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Baseball is often called the *national pastime of the United States*. Millions of Americans enjoy playing and watching this exciting “bat and ball” game.

Baseball

Baseball is a sport that is so popular in the United States that it is often called the *national pastime*. Every spring and summer, millions of people throughout the country play this exciting “bat and ball” game. Millions also watch baseball games and closely follow the progress of their favorite teams and players.

There are organized baseball teams for every age group from 6-year-olds to adults. The teams that attract the most interest are those of the two major leagues: the American League and the National League. These teams are made up of men who rank as the world’s best play-

ers. Every year, about 50 million people flock to ballparks to watch major league baseball games. Many more millions watch games on television, listen to them on radio, read about them in newspapers, and discuss them with their friends.

Baseball began in the eastern United States in the mid-1800’s. By the late 1800’s, people throughout the country were playing the game. The National League was founded in 1876, and the American League in 1900. Through the years, baseball spread from the United States to other parts of the world. Today, it ranks as a major sport in such countries as Canada, Italy, Japan, Taiwan, the Netherlands, South Africa, and many Latin American nations.

Baseball terms*

Batting average shows the percentage of times that a player gets a base hit. To find a player’s batting average, divide the number of hits by the number of official times that the player has been at bat. Carry the answer to three decimal places.

Double play is a play in which the fielders put out two opponents. Most double plays occur from ground balls hit in *force* situations, when a runner must try to advance to the next base because another runner follows.

Earned run average is the average number of *earned runs* scored against a pitcher every nine innings. An earned run is one that is scored without the aid of an error. To find a pitcher’s earned run average, divide the number of innings pitched by 9. Then divide the result by the number of earned runs the pitcher allowed. Carry the answer to two decimal places.

Hit-and-run play occurs when a runner on first base runs toward second as the pitcher releases the ball toward home plate. The second baseman or shortstop must cover second base. The batter tries to hit the ball through the “hole” left open by the fielder.

No-hitter occurs when a pitcher or pitchers allow the opposing team no hits during a game.

Perfect game occurs when a pitcher allows the opposing team no base runners during a game.

Pick-off play occurs when the pitcher or catcher throws the ball to an infielder in an attempt to catch a runner off base.

Pinch hitter replaces a scheduled batter in a game. The batter be-

ing replaced is then out of the game. The pinch hitter may remain in the game.

Pinch runner replaces a base runner. The replaced runner is then out of the game. The pinch runner may remain in the game.

Runs batted in are runs scored as a result of a batter’s base hits, outs (except double plays), walks, or being hit by a pitch.

Sacrifice occurs when a batter bunts the ball and is put out, allowing one or two base runners to advance. The batter is not credited with a time at bat.

Sacrifice fly occurs when a batter flies out and a runner scores from third base after the catch. The batter is not credited with a time at bat.

Shut-out occurs when one team scores no runs during a game.

Slugging average is a statistic that shows the effectiveness of a batter in making extra base hits. It is obtained by dividing the total number of bases from singles, doubles, triples, and home runs by the number of official at bats. Carry the answer to three decimal places.

Squeeze play is a type of sacrifice that calls for a batter to bunt the ball so that a runner can score from third base. If the runner waits to make sure the ball is bunted, the play is called a *safety squeeze*. If the runner runs toward home plate before the batter attempts to bunt the ball, the play is called a *suicide squeeze*.

Triple play occurs when three outs are made in a single at bat. This rare play often occurs when a batter lines out to an infielder, catching two runners off base.

How the game is played

A baseball game is played on a large field between two teams of 9 or 10 players each. The teams take turns *at bat* (on offense) and *in the field* (on defense). A player of the team in the field, called the *pitcher*, throws a baseball toward a player of the team at bat, called the *batter*. The batter tries to hit the ball with a bat and drive it out of the reach of the players in the field. By hitting the ball, and in other ways, players can advance around the four bases that lie on the field. A player who does so scores a *run*. The team that scores the most runs wins the game.

The information in this section is based on the rules of major league baseball. Most other leagues follow much the same rules. The section on *Baseball leagues* later in this article lists some exceptions. For information on softball, a popular game based on baseball, see **Softball**.

