when you are ready to challenge yourself! Take your time along the way - spend as much or as little time as you like on each activity, and do not forget to use additional resources to learn more about the topics you are interested in.

**Good luck, and have fun!**

Can you find  
**St. Petersburg,  
Russia?**



**Get ready for  
a bone-chilling adventure!**



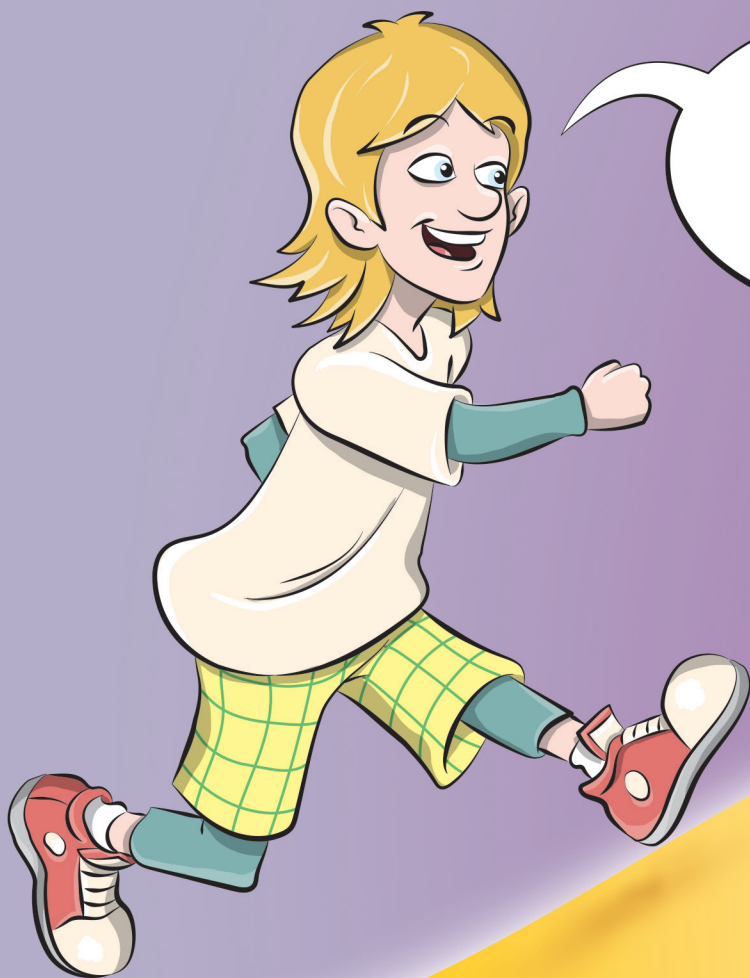
**Добро пожаловать!**

**(Dobro Pozhalovat)\***

That means "Welcome!" in Russian.

**\*Say it like this: "doh-bro – pas-zha-low-vat."**

**\*Syllables in bold are the strongest.**

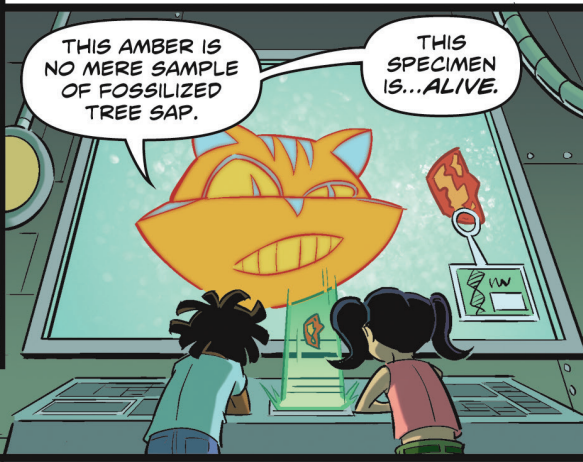


**Bone  
voyage!**

**This portal  
will lead you to...**

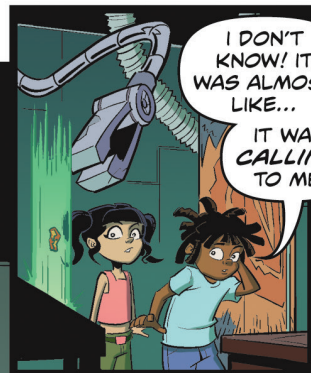
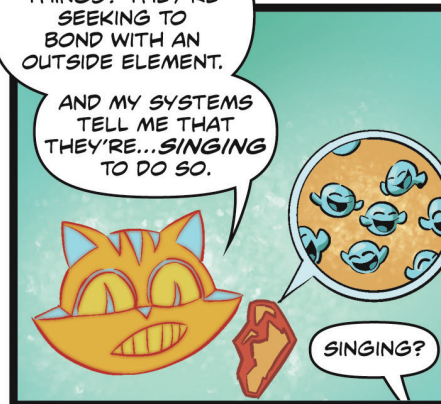


