

# Learning Skills for Enjoying Physical Activity

## 2



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## Lesson 2.1

# Learning Motor Skills

### Lesson Vocabulary

agility, balance, coordination, motor skills, motor units, performance skills, power, practice, reaction time, skill, skill-related fitness, speed, sport skills

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Click Student Info < Topic 2.1

Do you know the difference between skills and skill-related fitness? Do you know why you need skills and skill-related fitness? When you finish this lesson, you'll know the answers to these questions. You'll also know more about participating in groups, both as a leader and as a member.

## What Are Skills?

In chapter 1 you learned that health-related physical fitness helps you to be healthy, to feel and look good, and to enjoy life. Having good health-related physical fitness also helps you to perform well in sports, in most jobs, and even when doing schoolwork because you're better able to resist fatigue and stay focused on your work. Although health-related physical fitness is important to performing well, it's only one of several important factors that help you perform your best.

Two other important factors in helping you to be a good performer are skills and **skill-related fitness**. **Skill** is your ability to do a specific task, such as dribbling a basketball or performing a dance step. Performing a skill involves using your muscles and nerves together with your brain. You learned some very basic skills early in life, including crawling, walking, running, skipping, and jumping. When you perform a skill, your brain signals your nerves, and your nerves stimulate your muscles and tell them how to move. At first a specific skill may be hard to do, but after a lot of practice, the brain, muscles, and nerves learn to work together so that your movements become almost automatic.

You probably won't remember it, but walking is a skill that was hard for you when you first tried it. You may remember learning to ride a bike. It's also a skill that was hard at first. But you kept trying it over and

over again until you got good at it. Both walking and riding a bike are specific tasks that require practice. As you try different types of physical activities, you'll need to learn different skills including those used in light, moderate, and vigorous activities. Examples of skills used in light activity are typing, playing a musical instrument, and playing a computer game. Skills used in moderate activity include using tools for digging or raking when working in the yard.

You have to learn many skills when performing vigorous activities such as sports. These skills are sometimes called **sport skills** because they're necessary for you to be good at sports and games. Like walking, running, and jumping, sport skills are learned with practice. Each sport and game has many skills, so you'll have to practice different skills for different sports. For example, kicking isn't a part of softball or baseball, and batting isn't used in soccer. But many sport skills are common to several sports. Serving in tennis is similar to overhand serving in volleyball, but in volleyball you don't use a racket. The tennis serve motion is also similar to an overhand pitch in baseball or a quarterback's throw in football. Skills you learn for one sport can also be used to help you perform another.

Sometimes names other than *sport skills* are used. One example is **motor skills**. We often think of a motor as being the same as a car's engine. In this case *motor* means something else. Nerves and muscles that work together when signaled by the brain are called **motor units**. These units work together to cause body parts such as the fingers, arms, and legs to move when you want them to. Because skills are used in activities other than sports, they're sometimes



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**Different sports require different skills.**

referred to as **performance skills**. Whether we call them skills, motor skills, sport skills, or performance skills, we all need to be able to perform them. We all need to be able to use our brains, our nerves, and our muscles to cause our bodies to move and do our daily activities. With **practice** we learn these skills and are able to function effectively.

With practice anyone can learn skills. However, the younger you are, the easier you may learn skills. We know that most basic skills and sport skills are learned in elementary and middle school. That's why teachers and parents encourage young people to learn skills early. People who learn skills early in life are more likely to be active for a lifetime than are people who don't learn skills early.

## What Is Skill-Related Fitness?

Now that you've learned about skills, it's important that you learn about skill-related fitness. Skill-related fitness refers to abilities that help people learn skills. The six parts of skill-related fitness—agility, balance, coordination, power, reaction time, and speed—are described in table 2.1. Skill-related fitness isn't the same as skill. Having good skill-related fitness does help you to learn skills. For example, balance is important in many activities. If you have good balance, you'll be able to learn specific skills, such as in-line skating, more easily than if balance is hard for you. Different people have different skill-related fitness abilities based on their heredity, their

age, and the amount of experience they've had in a variety of physical activities. But balance practice can improve your general balance, just as skill practice can improve your performance of specific skills. Most people are good in a few parts of skill-related fitness and not so good in others. Later, you'll get a chance to assess your skill-related fitness. For now, look over the photos and descriptions of the parts of skill-related fitness on page 17. Think about activities you do that require different parts of skill-related fitness.

