



October 2018

Lesson Objectives:

Club members and parents will:

- Learn cool and interesting facts about bones
- Learn how to keep our bones healthy

Time: 30 minutes

Equipment and supplies:

- Print and cut out at least 2 sets of the attached bone pieces.
- Box or tub

Preparations:

- Review Lesson
- Gather equipment and supplies
- For each set of skeleton pieces, color code them on the back with different colors.

Bones! Bones! Bones!

Our lesson topic today is bones! To begin, we will play a quick relay game that will get you out of your seats and challenge you to speedily, but accurately put a human skeleton together.

Mr. Bones Relay Race

Ask 4-H members to form single-file lines of 5-7 people each. Then, introduce a box or tub containing skeleton pieces that they will collect, pass, pile, and ultimately assemble. Indicate that the pieces of multiple skeletons are inside the tub. Each skeleton is color coded on the back. The first person in line for each team will run up to the tub, find a puzzle piece that is appropriately color coded and return to his/her line. Then that team member will pass the piece over his/her shoulder to the person directly behind him/her. That person will pass the piece between his/her legs to the person behind him/her. That person will pass the piece over the shoulder to the next person in line and so on. When the last person in the line receives a piece, he/she will make a pile right behind the team where the skeleton will be assembled. The first person in the line does not have to wait for the pieces to get to the end of the line before obtaining and starting another piece down the line. When the team has passed all 14 pieces through the line, they can join together to lay the skeleton out on the floor or table in the correct way.

To save time, explain to students that you will be looking for 4 key things when determining a winner:

1. The bones are in the right place.
2. The femur is facing the correct way to connect to the hip.
3. The feet are on the correct sides of the skeleton.
4. The hands are on the correct sides of the skeleton.

It is tricky and time consuming to get all of the smaller bones (ulna, radius, humerus, tibia, fibula, etc.) facing correctly for the purposes of this race. It is suggested that ALL successful teams be rewarded at the end. Plan to pass out prizes at the end of the session.

Game will last about 5 minutes.

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Processing Questions

1. Why did I choose to have you engage in this game rather than simply look at a skeleton hanging on the board? (Gets participants familiar with how bones look, similarities and differences among them, where they belong, doing it may help them remember more, got them out of their seats and active, teamwork, etc.)
2. What made this game challenging?
3. What did you observe about the bones themselves?
 - ◆ How many bones do adult humans have? (206)

Some Cool Facts About Bones...

- ◆ How many bones to baby humans have? (300)
- ◆ What happens to the bones in babies that they end up having so many fewer as they grow and develop? (fuse together, so the number of bones changes)
- ◆ Longest bone in your body—femur (approximately $\frac{1}{4}$ of your overall length)
- ◆ Shortest bone in your body – the stirrup (only $\frac{1}{10}$ th of an inch)
- ◆ Half of the bones in your body are located in your hands and feet.
- ◆ One person in 20 has an extra rib. This extra rib is three times more common in males than females.
- ◆ As people age, their spines often curve to one side or another. Right-handed people tend to have spines that curve right; left-handed people tend to curve left.

Let's consider what a bone looks like—how it is structured.