# Time Skaters Adventure 2



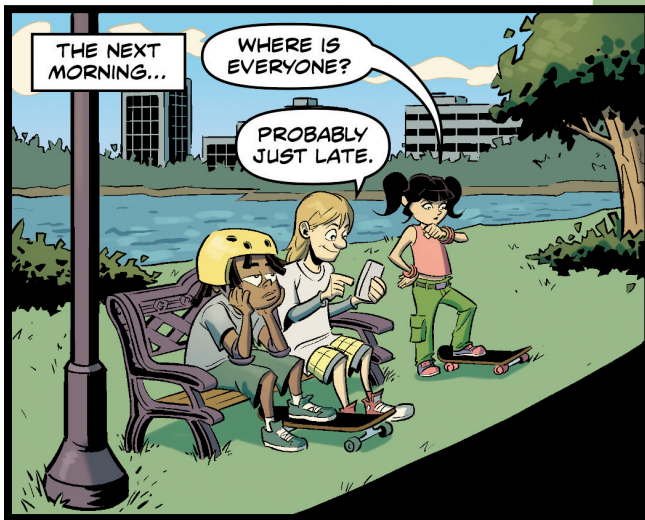
SEE THOSE LITTLE GLOWING THINGS? THEY'RE SEEKING TO BOND WITH AN OUTSIDE ELEMENT.

AND MY SYSTEMS TELL ME THAT THEY'RE...SINGING TO DO SO.



## TIME SKATERS: PART 2 BONE VOYAGE

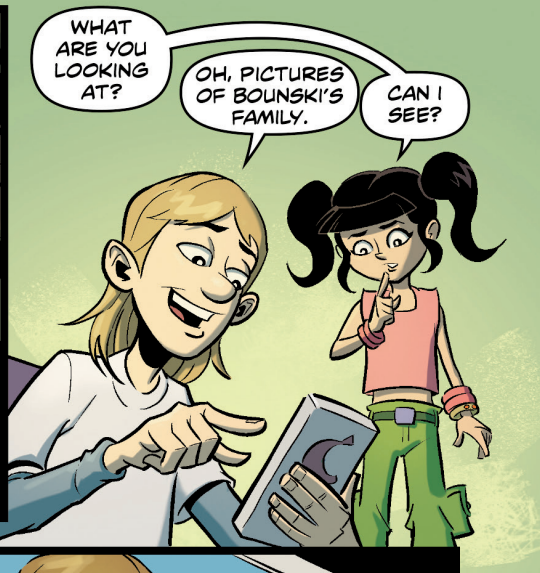




THE NEXT MORNING...

WHERE IS EVERYONE?

PROBABLY JUST LATE.



WHAT ARE YOU LOOKING AT?

OH, PICTURES OF BOUNSKI'S FAMILY.

CAN I SEE?



THIS HERE IS BOUNSKI'S MOTHER. SHE IS BEAUTIFUL, YES? SMART, TOO. BEST ENGINEER IN HER DEPARTMENT.



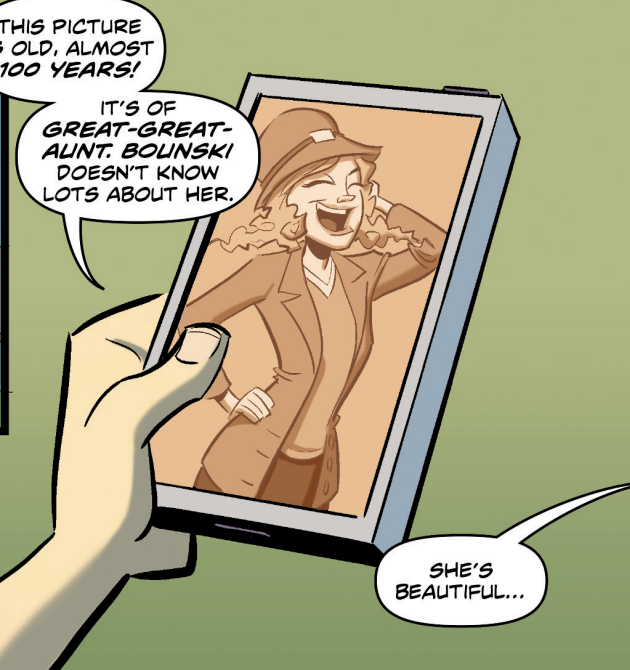
AND THIS IS BOUNSKI'S FATHER. HE IS NOT SO BEAUTIFUL. BUT KIND. LIKE A TEDDY BEAR WITH A BEARD.