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## Why Do I Need Motor Skills and Skill-Related Fitness?

There are many goals designed to help all of us to become healthy people. A major health goal is regular physical activity among all people, especially young people who are still in school. We know that adults aren't as active as young people and that elementary school and middle school students are more active than high school students. So finding a way to help young people stay active as they get older is an important health goal. Learning skills can help you to enjoy activities that you can use to stay active now and later in life.

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**Balance is required for performing a wide variety of motor skills.**

## FIT FACT

In 2005, Anthony Gatto set a world record by juggling seven clubs for 2 minutes and 49 seconds. Learning this skill took a lot of practice.

**Table 2.1**

## Parts of Skill-Related Physical Fitness

**Agility** is the ability to change body positions quickly and keep your body under control when it is moving. Agility helps you in activities such as rope games, dancing, wrestling, and defending in football and basketball.



**Balance** is the ability to keep your body in a steady position while standing or moving. Balance helps you to ride a surfboard, ride a bike, and do activities such as the balance beam in gymnastics.



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**Coordination** is the ability of body parts to work together when you perform an activity. Hitting a ball requires the use of your eyes together with your hands and arms. Jumping hurdles, kickboxing, and aerobic dance require your eyes, feet, and legs. Kicking and performing dance steps require coordination.



**Power** is the ability to combine strength with speed while moving. A shot putter combines strength with speed to perform with power. A softball player who swings the bat quickly and with a lot of force demonstrates power.



**Reaction time** is the ability to move quickly when you get a signal to start moving. A swimmer or runner starting a race needs good reaction time.



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**Speed** is the ability to get from one place to another in the shortest possible time. You can have speed of your whole body, such as when you skate or run fast, or speed of body parts, such as when you move your hands very quickly to steal a ball from another person in a basketball game.



## Moving Together: Full Participation

Can you remember a time when you were the leader of a group in a physical activity setting? How did you perform as a leader? Were you successful at getting all members of your group to participate? What strategies did you use to promote participation? How do you feel when people don't pay attention to you? How do you feel when some members of a group do less work than others?

Jimmy and Molly were in physical education class. The class was doing an exercise routine that required them to try several different skills and then do them to music. They were assigned to a group to read about a skill and then show the class how to do it properly. Molly was the group leader. She read the directions for the skill, showed the group a picture of it, and asked all group members to try it.

When it was her group's turn, Molly was going to read the class a description of the skill and have all group members demonstrate at the same time. But some group members didn't pay attention. Two group members were talking about other things. Jimmy just quietly stood to the side.



If you're the leader of a group, follow these guidelines.

- ▶ **Use basic leadership skills.** These include things such as speaking with a strong voice, maintaining eye contact when you talk to other group members, and showing enthusiasm for what you're doing.
- ▶ **Ask questions of the group members.** By asking questions of others in the group, you increase the participation by all group members.
- ▶ **Ask group members to help demonstrate skills.** You can show your enthusiasm by demonstrating some of the skills yourself, but you can also involve others in the group by asking them to demonstrate skills.

- ▶ **Have all group members practice the skill together.** If group members practice the skill with you, they may feel more involved in the group's activity.
- ▶ **Give positive feedback to those who try.** Thank them for their effort.
- ▶ **Tell group members that it is OK to make a mistake.** We all make mistakes at first. Practice will help everyone improve.

If you're asked to participate as a member of a group, follow these guidelines.

- ▶ **Help the leader by participating.** In this class all students will get a chance to be a group leader. When you're the leader, you'll want the help of other students, so giving your help when you're a group member will help get the cooperation of others when you're the leader.
- ▶ **Avoid talking when the leader is talking.** This is one of the best ways to help the leader. Also, paying close attention to the leader will help you learn the skill the leader is teaching.
- ▶ **Give your best effort in all activities.** Effort is one of the most important factors in learning. Most people don't succeed the first time. If you get in the habit of working at something, you'll find that you can do all sorts of things that you thought were hard at first.

### Discussion Questions

1. What could Molly do to get all group members to participate in the activity?
2. How could Jimmy help Molly to keep the group working together?
3. What other suggestions do you have to help the group complete its assignment?
4. Are there any other questions we should ask?