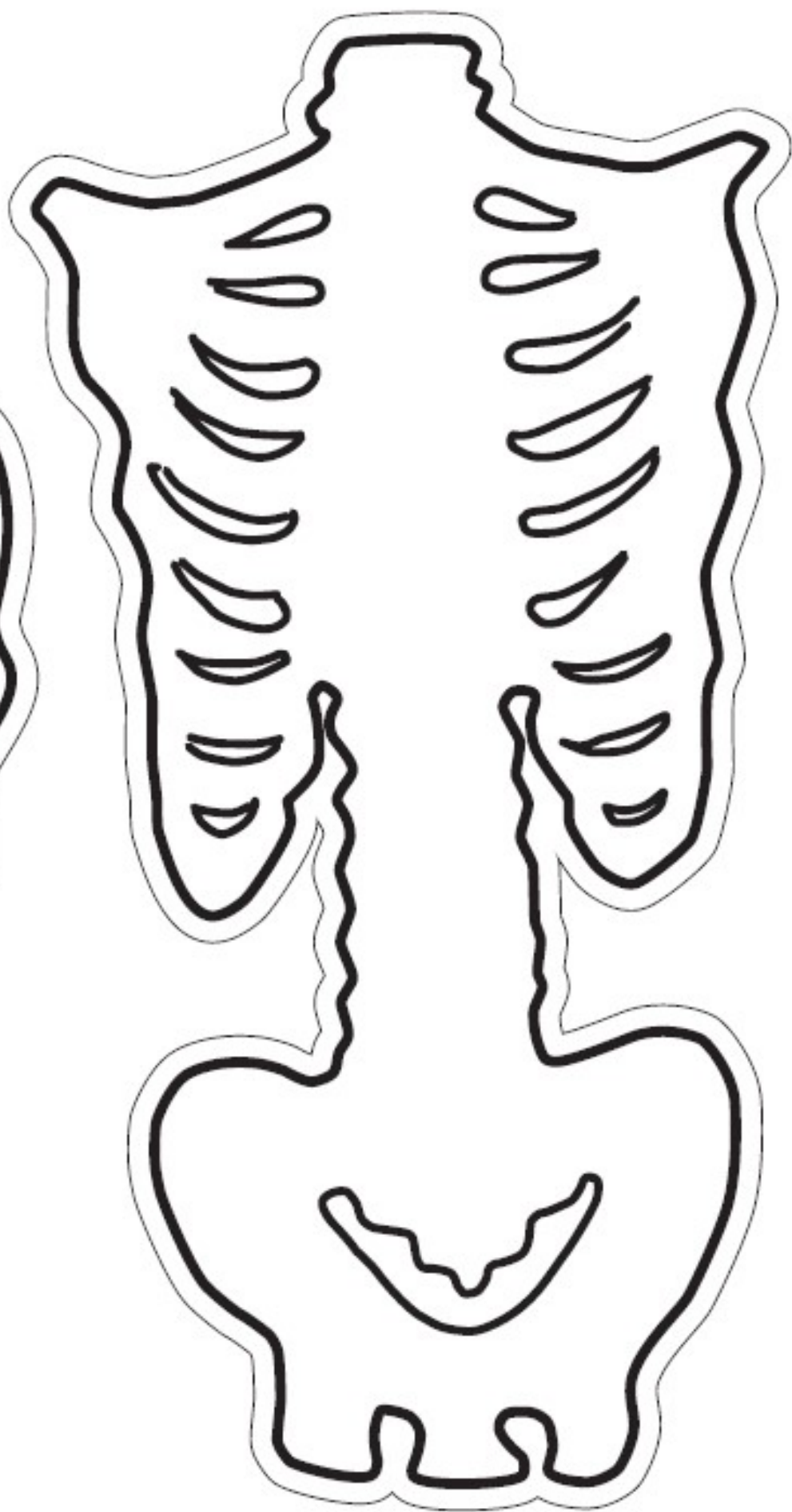
- ◆ Visualize a steak bone or the bone of a roast you have eaten. Can you describe what it looked like?
- ◆ The very center of a bone is hollow? Why would this be helpful? (It helps with the overall mass of the bone—making it lightweight, yet strong.)
- ◆ Next is the bone marrow which coats the inside of the bone. The bone marrow is responsible for making stem cells.
- ◆ Then, comes a spongy material. Why would spongy material inside of the bone be a good thing—particularly at joints? (It acts as a shock absorber whenever you move—preventing the bones from grinding against each other and keeping movement smooth.)
- ◆ Finally, the outside of the bone is made up of calcium phosphate—a strong, hard material. This layer is what we see when we look at the skeleton. It is the part of the bone that we depend on to be firm and healthy so our bones resist breaking. Where do we get calcium phosphate from? (eating foods that are rich in calcium.)

How do you keep your bones healthy?