WHAT ABOUT THAT ONE?

THIS PICTURE IS OLD, ALMOST 100 YEARS!

IT'S OF GREAT-GREAT-AUNT. BOUNSKI DOESN'T KNOW LOTS ABOUT HER.



SHE'S BEAUTIFUL...

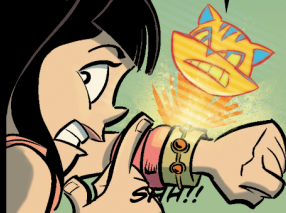


PINKY! DO YOU READ ME?

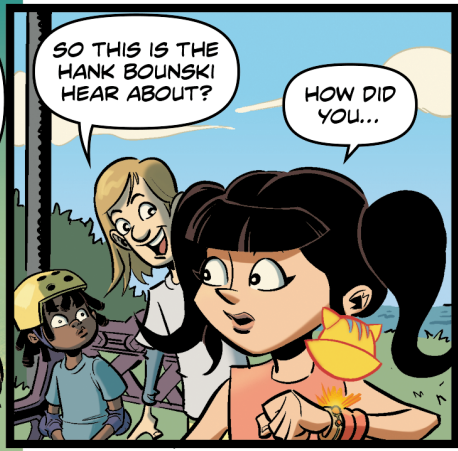
I'M BUSY, HANK...

YOU'RE BUSY? WHAT A RELIEF.

IT'S NOT LIKE OUR DEAR FRIEND DR. B. IS LOST IN THE SPACETIME CONTINUUM OR ANYTHING!!



SKH!!



SO THIS IS THE HANK BOUNSKI HEAR ABOUT?

HOW DID YOU...



STOKELY!!



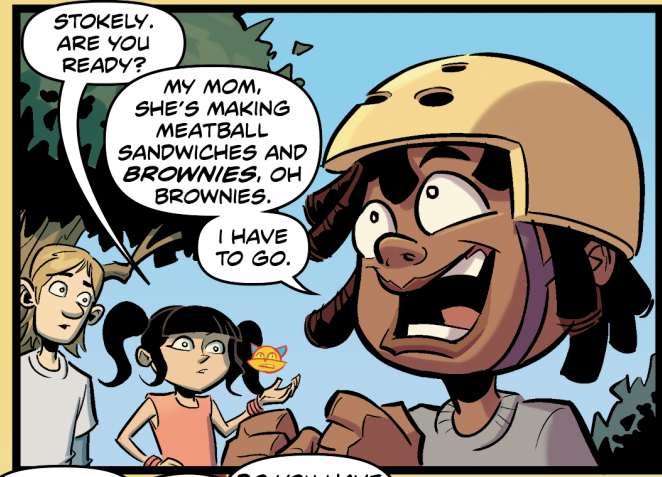
IT IS NOT HIS FAULT, PINKY. STOKELY CANNOT KEEP SECRETS.

BUT DON'T WORRY, BOUNSKI WILL NOT TELL ANYONE.

ONE BIG HAPPY FAMILY, GREAT. NOW GET MOVING.

THIS IS A JOB FOR AT LEAST TWO PEOPLE.

SORRY.



STOKELY. ARE YOU READY?

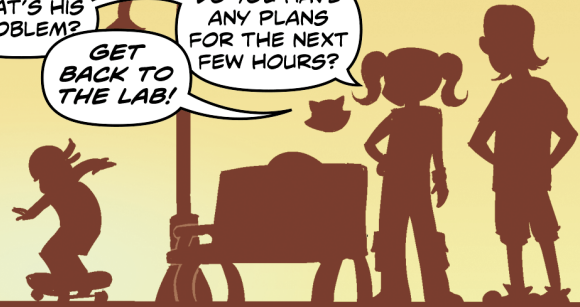
MY MOM, SHE'S MAKING MEATBALL SANDWICHES AND BROWNIES, OH BROWNIES.