Players and equipment

Players. National League baseball teams include nine players: a *pitcher*, *catcher*, *first baseman*, *second baseman*, *shortstop*, *third baseman*, *left fielder*, *center fielder*, and *right fielder*. Each player plays a defensive position when his team is in the field and takes a turn as the batter when his team is at bat.

American League teams include the same players, but they may—and almost always do—use a tenth player. This player, called the *designated hitter* (DH), bats in place of the pitcher. The DH does not play a defensive position. All other players except the DH and the pitcher both bat and play in the field. The American League adopted the designated hitter rule in 1973.

Baseball teams also have substitute players. A substitute may replace any player except the pitcher at any time. A pitcher must face at least one batter before leaving the game. A player who leaves a game for a substitute may not return to the game.

Other members of a baseball team include a *manager* and several *coaches*. The manager decides which players will play in the game and directs the team’s strategy. The coaches assist the manager.

Equipment. A *baseball* is a small, hard, round ball. It measures from 9 to 9 ¼ inches (23 to 23.5 centimeters) in circumference and weighs between 5 and 5 ½ ounces (142 and 148.8 grams). A tiny cork ball forms the center of the baseball. Tightly wrapped layers of rubber and yarn surround the cork. Two strips of white cowhide sewn together with thick red thread cover the ball. Until 1974, the cover was made of horsehide, rather than cowhide. For this reason, baseballs are sometimes called *horsehides*.

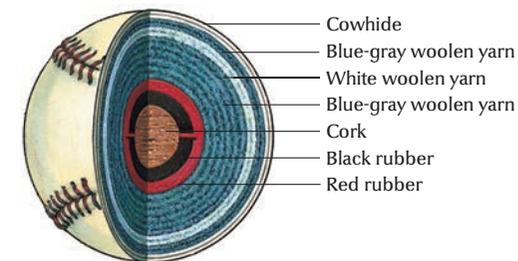
A *baseball bat* is a long, rounded piece of wood. Most bats are made of ash wood, but some are made of hackberry or hickory. A major league baseball bat may not measure more than 42 inches (107 centimeters) long or 2 ¾ inches (7 centimeters) in diameter at its thickest point.

Each defensive player wears a padded leather *glove*, and uses it to catch the ball. There are three kinds of gloves: the *catcher’s mitt*, which is worn by the catcher; the *first baseman’s glove*, which is worn by the first baseman; and the *fielder’s glove*, which is worn by all other players.

All players wear shoes with spikes on the soles so they can stop and start quickly. Most players wear shoes with metal spikes. But some wear shoes with synthetic

rubber spikes when they play on fields covered by artificial turf. Players also wear uniforms, which include socks, knickers, a jersey, and a cap. The batter wears a special plastic cap called a *batting helmet*. The helmets are designed to avoid injuries to batters who are hit in the head with a ball.

A catcher wears special equipment for protection. A metal *mask* protects the catcher’s face. A *chest protector*

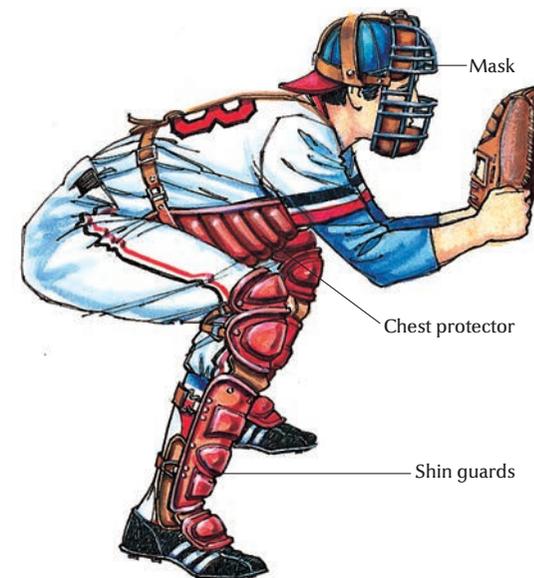


Cowhide
Blue-gray woolen yarn
White woolen yarn
Blue-gray woolen yarn
Cork
Black rubber
Red rubber

The inside of a baseball has a cork center and layers of rubber and yarn. Strips of cowhide sewn together cover the ball.