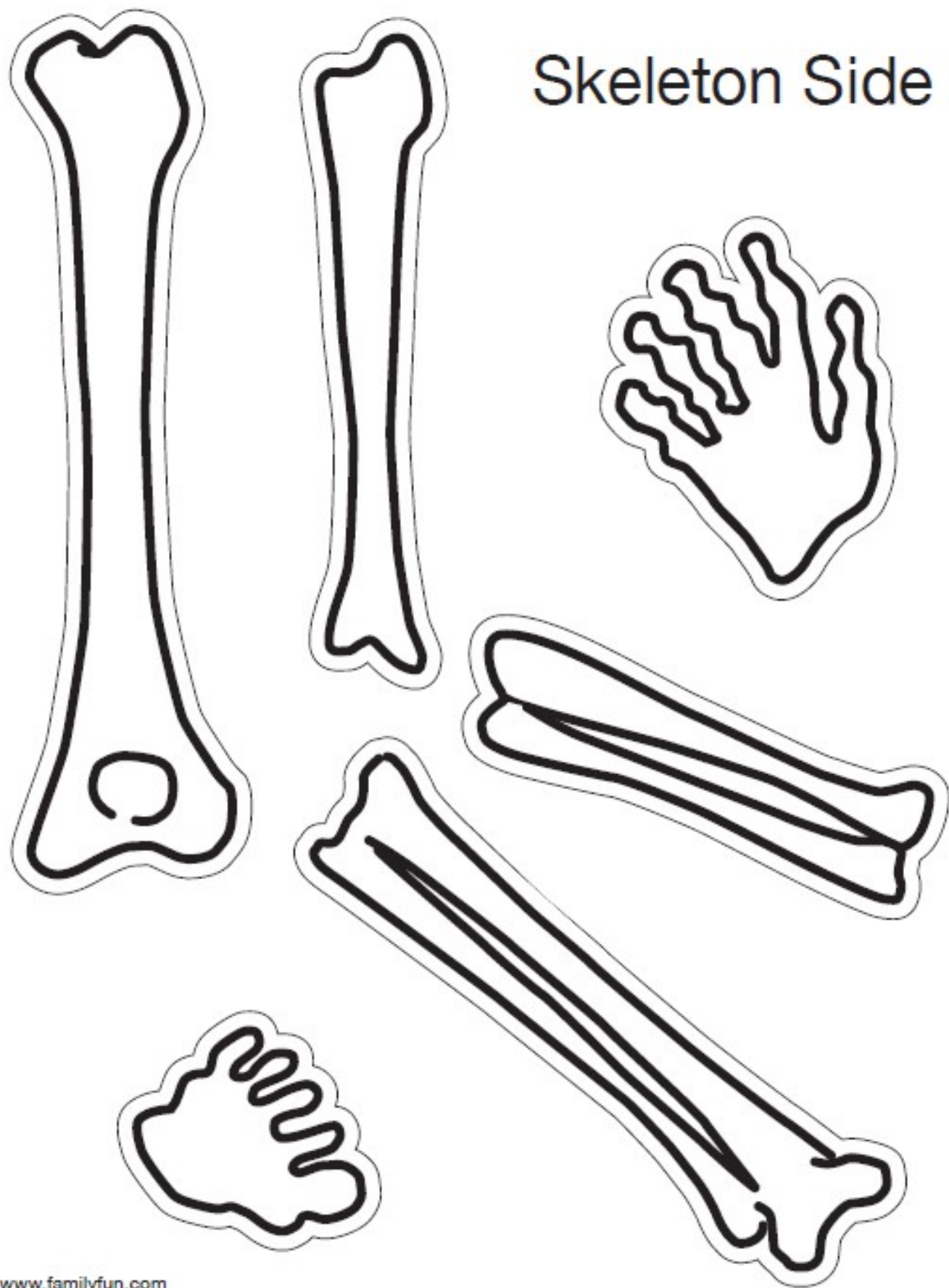
- ◆ You can keep your bones healthy by eating calcium-rich foods, and particularly foods from the dairy group: milk, yogurt, and cheese. The USDA recommends 3-4 servings of dairy products daily to insure that humans get enough calcium in their diets.
- ◆ Calcium can be found in a variety of foods, including some fruits, vegetables, meats, and grains. However, MILK, YOGURT, and CHEESE provide the most calcium per serving and are your best bets for making sure that you are getting this mineral in the amount that is needed.
- ◆ Consider this: to get the amount of absorbable calcium you would get from one cup of milk, you would need to consume...
 - 2.25 cups of cooked broccoli,
 - 5 cups of red beans, OR
 - 8 cups of spinach