I HAVE TO GO.

WHAT'S HIS PROBLEM?

DO YOU HAVE ANY PLANS FOR THE NEXT FEW HOURS?

GET BACK TO THE LAB!



# Learning Calendar

## Part 1

### Know Your History



**Gather** the adventure equipment you'll need from around the house - find the checklist on pages 22 and 23!

**Locate** Russia on a world map using a globe, an atlas, or an online map (like this one: <https://knowyourself.com/maps>)

**Read** the comic **Time Skaters: Part 2 - Bone Voyage**. Find it at the beginning of this Adventure Guide!

**Read** about Russia in *Know Your History*.

**Study** the masters in *Know Your Art*.

**Binge** on books with *Know Your Novelists*.

**Fabricating** like *Fabergé*.

**Soar** among the stars in *Space Racing*.

**Write** like a Russian.

**Complete** *20th Century Russia Crossword*.

**Test** all *Tsar Knowledge*!

## Part 2

### Know Your Skeletal System

**Study** the skeleton in *Know Your Skeletal System*.

**Pull** yourself together in *A Bone to Pick*.

**Dance** your way through *A Bony Twist*!





**Think on your feet!**  
Get that *Posture en Pointe*.

**Detangle** the *Skeletal System Word Search*.

**Answer** a *Skele-ton of Information*.

Part **3**  
**Know  
Your  
Appetite**



**Read** *Know Your Appetite*.

**Read** the recipes on the following pages.  
Make a shopping list, purchase ingredients,  
and get your kitchen ready!

**Make** *Russian Potato Salad with Dill*  
and *Sushkis*.

**Share** your dishes with your family. Discuss  
*Thoughts for Young Chefs* around the table!

Part **4**  
**Show What  
You Know!**



**Rush In** *and Bone Up*.

**Check out** *Further Reading*  
for more opportunities to learn.



# Know Your Art

Look at all of these dolls! They are called Russian nesting dolls, or **matryoshka**\*, if you happen to speak Russian.



## matryoshka

\***Say it like this:** “**ma-tree-osh-ka**”.

\*Syllables in bold are the strongest.

If you look closely, you'll notice something interesting about these hand-painted wooden dolls:

**they fit  
inside of each other!**



Inside of each doll is a smaller version of the same doll, and inside of that one is an even smaller one. This onion-like characteristic has led people to think that the dolls represent the many layers of Russian personality.

*Now grab some  
crayons or  
colored pencils.*

*Color them in!*



# Know Your Art

Get creative with colors.



Turn back to the skeletons on the previous page. Look closely at the bones.

Do all of the bones look alike? Can you find some that are similar to each other in appearance? Let's see how bones are grouped according to what they have in common!

## Long Bones

include the bones of your arms, legs, fingers, and toes. These bones are slightly curved, which helps them to absorb shock. Their strong shafts are made of compact bone. The inside of the wider ends have spongy bone that is covered with compact bone.

Arms • Legs • Fingers • Toes

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## Short Bones

are almost entirely made from spongy bone and sealed with a layer of compact bone. They are found in your wrists, ankles, and kneecaps.

Wrist Bones • Ankles • Kneecaps

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## Flat Bones

do not go up and down like long and short bones do. Your skull, ribs, sternum, hips, and shoulder blades are all flat bones. These flat plates of spongy bone are covered with compact bone.

Skull • Ribs • Sternum • Hips • Shoulder Blades

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## Irregular Bones

include facial bones such as the jawbone, the vertebrae that make up your spine, and the tiny bones (ossicles) in your ear.

Facial Bones • Spine • Ossicles in the Ear



Let's look at what makes up a long bone, shown here. Almost all bones include spongy bone, compact bone, and both red and yellow marrow.

### **Medullary\* Cavity**

runs down the middle of the long bone. In children, it's packed with red marrow. In adults, the medullary cavity becomes filled with fat (yellow marrow).

### **Nutrient Artery**

runs the length of the medullary cavity. This artery is the main blood supply to the bone and helps it to stay healthy.