The three kinds of baseball gloves are, *left to right*, the catcher’s mitt, first baseman’s glove, and fielder’s glove.



Mask

Chest protector

Shin guards

The catcher wears special protective equipment—a metal mask, a padded chest protector, and plastic shin guards.

*This table includes terms that do not appear in the text.



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Allsport

Soccer is the world's most popular team sport. The goalkeeper, shown here diving toward the ball, tries to prevent the ball from going into his goal. The opposing players, shown here kicking and leaping, try to control the ball for their team.

Soccer

Soccer is the world's most popular sport. It is the national sport of most European, Latin American, and African countries, and of many other nations. Millions of people in more than 200 countries play soccer. Soccer's most famous international competition, the World Cup, is held every four years for both men and women.

In a soccer game, two teams of 11 players try to kick or head a ball into each other's goal. The team that scores the most goals wins. Players must kick the ball or hit it with their head or body. Only the goalkeepers can touch the ball with their hands.

Soccer as it is played today developed in the United Kingdom during the 1800's and quickly spread to many other countries. Until the mid-1900's, the game was not greatly popular in the United States. But today, it is one of the nation's fastest-growing sports.

In the United Kingdom and many other countries, soccer is called *football* or *association football*. The word soccer comes from *assoc.*, an abbreviation for *association*.

The field and equipment

The field is rectangular and may vary in size. In international competition, it measures from 100 to 130 yards (91 to 119 meters) long and from 65 to 100 yards (59 to 91 meters) wide. The boundary lines on the sides of the field are called *touch lines* or *side lines*. Those on each end are called *goal lines*. The goals stand in the center of the goal line. Each goal measures 8 yards (7.3 meters) wide and 8 feet (2.4 meters) high. The *penalty area* is a rectangle in front of each goal. It is 44 yards (40.2 meters) wide and extends 18 yards (16.5 meters) in front of the goal. Defending players are penalized if they break certain rules while in their own penalty area, with the oppo-

nent awarded a penalty kick.

The *goal area* is a smaller rectangle that measures 20 yards (18 meters) wide and extends 6 yards (5.5 meters) in front of the goal. This area is marked to serve as a guideline for placing the ball to restart the game. For the names and sizes of other sections of a soccer field, and the names of other lines, see the field diagram on the next page.

The ball is made of synthetic material and is inflated with air. A soccer ball used for adult games measures from 27 to 28 inches (69 to 71 centimeters) in circumference and weighs from 14 to 16 ounces (396 to 453 grams). Children generally use a ball with a circumference of about 25 inches (64 centimeters).

The uniform consists of a shirt, shorts, calf-length socks, shoes with cleats, and shin guards. The goalkeeper's shirt differs in color from those worn by the other players of both sides and by the referee.

Players and officials

The players of a soccer team—except for the goalkeeper, who normally remains within the penalty area—use certain formations for offensive or defensive strategy. The score of the game often determines a team's strategy. For example, a team that is ahead may use a formation based on defense. A team that is behind may choose one that emphasizes offense. Some formations are designed to take advantage of the weaknesses of the opposing team. Other formations center around the special abilities of a star player.

One popular formation is the 4-4-2. The first line of this formation has four defenders, the second line consists of four midfielders, and the third line has two forwards. A number of other formations are also used in soccer. For example, the 4-3-3 is popular with many teams throughout the world. This formation uses four defenders, three midfielders, and three forwards.

International soccer rules allow a team to substitute only two players during a game, regardless of how many players are injured. Under international rules, a player for whom another player has served as a substitute may not return to the game. College and high school teams in the United States and Canada allow an unlimited number of substitutions, with a player allowed to return to the game after another player has served as his or her substitute.

The forwards have the primary responsibility for scoring goals. They are sometimes called *strikers*. They must be exceptionally skillful with the ball, be able to pass accurately, *dribble* (nudge the ball ahead with the feet while running down the field), and shoot accurately. A good forward can fake an opponent out of position in order to score a goal with the head or foot. Forwards may also put pressure on the opposing team's players when possession of the ball is lost.

