Note to the Counselor

Like other merit badges, the Swimming merit badge has been developed to teach and train youth in a manner consistent with the overall goals and values of the Boy Scouts of America. The merit badge counselor should be fair and consistent and should present and teach the skills as presented in this pamphlet. None of the requirements should be omitted, and nothing should be added to them.

The merit badge instruction should begin with a review of requirement 3. This will lay a suitable foundation for safety and first-aid requirements 1 and 2. This review also will indicate individual skill proficiency in various strokes, floating, and feetfirst entry.

The leaping entry, the preferred entry for the swim tests used in the Second and First Class rank requirements, should be taught and emphasized in the first session as a safety skill to be used throughout the class.

The faceup float (requirement 6a) also should be taught in the first class session as a confidence builder and as a resting/survival procedure for use during the class and beyond.

Stroke instruction also should begin in the first session and continue throughout the course with individualized instruction based on the proficiency of each participant. Opportunity to complete the stroke requirement (requirement 5) should be given when a participant appears ready.

Regarding other requirements, surface dives (requirement 7) should be mastered before beginning snorkeling and scuba diving (requirement 8a); and diving (requirement 9) should precede competitive skills instruction (requirement 8b). Survival skills and knowledge (requirements 4, 6b, 6c, and 6d) can be covered at any time; they relate closely to the safety and preliminary skills in requirements 1 and 3.

If requirement 10 is to be completed concurrently with instruction on in-water skills, then the pertinent information should be presented early enough in the course to allow time for study and preparation of individual exercise program plans. Requirement 10c must be completed in writing. Requirements 10a, 10b, and 10d may be done orally, but it is not sufficient for the Scout simply to hear a presentation from the counselor. Each merit badge candidate must learn the material and demonstrate that knowledge by explaining the facts or concepts to the counselor.

Safety

BSA Safe Swim Defense

All swimming activity in Scouting is conducted according to Safe Swim Defense standards. Developed more than 60 years ago, the procedures included in this water safety plan have earned Scouting what is believed to be the most exemplary water safety record of any youth organization in the United States. The eight points of Safe Swim Defense are as follows.

1. Qualified Supervision

All swimming activity must be supervised by a mature and conscientious adult 21 years of age or older who understands and knowingly accepts responsibility for the well-being and safety of the children in his or her care, who is experienced in the water and confident of being able to respond in the event of an emergency, and who is trained in and committed to compliance with the eight points of BSA Safe Swim Defense. (It is strongly recommended that all units have at least one adult or older youth member currently trained as a BSA Lifeguard to assist in the planning and conduct of all swimming activity.)

2. Physical Fitness

Require evidence of fitness for swimming activity with a complete health history from physician, parent, or legal guardian. The adult supervisor should adjust all supervision, discipline, and protection to anticipate any potential risks associated with individual health conditions. In the event of any significant health conditions, an examination by a physician should be required by the adult supervisor.

3. Safe Area

When swimming in areas not regularly maintained and used for swimming activity, have lifeguards and swimmers systematically examine the swimming area to determine varying depths, currents, deep holes, rocks, and stumps. Mark the area for three groups: not more than 3½ feet deep for nonswimmers; from shallow water to just over the head for beginners; deep water not over 12 feet for swimmers. A participant should not be permitted to swim in an area where he cannot readily recover and maintain his footing, or cannot maintain his position on the water, because of swimming ability or water flow. When setting up a safe swimming area in natural waters, use poles stuck in the bottom, or plastic bottles, balloons, or sticks attached to rock anchors with twine for boundary markers. Enclose nonswimmer and beginner areas with buoy lines (twine and floats) between markers. Mark the outer bounds of the swimmer area with floats. Be sure that clear-water depth is at least 7 feet before allowing anyone to dive into the water. Diving is prohibited from any height more than 40 inches above the water surface; feetfirst entry is prohibited from more than 60 inches above the water. For any entry from more than 18 inches above the water surface, clear-water depth must be 10 to 12 feet. Only surface swimming is permitted in turbid water. Swimming is not permitted in water more than 12 feet deep, in turbid water where poor visibility and depth would interfere with emergency recognition or prompt rescue, or in whitewater, unless all participants wear appropriate personal flotation devices and the supervisor determines that swimming with personal flotation equipment is safe under the circumstances.

4. Lifeguards on Duty

Swim only where there are lifeguards on duty. For unit swims in areas where lifeguards are not provided by others, the supervisor should designate two capable swimmers as lifeguards. Station them ashore, equipped with a lifeline (a 100-foot length of ⅜-inch nylon cord). In an emergency, one carries out the line; the other feeds it out from shore, then pulls in his partner and the person being helped. In addition, if a boat is available, have two people, preferably capable swimmers, take it out—one rowing and the other equipped with a 10-foot pole or extra oar. Provide one guard for every 10 people in the water, and

adjust the number and positioning of guards as needed to protect the particular area and activity.

5. Lookout

Station a lookout on the shore where he can see and hear everything in all areas. The lookout may be the adult in charge of the swim and may give the buddy signals.

6. Ability Groups

Divide into three ability groups: nonswimmers, beginners, and swimmers. Keep each group in its own area. Nonswimmers have not passed a swimming test. Beginners must pass this test: jump feetfirst into water over the head in depth, level off and swim 25 feet on the surface, stop, turn sharply, resume swimming, then return to your starting place. Swimmers must pass this test: jump feetfirst into water over the head in depth, swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; then swim 25 yards using an easy, resting backstroke. The 100 yards must be swum continuously and include at least one sharp turn. After completing the swim, rest by floating. *These classification tests should be renewed annually, preferably at the beginning of the season.*

7. Buddy System

Pair every boy with another in the same ability group. Buddies check in and out of the swimming area together. Emphasize that each buddy lifeguards his buddy. Check everyone in the water about every 10 minutes, or as needed to keep the buddies together. The adult in charge signals for a buddy check with a single blast of a whistle or a ring of a bell, and calls, "Buddies!" The adult counts slowly to 10 while buddies join and raise hands and remain still and silent. Guards check all areas, count the pairs, and compare the total with the number known to be in the water. Signal two blasts or bells to resume swimming. Signal three blasts or bells for checkout.

8. Discipline

Be sure everyone understands and agrees that swimming is allowed only with proper supervision and use of the complete Safe Swim Defense. The applicable rules should be presented and learned prior to the outing, and should be reviewed for all

participants at the water's edge just before the swimming activity begins. Scouts should respect and follow all directions and rules of the adult supervisor. When people know the reason for rules and procedures they are more likely to follow them. Be strict and fair, showing no favoritism.

Pool and Surf Swimming

Safe Swim Defense applies to swimming at a beach, private or public pool, wilderness pond, stream, lake, or anywhere Scouts swim. Here are some additional points for the pool and the surf.

Pool. If the swimming activity is in a public facility where others are using the pool at the same time and the pool operator provides guard personnel, there may be no need for additional designation of Scout lifeguards and lookouts. However, the buddy system is critically important, even in a public pool. Remember, even in a crowd, you are alone without protection if no one is attentive to your circumstances.

The rule that people swim only in water suited to their ability and with others of similar ability applies in a pool environment. Most public pools divide shallow and deep water, and this may be sufficient for defining appropriate swimming areas. If not, the supervisor should clearly indicate to the participating Scouts the appropriate areas of the public facility. Although such procedures add a margin of safety, their use may not always be practical when the swim activity is conducted at a public facility where non-Scouts are present. An adult supervisor who understands his or her responsibility and the elements of safety can exercise discretion regarding certain procedures while maintaining safety.

Surf. The surf environment—with its wave action, currents, tides, undertow, runouts, and sea pests like stinging jellyfish—requires precautions for safe swimming that aren't necessary in other environments. A swimmer's physical condition is very important and should enable the swimmer to recover footing in waves, swim vigorously for at least five minutes without becoming exhausted, and remain calm and in control when faced with unexpected conditions.

Designated swimming areas are marked by flags or pennants that are easily seen. Beginners and nonswimmers are positioned inshore from standing lifeguards equipped with

BSA Swimmer Test

Jump feetfirst into
water over your
head in depth,
swim 75 yards in
a strong manner
using one or
more of the
following strokes:
sidestroke,
breaststroke,
trudgen, or crawl;
then swim 25 yards
using an easy,
resting backstroke.
The 100 yards
must be swum
continuously and
include at least
one sharp turn.
After completing
the swim, rest
by floating.

reach poles. Better swimmers are permitted seaward of the lifeguards but must remain shoreward of anchored marker buoys. The lifeguard-to-swimmer ratio should always be 1-to-10 with a rescue team that is supplied with a rescue tube or torpedo buoy stationed at the beach area.

Swimming Skill

One of the most important elements of safe swimming is the ability to swim, and every First Class Scout has demonstrated that he is a strong, safe swimmer based on mastery of certain in-water skills. A strong swimmer can swim a reasonable distance with a confident, steady stroke, but a strong swimmer is not a safe swimmer until he can make a safe water entry, swim a restful stroke, and maintain himself in the water when hurt or exhausted.

The BSA swimmer test, required for First Class advancement, includes these in-water skills and thereby demonstrates the minimum level of ability for safe deep-water swimming. Consider the components of the test:

1. "Jump feetfirst into water over your head in depth, . . ."

   The swimmer must be able to make an abrupt entry into deep water and begin swimming without any aids. Walking in from shallow water, easing in from the edge or down a ladder, pushing off from side or bottom, and gaining forward momentum by diving do not satisfy this requirement.

2. ". . . swim 75 yards in a strong manner using one or more of the following strokes: sidestroke, breaststroke, trudgen, or crawl; . . ."

   The swimmer must be able to cover distance with a strong, confident stroke. The 75 yards must not be the outer limit of the swimmer's ability; completion of the distance should show remaining sufficient stamina to avoid undue risks. Dog-paddling and strokes repeatedly interrupted and restarted are not sufficient; underwater swimming is not permitted. The itemized strokes are inclusive. Any strong sidestroke or breaststroke, or any strong overarm stroke (including the back crawl), is acceptable.

3. ". . . then swim 25 yards using an easy, resting backstroke. . . ."

   The swimmer must perform a restful, free-breathing backstroke that can be used to avoid exhaustion during swimming activity. This part of the test necessarily follows the more strenuous swimming activity to show that the swimmer can, in fact, use the backstroke as a relief from exertion. The change of stroke must be accomplished in deep water without any push-off or other aid. Any variation of the elementary backstroke is acceptable. An overarm back crawl may suffice if it clearly allows the swimmer to rest and regain his wind.

4. ". . . The 100 yards must be swum continuously and include at least one sharp turn. . . ."

   The total distance is to be covered without stopping. The sharp turn demonstrates the swimmer's ability to reverse direction in deep water without assistance or push-off from side or bottom.

5. ". . . After completing the swim, rest by floating."

   This critically important part of the test evaluates the swimmer's ability to maintain himself in the water indefinitely even though exhausted or otherwise unable to continue swimming. Treading water or swimming in place will further tire the swimmer and therefore is unacceptable. The duration of the float test is not significant, except that it must be long enough for the test administrator to determine that the swimmer is resting and likely could continue to do so for a prolonged period. Drown-proofing may be sufficient if it is clearly restful, but it is not preferred. If the test is completed except for the floating requirement, the swimmer may be retested on the floating only (after instruction) provided that the test administrator is confident that the swimmer can initiate the float when exhausted.

First Aid

Following the eight points of Safe Swim Defense will eliminate any serious risks in swimming, but some minor injuries still may occur during swimming activity. Be prepared for such occurrences and remember to take appropriate precautions.

Hypothermia occurs when the body's core temperature falls below the normal range. You will learn about the risks of cold water and hypothermia when you complete Swimming requirement 6. The "Survival Skills" chapter of this pamphlet describes the symptoms and treatment of hypothermia.

Heat reactions, including heat exhaustion and heatstroke, result when the body can't keep itself cool enough. If someone feels dizzy, faint, nauseous, or weak; develops a headache or muscle cramps; or looks pale and is sweating heavily, treat for **heat exhaustion.** Have the person lie down in a cool, shady spot with feet raised. Loosen clothing and cool the person with a damp cloth or a fan. Have the victim sip water. If the condition worsens, get medical help. Recovery should be rapid.

Heatstroke is the extreme stage where **dehydration** (water loss) has caused a very high body temperature and a cessation of sweating. The pulse is extremely rapid, and the person will be disoriented or unconscious. The victim must be cooled immediately through immersion or with cold packs, and the fluid level of the body must be increased. Treat for shock and seek emergency medical help.

Muscle cramps, sometimes called muscle spasms, occur when oxygen or nutrient supply to a muscle is insufficient or when the blood flow cannot prevent the accumulation of wastes. Vigorous exercise and water loss through sweating can cause muscle cramps in the extremities—arms and legs. Cold water or cold weather increases the likelihood of cramping. Sudden, vigorous exercise without proper warm-up and stretching also can increase the risk of muscle cramps. If a muscle begins to cramp during swimming activity, get out of the water and massage the cramp. If conditions are hot, cool down and take fluids. If conditions are cold, find warmth and cover and rub the cramping muscles to improve circulation. If you have a cramp while swimming in deep water and cannot swim to safety, float on your back or survival float and wait for help.

Sunburn is a familiar condition commonly associated with swimming. Remember that reflected sunlight from the water surface can be as damaging as direct exposure. Cover up, use a waterproof sunscreen, and limit your exposure time. If you begin to redden or feel discomfort, get out of the sun.

Stings and bites are not common in pool or lake swimming, but severe stings may result from contact with certain types of jellyfish or other saltwater creatures during ocean swimming. Knowing your aquatic environment and avoiding possible contact is the best strategy. For jellyfish stings, soak the area with vinegar or alcohol, or cover with a paste of baking soda mixed with water. If there is severe or prolonged pain or any severe allergic reaction, dizziness, or respiratory distress, get medical help. For typical insect stings and bites, apply basic first aid as described in your *Boy Scout Handbook*.

Lacerations, incisions, and **abrasions** (cuts and scrapes) may occur on the feet when swimming in natural waters if the bottom has not been carefully checked for hazards. In pool swimming such injuries are more likely when climbing in and out of the water without being careful along rough edges or corners. As in other situations, the wound should be cleaned, disinfected, and covered. The patrol first-aid kit should provide for minor wound treatment. For severe bleeding injuries, control bleeding with direct pressure or at pressure points until emergency medical help is available.

Spinal injuries can occur from diving into shallow or obstructed water. Great care must be taken if a spinal injury is suspected. If the victim is not handled properly, additional serious injury could result. Spinal injuries can be fatal or can result in paralysis. Moving a victim is an extremely delicate task best left to trained personnel, but if no one else is present you may need to act. In a swimming accident, you may have to move the victim to prevent drowning or to administer rescue breathing. When tending to such a victim, it is necessary to minimize movement of the victim's head, neck, and back. The technique used to limit this movement is called *in-line stabilization.* Review the chapter concerning spinal injury management in the *Lifesaving* merit badge pamphlet.

Hyperventilation is the result of overbreathing (either deliberately or as a result of panic), which depletes the level of carbon dioxide in the blood and suppresses the breathing reflex. The likely result is dizziness and fainting. Hyperventilation from panic is not likely to occur in swimming if everyone stays in water suited to his or her skill level and the activity is properly supervised and disciplined. If a swimmer becomes panicky, he or she should be removed from the water and calmed. Before resuming any aquatic activity, determine and resolve the cause of the panic.

