

Build Strength with Protein

Discussion

1. Discuss the role of protein in the body.

Protein is the body's building block.

Protein helps you grow big and strong.

Protein supports and maintains body components, including:

- blood,
- organs,
- muscles,
- hair,
- skin, and
- nails.

2. What are some functions of protein?

- Helps body tissues grow.
- Helps repair body tissues.
- Aids proper function of red blood cells.
- Helps prevent infections.
- Regulates hormones and enzymes.

3. Talk about the amount of meat needed each day.

Group	Age	Daily Recommendation
Children	2 to 3 years old	2 ounces
	4 to 8 years old	3 to 4 ounces
Girls	9 to 13 years old	5 ounces
	14 to 18 years old	5 ounces
Boys	9 to 13 years old	5 ounces
	14 to 18 years old	6 ounces
Women	19 to 30 years old	5½ ounces
	31 to 50 years old	5 ounces
	51+ years old	5 ounces
Men	19 to 30 years old	6½ ounces
	31 to 50 years old	6 ounces
	51+ years old	5½ ounces

4. Compare 1 ounce equivalents.

- 1 ounce of meat, poultry, or fish
- ¼ cup cooked dry beans or peas
- 1 egg
- 1 tablespoon of peanut butter
- ½ ounce of nuts/seeds
- 1 deck of cards is about the size of 3 ounces of meat

Learner Objectives

Participants will be able to:

- discuss protein functions;
- identify plant and animal sources of protein;
- distinguish between involuntary and voluntary muscle movement; and
- identify one goal or action related to lean protein and/or physical activity.

Materials

- Hula hoops
- Jump rope
- Muscle man diagram



5. Discuss lean protein sources.

Remind students to choose lean meats because they are lower in fat. Encourage students to look for meat sources that are grilled or baked, rather than fried or breaded.

Have the students decide which of the two choices in the pairs below is the leaner protein choice.

- chicken nuggets or baked chicken
- tuna or fried catfish
- pork chop or tilapia
- turkey or steak

6. Compare protein sources.

Grilled vs. Fried	Calories	Protein	Carbs	Fat grams
Fried chicken, 4 ounces	296	28 grams	11 grams	15 grams
Grilled chicken, 4 ounces	110	20 grams	0 grams	1 gram
Fried fish sticks, 4 ounces	231	20 grams	8 grams	13 grams
Grilled fish (1 fillet)	80	14 grams	1 gram	3 grams
Chicken fried steak, 4 ounces	325	11 grams	34 grams	47 grams
Grilled lean hamburger, 4 ounces (97% lean)	136	24 grams	0 grams	4.5 grams

7. Brainstorm different sources of protein. (Meat is not the only source of protein.)

- almonds
- cashews
- eggs
- crabmeat
- flounder fish
- liver
- soybeans
- tofu
- lima beans
- peanuts
- trout
- tuna
- walnuts
- dairy products



8. Discuss the importance of physical activity and muscles.

- Physical activity makes muscles stronger (and larger).
- When muscles get stronger, you can exercise for a longer time.
- Examples: biking, running, walking.
- Strong muscles prevent injuries.

9. Brainstorm simple exercises for:

- Upper body
 - push-ups, pull-ups, tug-o-war
- Lower body
 - jumping, running, biking
- Core
 - sit-ups, hula hooping