The midfielders unite the offense and the defense. These players have a role in every play and require a variety of skills, depending on a coach's tactics. Defending midfielders, or *holding midfielders*, must be equally adept at intercepting passes, *tackling* (taking the ball from an opponent), and passing to link the defenders to the rest of the team. A *center attacking midfielder* is often responsible for making plays that result in scoring chances. *Wingers* play on the left and the right of the formation and attack and defend up and down the field.

The defenders form the last line of defense in front of the goalkeeper. A defender tries to take the ball away from the other team and, when possible, pass it to a midfielder to start an attack. If the goalkeeper is out of position, defenders may stand directly in front of the

goal to protect it against shots. In the modern game, teams most often employ two defenders called *center backs* and two *outside backs*, one on the left and one on the right. In addition to defending, outside backs can join the attack as wingers.

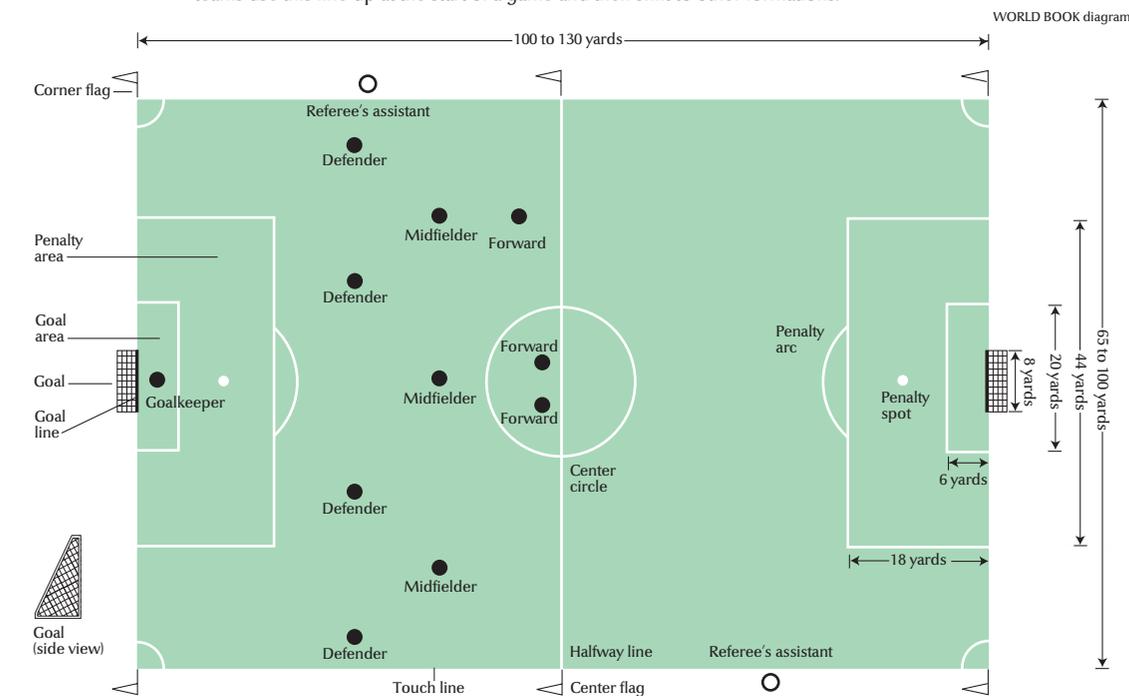
The goalkeeper has perhaps the most difficult job. A goalkeeper must move quickly to all parts of the penalty area to stop shots or take the ball from an opponent. After stopping a shot, a good goalkeeper controls the ball and starts an attack by kicking or throwing the ball to a teammate. The goalkeeper is the only player who may touch the ball with the hands or arms.

The officials. A referee and two referee's assistants officiate most games throughout the world. In high school and college games in the United States, two referees or a referee and two assistants may be used. The referee serves as the timekeeper and enforces the rules. This official decides all disputes and may put a player out of the game for repeated fouling. The assistants help decide which team gets possession of the ball after it goes out of bounds. The assistants also signal the referee when they see a player commit a foul. They cannot, however, make decisions. The assistants only assist the referee, who has the sole responsibility for calling fouls and breaches of conduct. At the professional and international levels, a fourth official is stationed between the benches to assist the referee, report any infractions by team personnel on the bench, and serve as an emergency replacement official.