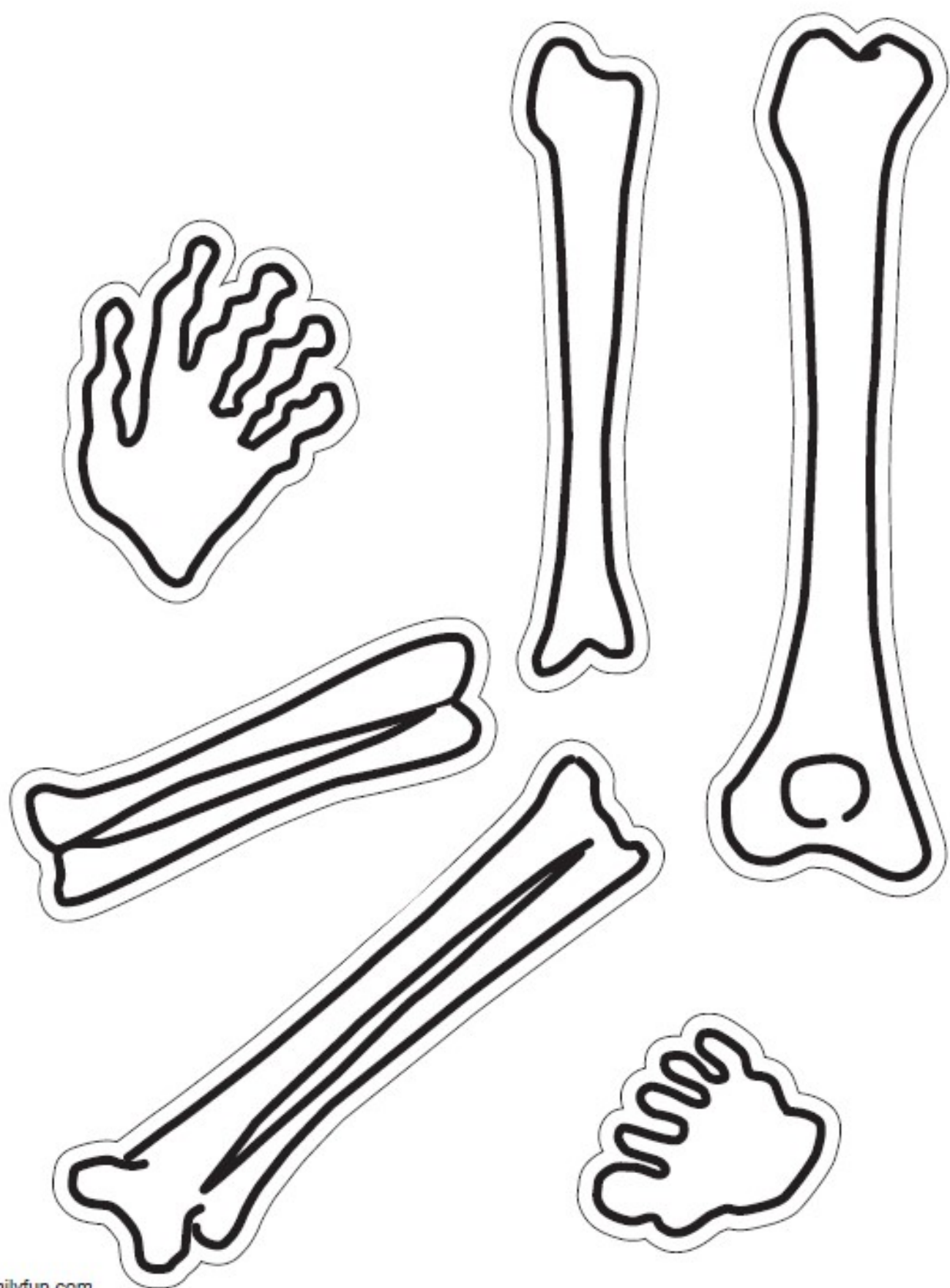
(Tip: It is helpful, visually, to have actual examples of measured broccoli, red beans, and spinach for the students to look at during this part of the program.)

- ◆ Additionally, dairy products offer a variety of other valuable dietary components at the same time:
- ◆ Protein; Carbohydrates; Vitamins A, C, and D; and Protein. In a comparison of single servings of drinks: 1% milk, 1% chocolate milk, orange juice, fruit punch, cola, diet cola, bottled water, and sports drink, only milk (white or chocolate) offers the combination of ALL of these nutrients in sizeable proportions.
- ◆ The bottom line is that in order to take in calcium efficiently and at the appropriate levels, milk, yogurt, and cheese are your best bets. Consuming these dairy products will help insure that your bones will be strong and healthy for a long time to come.



Skeleton Side A





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Sources & Additional Lesson info:

4-H Club GO TO Resources is being offered to 4-H clubs in Boone, DeKalb and Ogle Counties as a way to enrich and enhance 4-H experiences and programming at the club level. It is the goal of the Extension staff to assist 4-H leaders and officers in providing simple hands-on activities on a monthly basis that can broaden the 4-H club experience and as a result heighten positive youth development.

Blood and Guts: A Working Guide to Your Own Insides by Linda Allison, Little, Brown, and Company. Boston: 1976

Thinking About Calcium? Find it in Food First. National Dairy Council, 2003.

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