Activity

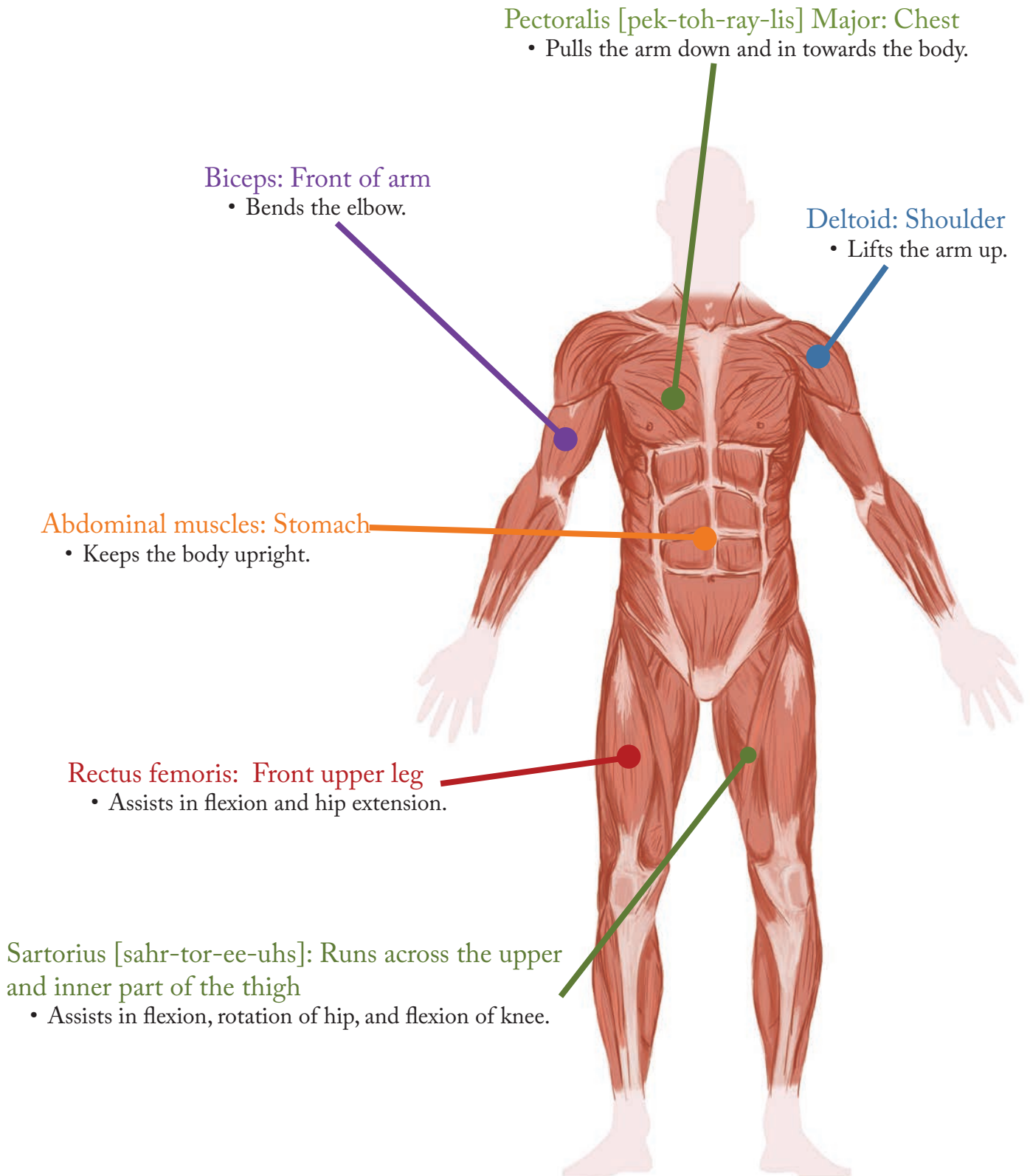
Shake and Move: Have youth participate in exercise challenges. Don't compare them to each other. Instead, have them do the challenge several times, trying to improve their score each time.

- Push-ups: Have youth see how many push-ups they can do in 1 minute.
- Jump rope: Have youth see how many times they can jump rope in 1 minute.
- Sit-ups: Have youth see how many sit-ups they can do in 1 minute.
- Hula-hoop: Have youth see how many times they can hula-hoop in 1 minute.