How soccer is played

Soccer games played according to international rules are divided into two 45-minute halves, with a brief rest

A soccer field This diagram shows the players of a soccer team in a 4-3-3 formation on the rectangular field. Most teams use this line-up at the start of a game and then shift to other formations.



be a recreational or educational activity.

Two or more teams compete in a gymnastics meet, which takes place in a gymnasium. The gymnasts use equipment called *apparatus* and a variety of mats. Judges evaluate each gymnast's performance, called a *routine*, for its difficulty, skill, and technical precision. Judges then assign a score to the performance.

Friedrich Jahn, a German schoolteacher, built the first modern gymnastics equipment in the early 1800's. The sport has been a part of the Olympic Games since the modern Olympics began in 1896. Worldwide television coverage has helped gymnastics grow in popularity as a spectator sport.

Men's events

A men's gymnastics meet consists of six events. These events, in order of performance, are the (1) floor exercise, (2) pommel horse, (3) still rings, (4) vault, (5), parallel bars, and (6) horizontal bar. Men who compete in all six events are called *all-around gymnasts*. Those who enter fewer than six events are called *specialists*.

The floor exercise is performed on a mat that measures 40 feet (12.2 meters) square. The gymnast should use the entire mat area during the exercise, which consists primarily of tumbling movements in different directions. The floor exercise must not take longer than 70 seconds.

The pommel horse is named for the padded piece of apparatus on which this event is held. The horse measures about 46 inches (1.15 meters) high, about 14 inches (35 centimeters) wide, and about 5 feet 3 inches (1.6 meters) long. It has two handles on top called *pommels*. The hands are the only part of the body that should touch the horse. Pommel horse routines consist of continuous circular movements interrupted only by required scissors movements with the legs.

The still rings event is performed on two rings suspended from cables about 9 feet (2.75 meters) above the floor. The athlete supports his body in various *strength positions*, which require exceptional power. In a movement called the *iron cross*, for example, the athlete supports himself in an upright position with his arms extended sideways. At least one of the positions of strength must be held for two seconds during the routine. It is essential that the gymnast remain motionless and maintain proper body position while performing strength elements.

The vault is performed on a piece of apparatus called a *vault table*. The table is about 4 feet (1.25 meters) high, 37 inches (95 centimeters) wide, and about 37 to 41 inches (95 to 105 centimeters) long. The gymnast approaches the table at a run and jumps up and forward from a springboard. He places one or both hands on the vault table for support as he goes over. He may perform any of several movements while in the air, such as a twist or a somersault.

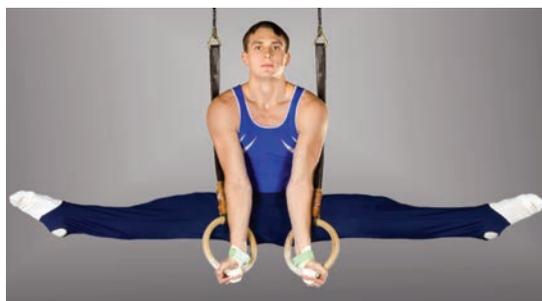
The parallel bars is an event performed on two long and slightly flexible bars about 6 feet 6 inches (1.95 meters) above the floor and about 16.5 to 20.5 inches (42 to 52 centimeters) apart. The athlete supports himself on the bars with his hands while performing handstands, swings, twists, and other required movements. This event requires a great deal of hand-eye coordination, timing, and balance.

Some men's events



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The pommel horse event is performed on a piece of equipment called a *horse*. The gymnast uses his hands to support his weight and performs various leg movements without stopping.



© Shutterstock

The still rings is an event held on two rings suspended from cables. The gymnast tries to keep the rings motionless while he executes a number of maneuvers with his body.



© Shutterstock

The parallel bars event takes place on two long bars. While supporting himself with his hands, the gymnast carries out acrobatic movements that require great strength.