A foolish swimmer may deliberately hyperventilate to suppress the breathing reflex for underwater swimming. This is dangerous and puts the swimmer at high risk. Such conduct is prohibited and should be sharply disciplined.

Cardiopulmonary resuscitation (CPR) is the important first response in the event of cardiac emergency, and such emergencies can occur as the result of any strenuous activity. CPR is used in drowning accidents when submersion has caused respiratory and cardiac arrest, and individuals trained in CPR should be included in every swimming outing. *The Boy Scout Handbook* and the *First Aid* merit badge pamphlet explain CPR and when it should be used.

Complete CPR should be attempted only by persons qualified by practice under the supervision of a trained instructor. Practice using a training device approved by your counselor; injury can result if CPR is performed on a person whose heart is functioning. If it has been over a year since you received your training, a refresher course might be needed. These are offered by numerous organizations in your community. Also explore the possibility of more advanced training. Some important techniques are not covered by requirement 2 of the Swimming merit badge.

Entering the Water

Get into the habit of entering the water feetfirst whenever you practice swimming skills. This will protect your head and neck from injury caused by unseen objects below the surface or when the water is shallower than you think. It is always safer to learn and practice entries in water that is over your head in depth.

3 FEET MAXIMUM
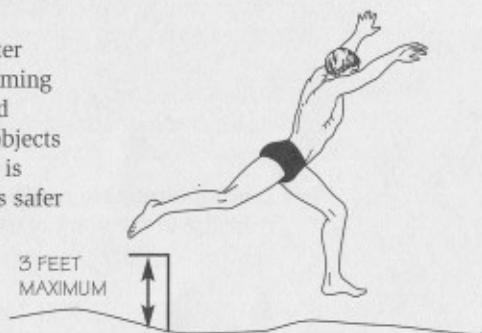
Leaping Entry (Stride Jump)

Take off on one foot, leaning forward, reaching out with both arms, and stretching your front leg far ahead—as if you were hurdling. Leap far out. When you meet the water, snap your legs together and slap downward with your arms. If you do it right, you won't even get your chin wet. In lifesaving, this entry allows you to keep your subject constantly in sight. Limit the height of the starting point to 3 feet above the water.

Leaping entry (stride jump)

Floating

Floating faceup is the most restful way to maintain yourself in deep water. This simple skill requires buoyancy and balance. Buoyancy comes mainly from the air you hold in your lungs, and balance is achieved by distributing your body mass above and below your chest. Think of your lungs as balloons supporting the center of a seesaw. You want to spread the weight so the seesaw balances and holds steady in the water. You add weight above your chest by extending your arms out and above your shoulders and tilting your head as far back as you can.

Practice in chest-deep water. Start from a standing position. Take a deep breath and hold it. Bend your knees slightly and lean backward, arching your back and stretching your neck backward until your ears are in the water and your chin is your highest point. Slowly extend your arms out and up from the shoulders, palms up. Do not try to arm stroke or kick yourself into a higher position because this will throw off your balance. Relax and let your body settle into its natural floating level and position in the water. The natural floating position for many people is with their legs and feet hanging down almost vertically under the water. Others float high on the water with their hips and legs near the surface.

Begin by holding the float position as long as you can hold your breath. When it is necessary to breathe, quickly blow out a short puff and suck in fresh air through your nose. As your floating experience and confidence increase, you will be able to breathe in a more relaxed and natural rhythm.
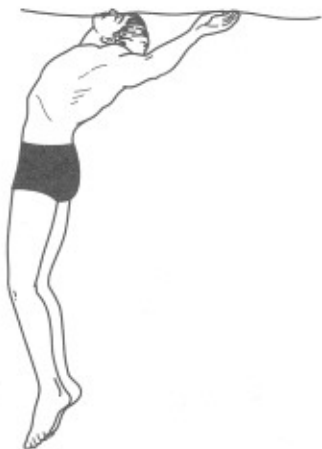
Swimming Strokes

You are already a good swimmer, as shown by your completion of Second Class and First Class swimming requirements. To earn the Swimming merit badge you must further demonstrate your swimming strength and stroke proficiency by swimming 150 yards using a combination of five strokes. You must swim continuously in a strong manner for the entire distance, showing good form on the front crawl or trudgen for 25 yards, the back crawl for 25 yards, the sidestroke for 25 yards, the breaststroke for 25 yards, and the elementary backstroke for 50 yards.

"Good form" requires that each stroke be performed consistent with the technique shown in the pamphlet. For example, the breaststroke (for requirement 5) is a restful stroke that includes a long, prone glide between strokes. If your breaststroke is a vigorous, bobbing stroke as used in competition, it is not satisfactory for this requirement. Doing the backstroke using a frog kick rather than the prescribed whip kick also is unacceptable for this requirement.

You also are required to swim the specified strokes in a "strong manner." This means no rest stops and no gasping, panting completions. The stroke sequence begins with the more strenuous strokes and moves progressively through the more restful strokes, concluding with the most restful. The stroke sequence should be followed as presented in the requirement. If you complete the swim "in a strong manner" in the specified sequence, then you should be rested and able to continue well beyond the 150-yard requirement.

On the following pages the required strokes are illustrated and explained as you should swim them to complete requirement 5.

Front Crawl

The *front crawl* has three parts: the flutter kick, the rotating arm stroke, and rhythmic breathing. It is the fastest and one of the most graceful of all swimming strokes.

The flutter kick relies on relaxed ankles and the use of the entire leg. The movement begins at the hips and flows to the feet. As one foot moves downward, the other comes up in a beating or fluttering rhythm. The kick should be smooth and steady, of even range (8 to 12 inches), and just below the surface of the water. You can practice the kick by holding the edge of the pool or by supporting yourself on a buoyant kickboard.

Practice the arm stroke in waist-deep water. Bend forward so that the top of your body is in a swimming position. Extend your right arm and bring it down to your hip so that you are pushing water toward your feet; then raise that elbow to extend your arm forward again. Alternate with your left arm. Keep your fingers together and slightly cupped.

Push off into a glide. Use the flutter kick and arm stroke together to move through the water. Remember to exhale through your mouth and nose while your face is in the water. To inhale, roll your head to one side as the arm on that side is pulling to your hip and the elbow is lifting out of the water. Inhale through your mouth, then turn your face back into the water as your arm is recovering to the extended position in front of you.

Front crawl

Back Crawl

The *back crawl,* or racing back-stroke, has the advantages of speed and a faceup position. The leg motion is the flutter kick, and the arms work in a continuous alternating motion with one pulling as the other recovers. Bring your arm out of the water at your hip and through the air to slice back into the water at a point beyond your head. Keep your fingers together and your hands slightly cupped.
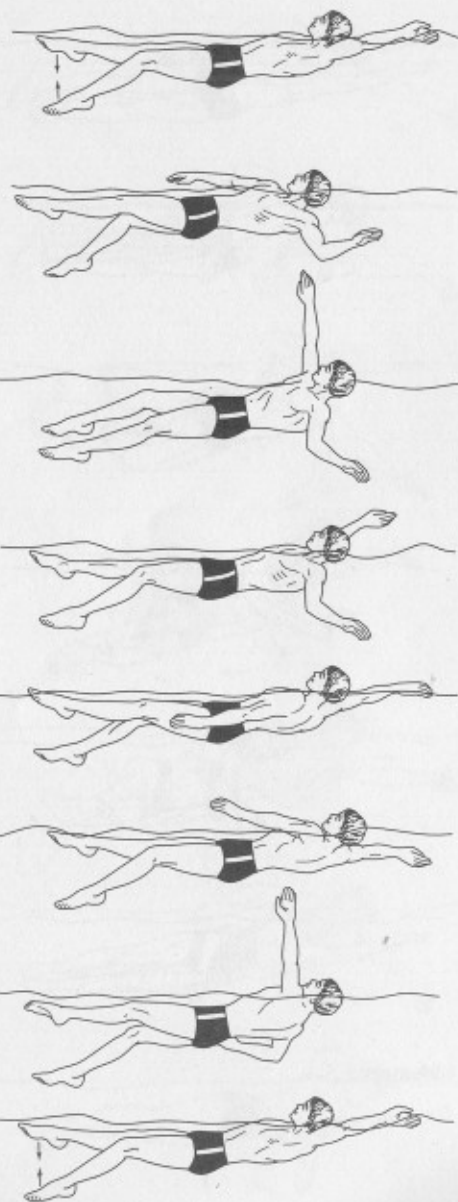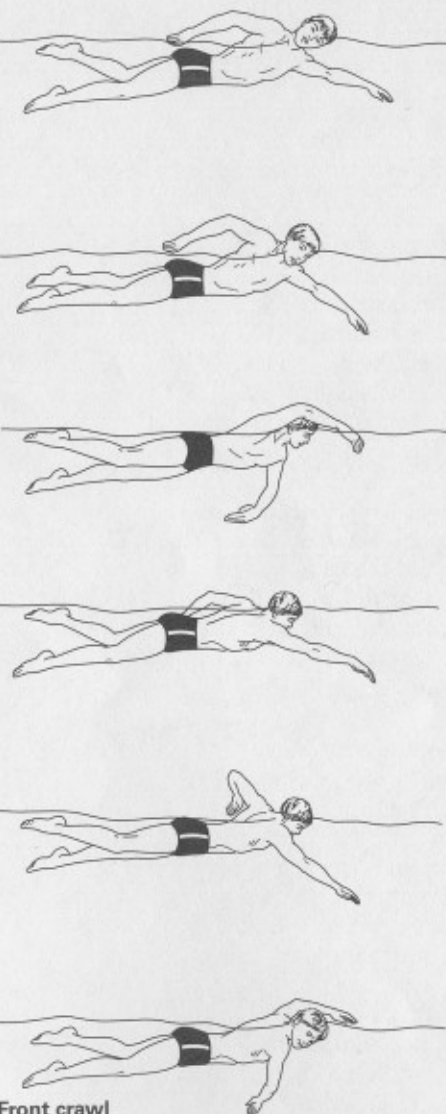
Back crawl

Sidestroke

The sidestroke is a good long-distance stroke with a long, restful glide. It also introduces the scissors kick, which is used in swimming rescues.

Start in the extended glide position on your side with one ear in the water, your nose and mouth turned to the shoulder out of the water, and your eyes looking toward your feet. Begin moving the leading arm into a catch motion, then start the trailing arm and leg action. The leading arm pulls as the trailing arm slices through the water toward the upper chest; the legs bend as the trailing arm moves forward. Pull the leading arm to a point just below your chest. As your arms begin to change directions, extend your top leg forward and your lower leg back. Without stopping, continue to move your arms and snap your feet together in a scissoring motion. The stroke is complete when you arrive back at the glide position. Hold the glide position for three or four counts and repeat the stroke.
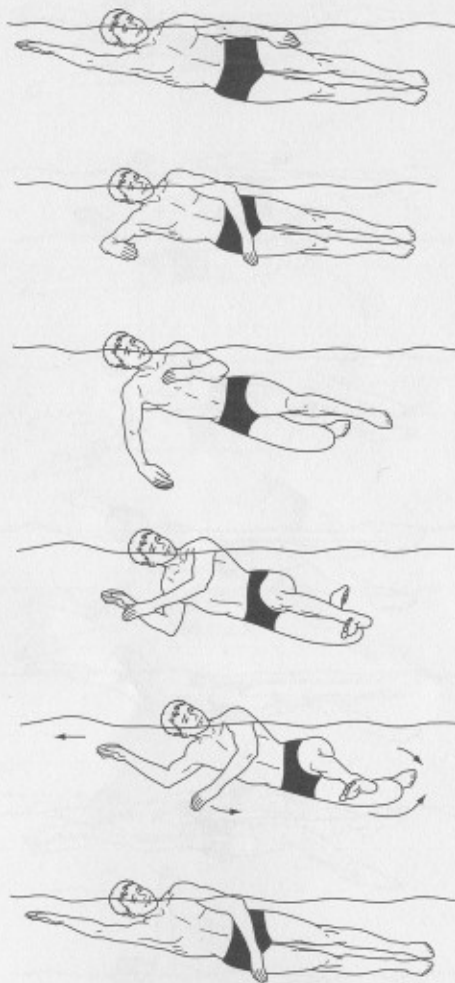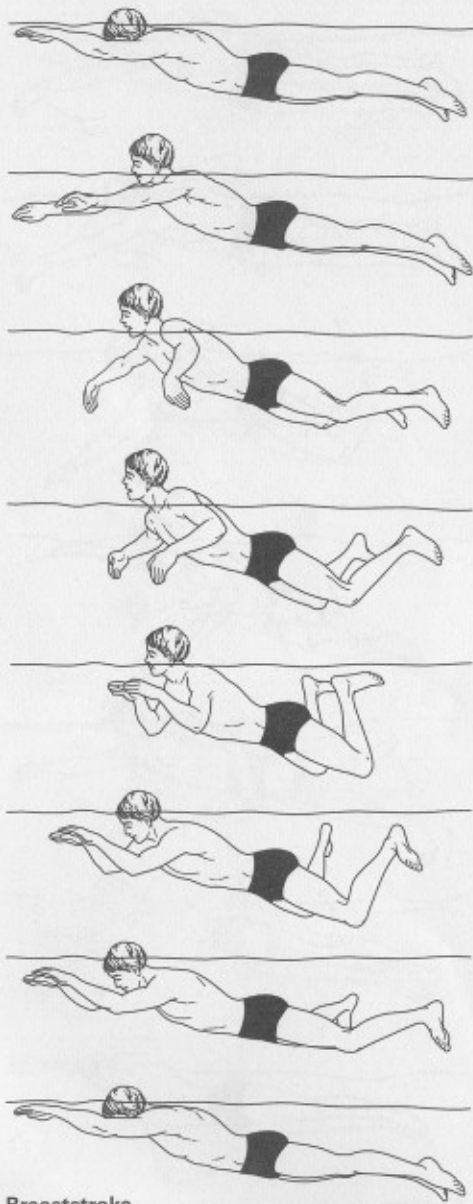
Sidestroke

Trudgen

Experienced swimmers frequently prefer the *trudgen* as a strong, energy-conserving, all-purpose stroke. It combines the arm movements and breathing of the front crawl stroke with the scissors kick. The kick is completed with hips turned up on the rhythmic breathing side just as the arm on that side completes its pull. The legs trail in the extended position as the other arm pull is performed. This interesting stroke was named for Englishman John Trudgen, who introduced the stroke in competition in 1868.
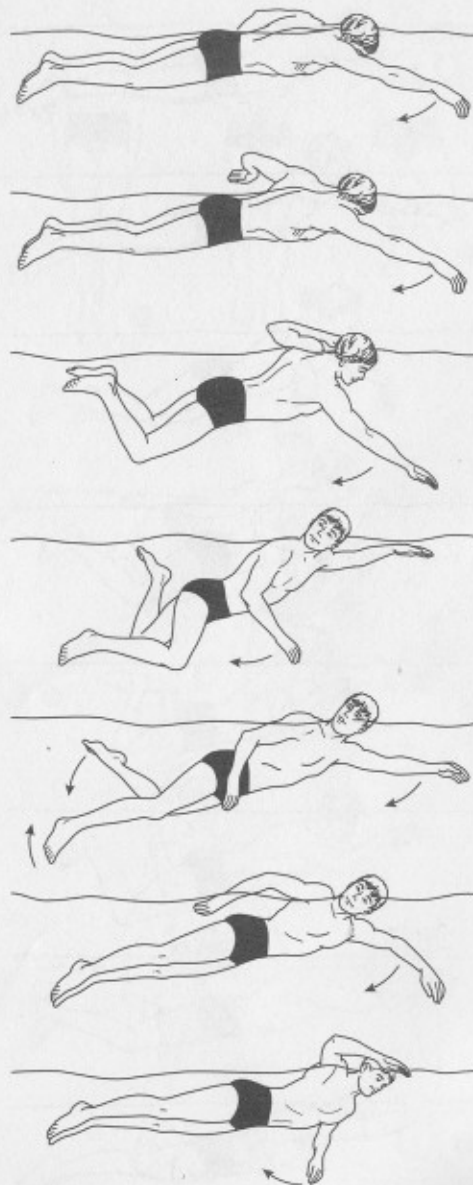
Trudgen

Breaststroke

This is one of the oldest strokes used in Scouting, and variations range from a restful distance stroke to a competitive racing stroke. With an extended glide as is taught in Scouting, the *breaststroke* is a powerful, long-distance stroke that conserves energy and has applications in lifesaving. The stroke uses a whip kick and shallow arm pull.