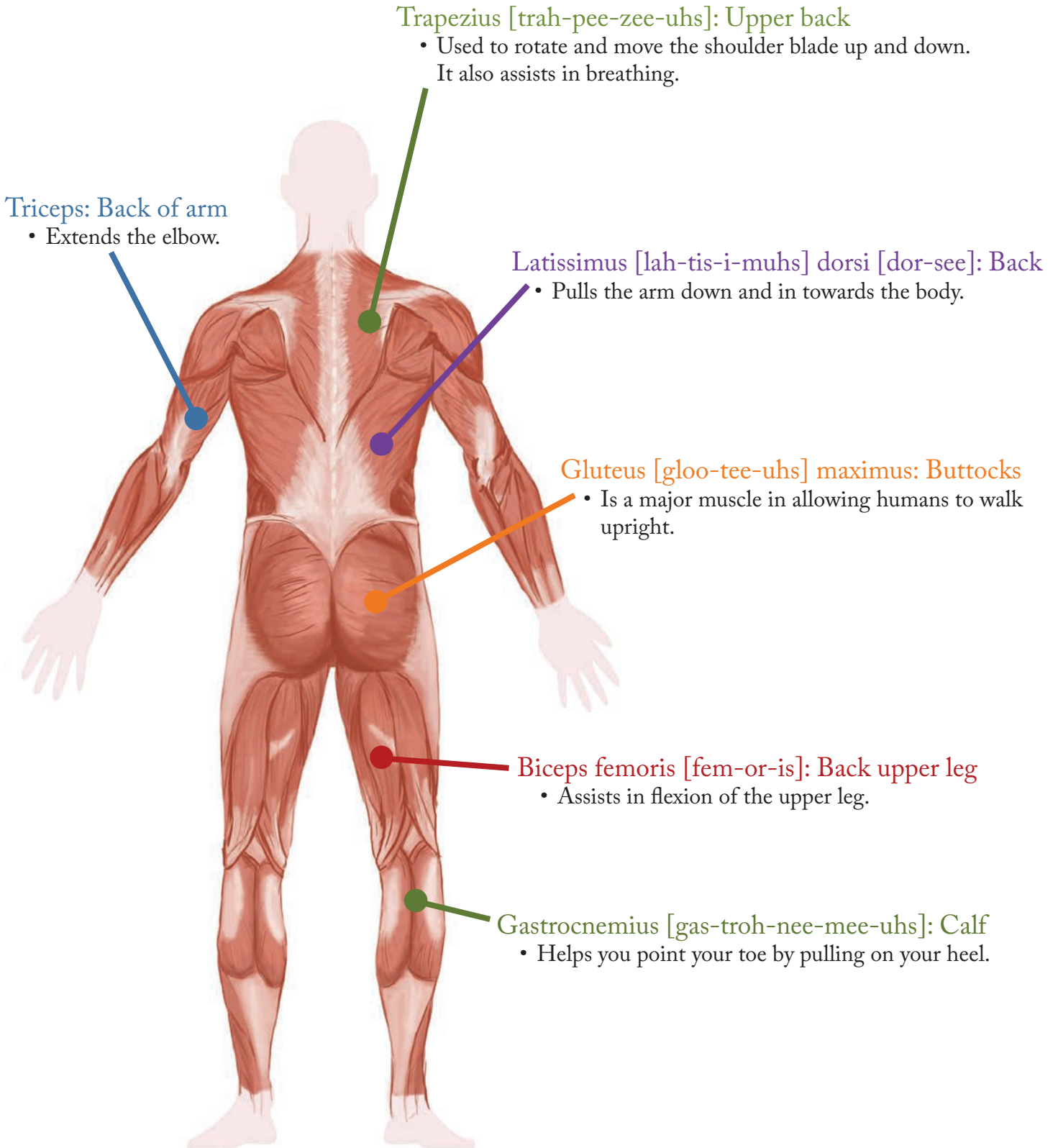
Name that Muscle (Front)

Play “Name that Muscle” to help youth learn major muscles of the body.



Name that Muscle (Back)

Play “Name that Muscle” to help youth learn major muscles of the body.



Types of Muscle

- **Skeletal (or voluntary) muscle** is the type of muscle you can see and feel. When you work out with weights, you are exercising skeletal muscle. Skeletal muscles attach to the skeleton and come in **pairs** because one muscle moves the bone in one direction and the other moves it back the other way. These muscles contract **voluntarily** — you think about contracting them, your brain sends the signal, and the muscles contract.
- **Smooth (or involuntary) muscle** can **stretch** and **maintain tension** for long periods of time. It is found in your digestive system, blood vessels, bladder, and airways. Your nervous system controls it without you having to think about it, so it contracts **involuntarily**. For example, your stomach and intestines work all day, but most of the time you're not aware of it.
- **Cardiac muscle** is found only in your heart, and is a **twitch** muscle that contracts **involuntarily**. Its big features are **endurance** and **consistency**. It can stretch in a limited way, like smooth muscle, and contract with the force of a skeletal muscle.