© Dave Black

The vault is performed on a piece of equipment called a *vault table*. From a running start, the gymnast jumps up and forward from a springboard and vaults across the length of the table.



AP/Wide World

The horizontal bar event is performed on a somewhat flexible bar. The gymnast holds the bar with one or both hands and performs acrobatic movements without coming to a full stop.

The horizontal bar event takes place on a somewhat flexible bar fastened about 9 feet (2.75 meters) above the floor between two supports. During the routine, the gymnast must execute a series of continuous swings and turns and at least one move in which he releases and regrips the bar. The routine ends with a landing called a *dismount*, which often includes multiple somersaults and twists before hitting the floor.

All-around competition for men consists of all six events. The gymnast performs a routine in each event, doing whatever movements he chooses.

Women's events

A women's gymnastics meet consists of four events. In order of performance, they are the (1) vault, (2) uneven bars, (3) balance beam, and (4) floor exercise. Most women gymnasts enter all four events.

The vault is performed in the same general manner as the men's vault. The apparatus is also the same.

The uneven bars is an event performed on two parallel bars. The higher bar's height is about 8 feet (2.46 meters), and the lower bar is about 5 feet 6 inches (1.66 meters) high. The gymnast swings around one bar at a time, performing maneuvers requiring great flexibility and agility. She switches rapidly back and forth from one bar to another, trying to keep in constant motion.

The balance beam is performed on a long beam about 16 feet (5 meters) long, 4 inches (10 centimeters) wide, and about 4 feet (1.25 meters) above the floor. Gymnasts perform jumps, leaps, running steps, and turns and must use the beam's full length. The routine must not exceed 90 seconds.

The floor exercise is performed to music on a mat 40 feet square. The event allows gymnasts to express their personalities through their choice of music and *choreography* (dance movements). The routine must last no longer than 90 seconds and cover the entire floor space. There are certain required acrobatic movements, such as a dance movement with a minimum of two leaps, each taking off from one leg.

All-around competition for women includes all four events. Each gymnast performs in each event, selecting her own routine.

Rhythmic gymnastics

Rhythmic gymnastics is a separate type of gymnastics competition for women. Rhythmic gymnastics involves body movements and dance combined with the handling of small apparatus—a rope, a hoop, a ball, clubs, and a long ribbon. Routines must cover the entire mat and include jumps, leaps, balances, and flexibility movements.

Rhythmic gymnasts perform as individuals or in a group on a carpet about 43 feet (13 meters) square. The group event involves five gymnasts who perform simultaneously. Each group must perform two routines. One of the routines is performed with the same pieces of apparatus. The other routine is choreographed with mixed equipment. The time limit for individual routines is 75 to 90 seconds. The time limit for groups is 2 minutes 15 seconds to 2 minutes 30 seconds.

Trampoline and tumbling

Trampoline routines are performed on a flexible bed 7 by 14 feet (about 2.1 by 4.3 meters) that can propel the gymnast up to 30 feet (about 9 meters) in the air. At the Olympic Games level, competition consists of two routines, the first with 10 required skills and the second with skills selected by the athlete. At the age group and developmental level, athletes must perform a *compulsory* routine and a *voluntary* one. The compulsory routine must include four required elements, plus six chosen by the athlete. The voluntary routine consists of 10 skills selected by the athlete, but they must include single, double, or triple somersaults with multiple twists. In *synchronized trampoline*, two athletes using two trampolines perform identical 10-skill routines at the same time.

Power tumbling is performed on a platform 6 by 88 feet (about 1.8 by 27 meters). Tumblers demonstrate speed, strength, and skill while executing a series of acrobatic maneuvers. Athletes perform two eight-skill routines. The first focuses on somersaulting. The second re-

Some women's events



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The **balance beam** is performed on a long beam. The gymnast tries to use the full length of the beam while she performs acrobatic movements, jumps, leaps, running steps, and turns.