Start in the prone glide position with your face in the water. As you drop and pull your hands, lift your face out of the water to breathe and draw your feet toward your hips. When your arms are at shoulder level, your legs should be under your hips with your feet drawn up. Inhale and have your face ready to go back into the water. Rotate your hands until they meet under your chin and thrust them through the water to the extended position. Push your legs out and back in a circular motion as your face returns to the water, ankles touch, and legs extend. Hold the glide for a count of three or four while exhaling into the water. Then begin the stroke again.

Elementary Backstroke

The *elementary backstroke* is the resting stroke for the last 50 yards of your test, and you should be less exhausted at the end of the distance compared with when you began the stroke. Use this stroke for long-distance swimming or for when you are tiring and want to rest while continuing to make progress.

Start on your back in the glide position, legs extended, arms at your sides, hands at your thighs, and toes pointed. Move your hands up while you begin to drop your heels. As you extend your hands outward, turn your toes outward. Now complete the power part of the stroke by sweeping your hands down toward your feet and whipping your feet back together in circular motion. To avoid getting water in your mouth and nose, keep your forehead slightly higher than your chin as your arms push toward your feet.

Make your movements continuous, resting only at the end of the stroke to permit a long glide. As you finish your glide, repeat the process. Keep your head in line with your body. Don't be in a hurry. Remember, this is a resting stroke, so be sure to relax and glide for three or four counts.

Breaststroke
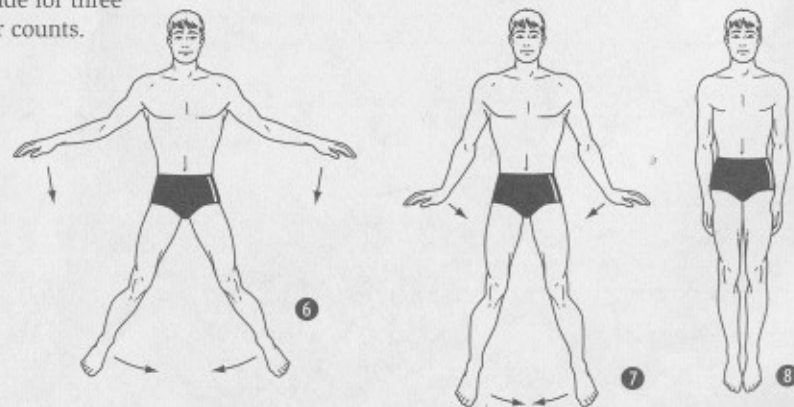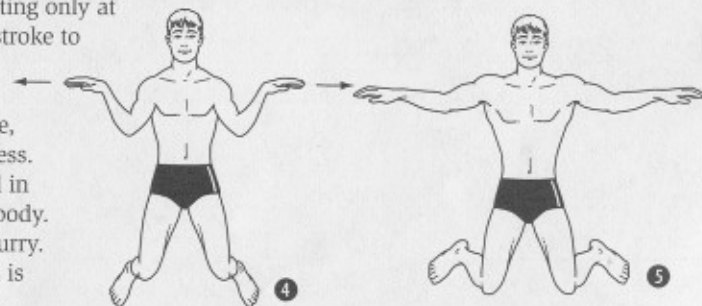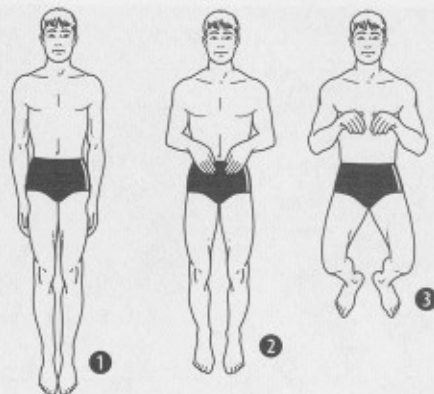
Surface Dives

If you want to swim underwater to recover an object or explore the bottom, a surface dive is an easy way of going down. This swimming skill is commonly used in snorkeling and lifesaving. There are two ways to do a surface dive: feetfirst from an upright position or headfirst from a forward swimming position.

Feetfirst Surface Dive

While treading water in an upright position, raise yourself partly out of the water by whipping your legs together in a scissors kick and pressing your hands down on the water. Now let yourself sink. As your face goes under, turn your palms out and press upward with your arms and hands, which will send you down fast. Keep your feet together and toes pointed to streamline your body. When you near the bottom, change to a swimming position by pulling your knees in until you are tucked. Drop your head and start an underwater breaststroke with your arms and legs.
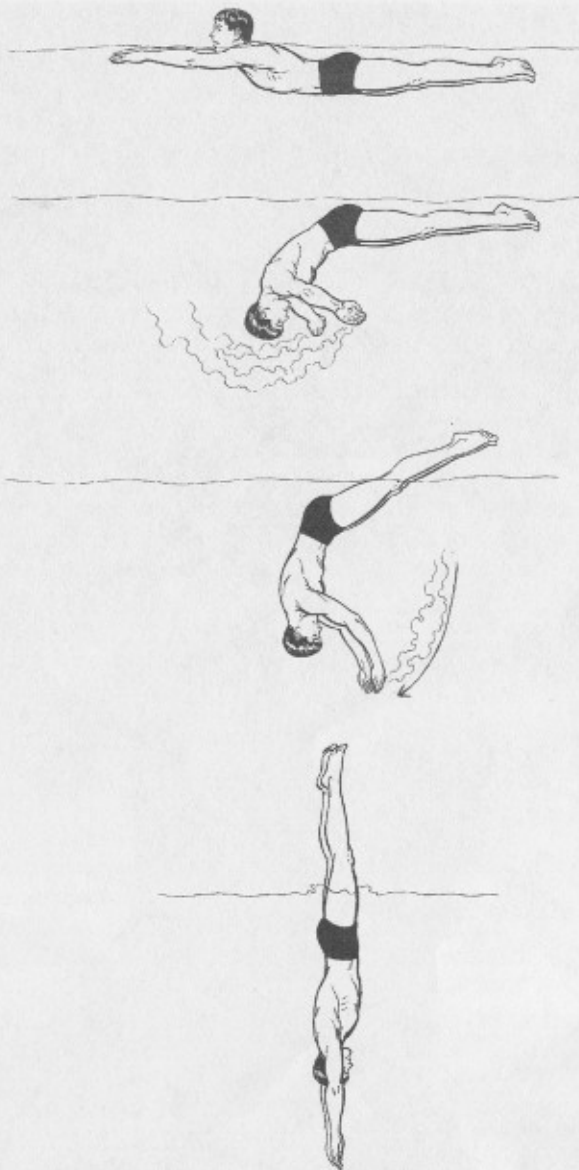

Feetfirst surface dive

Headfirst Surface Dive

The headfirst surface dive is most easily done while moving forward with a breaststroke. As you begin a new arm stroke, keep your legs in the glide position and bend sharply at the waist with your head down so that the upper portion of your body is angled toward the bottom. Then reverse the direction of your arm stroke while lifting your legs out of the water and into the air. When you complete the reverse arm motion and leg lift, you will be in a vertical handstand position with your body straight and your arms extended toward the bottom. In this streamlined position, the weight of your legs above the water will drive you downward. It all should happen quickly in one smooth motion. If you want to go deeper or faster after you are completely beneath the surface, use the breaststroke, which you also can use to swim along the bottom.

This is called the *pike surface dive*. You also can do a *tuck surface dive*. Instead of lifting your legs, pull your knees toward your chest and then thrust them upward when your head and arms are extended toward the bottom. The tuck might be a bit easier to learn at first, but you will not go as deep or dive as fast as with the pike.

Headfirst surface dive in pike position

Snorkeling and Scuba

Snorkeling, sometimes called skin diving, is a sport that can be enjoyed by any swimmer, regardless of age, size, or strength. The sport basically has two activities: (1) the relatively passive activity of floating or swimming on the surface using a breathing tube and eye cover to view underwater scenes, and (2) breath-hold diving to swim and explore underwater environments or to gather and recover submerged items.

The Selection and Fit of Equipment

There are four basic pieces of snorkeling equipment: mask, snorkel, fins, and vest. The vest is a flotation safety device, sometimes called a buoyancy compensator, that is not required for snorkeling in confined areas of clear water with a 12-foot maximum depth, such as a swimming pool. Use of a properly fitted vest is recommended for open-water snorkeling or when snorkeling in water deeper than 12 feet.

The Mask

The most important piece of snorkeling equipment is the mask. Because the human eye is designed to see through air, the mask provides the necessary airspace through which the eye can focus clearly. It also enables you to look down from a point below the water's surface without the effects of light refraction and reflection. Additionally, the mask keeps water out of your nose so that you can use the breathing tube more comfortably.

Masks come in a variety of designs, but the most common are the one-piece and two-piece faceplate varieties. Generally, the two-piece design is better because it has less air between the glass and the face and does not cause as much face pressure when diving. It is very important that the mask have a tempered glass lens; a tempered lens is stronger and if broken will shatter into pieces with no sharp edges or splinters.

Earn the
Snorkeling, BSA,
swimsuit patch
by completing
the requirements
stated in your
Scout require-
ments book or
the Snorkeling,
BSA, application,
No. 19-176.

The part of the mask that fits against the face is called the skirt. Most mask skirts are made of either clear or colored silicone or black neoprene. The neoprene is usually less expensive and is acceptable, but silicone usually lasts longer. Silicone also is a bit softer and more pliable and will more easily fit the contours of the face. A double skirt also will provide a better fit for more comfort and less leakage. Avoid masks made of polyvinyl chloride (PVC) or other plastics.

Be sure the mask covers the nose but does not cover or interfere with the mouth. The mask should have an exposed nose piece ("nose pocket") or pinch holes for the nose; this allows you to equalize pressure in your ears easily with one hand. Some masks feature a purge valve on the nose pocket or faceplate for clearing water from the mask. Such valves tend to leak and easily malfunction, and they generally are not needed since a diver can easily remove water from the mask without these.

A good mask also needs a noncorrosive band that holds the lens securely in the skirt and a split, adjustable head strap. A split strap prevents slipping and is much more comfortable.

If the mask has all the features recommended above, then the deciding factor on selection is *fit*. To check the fit of the mask on your face, place it against your face without using the strap and inhale lightly through your nose (be sure no hair is trapped between skin and skirt). The mask should seal against your face and feel secure with no air leakage. If air leaks into the mask, try other styles and sizes until you have a no-leak fit. If a mask leaks air, it will leak water.

Before putting on the mask, adjust the strap. Undo the strap locks or "keepers" and move the strap a notch at a time with your finger. Do not grab the loose end or middle of the strap and try to pull it tighter or looser. If the mask fits properly, the strap only holds it in place. Tightening the strap to stop leakage will further distort the skirt, causing additional leakage.

With the strap properly adjusted, there are several ways to put on the mask. One way is to put the mask over your face, inhale lightly to hold it, and then use both hands to slip the strap gently over the head and into place. You also could reverse the process by putting the strap in place and then, while holding the strap in place with one hand, pulling the mask forward and down into position over your face. Have your buddy examine the mask to be sure no hair is under the skirt, no straps are twisted, and the skirt is properly fitted.

To prevent fogging, keep the inside of your lens clean and use a commercial no-fog spray. Other substances, such as saliva, can reduce fogging, but none is as efficient and reliable as the relatively inexpensive spray.

The Snorkel

Although snorkels come in many designs, all feature an oblong, curved rubber mouthpiece with a T-shaped tab molded on each side of the air hole. The longest part of the J-shaped tube is 10 to 14 inches long and may have a slight bend toward the head. The tube should be about ¼-inch to 1 inch in diameter. A snorkel should not be more than 14 inches long or less than ¼-inch in diameter so that it does not interfere with breathing. The mouthpiece of your snorkel also may contain a purge valve, a one-way valve that allows water to drain out of the snorkel at its lowest point.

There are several ways to attach the snorkel to the mask strap. A snorkel holder or "keeper" usually comes with the snorkel. Two common types of keepers are the rigid tube clip that attaches to the mask strap and the rubber strip that loops around the snorkel tube and under the mask strap. Securing the snorkel to the mask strap prevents loss and adds comfort. Simply slipping the tube under the strap may distort the mask fit and put the snorkel at an uncomfortable angle.

With the snorkel in place, you simply breathe through the mouth tube. The curved flare of the mouthpiece is between the lips and gums while you bite gently on the tabs to hold it in place and keep it watertight.

While floating or swimming on the surface with your face down, breathing through the snorkel should be easy and natural. When you are ready to dive, inhale deeply and hold your breath until you have completed your dive and returned to your facedown position at the surface. Of course, the snorkel tube will fill with water during your dive and you cannot resume breathing until it is cleared. This is why you hold your breath until your dive is completed. Simply exhale sharply to "blast" the water from the tube.

An alternative method for clearing the snorkel is the displacement method. While ascending from your dive, look up so the snorkel points down. As your faceplate breaks the surface, exhale and roll forward to the facedown position. This should clear the snorkel with a little less effort than the "blast" and avoids the surfacing "blowhole" effect.
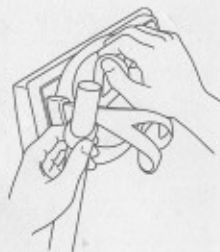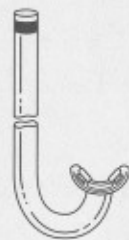
The Fins

Swim fins are wedge-shaped, flexible devices worn on the feet to add thrust to the kick. By reducing effort and adding efficiency, fins usually eliminate the need for an arm stroke while swimming and diving with a snorkel.

The most important consideration in selecting fins is comfort—a function of fit, blade, length, and blade tension. The foot pocket should hold the foot comfortably and snugly. For the beginner or casual snorkeler, a relatively flexible blade of moderate length (24 inches maximum) is recommended.

A full-foot fin has a soft rubber foot pocket and is fitted like a shoe over the bare foot. An open-heel adjustable fin also is available but may require the extra expense of neoprene boots for a comfortable fit. These fins are recommended for cold-water snorkeling where neoprene boots are needed for warmth.

It is best to put on the fins while sitting on the dive platform of a boat or at the water's edge, where you can slide into the water without having to stand up or walk. Trying to walk in fins is a good way to take a fall.