### Guidelines for Full Participation

Everybody learns faster and better when all members of a group are actively involved in the group activity. Two kinds of guidelines can help the group to have full participation: group leader guidelines and group member guidelines.

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Consider these examples when choosing activities. If you have good balance, you may decide that gymnastics is a good choice. If you have good coordination, you may decide that tennis or baseball is a good choice. But your skill-related fitness shouldn't keep you from choosing an activity that you think you'll enjoy. The key is practicing the skills of the activity that you choose. With good practice and good instruction, any activity choice is a good one.

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Enjoyment is a very good reason for learning skills. If you practice motor skills, you get better at performing them. The better you are, the more you enjoy the activity. And the more you enjoy the activity, the more you'll do it. Of course, many movement skills are important to daily living, too. Some skills help you to do important activities that don't build fitness and health. For example, you need to be able to write to do schoolwork, but writing isn't a movement skill that leads to fitness.

Once you have learned a skill, you need to keep practicing it as you grow older. The body of a teenager often changes rapidly. As you grow taller and



*It's fun to practice skills that you enjoy.*

your arms and legs grow longer, practice will help you adjust your performances to your new body size. As you grow bigger, practice will help you to move your body with greater speed and accuracy. These are both important in performing well in sports and other physical activities. As you grow, you'll also be able to apply more force with your body's longer levers (your arms and legs), allowing you to kick or throw a ball a greater distance.

people is all it takes to make a real difference. Often we don't know how many people we have on our team until we run into a problem. Knowing who is on your team will help you identify people to help with your assignments in this class.

Use the worksheet supplied by your teacher to list people who are on your support team or who could be recruited to join your team. Then choose team members who can support your physical activity or practice with you this week. You can support and encourage their physical activity, too.

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## Take It Home

### Your Support Team

In NASCAR auto racing, drivers have support teams that help them in training and getting through the race. When drivers need fuel or their tires changed, they pull into the pit area and their team goes to work to get them ready to roll again. Wouldn't it be great if we each had a support team like that? Being on the support team of others and building support teams for ourselves are some of the most important things we do in life. Family, friends, teachers, and teammates may all be part of our support team.

Sometimes when we're feeling bad, we think that no one is on our team. Most people feel that way at one time or another, but if you think about it, you'll realize that you have quite a few people on your support team. Everyone has a different combination of people who are available to listen, share experiences, offer advice, and generally just help us through life. Some kids have one parent, some have two parents, and some have three or more. Some kids have grandparents, guardians, aunts, or uncles who are important in their lives. Some kids have brothers, sisters, nieces, or nephews that are best buddies. Neighbors, church members, teachers, coaches, recreation workers, and librarians can all be part of our support teams. A few

### Lesson Review

- ▶ What are skills?
- ▶ What are the parts of skill-related fitness?
- ▶ Why are skills and skill-related fitness important?
- ▶ How can you encourage others to participate in a group that you're leading?
- ▶ How can you participate in a group that you're not leading?

## Lesson 2.2

# The Importance of Practice

### Lesson Vocabulary

feedback, first-class levers, lever, mental practice, paralysis by analysis, practice, routine, second-class levers, third-class levers

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What is **practice**, and why should you do it? Do you know the best way to practice? When you finish this lesson, you'll know the answer to these ques-



*Perfect practice makes perfect.*

tions. You'll also know more about how the levers of the body are used to help you to be active and perform skills.

## What Is Practice, and Why Should I Do It?

Practice means repeating an action over and over to improve skill. One famous saying is "Practice makes perfect." This means that the more you practice a skill, the better you get at performing it. Practice can improve all kinds of skills, from daily performance skills such as brushing your teeth and typing on a computer to sport skills such as hitting, catching, and kicking. If you want to get better at a skill, the best thing you can do is practice it. But some kinds of practice are better than other kinds. For the best results, you should practice in the best possible way.

## What Is the Best Way to Practice?

Not all practice is good practice. Some experts have changed the old saying to "Perfect practice makes perfect." They did this to let you know that there's a right way and a wrong way to practice skills. If you practice the wrong way, your performance won't get better; it may even get worse. So before you begin to practice a skill, be sure to get good instruction. Instruction from an expert such as your physical education teacher can help you to get the most from your practice.