### **Compact Bone**

is also known as cortical bone. Compact bone is the hard bony surface that you see when you look at skeletons. Compact bone is the heaviest type of bone and supports the weight of the body.

### **Spongy Bone**

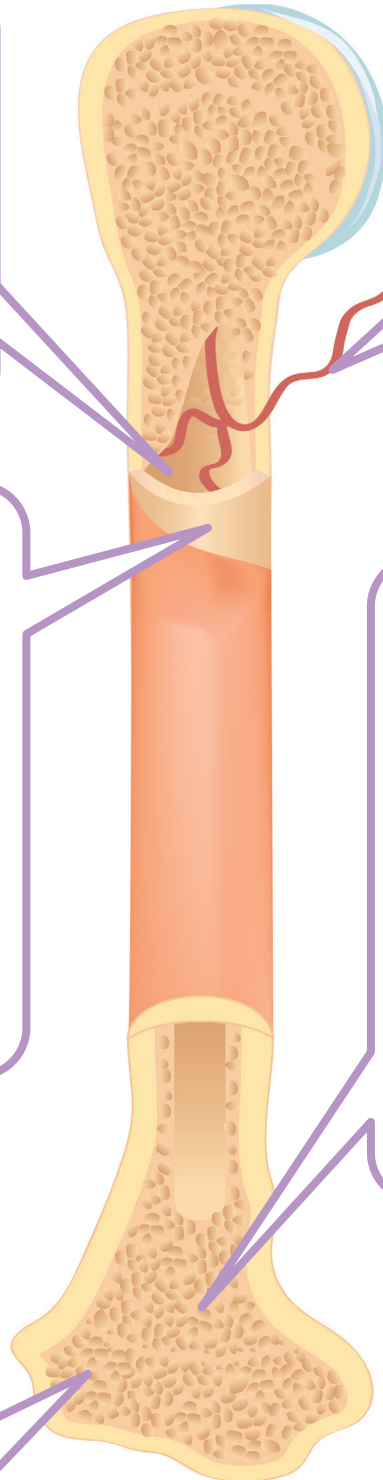
is also known as cancellous bone. It's really a network of many bony fibers that provide the bone with support. Spongy bone reminds us of a real sponge, with the sponge being the bony fibers and the air pockets being red or yellow marrow.

### **Red Marrow**

is found within spongy bone and in the medullary cavity in children's bones. Both red and white blood cells are made in the red marrow.