The kicks used in snorkeling are the flutter kick and the dolphin kick. The flutter kick is used both on the surface and underwater. The kick should flow smoothly and slowly from the hips to the toes of the fins. The dolphin kick is useful for short bursts of speed while swimming underwater or ascending from a dive. For the dolphin kick, the legs are held together and move in an up-and-down motion with the toes pointed as in the flutter kick. The leg action helps propel the swimmer through the water.

The Vest

For open-water or deep-water snorkeling, an inflatable vest is recommended. It should fit over the head with a back strap or crotch strap to hold it in place. A snorkeling vest also must have a way to add and release air to adjust buoyancy.

The most common inflation feature is a short tube extending from the upper portion of the vest that is accessible to the diver's mouth. A valve in the tube allows the diver to inflate by blowing into the tube or to deflate by manually triggering a valve release. Some vests also have a compressed air cartridge for emergency use.

The vest is not simply an emergency device. By partially inflating the vest, the snorkeler can adjust his or her floating or swimming position on the surface, provide extra buoyancy, and make swimming easier for longer periods or distances.

BSA Snorkeling Safety

The BSA Snorkeling Safety is the recommended procedure for conducting BSA swimming activities using masks, fins, and snorkels. Since snorkeling is a swimming activity, Safe Swim Defense guidelines also apply. The BSA Snorkeling Safety extends Safe Swim Defense concepts to situations encountered during training and open-water snorkeling.

1. QUALIFIED SUPERVISION

All swimming activity, including snorkeling, must be supervised by a mature and conscientious adult age 21 or older who understands and knowingly accepts responsibility for the well-being and safety of the youth members in his or her care; who is experienced and confident of his or her ability to respond in the event of an emergency; and who is trained in and committed to compliance with the eight points of BSA Safe Swim Defense.

An experienced snorkeler must supervise snorkeling instruction and open water snorkeling activities. At a minimum, the supervisor must possess skills and knowledge matching the Snorkeling, BSA, recognition and have experience with environments similar to those of the planned activity. The supervisor is responsible for compliance with each point of BSA Snorkeling Safety.

Unit leaders may rely on the expertise of other adults to supplement their knowledge and training. They may delegate the task of supervision, for example, when the unit is participating in a snorkeling activity conducted by a tour operator, provided they are satisfied that the operator's training and experience will provide a safe activity with appropriate safeguards.

2. PHYSICAL FITNESS

All participants must present evidence of fitness for snorkeling activity with a complete health history from a physician, parent, or legal guardian. The adult supervisor should adjust all supervision, discipline, and protection to anticipate any potential risks associated with individual health conditions. Recent sinus or ear infections may temporarily preclude surface dives while snorkeling. Those with known adverse reactions to stings from marine life, or with chronic conditions such as diabetes or asthma may need special medications at hand. Adults with

known risk factors for cardiovascular disease should not undertake strenuous activities without the advice of their physician. In the event of any significant health conditions, a medical evaluation by a physician should be required by the adult leader. Those with chronic disease or physical disabilities may still be able to enjoy and benefit from aquatics if the conditions are known and the necessary precautions are taken.

3. SAFE AREA

Training in the use of snorkeling equipment shall be performed in clear water in a confined area that conforms to Safe Swim Defense guidelines. "Clear water" implies pool-like visibility. At a minimum, an 8-inch disk with white and black quadrants at a depth of 8 feet should be recognizable from above the surface. "Confined area" denotes either a pool or an established summer camp swimming area with direct access from the shore or a dock.

Safe conditions for open-water swimming and snorkeling depend on water clarity, area definition, depth, access, and other environmental factors. Snorkeling is limited to clear water. "Open water" denotes a temporary swimming area of flexible extent in a natural body of water that may not be close to shore.

An open-water snorkeling area need not have physical boundary markers, but the activity should be restricted within a specified distance of a point on shore, an anchored vessel, a moving guard boat, or a float with a dive flag attached. Generally, a 50-foot radius is recommended and may be dictated by local regulations concerning the use of a dive flag. The area covered by the snorkeling group should be small enough to allow rapid assistance from rescue personnel.

Emergency response places limitations on safe water depth as well as water clarity and area. Guards should be able to quickly and easily reach the bottom and locate, recover, and transport a submerged victim to shore or vessel. At the start of the activity, and periodically if the group moves along a reef or other feature, the guards should check each swimmer's ability both to see and to reach the bottom.

The group should be directed toward shallower water whenever the guards experience any difficulty. (Twelve feet is designated as a reasonable maximum depth in Safe Swim Defense. In practice, slightly shallower or deeper depths may be appropriate. Different guard personnel will be able to easily recover objects from different depths, particularly if wearing fins. The practical way to confirm a safe depth is to test that the bottom is within comfortable reach of all designated rescue personnel.)

Limited or distant access to the snorkeling area may require additional consideration. Underwater features close to a sloping beach or near an anchored vessel are ideal. If the snorkeling site is a considerable distance from a beach or permitted anchoring location, the ability to rest becomes important and may restrict the activity close to shallow water or dictate the use of inflatable vests and/or small guard craft. Tide tables should be consulted in areas with large tidal changes, especially when beach access is at the base of a cliff. Snorkeling in a river may require an exit point downstream of the entry.

Snorkeling should not be done if water depth, clarity, or temperature, boat traffic, waves, current, weather, marine life, or bottom conditions, including vegetation, are deemed unsafe by the qualified supervisor. Time in the water should be adjusted based on water temperature and sun exposure. Snorkeling at night is limited to lighted pools unless the activity is conducted at a BSA nationally accredited high-adventure base.

4. PROPER EQUIPMENT

a. All snorkeling equipment shall be properly fitted and in good repair.

b. The use of snorkeling vests and personal flotation devices (PFDs) is at the discretion of the qualified supervisor based on local conditions and the abilities of the snorkeling participants and guards. Use of individual flotation devices is required in open water whenever there is a noticeable current or swells, when the bottom is not visible from the surface (due to vegetation or limited visibility beyond 8 feet), or when the activity is an extended distance (more than 50 yards) from shore or craft.

c. A dive flag should be used at all open-water sites. It may be displayed from a dive boat or attached to a float and towed with the snorkeling party. Local rules and regulations may specify the type of flag and how close snorkelers must stay to it.

d. Protective clothing may be worn. Gloves are appropriate in areas with sharp rocks or encrusted structures. A shirt or a diver's bodysuit will provide limited protection from sun, abrasion, or coral

burns and minor insulation in warm water. In temperate water, a partial or full wet suit may be worn. Weight belts may not be used.

e. Lifesaving equipment in good repair shall be ready for immediate use by guard personnel. A flotation device is recommended, such as a rescue tube, bodyboard, or PFD, supplemented, as appropriate by reaching and throwing devices, and small craft. Dive boats should be equipped with radios and first-aid kits, and should deploy a safety line.

5. LIFEGUARDS/LOOKOUT

It is the responsibility of the qualified supervisor to designate personnel for emergency response whenever lifeguards are not provided by a facility or tour operator. The snorkeling party should be divided into groups of two to eight swimmers with two guards, paired as buddies, assigned to each group. (Units may be divided by patrols or crews.) The guards should be competent swimmers with basic water rescue skills. Emergency procedures, including entries, exits, and the role of everyone in the group, should be reviewed and practiced prior to the activity using rescue aids at the site.

The guards should be stationed either afloat or ashore where they can see and hear all those in their group. Neither the guards nor the swimmers should face into the sun to see the other. Snorkelers in a group should remain off the same side of a vessel. Inflatable or rigid dinghies with oars are appropriate guard craft. The guards and snorkelers should remain close enough for rapid rescue response, generally within 50 feet of one another. In some situations, the qualified supervisor may deem it appropriate for the guards to tow rescue aids while accompanying their group in the water.

6. ABILITY

Scouts classified as beginners or nonswimmers may use snorkeling equipment in clear, confined water of appropriate depth, as specified in Safe Swim Defense (points 3 and 6), during instructional swims or during closely supervised recreational activity. Training for the Snorkeling BSA recognition is limited to Scouts and adults classified as swimmers. Only those who have completed the Snorkeling BSA requirements may participate in open-water snorkeling.

7. BUDDY SYSTEM

All participants in snorkeling activities are paired as buddies. Buddies should check each other's equipment prior to the activity and review hand signals. During the activity, they remain close enough that they are constantly aware of their buddy's location and condition. Generally, buddies should take turns making breath-holding dives. That is, one buddy remains at the surface, floating with his mask in the water while breathing through the snorkel, and keeps an eye on the buddy who is down. When the diver surfaces, both buddies check their position relative to the group before moving on or letting the other buddy dive.

The adult supervisor, lookout, or guards may call buddy checks as needed to keep the buddies together. Buddy checks also may be called to aid communication. Buddy pairs should be instructed to routinely watch for predetermined audible and visual signals of a buddy check.

8. DISCIPLINE

Be sure everyone understands and agrees that snorkeling is allowed only with proper supervision and use of the complete Safe Swim Defense and BSA Snorkeling Safety standards. The applicable rules should be presented and learned prior to the outing, and should be reviewed for all participants at the beginning of the snorkeling activity. Scouts should respect and follow all directions and rules of the adult supervisor. When people know the reason for rules and procedures, they are more likely to follow them. Treatment should be strict and fair, with no favoritism.

Search and Recovery

A team of snorkelers can systematically search an area by slowly moving forward, side by side on the surface, while observing the bottom. When one snorkeler sees the search object or an area requiring closer inspection, he or she dives while the others maintain their surface position so the diver can return to the search line.

A single snorkeler should search across the area and then return on a close parallel course, continuing back and forth until the entire search area has been covered.

If a search area has been covered by a search team or individual without recovery, it should be covered again with a line of search at a right angle to the first search. If the grid-pattern search is unsuccessful, an alternative search-and-recovery method should be considered.

Scuba in Scouting

The use of self-contained underwater breathing apparatus (scuba) is not a program activity in Scout summer camp and is not authorized for Boy Scout unit activity or any Cub Scout activity. Scuba equipment may be used by qualified summer camp aquatics program personnel for installation and maintenance of waterfront equipment or for search and recovery operations. Search and recovery could include lost equipment as well as rescue efforts.

Any person possessing, displaying, or using scuba equipment in connection with any Scouting-related activity (Boy Scout, Cub Scout, Venturer, Varsity Scout, or Venture patrol member) must be currently trained by the National Association of Underwater Instructors (NAUI) or the Professional Association of Diving Instructors (PADI). These two agencies are recognized by the Boy Scouts of America for scuba training and instruction. Alternatively, if PADI or NAUI training and instruction is not available, training may be accepted from other agencies that comply with Recreational Scuba Training Council (RSTC) guidelines, provided that such acceptance has been expressly approved by the BSA local council in consultation with the BSA national Health and Safety Service.

Scuba programs may be a part of Boy Scouting or Venturing activities for participants who are 14 years of age or older.

Persons meeting the age requirement and properly certified may participate in group dives under the supervision of a responsible adult who is currently certified as a dive master, assistant instructor, or any higher rating from NAUI or PADI. Student divers must be under the supervision of a currently certified NAUI or PADI instructor. No exceptions to the BSA age requirement are permitted, and any NAUI or PADI age requirements for those 14 or older shall be followed in all Scout-related activities. A 14-year-old participant with a junior diver certification may dive only when accompanied by a buddy who is a certified open-water diver at least 18 years old.

Because of lack of frequency of diving by most sport divers, it is important that any certified divers be screened and evaluated by a certified diving instructor before participating in BSA-related activities. The skills to be evaluated include the following:

- Use of buoyancy control device
- Giant stride entry
- Removal and replacement of weight belt
- Neutral buoyancy
- Snorkel-to-regulator exchange
- Removal and replacement of scuba unit under water
- Face mask removal, replacement, and clearing
- Emergency swimming ascent
- Alternate air-source ascent
- Predive safety drill
- Five-point ascent and descent
- Deepwater exits
- Simulation of surface procedures

BSA employees whose position descriptions require or anticipate scuba use should be certified as instructors by either PADI or NAUI. When scuba diving is to be taught in connection with any local council program, local PADI- or NAUI-certified instructors should provide the instruction on a contract basis. Such instructors should be associated with a dive shop or other business that provides liability coverage. Direct employment of scuba instructors is not recommended.

Local council programs may not compress or sell air for scuba use, or sell, rent, or loan scuba equipment to anyone for any purpose. All air and equipment for local council program use must be obtained from properly licensed sources, unaffiliated with the Boy Scouts of America and under the supervision of PADI- or NAUI-certified instructors. Established and preexisting local council programs may request special authorization through the BSA National Health and Safety Service for non-conforming activity. Determinations with respect to such authorization will be based upon independent evaluation of each local program, confirmed in writing, and subject to periodic reevaluation.

So-called hard-hat diving or any diving using surface-supplied air systems is unauthorized in connection with any BSA activity or facility except when done under contract by commercial divers.
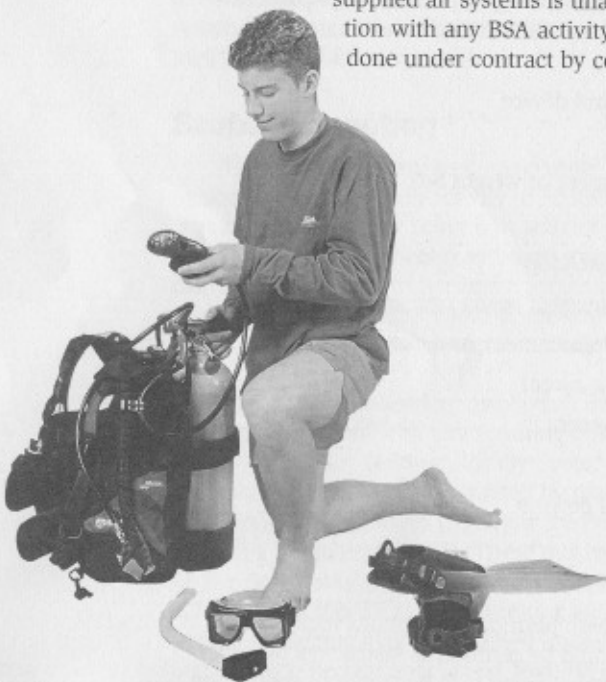
Diving

Elementary Diving

Diving is fun. Springboard diving is a good muscle builder and teaches you to make your whole body work gracefully. But don't try board diving before you have mastered elementary diving skills. And remember, always check the water before any dive to make sure it is deep enough and there is nothing in the way.

The steps in learning elementary diving are the kneeling start, the bent-knee start, and the standing dive.

Kneeling Start. Kneel on one knee and hook the toes of the other foot over the edge of the pool. Bend forward, chin down toward your chest, arms extended forward against the ears, hands together. Lean forward and slide into the water, always leading with your hands and the top of your head, pushing with your foot against the edge of the pool. Straighten your body and legs and bring your feet together as you go into the water.

After you have practiced the kneeling start a few times, raise up from the kneeling position, both knees off the deck. Keeping the formerly bent knee behind the edge of the pool and the other foot near the edge, imitate a running position. With your arms and head in the same position as when kneeling, bend toward the water. When you start to fall forward, push off toward the water. Bring your feet together as you go in.

Bent-Knee Start. Stand with your knees slightly bent, feet about 5 to 10 inches apart and toes gripping the edge. Bend forward at the waist, chin toward your chest, arms extended forward. Fall forward and enter the water 3 to 4 feet from the side. As you fall forward, keep your chin down and push up with your feet.