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Once you have chosen a skill that you want to learn, an instructor can show you how to perform it correctly and how to practice it in the best possible way. If you're doing a skill incorrectly and practice it incorrectly, you won't get better at performing the skill. A qualified instructor helps you by giving you **feedback**. Feedback is information that the instructor "feeds" or gives "back" to you after you perform a movement so you have a better idea of what you did. Feedback helps you to make appropriate changes so that you improve your performance. It's hard to tell when you're doing a skill correctly because you can't see yourself move. But an instructor can see your movements and help you make adjustments.



# Biomechanical Principles: Levers

**The levers of the body allow you to apply force to create movements of many different kinds.**

A **lever** is a very basic machine. It is a bar or stiff, straight object that can be used to lift weight, increase force, or create speed. The bones of your body are levers that allow you to perform many skills. For example, the bones of your foot act as a lever when you push with your foot while you walk and run. The calf muscles shorten, causing your foot to push down against the ground. To do its work, a lever must have a pivot point at the middle or at the end of the lever.

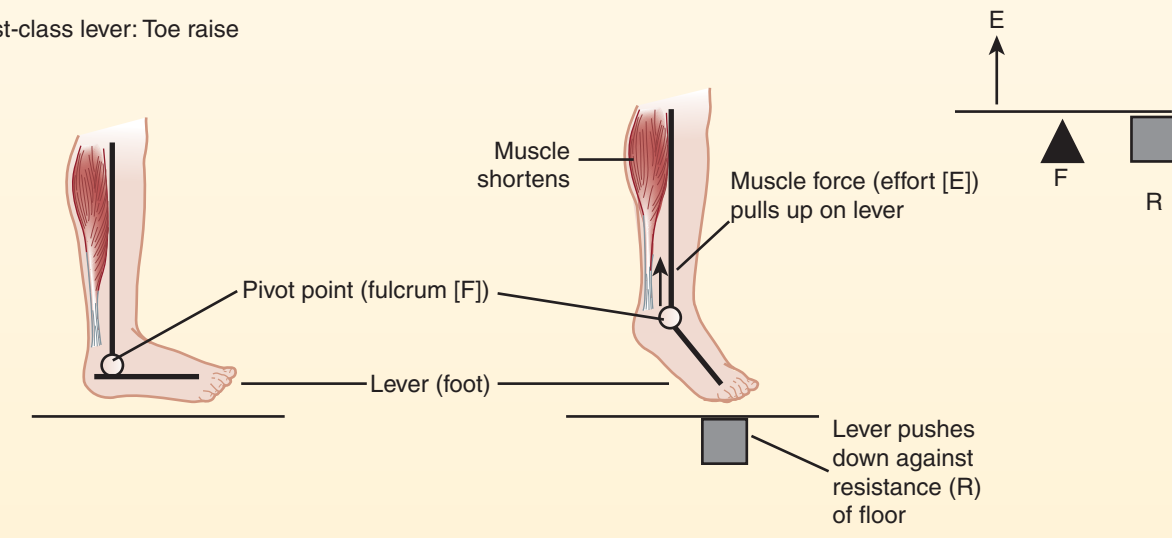
When you use the foot as a lever in walking and running, the ankle is the pivot point and the bones of the foot are the levers. When you use the bones as levers in this way, they are called **first-class levers**. First-class levers can allow you to lift a heavy weight with a small amount of force. For example, first-class levers allow you to lift your whole body weight with the relatively small leg

muscles (see below). A first-class lever also causes a change in the direction of the force so that the muscles in the back of your lower leg, which pull upward on the back of your foot (your heel), make the front of your foot (your toes) push downward against the ground.