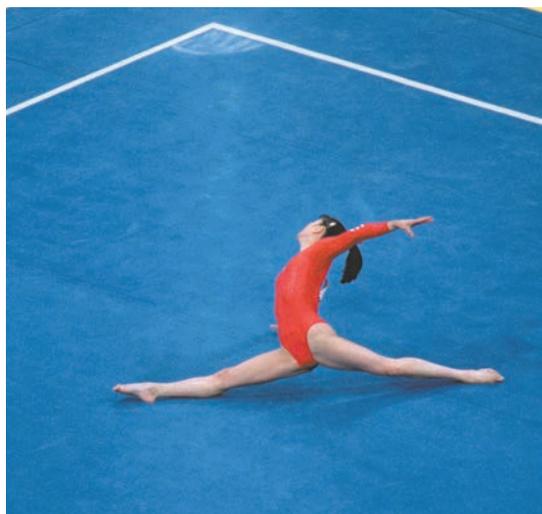
© Eileen Langsley Gymnastics/Alamy Images

The **uneven bars** event is performed on two bars. The competitor swings back and forth from bar to bar and executes difficult maneuvers while in constant motion.



© Dave Black

Rhythmic gymnastics involves graceful body movement and dance combined with the handling of a piece of equipment. The gymnast shown here is performing with a long ribbon.



© Mike Powell, Getty Images

The **floor exercise** is performed to music on a mat. The gymnast demonstrates her skill in acrobatics, dancing, and tumbling, matching her routine to the mood and tempo of the music.

quires athletes to show their twisting skills.

Double mini-trampoline involves a small two-level trampoline. The event combines the horizontal character of tumbling and the vertical character of trampoline. Competitors perform two two-skill voluntary routines in preliminaries and two two-skill voluntary routines in the finals. A good routine shows height, multiple flips and twists, and a dismount with no extra steps before coming to a stop.

Sports acrobatics

Sports acrobatics consists of five events performed on a mat similar to the one gymnasts use for floor exercises. The events are (1) women's pair, (2) men's pair, (3) mixed pair, (4) women's trio, and (5) men's four. Smaller and more flexible athletes perform in the top, or "flyer" positions. Taller and stronger athletes assume the lower positions. Each pair or group performs routines that feature gymnastics tumbling skills, balances, and tempo skills. Balance routines consist of such elements as pyramids and handstands. Tempo routines involve somersaults and twisting with landings on the floor or catches by a bottom partner.

Gymnastics competition

Judging. At a gymnastics competition, one to eight judges sit at each piece of apparatus. Each routine receives a score for difficulty and a score for execution. The two scores are combined to create the final score. The difficulty score begins at 0.0 and increases with every difficult skill performed. The execution score begins at 10.0, and the judging deducts for errors in performance. There is no limit to how high a gymnast may score. However, the top performances typically receive scores in the middle to high 15's. A score of 16 is considered exceptional.

In rhythmic gymnastics, a score may reach a maximum of 30 points. The score for *artistry* (dance and mu-

sic) is averaged with the score for difficulty of the moves to produce one score, which is then added to the score for execution. The combination of these two scores creates the final score.

In trampoline competition, the entrants complete both optional and compulsory routines in qualifying competition. In the final round, the contestants perform an optional routine only. Two difficulty judges give the difficulty score for each routine, starting with 0 points. A panel of five judges assesses the execution of each routine, giving a score up to 10. The two scores are combined for the final result. Judges reward competitors who perform with artistry and grace. Execution is weighted more heavily than difficulty in the final score.

Sports acrobatics competitions are decided on a score that can reach a maximum of 30.00 points. A maximum score of 10.00 is allotted to an artistic component, an execution component, and a difficulty component. The three individual scores are combined to create the final score.

Organization. The International Gymnastics Federation, based in Switzerland, governs international gymnastics. National federations, such as Gymnastics Australia in Australia, British Gymnastics in the United Kingdom, and USA Gymnastics in the United States, supervise the sport in most countries. The federations conduct programs for men and women that determine the members of each nation's teams for international competition. Such competition includes the Olympic Games, the Pan American Games, the World Championships, and the World University Games.

In the United States, many states hold a championship competition for high school athletes. The National Collegiate Athletic Association (NCAA) has men's and women's championships.

Critically reviewed by USA Gymnastics

See also *Comaneci*, *Nadia*; *Olympic Games* (table; pictures); *Trampoline*.