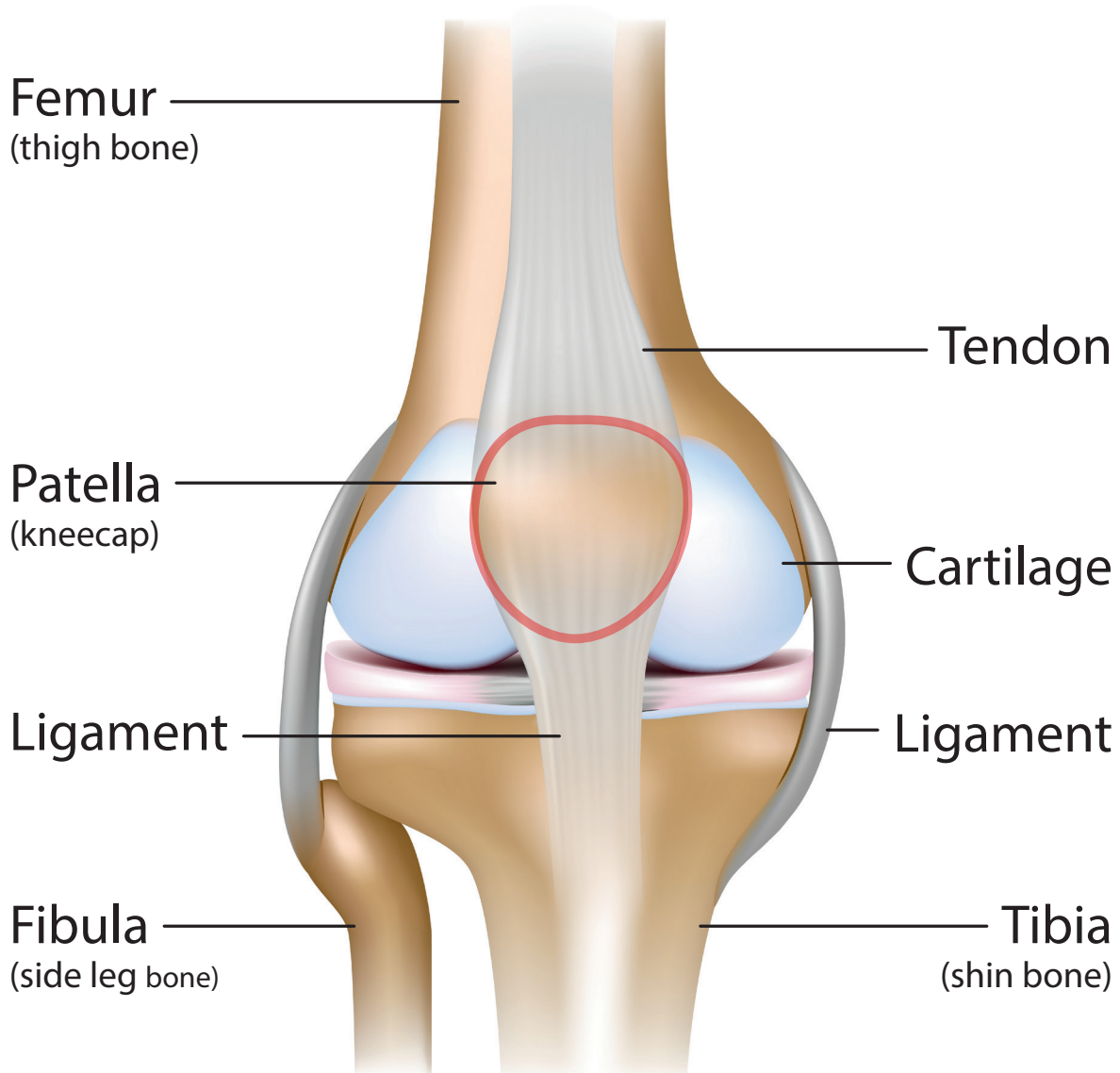
\*Say it like this:

**“meh-dull-lary”**



# Keeping it all Together!

Your bones need connective tissue like ligaments, tendons, and cartilage to help them move. These connective tissues join bone to bone and muscle to bone so you can move your body. Let's look at the diagram below to see the connective tissue inside your knee.



The smallest bone in your body is located in your middle ear. It's called the stapes.\* Say it like this: "**STAY**-peas".



## Cartilage

is stiff connective tissue that's not as hard as bone. Your nose and outer ear are made of cartilage. Cartilage is also between some bones, such as the meniscus between your femur and tibia.

## Tendons

connect bone to muscle. Without ligaments and tendons, your bones couldn't move, regardless of how muscular you are!

## Ligaments

connect bone to bone so they can work together. Locate the ligaments on the knee illustration. See how they are connecting bones?



## BE A LABEL DETECTIVE!

Your bones need more than calcium to be strong. They need Vitamin D, too! Vitamin D helps your bones use calcium from foods like cheese, almonds, and yogurt. If you eat foods high in calcium and Vitamin D, plus add in bone-strengthening activities, you can build strong bones now and help prevent bone fractures when you're older.

Now, try out your detective skills!

Lots of foods have calcium, but Vitamin D is harder to find.

Take a look at the labels of foods that you eat. How many foods have Vitamin D? How many foods have calcium? Write their names in the appropriate areas.

**VITAMIN D**

**CALCIUM**



# A Bony Twist!

**Get ready for A Bony Twist on listening to some of your favorite music!**

## Materials:

- **White paper**
- **Markers**
- **Your completed skeleton from “A Bone to Pick”**
- **Music**

This is a fun game you can play with one other person or add more people for more fun. To play, you will need to first create some signs with bones names. Use the skeleton you built in the previous activity “**A Bone to Pick**” for reference.