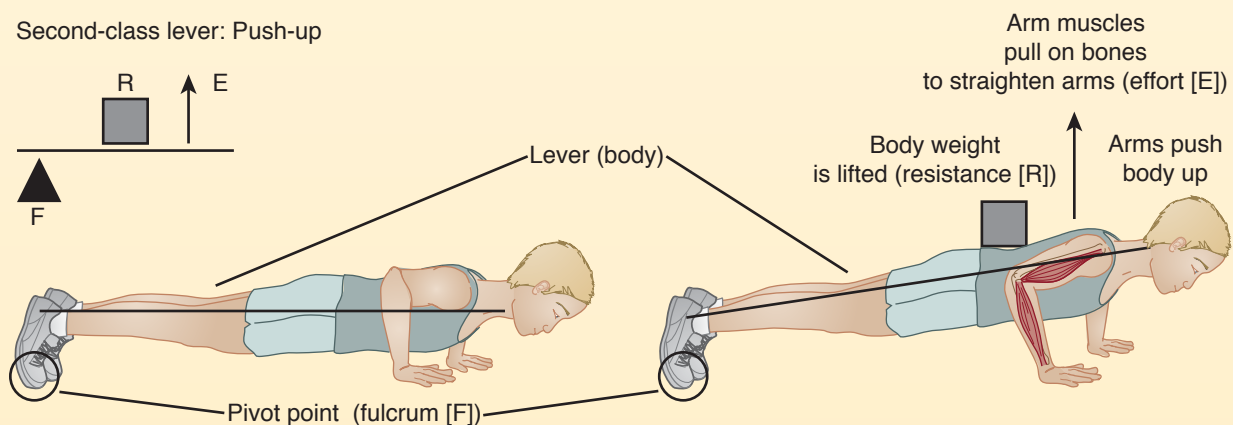
In a first-class lever, the fulcrum (or pivot point) is between the resistance (or weight) and the effort (or force). First-class levers can be used to either increase the force applied or increase the speed and distance of movement.

**Second-class levers** are not common in the body. However, a good example of a second class lever is a person doing a push-up (see below). The body is straight from the shoulders to the feet. It acts as a lever with the pivot at the feet. The weight of the body is near the center, near the waist, and the arms work at the shoulders to lift the body. The force required for the arms to lift the body is about half the total body weight.

First-class lever: Toe raise



Second-class lever: Push-up



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(continued)



## Biomechanical Principles: Levers (continued)

In a second-class lever, the weight (or resistance) is between the fulcrum (or pivot point) and the effort (or force). Second class levers increase the force applied.

The most common type of levers in the body are **third-class levers**. In the human body, third-class levers have the pivot point at one end. The muscles apply force to the lever near the pivot. This causes the levers (your bones) to move. For example, in performing a biceps curl as illustrated below, the force of the contraction of the muscles of the upper arm pulls the lever (the lower arm) upward. The fulcrum or pivot point is the elbow, and the weight or resistance is the weight of the lower arm and the weight that's held in the hand. Third-class levers allow you to do fast movements such as throwing, kicking, or swinging a tennis racket. When you kick a ball, you use the bones of the upper leg, the lower leg, and the foot as third-class levers. For example, in kicking, the muscles of the hip move the upper leg forward, the muscles of the front of the upper leg move the lower leg forward, and the muscles of the lower leg move the foot forward and upward with great speed. That allows you to kick the ball a good distance if you make good contact with the ball when you kick it. Adding the levers one at a time results in even faster movement of the leg.

The levers of the arm work in a similar way when you swing an object such as a tennis racket or perform an exercise such as a biceps curl (see below). With practice, you can learn to move the levers with improved accuracy as well as improved speed.

In a third-class lever, the effort (or force applied) is between the weight (or resistance) and the fulcrum (or pivot point). Third-class levers increase speed.

You have to learn to use the levers of the body efficiently if you are going to learn a wide variety of skills. The more you practice, the better you become at using the body levers. With practice your timing improves so

that you can kick, throw, jump, and do other skills faster and better. Practice helps your body memorize movements so that you can control them better and so that you can perform skills more accurately.