Standing Dive. Stand with your legs straight and your feet together. Bend forward, chin toward your chest, arms extended forward. Fall forward and push upward to lift your hips and give height to your dive. Be sure to keep your head down until after you have entered the water. Straighten your legs and keep them extended together until you are beneath the surface. Practice to improve your form.


Kneeling start
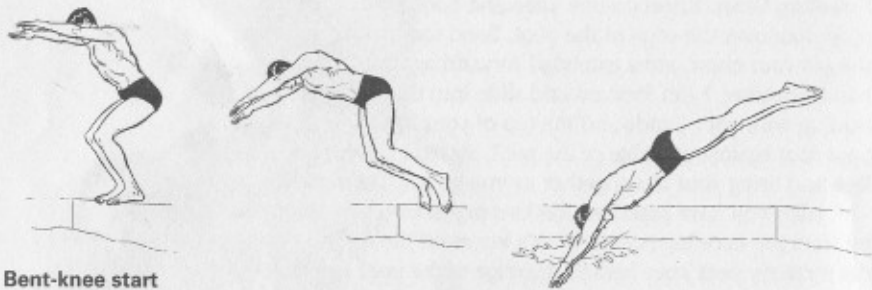
Bent-knee start
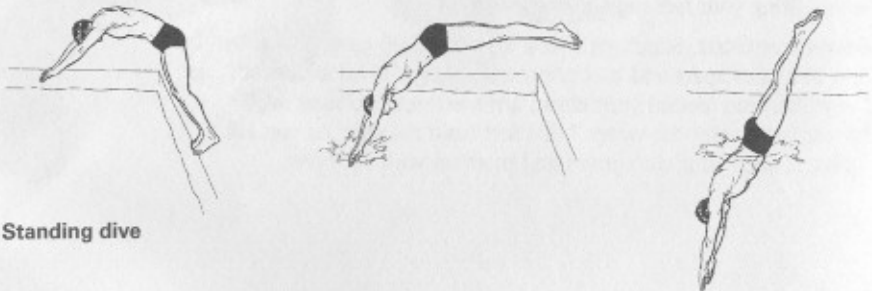
Standing dive

Long Shallow Dive

The long shallow dive is performed in a streamlined, arrowlike body position that allows the diver to enter the water with great forward speed at a shallow angle. It can be used for fun, for informal racing starts, and especially in lifesaving when time counts. As in all diving, remember that the water should be clear and of proper depth, with *no* dangerous obstacles. The dive is usually performed from a standing position, from a walk or run if the deck or dock surface is not slippery.

Once you have learned the standing dive, it is easy to learn the long shallow dive. Start with your feet on the edge of the deck, in a comfortable position, 6 to 8 inches apart, toes gripping the edge. Your knees and hips should be flexed and your back almost parallel to the deck. Let your arms hang down in a relaxed, loose fashion with your head up and eyes focused on a point in the water about two body lengths from the edge. Start the forward motion by swinging your arms backward and up toward your hips (figure 1). Allow your heels to rise and your body to lean forward (figure 2). Then immediately swing your arms down (figure 3) and forward and extend your hips, knees, ankles, and toes with a powerful thrust, driving your body out over the water in a position almost parallel to the surface (figure 4).

During this flight, drop your head slightly to a point between your outstretched arms, which are angled slightly toward the water. You should enter the water at a slight angle (figure 5). *Do not allow your body to land flat on the water.* It will slow you down and could cause injury.

Keep your arms extended and your toes pointed, with your body in an arrowlike position during the underwater glide. As the glide slows, start kicking. This will bring you to the surface, where you can begin the swimming stroke.
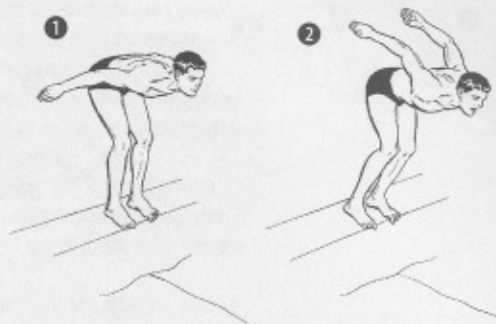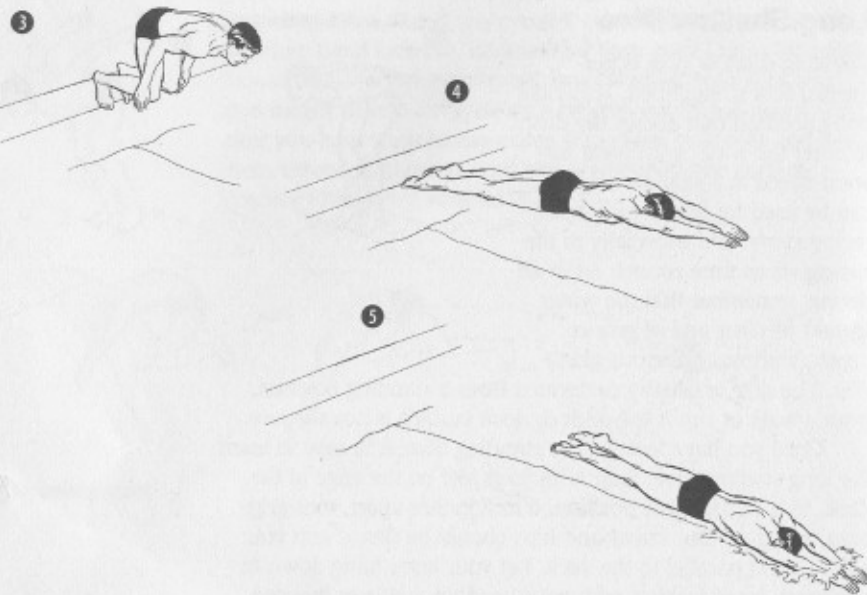
Again, this is a recreational dive that can be used for life-saving approaches. It also is useful when you are racing for fun. When you have learned the long shallow dive, you might be ready to be coached for a racing dive. Racing dives should only be taught by and practiced in the presence of an experienced swimming coach. *Never* dive from racing start blocks unless you have been properly trained and are supervised.

Plain Front Dive From Springboard

Springboard diving involves a proper starting position and approach to the end of the board, a hurdle or jump, a takeoff from the board, flight or passage through the air, and the entry. Practice your diving from a board about 3 feet (or 1 meter) above the water.

First, get used to the extra height above the water by practicing a simple standing dive from the end of the board the same way you did at the edge of the pool. (If you have never been on a board before, your instructor may have you first practice with a simple feetfirst entry.)

The next step is to learn the approach and hurdle. Most divers use three steps before the hurdle. Your instructor will probably have you first learn a one-step approach and hurdle on dry land, and then have you practice the full three-step approach and hurdle on land before moving to the board. Practice on land with a line to represent the end of the board. This exercise also will allow you to judge how far from the end of the board you should start.

Take the first step with your jumping leg—the leg that gives you the most power when you jump from it. Keep your head up, focusing your eyes on the line on the deck or the end of the board.

Your second step follows your first. Let your arms swing naturally at your sides as if you were walking down the street.

Take the third step with your jumping leg. This step should be about a foot longer than the first two. The lengthened stride helps change your forward motion into upward motion.
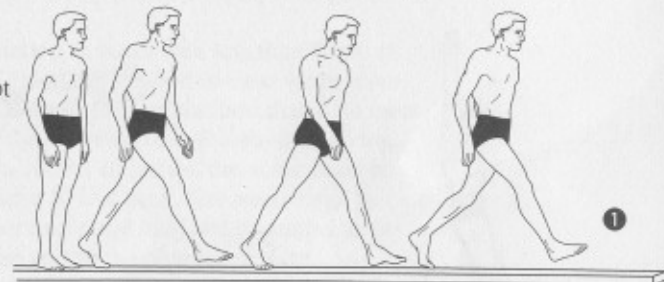
As your weight moves over your

jumping leg, start your hurdle. Swing your arms forward, lifting the opposite knee at the same time.

Then drive up from the board with your jumping leg. Bring both arms over your head, keeping the toes of both feet pointing down. When you reach the peak of your hurdle, move your arms out to the side and straighten both legs together with your toes pointed as you drop to the end of the board.

Let your toes hit just before your heels so you will land softly. Let your arms sweep down slightly behind you, pass next to your hips, and start forward. At the same time, bend your knees a little and lift your head until you're looking across the pool.

As the board starts to spring up, push high into your dive, lifting your arms over your head. Use your whole body to dive over an imaginary crossbar located at eye level about a foot in front of the board. Clasp your hands together and duck your head, ready for the entry. Aim straight for the bottom, holding your legs together with your toes pointed until you are entirely beneath the surface.
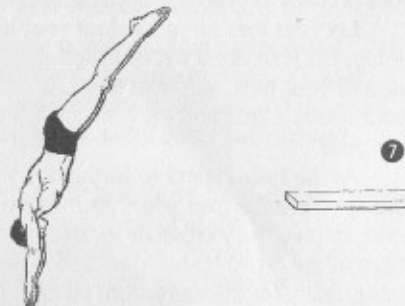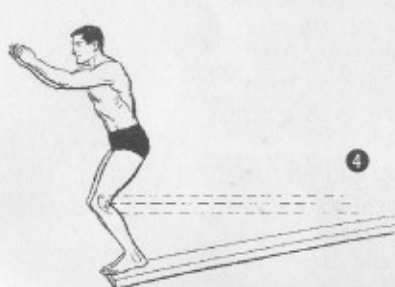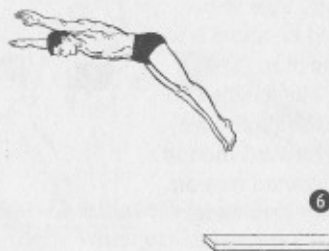
Diving Safety

Scouting has specific guidelines for safe diving and elevated water entry. "Diving" refers to any water entry in which the feet do not make first contact with the water. "Elevated entry" refers to any water entry from a height more than 18 inches above the water. According to BSA Safe Swim Defense standards, no diving or swimming activity of any kind is done in water that is more than 12 feet deep.

All water entry must be feetfirst where the water has less than 7 feet of unobstructed depth. A leaping entry is recommended where water is at or above head level; a step-down or jump-down entry from a sitting position is recommended for shallower water.

No diving is permitted in water with less than 7 feet of unobstructed depth. Diving is permitted in clear water more than 7 feet deep from a dock, pier, or platform that is no more than 18 inches above the water surface. For elevated diving from a height between 18 and 40 inches, the water must be unobstructed and at least 10 feet deep. The water must be clear enough to enable supervisory and lifeguard personnel to see the diver at the deepest part of the plunge.

Board diving is permitted only from boards, mounted on a fixed (not floating) platform or deck, no more than 40 inches (approximately 1 meter) above the water surface. Clear water depth below the board should be 10 to 12 feet. A lifeguard or supervisor should be positioned where the diver can be seen at all times beneath the surface. There should be no other surface or underwater activity or obstruction for at least 15 feet on either side of the board and 25 feet in front of the board. Diving always should be done straight ahead from the board, never to the sides.

Any elevated entry from a height greater than 40 inches must be feetfirst and only from a fixed platform or solid footing no more than 60 inches above the water surface. Clear water depth should be 10 to 12 feet. Other protective measures and distances are the same as for board diving.

Competitive Swimming

Competitive Strokes

The swimming strokes you have learned in Scouting emphasize energy conservation, safety, and function. Speed has not been a concern. In competitive swimming, however, speed is obviously a priority.

To complete requirement 8b, you must demonstrate good form on one competitive swimming stroke. If you select the front crawl, back crawl, or breaststroke, you already have a strong basic stroke foundation and will need to make only a few modifications for racing form. If you will enjoy the challenge of learning a new stroke, you can master the unique butterfly stroke, which is used almost exclusively for competition and vigorous exercise.

Front Crawl

The competitor's choice and fastest stroke in freestyle competition is always the crawl. The basic front crawl stroke requires a strong foundation for freestyle competition. For racing form, you should modify your arm stroke, refine your kick, and regulate your breathing to a comfortable and consistent pattern.

Arm Stroke. Begin the stroke from a prone glide with arms extended overhead and hands just below the surface. Hands should be relaxed with fingers straight. Starting with the right arm, bend the right wrist and rotate the entire arm inward, pointing the fingers down and slightly out. As the arm rotates, bend the elbow slightly, turning the palm out. Lock your elbow, hand, and wrist in this position and move the arm a few inches outward.

As the hand reaches the end of this outward movement, rotate the forearm, straighten the wrist, and bend the elbow so your fingers point down and slightly in. Now slice the hand

Arm path for racing crawl

down and across the centerline of the body at about chin level. The arm should be at shoulder level with the hand directly under the chin.

Then the entire arm pulls down and back, with the hand passing just a few inches below the centerline of the body. The palm should remain flat against the direction of the push. As the elbow becomes straight, the hand moves out to just beside the hip. During the stroke, the upper body is rolling so the shoulder clears the water just as the hand reaches the hip.
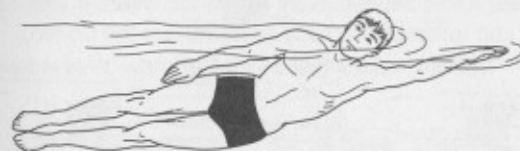
Body position at end of arm pull on breathing side

Begin the arm-stroke recovery by lifting the elbow up and forward with elbow, wrist and hand relaxed. As the hand passes the shoulder, reach up and over to touch the water with your fingertips as far ahead as possible. Then the rest of the arm straightens and enters the water. The opposite arm stroke begins just before the fingers touch the water at the completion of the first stroke.

Begin arm-stroke recovery.

Reach up and over, like reaching over a log.

Kick. Some competitive swimming coaches now believe that the flutter kick requires more energy than it produces in propulsive force, and there is a great deal of variance in the kick coordination patterns used in competition. Sprinters frequently use the cycle of six beats per arm stroke, but distance competitors may use a four- or two-beat stroke using the kick primarily for balance. Each crawl stroke swimmer should adopt a flutter kick pattern that feels most natural.

To get the most out of your flutter kick, remember to keep the body straight—no bending at the waist. Kick from the hip, not from the knee. The legs should feel supple from hip to toes. Make the kick compact, light, and steady. Your body position should feel stable and relatively stiff in the water. If your kick is twisting and turning your body position, it is too labored.

Kick from the hips, not knees, with legs supple like a ribbon or light chain. An efficient kick is compact, light, and steady with little apparent effort.

Breathing Coordination. Breathing on the crawl must coordinate with the arm stroke. Choose your breathing side and remember that the head only *turns*, never *lifts*, for a breath, and much of the rotation is with the roll of the shoulder. Inhale during the last half of the arm pull, as your arm is finishing its power stroke with the hand still in the water and the shoulder rolling up to begin the recovery. When your mouth clears the water, inhale quickly open-mouthed and roll your face down as the arm recovery begins. This also is a smooth rotation with the now-downward roll of the shoulder. Begin exhaling as soon as your face submerges. Most swimmers exhale steadily through the arm stroke cycle to keep the airway clear of water. However, some prefer to hold the breath for an explosive, forceful exhalation just before the mouth clears the water for the next breath. Either way, remember to finish exhaling while your face is in the water, so inhaling is completed in rhythm and without hesitation.