Strength vs. Power

- Muscle strength is the maximal force that a muscle can develop. Strength is directly related to the size of the muscle.
- The power of muscle contraction is how fast the muscle can develop its maximum strength. Muscle power depends on strength and speed [power = (force × distance)/time]. Muscle endurance is the capacity to generate or sustain maximal force repeatedly.

Worksheet

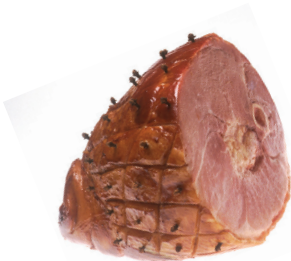
1 What is the role of protein?

2 Protein provides 4 calories per gram. If 1 cup of milk has 8 grams of protein, how many calories is the protein providing?

3 What are the three types of muscle?



4 What does it mean if a muscle is involuntary?
What is an example?



5 What is the name of the muscle of the chest?

6 Name two muscles in the upper arm.

7 What is one thing I can do today to increase the amount of lean protein I eat?



Kansas School Wellness Policy Model Guideline — Nutrition Education

Classroom: Middle-High School

Requirements achieved in this lesson:	Basic	Advanced	Exemplary
Basic, Advanced and Exemplary	At least 25 percent of nutrition education involves hands-on activities that engage students in enjoyable, developmentally appropriate, culturally relevant, participatory activities.	At least 50 percent of nutrition education instruction involves hands-on activities that engage students in enjoyable, developmentally appropriate, culturally relevant, participatory activities.	
Topic	Basic nutrient requirements for protein. Dietary guidelines and personal eating plans.		

References

Details on Protein Function, Your Daily Protein Requirement and Vegetarian Protein Need: <http://www.fatfreekitchen.com/nutrition/protein.html>
 Your Muscles: http://www.kidshealth.org/kid/body/muscles_noSW.html
 Learning About Proteins: http://www.kidshealth.org/kid/stay_healthy/food/protein.html
 How Muscles Work: <http://health.howstuffworks.com/muscle.htm>
 Top 5 Reasons Why Physical Activity Is Cool: <http://www.kidnetic.com/BrightPapers/?c=Fitness&p=34>
 Choose My Plate: <http://www.choosemyplate.gov/>
 Nutrition Facts, generic grilled chicken breast: <http://www.myfitnesspal.com/food/calories/generic-chicken-breast-4oz-grilled-2540720>

Answer Key

1. Helps with growth and repair of body tissues, aids proper function of red blood cells, helps prevent infection, and regulates hormones and enzymes.
2. $8 \times 4 = 32$, 32 calories provided just from the protein.
3. Skeletal, smooth, cardiac
4. You do not have to think about contracting it. An example would be intestinal muscles.
5. Pectoralis
6. Deltoid, biceps
7. Answers vary

The author gratefully acknowledges the contributions of Catherine Metzgar (senior in dietetics, graduated May 2010); Kyleen Krehbiel (senior in dietetics, graduated May 2011); reviewed by Lisa Friesen, R.D., Virginia Barnard, MPH; additional review and editing by Erika Bono, MPH, R.D., and Yijing Li, M.S.

Brand names appearing in this publication are for product identification purposes only.
 No endorsement is intended, nor is criticism implied of similar products not mentioned.
 Publications from Kansas State University are available at: www.ksre.ksu.edu

Publications are reviewed or revised annually by appropriate faculty to reflect current research and practice.
 Date shown is that of publication or last revision.

Contents of this publication may be freely reproduced for educational purposes. All other rights reserved.
 In each case, credit Tandalayo Kidd, Ph.D., R.D., LPN, associate professor, human nutrition, *Build Strength With Protein*,
 Kansas State University, November 2013.