### Applying the Principle

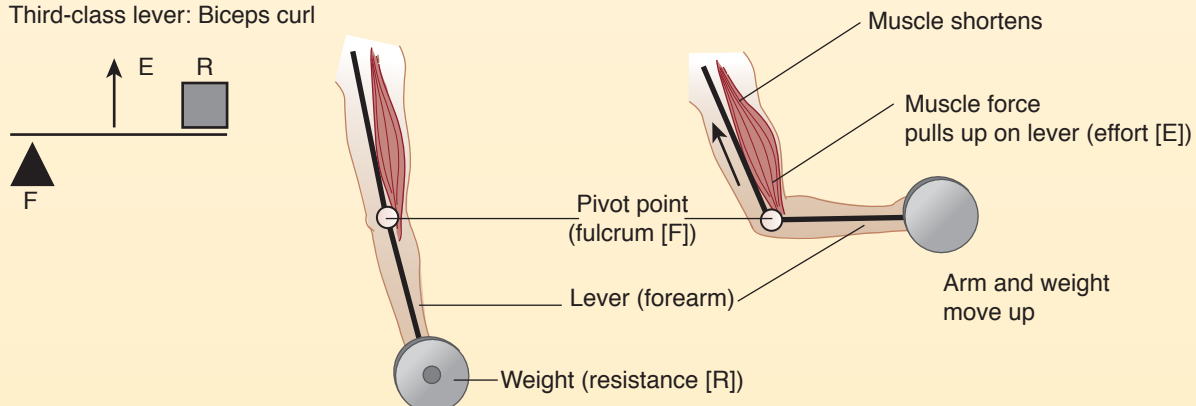
When you move one of the body's third-class levers such as the arm, the muscles move only a short distance but the end of the lever (the arm) moves a much greater distance. This creates a fast movement at the end of the lever (arm). This speed allows a person to throw a ball a great distance.

Put your hand on the muscles that are moving levers (bones) when you perform the following activities. Remember that the muscle causing the movement often is found closer to the center of the body than the moving part and does not attach near the fast-moving end of the bone, but closer to the other end of the lever.

- ▶ Kicking a hacky sack behind your back with your foot uses the muscles of the back of the upper leg and causes a backward movement of the lower leg (see *a* on page 23).
- ▶ Performing a forehand serve in badminton uses the muscles on the front of your shoulder and upper arm and causes a fast movement of the lower arm and the racket (see *b* on page 23).
- ▶ Performing a biceps curl using an elastic band uses the muscles on the front of your upper arm and causes movement of the lower arm (see *c* on page 23).

Notice that in each case, the end of the lever is moving farther and faster than the part closer to the pivot where the working muscle is attached.

Third-class lever: Biceps curl



In addition, other muscles and levers are involved in each of the motions described on the previous page. For example:

- ▶ Kicking a hacky sack with the back of your foot involves the muscles of the upper leg and lower leg and the levers of the lower leg and foot.
- ▶ Serving a birdie in badminton involves the muscles of the upper arm and forearm and the levers of the upper arm, forearm, and hand.
- ▶ Performing biceps curls against an elastic band involves the muscles of the upper arm and the forearm muscles that control the fingers.

Only some of the levers and muscles involved are described in the examples.

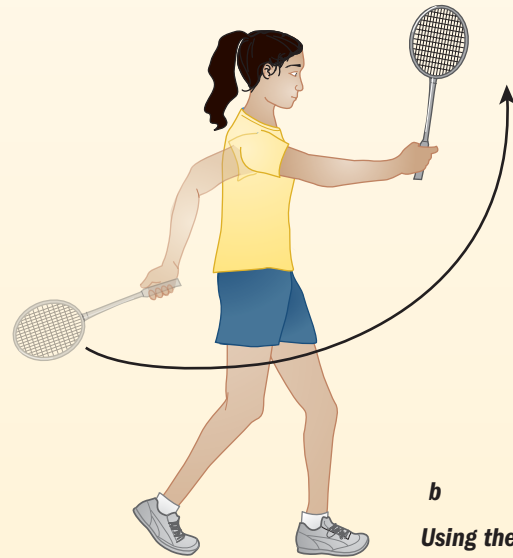
### Principle in Practice

Using the body's levers helps you to perform skills that require speed. Practice kicking a ball using the levers of your leg. Start by kicking a ball that is lying on the ground. Think about using the levers in your upper and lower leg. The upper leg should move forward first, and then the lower leg. This will help you learn to use the same levers in punting a ball, such as in playing goalie in soccer. As you improve, the speed of your foot should increase and the distance you can kick will increase. Practice will also help you improve accuracy of kicking and throwing. However, it is best not to focus too much on accuracy when you are first learning. Once you have learned a skill properly (such as throwing or kicking), additional practice will help you improve accuracy. Practice using the levers of the arms in throwing a baseball or serving a volleyball. Use the worksheet provided by your teacher to investigate levers that you use every day.



a

**Using the legs as third-class levers.**



b

**Using the arms as third-class levers.**



c

**Using the arms as third-class levers.**

## FIT FACT

Scientists have found that the same neurons in your brain fire whether you're thinking about a movement or actually doing it.