## Directions:

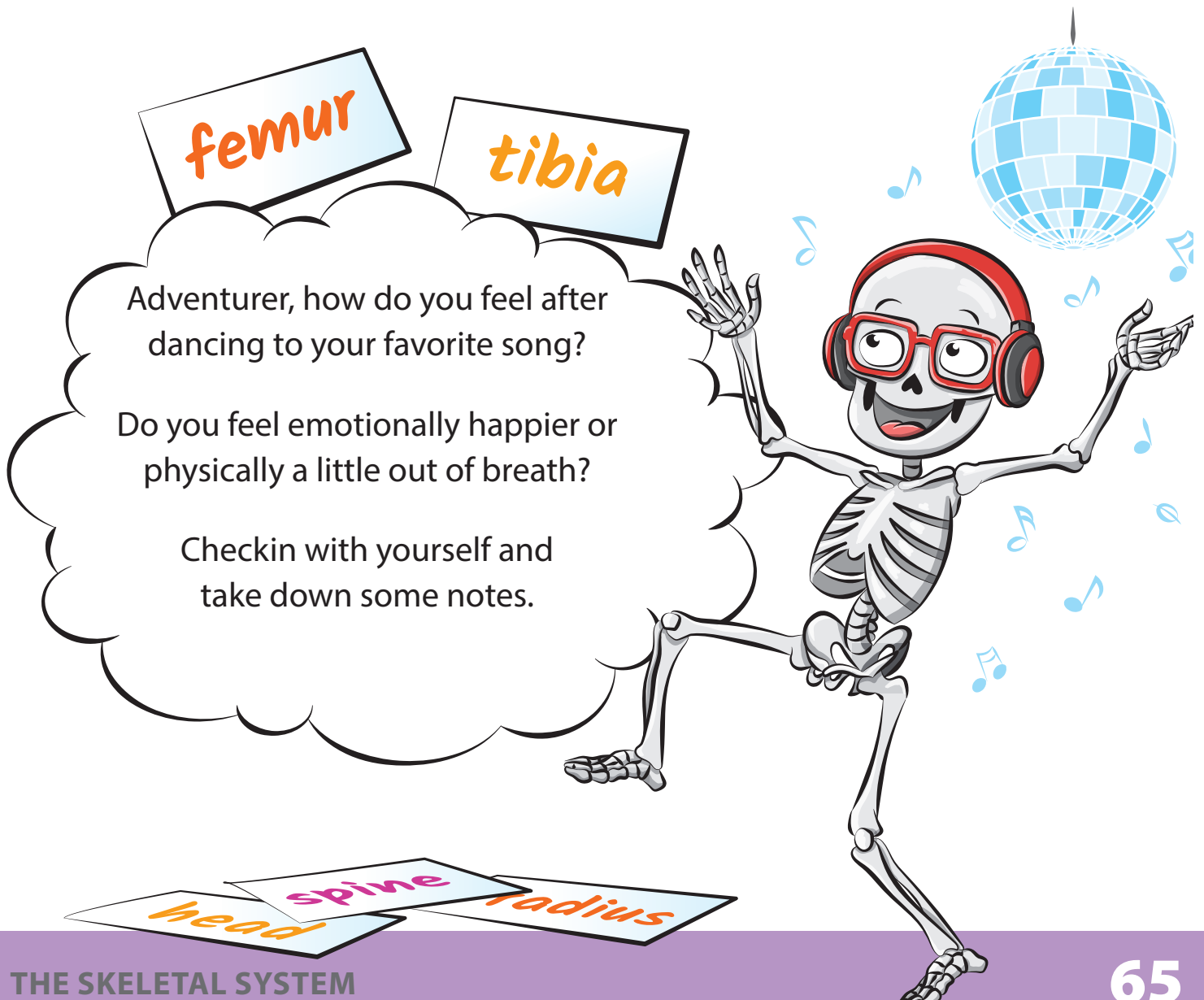
### PREPARING YOUR BONE SIGNS

- 1.** Take your paper and markers out onto a flat surface. Place your skeleton nearby or assistance.
- 2.** To design your signs, you will need to write in large, uppercase writing that can be read from a distance. Write either a bone or group of bones onto each piece of paper. Reference your skeleton if you need help remembering the name of a bone or bone group.
- 3.** Make as many or as few signs as you like!
- 4.** Once your signs are complete, grab your favorite music, a friend, and get ready to twist!

## HOW TO PLAY

1. Playing the game is easy. Just turn on your favorite jams and see how well you know your bones. When your friend shows you a sign, bust a bony move using whichever bones are shown on the signs you made.

**Note:** You can make **A Bony Twist** more challenging by writing the name of each bone on each piece of paper, or less challenging by just writing groups of bones on each piece of paper. For example, write femur, tibia, or scapula for a challenge. For something a bit easier, use groups of bones instead - for example, upper extremities, rib cage and spine, lower extremities, and head.



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