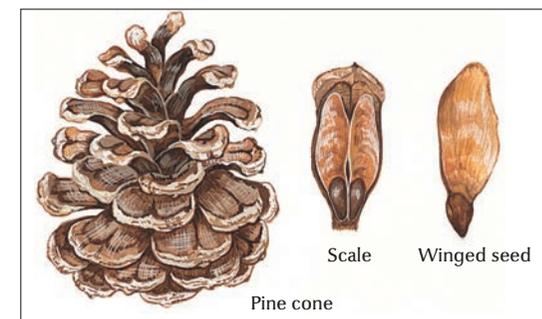
Gymnosperm, *JHM nuh spurm*, is the name of one of two large groups of seed plants. The plants in the group have naked, or uncovered, seeds. The term *gymnosperm* comes from two Greek words meaning *naked* and *seed*. The other group of seed plants, called the *angiosperms*, consists of plants whose seeds have a protective *ovary* (seed case).

Gymnosperms are woody perennials that are among the largest and oldest living plants. There are hundreds of *species* (kinds) of gymnosperms. Most species are conifers, such as balsams, firs, pines, and spruces. These cone-bearing trees make up the largest *division* (group) of gymnosperms. The tropical and subtropical *cycads*, also gymnosperms, are among the most primitive living seed plants. The *ginkgo* and the *gnetophytes* make up the other two divisions of gymnosperms (see *Ginkgo*).

Many of the gymnosperms are evergreen with a wide variety in the structure of the leaves. They do not bear flowers. Tiny male cones produce the pollen, which is usually spread by the wind. The naked, or exposed, seeds are borne between the scales of the female cones and drop when they become ripe. Gymnosperms provide the source of many valuable products, such as tar, turpentine, rosin, and timber.

Bruce H. Tiffney

Scientific classification. Gymnosperms are made up of the divisions Coniferophyta, Cycadophyta, Ginkgophyta, and Gnetophyta.



WORLD BOOK illustration by Lorraine Epstein

A **gymnosperm** is a plant that has exposed seeds. The pine tree, which bears seeds upon cone scales, is a gymnosperm.

See also *Angiosperm*; *Conifer*; *Seed*.

Gynecology. See Obstetrics and gynecology.

Győr, juhr (pop. 129,527), is a major commercial and industrial city in northwestern Hungary. It lies where the Rába River and a branch of the Danube River meet. For location, see *Hungary* (political map).

Győr serves as a commercial center for the surrounding region, which is linked to the city by railroads and highways. The city's chief manufactured products are machines and textiles.

Győr has a cathedral that dates from the 1100's and several houses built in the Baroque style of architecture. Roman soldiers established a camp on the site of what is now Győr in about A.D. 50.

During the Middle Ages, beginning about the 1200's, the community gained importance because of its strategic location on the route between Vienna, Austria, and what is now Budapest, Hungary. It became a commercial, intellectual, and religious center for western Hungary. Győr's industrial development began during the mid-1800's and has been especially rapid since World War II ended in 1945.

Vojtech Mastny

Gypsies. See Roma.

Gypsum, *JJHP suhm* (chemical formula, $\text{CaSO}_4/2\text{H}_2\text{O}$), is a white to yellowish-white mineral used to make plaster of Paris. Large beds of gypsum formed when seawater evaporated, leaving dissolved calcium and sulfate to form deposits of gypsum. Gypsum is so soft that it can be scratched with the fingernail. Sometimes it forms transparent crystals called *selenite* or fibrous crystals called *satin spar*.

The chemical formula of gypsum shows that it is a *hydrate* of calcium sulfate. A hydrate contains water. When gypsum is heated, it loses three-fourths of its water. This process, called *calcination*, changes the gypsum to the fine white powder called *plaster of Paris*. The plaster hardens after it is mixed with water and exposed to the air. Plaster of Paris is used to make all types of casts.

Heating gypsum at high temperatures will drive off all the water. Calcined gypsum in this form is used in the building industry for base-coat plaster, plasterboard, lath, and wallboard. It is also used as a filler in such products as candy and paint.

Ground gypsum (*land plaster*) is sometimes used as a fertilizer for soils that need calcium. It is not used much today, because ground limestone and prepared fertiliz-