Back Crawl

In backstroke competition, swimmers must push off on their backs and continue swimming on their backs throughout the race. Choice of styles is left to the swimmer, but it is no surprise that the back crawl is the competitor's choice. The secret of the competitive back crawl is in the kick, but efficient use of the hands and a steady head position can be the racer's edge. Note two unique features of the stroke—you can breathe at will, but you cannot see where you are going.
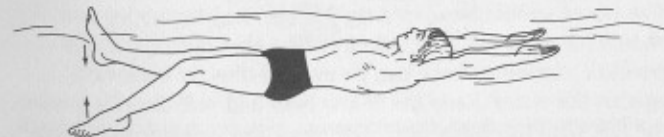
RACING BACK CRAWL KICK

The head is back, with the hips up and ankles relaxed.
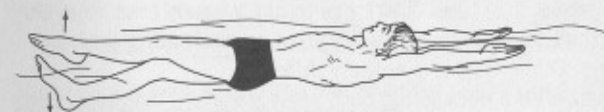
The knee is straight, with the ankle hooked as the leg descends.

The knee bends and toes point as the leg begins the ascent.

When the knee is just below the surface, the lower half of the leg comes up forcefully.

Kick. The backstroke kick is *not* simply an inverted version of the front crawl kick. In the prone position of the front crawl, if the leg bends at the knee, the foot and lower leg are lifted out of the water and the knee is pushed downward—counterproductive movements. (That's why the kick is from the hip—not the

knee—on the front crawl.) But in the supine position of the back crawl, the greatest propulsive force comes when the top of the foot and the shin push the water as the lower leg recovers from the bent-knee position. For a strong backstroke kick, tilt the head back until both ears are underwater, keep the hips up (but avoid a partial sitting position), and completely relax the ankles so the feet flop loose and will hook or point in response to the water pressure as the leg moves. Keep each knee straight on the downward portion of the kick. The foot should drop about 20 inches below the surface with the toes up as the foot descends. As the upward thrust begins from the hip, the knee bends to about a 60-degree angle and then is held with the toes down. When the knee is just a few inches below the surface, the upward motion of the thigh stops and the knee is forcefully straightened as though shoveling water with the shin and top of the foot.

Arm Stroke. The back crawl arm stroke vaguely resembles the front crawl arm stroke because it uses an alternating overarm recovery. Otherwise, it is entirely different.

Start with a back glide, both arms stretched overhead with palms out. Roll slightly onto one side and drop one shoulder a little deeper in the water. Rotate the lower arm outward from the shoulder so the palm faces down. Then bend the wrist forward sharply to put your palm in position to press directly backward toward the feet. Leave the elbow high and bent to bring the forearm into position to press directly backward toward the feet.

As the forearm attains pulling position perpendicular to your body, straighten the wrist. The forearm and hand should be about 12 inches under the water and parallel to the surface. The elbow should bend to a right angle, and the upper arm should have moved very little from the shoulder. From this position maximum force can be exerted directly backward against the water. Keep the elbow bent and pull directly toward the feet with the entire arm. The hand and forearm should rise slightly toward the surface during the pull. As the arm passes the shoulder, straighten the elbow and relax the wrist. The water pressure will begin to bend the hand back at the wrist. Keep it perpendicular to the line of thrust as long as possible.

As the arm nears full extension, rotate the entire arm from the shoulder to a palm-down position and press downward, flipping the hand downward as it passes the thigh. Use this downward hand pressure to roll away from that side and elevate that

shoulder above the water for the arm recovery. Keep the elbow straight but allow the wrist to relax as you lift the arm from the water palm-down. If the wrist is totally relaxed, the hand will flop to approximately a right angle to the arm. Raise the straight arm directly upward to a vertical position. As the arm passes shoulder height on its recovery, rotate the entire arm from the shoulder so the fingers point away from the body. Extend the arm as far forward as possible, roll onto that side, and place the hand into the water palm-down, ready to start the next pull.

The opposite arm follows the same pattern, beginning its pull as the body rolls toward that side to effect the recovery of the first arm. The arms are in direct opposition to each other at all times.

RACING BACK CRAWL ARM STROKE

Begin on the back glide; drop one shoulder slightly and rotate the lower arm out with the palm down.

Begin the pull with the elbow high and bent at a right angle.

Bend the elbow as the arm comes straight back, with the palm flat against the water.

End the stroke at the hip, palm down, with the shoulder slightly up, and start the opposite armstroke.

Recover the arm straight and rotate it slightly outward, with the wrist relaxed.

Reach forward and prepare for the next stroke.

Body Position and Coordination. Keep the hips up and the head back. Concentrate on holding the head absolutely still, staring straight up, independent of the shoulder rotation. The head position serves to anchor and steady the entire stroke. Watch the ceiling or overhead markings to know your position and for safety. To coordinate arm and leg movement, count a six-beat kick (each upward leg thrust is one beat) and complete one full arm-stroke cycle in six beats. In other words, one arm enters the water on the 1-count and the opposite arm enters the water on the 4-count. Although this is a free-breathing stroke, each swimmer should develop a comfortable breathing rhythm and then stick with it.
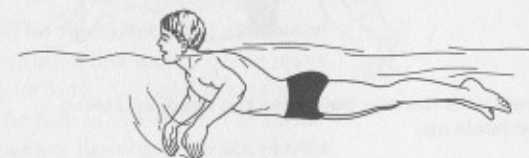
Breaststroke

To convert the basic breaststroke from an easy, restful, distance-swimming stroke to a high-energy racing stroke, omit the glide, modify the arm stroke, and begin the kick slightly later in the stroke cycle.

Arm Stroke. Start from a prone float, arms extended. Flex the wrists, point the fingers down, and lift the elbows into an "over-the-barrel" position. Turn the hands to a slightly palms-out position. Lift the chin and pull each arm sharply in a semi-circular motion—out, back, and in—with elbows bent 90 degrees and fingers pointing down. Breathe as you finish the pull with elbows out and palms under your chin. To recover, lay your face back in the water, bring elbows in and turn the palms down and push them forward just under the water, fingers leading, into full arm extension.

The arm pull should feel as though you are grabbing the water ahead of you and pulling yourself forward until your head passes your hands. The hands do not pull past shoulder level. Each hand makes a half-circle motion from full extension to the chin.

Kick. The racing breast-stroke kick is the same as during the restful stroke except that the next kick begins almost immediately after the end of the previous kick. To get the most power from your kick, allow your lower body to drop just low enough to keep the heels underwater as you bend the knees, hook the ankles, and lift the feet directly upward and forward as far as possible toward the hips. With both ankles hooked out, the knees spread no more than shoulder width, and the toes turned out as far as possible, move your feet outward to the sides and allow your knees to separate as you kick outward, around, back, and together at full extension.

Arm stroke sequence for the racing breaststroke

Breaststroke kick

COMPETITIVE BREASTSTROKE COORDINATION

Begin with a prone glide.

Start with the arm pull, raise the head, and bring the heels up.

The hands start forward, the feet move out, and the head drops.

The arms extend and the legs thrust; begin the next arm pull.

Coordination. The coordination between the arm stroke and the kick is slightly different for competition than it is for other swimming. The kick begins a little later in the stroke sequence, and the forward arm thrust begins earlier.

From a prone float position, start the arm pull and head lift. Then bring both heels up as you inhale quickly. As the hands rotate during the elbow squeeze, the feet should be rotating outward in preparation for the leg thrust. Lay your face down in the water and thrust the hands forward immediately, so they are nearly at full extension when the kick is at its most powerful point.

Butterfly

This stroke is so named because of the simultaneous overarm recovery. Perhaps as the water flies from the arms and hands, the swimmer looks a bit like a butterfly gliding near the water's surface. A better name might be the sea-mammal stroke because of the reliance on the dolphin kick, which copies the powerful, propulsive motion of that sea mammal's tail. This is the second fastest of the competitive strokes and has no uses other than racing and high-energy exercise.

Body Position and Breathing. The swimmer is flat and prone in the water. The hips are kept within a few inches of the water surface. As the swimmer moves forward, the head is kept in alignment with the body, with the face in the water. The swimmer inhales by raising the head out of the water. Do not elevate the shoulders or arch the back to raise the head. The head should be elevated just until the mouth clears the water, and the swimmer should always keep the lower half of the chin in the water. The breath is taken while the arms are in the rear position. As soon as the breath is taken, the head is returned to the water and the air is exhaled.

Kick. For the dolphin kick, the legs are held together and move in an up-and-down motion with the toes pointed as in the flutter kick. The leg action helps propel the swimmer through the water. The kick begins with the legs straight. The knees begin to bend as the feet are brought forward and upward. When the upper leg is at a 45-degree angle with the body, the downward thrust is started. This downward motion is also called the *power thrust*. The downward thrust is made by straightening the knees and whipping the feet downward.

Arm Stroke. The arm pull begins with the arms fully extended in front of the body and the palms facing outward. The arms should be spaced apart about shoulder width. To start the arm pull, the palms are turned inward as the hands are pressed downward. The elbows begin to bend with the downward

BUTTERFLY STROKE SEQUENCE
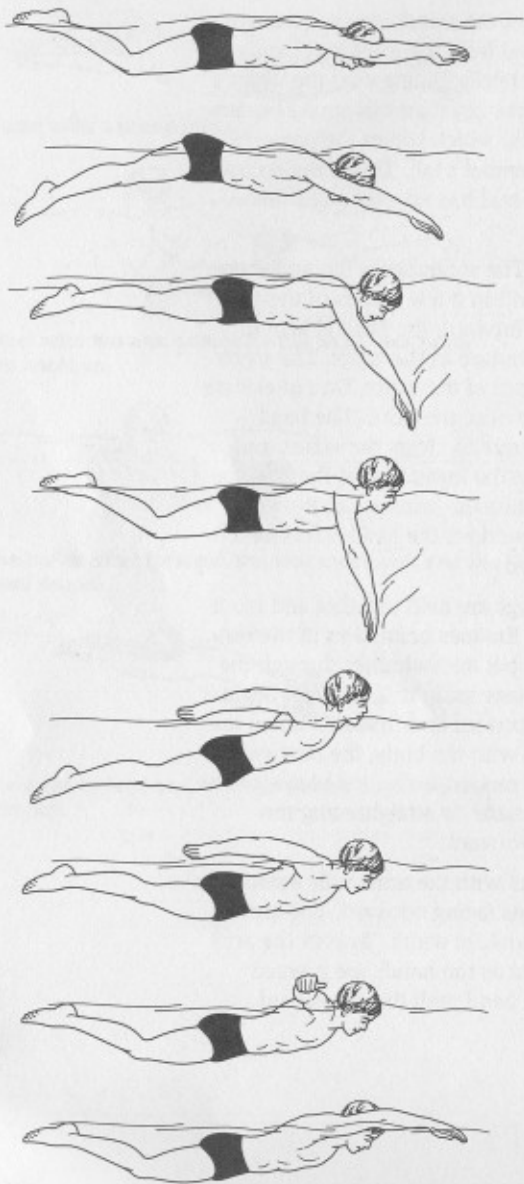
hand motion and the neck begins to flex, bringing the head upward while exhaling. Air is exhaled. The elbows continue to bend as the hands are brought inward toward the body. As the arms reach a 90-degree angle to the body, the head is out of the water and air is inhaled. The hands are now halfway through the pull. The hands continue their path backward as the elbows are extended. This path continues until the arms are fully extended and the hands are alongside the upper legs. The arms are returned to the front of the body in a semicircular swing just above the surface of the water. The hands, with palms outward, enter the water as the elbows are fully extended. The starting position is again assumed and the arm-pull cycle repeats.

Coordination. The swimmer should execute two dolphin kicks with each arm-pull cycle. The first kick begins as the arms are extended forward. The second kick should begin at the halfway point of the arm-pull cycle.

The Racing Dive

In a racing start, the objective is to get as far down the pool as quickly as you can before taking the first stroke. The keys are staying aloft as long as possible and slicing cleanly into the water.

❶ On the signal to take your mark, bend over and grasp the edge of the deck with your toes and with your fingers on either side of your feet. Bend your knees slightly to set your hips high with your weight directly over the balls of your feet. Hang your head comfortably between your shoulders and look at your toes. Straighten up slightly until your arms lock.

❷ On the "go" signal, bring your head up sharply forward to begin the short upward arc of your dive.

❸ Quickly bring your hands forward, covering one with the other. Keep the hands below shoulder level and arms outstretched as you push off with your feet.

❹ As quickly as possible, your head and hands reach the highest point and you begin to drive yourself out over the water with a powerful leg push.

⑤ Shift your momentum by stopping the forward movement of the arms and letting the head begin to drop between the arms. This shifts to your back and hips the up-and-out momentum created by the initial upward thrust of your head and arms.

⑥ As you begin to descend, curl your back and torso. Drop your head between your arms, and squeeze your upper arms behind your ears. Keep your body compact and streamlined but supple.

⑦ Slice cleanly into the water with your hands. The rest of your body should slip through the "hole" opened by your hands. Keep your head tucked low to avoid slapping your face on the water. Even the feet should slip through the "hole" without a splash.

Glide just below the surface until you slow to swimming speed, and then begin your stroke.

Racing Turns

Competitive swimming events frequently involve two or more laps or pool lengths, so turns are an important racing skill. Indeed, learning and practicing quick racing turns can be as important to winning as mastering stroke skills. Turning methods vary depending on the stroke.

Most competitive swimming facilities have bottom and overhead markings, or *turn targets*, that let you know when to begin your turn, but these are of little help if you are not watching for them. Always practice swimming with your eyes open.

A comfortable, well-fitted pair of swim goggles is recommended for serious competitors.

Crawl Stroke Open Turn

When about 5 feet from the wall, or when positioned over a turn target, pull through to the end of an arm stroke, roll onto your side, and glide with your lower arm fully extended.

As the forward hand touches the wall, absorb the momentum by placing the palm flat against the wall and allowing the elbow to bend, keeping the forearm between your head and the wall. As the elbow bends, remain on your side and tuck both knees up to your chin.

Let the top arm point toward the other end of the pool as you push with your palm against the wall, raise your head sideways, inhale quickly, and use the momentum from your glide to pivot sideways so your feet meet the wall.

Keep the knees tucked and rest your ear on the other arm. Bring your arm from the wall, over the water, and beside the other arm as you roll to a face-down position.

Push off the wall with both feet into a shallow underwater prone glide. Glide until your speed slows to swimming speed, then begin stroking.

CRAWL STROKE OPEN TURN

Begin in a glide.

Touch the wall and tuck.
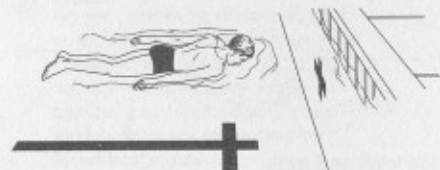
Pivot the body and inhale.

Arm over in tuck.

Push off and glide.

CRAWL STROKE FLIP TURN

Swim until the head passes over the turn target.

Pull through, stopping the hands at the thighs.

Reverse the arm motion with palms down; bend at the waist.

Tuck the legs, turn the head, and somersault.

Roll to the prone position, push off, and glide underwater.

Crawl Stroke Flip Turn

As your head passes over the turn target on the bottom of the pool, finish the arm pull in progress but leave the arm trailing. Pull with the other arm and leave that hand trailing. Your head should be about 3 to 4 feet from the wall.

Quickly do a reverse arm motion with arms and hands palms-down, bend at the hips, and tuck your legs as though beginning a tuck surface dive. Then, instead of straightening the legs vertically for a dive, hold the tuck and complete a one-half somersault with your head turned to one side.