A teacher is giving you feedback to help you improve your practice when he or she tells you if you're gripping the tennis racket properly or if you need to reach farther back when you swing the racket. Good feedback from an instructor helps you to practice better. A friend or family member can also provide feedback if the person knows what to look for when you practice. Some sport teams use video to get feedback to improve practice. If video is available to you, you could do the same.

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Sometimes getting too much feedback when you're practicing can be a problem. Imagine practicing a skill such as the overhand volleyball serve. A friend is trying to help you. First, your friend says to toss the ball higher before hitting it. Then your friend says to toss the ball farther in front of you before hitting it. Then the advice is to jump before hitting the ball. Finally, you're told to keep your eye on the ball. This is just too much information for you to take in at one time. Too much information given at one time can lead to **paralysis by analysis**. Paralysis by analysis occurs when you have so much information (feedback) that you can't keep your focus—you're paralyzed by having too much to think about. Practice is best when you focus on one or two things at a time. Trying to think about too many things at once causes problems.

**Mental practice** can also help you to improve your skills. Mental practice is imagining performing a skill properly. Just thinking about performing the skill the right way can make your regular practice better. Mental practice can also help you develop a **routine** for doing the skill the same way every time. A routine is a series of steps that you go through

every time you perform a skill. For example, good putters in golf use the same routine each time they putt. Using a routine can improve your performance because you repeat the task over and over again in exactly the same way.

## How Often Should I Practice?

Practice works best when you enjoy it and can focus on it. If you practice too long and get tired or bored, the practice is less effective because you're more likely to practice the movement incorrectly. That's why sport teams practice one skill for a while and then practice another. Finding ways to make practice fun, such as practicing with friends or using enjoyable practice drills, helps to keep it interesting and keep you focused. Although a practice session can be as long as a couple of hours, time spent practicing one skill may last only 5 to 30 minutes. Athletes often practice longer than this, but for most people longer practice sessions aren't necessary and may not be possible.

Practicing regularly is also important. If possible, daily practice is best. If you have limited time to practice, though, it's best to distribute practice over several days rather than do it for several hours on one day. In the same way that you forget facts that you learn, if you don't practice, your body "forgets" the best way to perform skills.



*Practicing skills with friends helps keep practice interesting.*

Practice over several days rather than do it for several hours on one day. In the same way that you forget facts that you learn, if you don't practice, your body "forgets" the best way to perform skills.

### Lesson Review

- ▶ What is practice, and why should you do it?
- ▶ What are the important elements of good practice?
- ▶ How do body levers help you to perform physical activities?
- ▶ How often should you practice?

# 2

## Chapter Review



Number your paper from 1 to 5. Read each question. After the number for the question, write a word or a phrase that best answers the question. The page number where you can find the answer is listed after the question.

1. What word (or words) in this chapter describe(s) the ability to perform a specific task? (page 15)
2. What word describes nerves and muscles that work as a unit with the brain? (page 15)
3. What do you call the part of skill-related fitness that refers to the ability to change body positions quickly? (page 17)
4. What word describes the information you get from a teacher or from practice that helps you to change performance? (page 20)
5. What is the name of a basic machine described in this chapter? (page 21)

Number your paper from 6 to 10. Next to each number, write the letter of the best answer.

- |                          |   |
|--------------------------|---|
| 6. balance               | a. a combination of strength and speed              |
| 7. practice              | b. repeating a skill to improve performance         |
| 8. routine               | c. a series of steps for doing a skill the same way |
| 9. paralysis by analysis | d. ability to keep your body in a steady position   |
| 10. power                | e. too much feedback that hurts performance         |

Number your paper from 11 to 15. Follow the directions to answer each question or statement.

11. Give examples of skills used in playing sports.
12. Explain the difference between skills and skill-related fitness.
13. Give examples of guidelines that help leaders get full participation from a group.
14. Describe the six parts of skill-related fitness and give examples of each.
15. Give examples of how the body's levers are used in physical activities.

### Ask the Authors

Is it possible to get too much practice?

Get the answer and ask your own questions at the *Fitness for Life: Middle School* Web site.

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