As you reverse direction, you will be lying nearly on your back underwater (slightly on one side) in tuck position with your feet against the wall. Your head turn during the half-somersault causes you to look at one hand. Push upward with that hand to start turning your body into a prone position, then make a strong foot push against the wall. As you leave the wall and roll into the prone position, extend both arms forward and glide underwater. As you surface and your glide slows to swimming speed, begin stroking. Do not take a breath until the second or third arm stroke. This flip also is referred to as the *tumble turn* on the crawl stroke.

Backstroke Open Turn

Like open turns on other strokes, the backstroke open turn is now used primarily for lap swimming.

This turn is an early version of the racing turn and is now used widely for lap swimming (exercise) and informal racing, but is rarely seen in competitive swimming.

Set your turn target overhead or to the side about 15 feet from the end of the pool. As your head passes the target, complete the arm pull in progress and do two more.

As you finish the second pull, roll completely onto the side of the outstretched forward arm and glide toward the wall. As your hand touches the wall, grasp the edge of the pool and pull, tuck your knees quickly, and bring both feet under you as you turn to face the wall. Take a big breath, release the wall, tilt your head back, and place both feet against the wall just under the surface. Place both hands by your ears, palms up, and push off just under the surface. Extend your arms as you push off, and exhale slowly through your nose as you glide under the surface. When your speed slows to swimming speed, kick to the surface and begin stroking.

If the pool has a flat wall with no place to grasp, glide in, place the palm flat against the wall, allow the elbow to bend until the head is near the wall, then press downward to initiate the pivot in a tuck position. Stay as close to the wall as possible to ensure a good push-off.

BACKSTROKE OPEN TURN

Roll to the side and glide.

Grasp, pull, and tuck.

Inhale, release, and lay back.

Push in full supine extension, and then glide underwater.

BACKSTROKE SPIN TURN

Kick in, touch low on the wall, and inhale.

Tuck and lift legs, scoop hands to begin the pivot.

Spin onto the back.

Drop the feet to the wall, with the head back and arms extended.

Push off in full supine position; glide underwater.

Backstroke Spin Turn

Although no longer widely used, the backstroke spin turn is an interesting combination of elements from the earlier open turn and the relatively new flip turn.

Determine how many full-speed arm pulls you make from when your head passes your turn target to the point from which you can glide strongly to the wall with outstretched arm.

When you complete this predetermined pull, stay flat on your back and stretch your forward arm overhead and deep so it will contact the wall directly in front of your head, about 12 inches under the surface, with the fingers pointed down and in. Continue your strong kick, but be ready to react when your forward hand touches the wall. Inhale deeply as you stretch and kick.

As the forward hand touches the wall, absorb the momentum by bending the elbow until it almost touches the wall. At the same time, turn the other palm up at your hip and tuck and lift your legs out of the water. Your head will submerge at this point, and you must begin a long exhalation that will continue until you emerge from your push-off and glide. Push up and away from the wall with the forward hand and scoop strongly out and around toward your head with the other hand. This will rotate you onto your back on the surface of the water. If your right hand is forward, your feet should spin to the right while the left hand scoops out and presses upward toward your head to hasten the spin.

Continue to scoop with one hand and push the water toward your hips with the other until the scooping hand is just above your head and your other hand is about to touch your hip. Your feet should be pointing toward the wall. Drop your feet from above the water to a depth of about 18 inches and begin to extend your knees to plant the balls of your feet solidly against the wall. Leave your scooping hand at ear level, palm-up; bring your other hand underwater from your hip to the other ear, palm-up. Continue to exhale through your nose and push strongly with both feet as you extend the arms beyond the head, drop the head back, and lift the hips for an underwater glide. Glide until you slow to swimming speed, and then kick to the surface and begin stroking.

Backstroke Flip Turn

The backstroke flip turn is now used for all serious competition and can cut about a half-second from a competitor's best time.

Start the flip one stroke from the wall by turning your head and looking toward your pulling arm as it does the catch. As you pull, rotate onto your stomach, drive your head downward, and stop your pulling hand at your hips. At the same time, your other arm recovers across your body, enters the water in the same position as in the front crawl, and pulls to the hips.

Drive your head down and start the somersault while tucking your knees tightly to your chest. During the somersault, turn both palms toward your body and sweep them toward your head to complete the flip. Keep your legs tucked until your feet contact the wall, toes pointed upward. If you have done a good horizontal axis flip, you will now be on your back. Push straight off forcefully and go into a streamlined position as you leave the wall.

Breaststroke and Butterfly Turns

When your head passes the turn target (about 5 feet out), complete the stroke in progress and glide with arms outstretched.

As both hands touch the wall, allow your elbows to bend until your head is close to the wall. If the pool edge provides a handhold, grasp it for a pull.

Pull in quickly, tucking your knees tightly and turning sideways to the wall. Pull one hand away and press with the other as your feet come in under you sideways toward the wall. Lift your head sideways, grab a breath, release the wall as or before your feet make contact, and place your face in the water facing the other direction. Put both hands under the chest, palms down and elbows in, and push off strongly, extending your arms to glide at or just under the surface. As your glide slows to swimming speed, begin stroking.
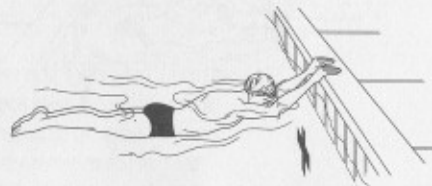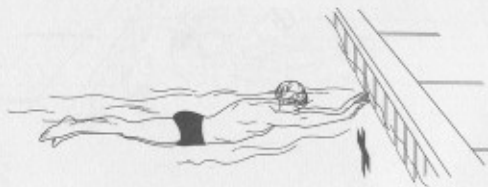
In breaststroke competition, you could vary the turn by pushing off at a depth of about 2 feet. When the glide slows, pull both arms all the way back to the thighs in an underwater butterfly stroke. Glide in this arms-back position until you slow to swimming speed, then recover arms to under the chest and kick hard while extending the arms. Glide to the surface and begin stroking.

Survival Skills

Cold Water

When a person is immersed in cold water, the skin and nearby tissues cool quickly. The body immediately begins generating heat to rewarm the skin and to prevent cooling of vital organs. **Hypothermia** is the lowered internal body temperature that occurs when the body loses heat faster than it can produce it. This condition triggers the body's last defense against cold, its final effort to defend the vital organs. Early symptoms include violent shivering and muscle spasms. As cooling continues, the pulse rate slows and blood is shunted to the critical organs and away from the extremities. The effect is to keep the heart and lungs working at the expense of the hands, feet, and brain. The problem is that in many situations the hypothermia victim needs the use of his extremities—possibly to hang on to a capsized craft. The blood shortage affects the brain, and survivors of hypothermia recall a feeling of well-being sweeping over them as they begin to lose their mental grip.

Water or air temperature lower than 70 degrees poses hypothermia risks. If you don't have a thermometer, try sitting still in the water for two minutes. If you are uncomfortable or begin to chill, then the water should be considered cold and proper precautions taken. If goose bumps appear on wet skin shortly after leaving the water, then the air temperature should be considered cold and proper precautions taken. Remember that moving water, as well as wind, substantially increases the loss of body heat. Swimming or treading water also cools the body faster than remaining still.

The first protection for cold-water activity is to reduce the length of time in or on the water. At 70 degrees, maximum safe in-the-water time is approximately 20 minutes. Open-water swimming in temperatures of 65 degrees or lower may pose

substantial risks and should be avoided. In all swimming activities, precautions should include procedures and equipment for immediate warming of anyone showing symptoms of chill.

For all activity afloat on cold water or in cold weather, appropriate clothing should be worn for warmth, with the PFD worn at all times, normally on top of the outermost garment. A dry change of clothes also should be available in case of a spill. As in swimming, activity afloat should include procedures and equipment for warming anyone showing symptoms of chill. Overboard activity should never be permitted in water temperatures of 65 degrees or lower, except for closely supervised capsize skill training in preparation for activity afloat.

As previously noted, if there is any risk of being in cold water or being stranded in water far from shore, you should be wearing a personal flotation device. A well-fitted and properly worn U.S. Coast Guard–approved PFD not only will keep you afloat and avoid the need for energy-consuming activity, but it also will provide insulation and significantly reduce heat loss in cold water.

Since heat loss leads to hypothermia, cold-water survival requires heat conservation. If alone in cold water and more than a short distance from safety, you can reduce heat loss by avoiding movement, using clothing and the PFD for insulation, keeping your head above water, and maintaining a tuck position. The more you move in the water, the greater and more rapid the heat loss.

To conserve heat, your best strategy is to float motionless. Keep PFD and all clothing on for insulation. Remember that heat loss is most rapid from the head and crotch. Because water will conduct heat away from the body faster than air, keeping your face and head in the water will accelerate heat loss. Vigorous swimming will chill you most rapidly. Treading water will produce heat loss almost as rapidly as swimming. Survival floating or drown-proofing might be somewhat better than swimming or treading water if your movements are slow and limited, but submerging the head and face will increase the heat loss.

For these reasons, your best cold-water survival strategy is to float motionless with your PFD and clothes on, your head out of the water, and your legs drawn up close to your trunk. This is called the *heat escape lessening posture (HELP)*.

HELP (heat escape lessening posture)

Survive in Cold Water

- Wear a PFD.
- Keep your head out of the water.
- Get out of the water onto your boat, a log, a raft, or anything that floats.
- Remain as still as possible while in the water.
- While afloat in the water, do not attempt to swim unless it is to reach a nearby craft, fellow survivor, or floating object you can lean on or climb onto.
- If there is more than one person in the water, huddling is recommended while waiting to be rescued.
- **Maintain a positive mental attitude. Never give up hope.**

Huddle

If two or more people are stranded in cold water, they should huddle to reduce the cold-water contact and conserve heat. This is done by pressing together tightly and floating motionless.

Survival Floating

What if you find yourself in deep water without flotation support and too far from shore to swim? Perhaps you were swept out to sea by an unusually strong current, thrown overboard from a boat in strong waves, or the lone survivor of a sudden ship disaster. In any event, you must keep yourself afloat until help arrives.

Treading water may work for a short time, but you will tire quickly because this usually requires more energy than a restful swimming stroke. Floating on your back is a good strategy if there are no waves. Another possibility is survival floating, or drown-proofing, which will work even if you are being tossed around by wind and waters.

First, take a breath to fill your lungs, and then float in a relaxed, facedown position in the jellyfish float. For most people, the back of the neck will break the surface of the water. After holding your breath for a comfortable length of time, begin to exhale slowly while slowly spreading your legs and bringing your arms up near the surface of the water. As you begin to exhale, bring your legs together and push gently down with your arms. This movement should give you just enough lift to raise your head and mouth above the surface of the water for a quick breath. After getting your breath, lower your head and immediately return to your relaxed, facedown position.

Several different arm and leg movements may work. Experiment and practice to find what works best for you. Remember that less movement is better because you are trying to conserve energy. Slow, relaxed movement also is better than quick or precise movement that requires more exertion.

Some people find survival floating difficult because they want to keep their heads above water longer than the minimum necessary for one quick inhalation. To do this, they have to tread water, which is quickly tiring. One problem may be a failure to exhale before the head is lifted. If you don't exhale while the head is down in the water, you have to keep the head up long enough to exhale and inhale, and this likely will force you to start treading water. Practice survival floating until it becomes easy for you to make slow, easy movements, exhaling in the water and lifting your head just enough for one quick breath. Remember to relax—it may be a long wait.

Survival floating or drown-proofing
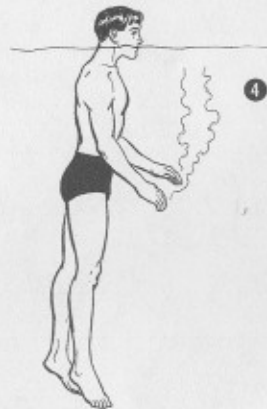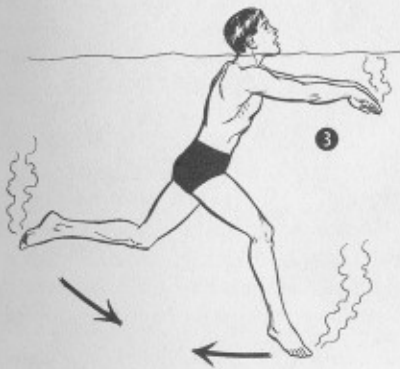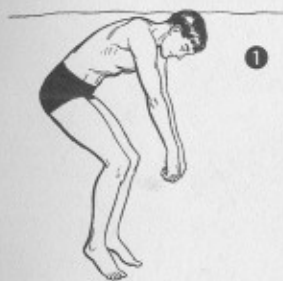
Swimming for Fitness and Health

Regular exercise may be the single most important thing a person can do to live a long and healthy life. Studies of individuals who live to great age—into their 90s and beyond—indicate that these people have at least one thing in common: regular, consistent exercise. While exercise has a wide variety of benefits, the most remarkable are the prevention of heart disease and the strengthening of bones.

Exercise and Health

The relationship between exercise and heart disease has been investigated extensively. The results are always the same: less heart disease among the physically active. The impact of exercise on heart disease is, in part, due to its beneficial effects on the other risk factors of heart disease.

People who exercise regularly are much less likely to be overweight because exercise burns calories. Exercise reduces blood pressure, too. In fact, the combination of exercise and weight reduction often allows people with hypertension (high blood pressure) to control it without medication. This control may be better than was possible with medication. Research has shown that active male joggers have lower total cholesterol than men of the same age who don't run. There is no substitute for exercise when it comes to protecting your heart.

Without sufficient exercise, bones become demineralized. They lose their calcium and become brittle. If a person is put to complete bed rest, this process starts almost immediately and progresses rapidly. This is one reason why doctors recommend that activity be resumed as soon as possible after a major operation or heart attack.

The demineralization of bones has been documented in astronauts returning from space, where lack of gravity robs

activity of its exercise value. Weak and brittle bones, caused by lack of exercise, are also common in the aged.

Exercise is an excellent cardiovascular conditioner and is important to living better as well as longer. People who exercise regularly feel and look younger than those who don't. Improvements in muscle tone and circulation undoubtedly contribute to freedom from fatigue and the feeling of well-being that the physically fit enjoy. Moreover, research shows healthy people are more productive at work.

So why do people often neglect to exercise and protect their health, if the importance of exercise is so well-known and obvious? The primary reason is *choice!* Remember your Scout training and Oath—what will be your choice?

How, when, and where you choose to exercise will depend on such things as where you live; what facilities and equipment are available to you; and your health, physical abilities, and training. But these things should determine only the type, place, and timing of your exercise, not your basic decision as to *whether* to exercise. Some people may go rock climbing; others may take daily walks. For some the choices may be almost limitless, for others the choices may be fewer, but everyone can choose to exercise and gain from doing it.

For those who are limited by choice or circumstances to one form of exercise, a full-body exercise is strongly recommended. In full-body exercise, all muscles and joints are moved and flexed. Such forms of exercise include brisk walking, running, cycling, rowing, and swimming.

Swimming for Exercise

In many respects, swimming is superior to other forms of exercise because it involves all the muscles and joints, is highly aerobic, involves no impact stress like in running, and has a very low injury rate. Swimming also promotes coordination, and joint stress is further reduced by the buoyancy effect of water immersion. Upper body strength can be enhanced by concentrating on overarm strokes, and leg development can be emphasized with kick drills and swim sprints using the flutter kick. It's not surprising that swimming is often prescribed and used in physical therapy for paralysis, stroke, and injury victims.

Planning a Swimming Exercise Program

Why not enjoy your favorite activity—swimming—and get that ever-so-important exercise at the same time? Simply plan and pursue a regular swimming routine, and you've got it.

The five components of a fitness exercise routine are warm-up, aerobic activity, strength building, flexibility maintenance, and the cool-down. You could warm up with a lazy 50-yard swim using the sidestroke or breaststroke. A great aerobic workout would be three or four 25-yard swim sprints using an aggressive butterfly or crawl stroke with a one- or two-minute rest between sprints. Follow the sprints with a 300- to 500-yard swim using a crawl or trudgen for a good strength workout. Flexibility is a part of almost every swimming activity, so add a few stretching/flexibility exercises to your warm-up and cool-down routines before or after your time in the water.

The key is commitment and consistency. If you go through your full swimming fitness routine two or three times every week for an extended period, you will get the most from it. Participating even once a week will make a significant difference; less than once a week is still better than being a full-time couch potato. To help yourself make the commitment and develop self-discipline, keep a detailed record of your exercise—how far you swam, time in the water, what strokes were used, comparative times, and number of repetitions. These records will chart your progress and show the improvement in your stamina and strength. Seeing your own success will provide even greater incentive.

For more information on planning a fitness exercise program, refer to the *Personal Fitness* merit badge pamphlet.

PERSONAL FITNESS

BOY SCOUTS OF AMERICA
MERIT BADGE SERIES

Basic Swimming Skills

The Scout method of basic instruction for those who have not yet learned to swim involves 11 steps.

1. Orientation and Adjustment to Water

Although many nonswimmers will be ready to enter the water immediately to begin playing and learning, some will be a bit timid or cautious, particularly on the first day or if the water is a bit cool, turbid, or unfamiliar. For this reason and to minimize physical discomfort, the initial adjustment process should be gradual and deliberate. (After the first session, the adjustment routine may be somewhat quicker and more spontaneous.)

The instructor should begin the first instructional period by entering shallow water and facing participants who are either seated on the pool edge or standing on the beach at water's edge just a few feet from the instructor. With their buddies, participants should either dangle their feet in the water where they can bend and reach water with their hands, or they should walk into the water down steps or on a beach until they are approximately knee deep. (If the instructional area is not a pool, the nature of the bottom should be carefully explained before learners are asked to enter the water. A reassuring comment on turbid or discolored water also is important.)

Imitating the instructor, the participants dip, splash, and rub water on their necks, faces, arms, and upper bodies. This exercise will enable the instructor to identify quickly those who are uneasy and will need special assistance in overcoming a reluctance about the water. If all are willing and enthusiastic, however, this exercise may be advanced quickly to a brief bob and splash.

Adjusting to the water

2. Breathing

The most basic and important skill in swimming is breath control—when and how to inhale and exhale. Form the class into a circle in waist-deep water with the instructor in the center and an assistant participating in the circle. The instructor demonstrates cupping the hands, holding water to the face, and blowing into the water through the nose. Participants should then imitate and practice. Next, have participants imitate the instructor as he or she bends forward at the waist with hands on knees, exhales through the mouth and nose toward the water, turns to the side, and inhales through the mouth. This rhythm is quickly learned, and the next step is to repeat with the face in the water while exhaling.
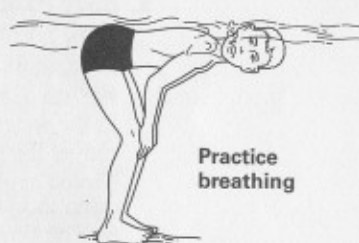

Practice breathing

After exhaling slowly through the mouth and nose for three to four seconds, the participant rotates the head to one side until the mouth is clear of the water. With the mouth clear, the participant takes a breath and rotates the face back into the water to exhale. Practice until the participant can comfortably perform rhythmic breathing 10 to 15 times without hesitation. (In clear water, encourage participants to keep their eyes open. Even in muddy or turbid water, they should learn to open their eyes when inhaling to avoid disorientation.)

One problem that could develop is that nonswimmers may want to raise their heads before turning to breathe. Demonstrate turning the head with the ear in the water, then the nose in the water. (Help the participants practice by reminding them—ear-nose . . . ear-nose . . . ear-nose.) Be sure they blow air out through the nostrils when they exhale in the water; this keeps water out of the nose.

Next, have buddies practice the seesaw in chest-deep water. To do this, have them join hands and face each other. One buddy takes a breath, goes below the surface, and
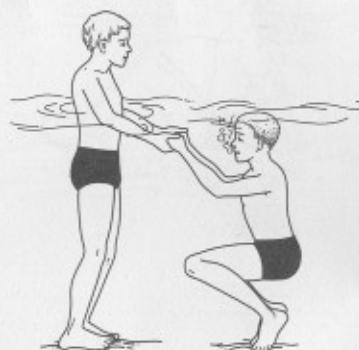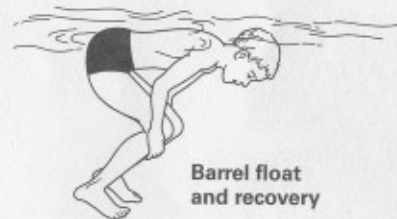

Seesaw

remains there for two to three seconds, while the other buddy remains above the surface. As the first buddy exhales and comes up, the other goes down for two to three seconds. This continues in a rhythmic pattern. Keep the participants working on this until they are able to do it 15 to 20 times without stopping.

3. Body Position and Buoyancy

Some nonswimmers may be reluctant to try floating or other skills because they do not know how to recover their footing. The instructor should demonstrate how arm motion in the water moves the body (forward sweep of arms moves the body back and vice versa), and the participants should experiment with these motions while standing in chest-deep water.

Barrel float and recovery

They should then be shown how to recover from a prone float by lifting the head and pressing down with the arms, and then how to recover from a back float by bending the head forward and pushing down on the water with the arms. Participants should practice these maneuvers as they learn to float.

Buoyancy is most easily shown in shallow water by demonstrating the barrel or jellyfish float; that is, taking a deep breath, leaning forward and holding the knees against the chest with the face down in the water. The instructor can demonstrate the importance of breath control in floating by beginning a barrel float, then slowly exhaling and sinking while staying in the floating position. While practicing the barrel float, participants also have an opportunity to practice their recovery to a standing position. After they have practiced the barrel float and discovered their own buoyancy, they are ready to begin learning the basic swimming stroke components and coordination.

4. Prone Float and Glide

The prone float should be demonstrated by the assistant instructor who faces and holds hands with the instructor (the buddy)

Prone float/glide

with arms extended, takes a deep breath, puts his or her face in the water, and then eases the legs back and straight behind until the body is extended and relaxed. After a few seconds in this position, the hands are released and the assistant recovers his or her footing by pulling the knees forward, pressing the hands down, and lifting the head. (The recovery should be slow and easy.) The instructor and assistant should help each participant personally with the first attempt if there is any reluctance. The buddies should practice until all are confident of their skills.

The next step is to have them learn and practice *plunging and coasting* (the prone glide). This skill is nothing more than a moving prone float. The skill should first be demonstrated by the instructor, including a proper recovery to the standing position.

Recovering from a prone float

In waist-deep water, have the participants lean forward with arms extended and hands together until the shoulders are below the surface, have them take a breath, place their faces in the water, and push forward off the bottom. (Be sure to have participants push toward or across shallow water, never toward deep water.)
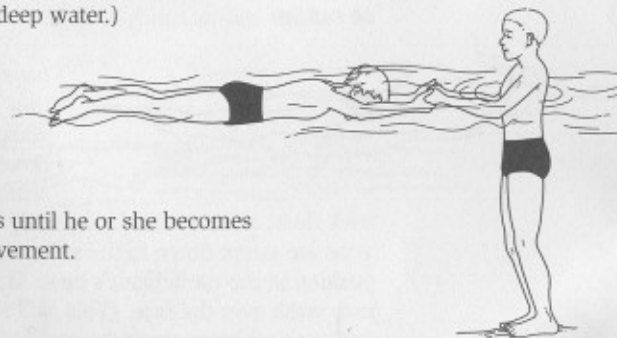
For the reluctant participant, the instructor should hold his or her hands and walk quickly backward for several repetitions until he or she becomes familiar with the movement.
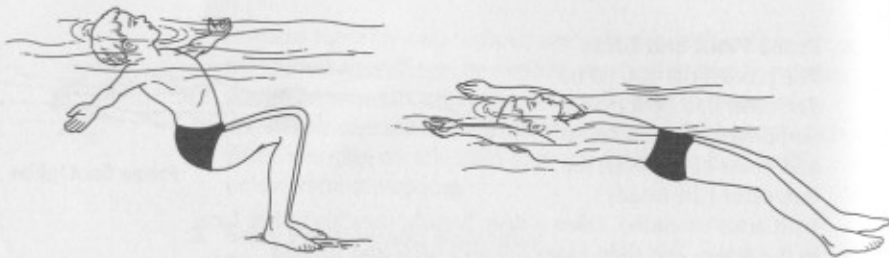
5. Back Float and Glide

The instructor demonstrates the back float in waist-deep water by squatting down as if to sit on a chair. When the shoulders are just below the surface, the instructor extends the arms to the side just below the surface with the palms up. Next, the instructor takes a deep breath and tilts the head well back with the chin up and the ears in the water.

The legs are slowly extended and relaxed as the body bobs and settles into a natural floating position with the arms extended above the head with palms up on the water. (Some will float high on the water with hips and legs near the surface; others will float with only their face and portions of their chests breaking the surface.) As with the prone float, the back float demonstration should include an easy recovery to the standing position. As participants make their first attempts to float on their backs, the instructor or assistant should provide some support under their backs and hips, not lifting but simply balancing the body at the buoyant level. Physical contact is important in this exercise to overcome natural insecurity about falling backward in the water. Once the participant has relaxed and is floating, the support should be withdrawn. This withdrawal should not be sudden and unanticipated, however.

When the participants have learned to back float, they can be taught a back glide. Have them squat down and lean back with arms out, as if beginning the back float, and then push off gently with the feet as the arms are swept down to the sides with palms in. Watch the position of the participant's head. If it is too far back, water may wash over the face. (This skill should be demonstrated with an easy recovery at the end of the glide.)

6. Flutter Kick

Demonstrate the flutter kick out of the water lying prone and then repeat lying on the back.

Keeping the toes slightly pointed, the ankles and knees relaxed but straight, kick from the hips. With the legs close together, the depth of the kick should be about 12 to 14 inches. Kick slowly and fluidly. Have the participants lie on a bench, table, floor, ground, or deck of a swimming pool to practice. Encourage them to make the movement slow and even. (Dry-land drills are helpful but not much fun; don't overdo this practice.) If a kickrail is available in a pool, participants can easily practice the flutter kick while holding on. Kickboards also may be useful, but the best way to practice is with the prone or back glide. Have them begin their glide and then add the flutter kick. "Steamboat races" for distance can encourage practice. (Emphasize rhythm and distance, not speed.)

Many participants will want to chop when they kick, bending the leg at the knee. Others will tend to kick on the top of the water. Some forget to kick. Stress that the legs remain under the water while kicking. Kicking from the hip is much like walking stiff-legged.
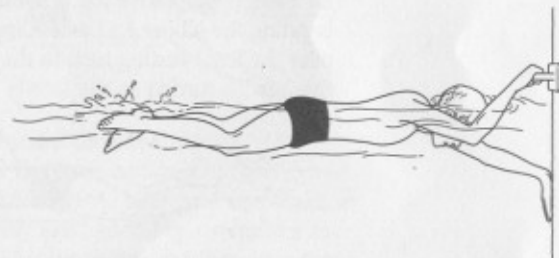
7. Arm Movement

Demonstrate and explain the arm movement as a progression from the prone glide. To practice the basic skill, have the participant stand in chest-deep water and bend forward slightly, practicing the arm movement slowly and accurately without losing his balance. Have him push off into the prone glide and add the arm movement while keeping his face in the water. Do not move on to other skills until at least four or five arm strokes can be performed easily on one breath. Once the participant has experienced the basic movement of the arms and understands the result of each movement, he or she is ready to practice the arm movement with rhythmic breathing.

The participant should turn the head toward the breathing side so the ear is down. The arm on the breathing side is next to the thigh. The other arm is beyond the head next to the ear. Move the arm on the breathing side by bending the elbow and extending it so the arm is straight over the head resting next to the ear. As this arm is moved, the head is turned so the face is in the water. At the same

time, the other arm is pulled through the water, down to the thigh. This is one-half of a revolution. To complete the revolution, pull the arm on the breathing side down through the water and next to the thigh. Turn the head so the ear is down. At the same time, bring the opposite arm, bent at the elbow, straight over the head next to the ear. This completes one full revolution of the arms.

Participants should first practice the arm motion slowly while bent over at the waist and standing stationary. As a second practice step, have them walk forward in the water while moving their arms rhythmically. They should feel the pulling effect of the arm motion. To refine the movement, make sure that as the arms recover from the water, the elbow leaves the water first and the arm is extended over the head. The thumb and index fingers should enter the water first. The palm of the hand may be slightly cupped

but should be relaxed and comfortable. The power of the stroke comes from the arms. Remind participants that they should pull through the water with their entire arm, not just their hand, as if the arm were the paddle of a canoe.

8. Coordination

Putting the rhythmic breathing, arm motion, and flutter kick together in the prone position produces the crawl stroke. Synchronize the rhythm of the kick with the arm motion, kicking about six beats for every complete revolution of the arms. Coordination cannot be taught; it must be learned through practice and boosted by enthusiastic encouragement and skillful coaching. The instructor should stress the ease of the stroke. Swim it easily, relaxed, and streamlined.

9. Turning Over

Once participants have learned the crawl stroke and are able to do a back float and back glide, they should learn how to turn over from front to back and from back to front. This is a useful safety skill, enabling a swimmer to rest on his back when he begins to tire and then to resume the crawl stroke when rested.

To turn from the crawl stroke position onto the back, the swimmer lowers one shoulder and turns the head in the opposite direction. To turn over while swimming on the back, the swimmer lowers one shoulder and turns the head in the same direction. When turning from the back float position, immediately begin swimming the crawl stroke.

Although explanation and demonstration of these turnover maneuvers will be helpful, participants will learn quickest by simply practicing and experimenting with the concepts of "roll over and float" and "roll over and swim." Despite the apparent simplicity of this specific instruction, the instructor should not omit it, and participants should practice these maneuvers in shallow water before attempting to swim in water over the head in depth.

10. Turns, Reverses, Stops, and Starts

Some skills are not particularly significant when swimming in shallow water where footing is always available. But the ability to stop and restart swimming, to reverse direction, and to turn while swimming is of critical importance when swimming in deep water. (Note that the beginner swim test requires the Scout to stop, turn, and resume swimming.)

To stop while swimming the crawl stroke, the swimmer simply stops kicking and raises his head while pushing down and slightly forward with the arms. A reverse after stopping can be done in one quick motion by sweeping both arms in the same direction across the front of the body while turning the head and shoulders in the opposite direction. Starting a stroke in deep water is accomplished by pressing the arms down from the surface of the water and back alongside the body while leaning forward, putting the face in the water, and beginning the flutter kick. This planes the body into the prone glide position for the crawl stroke to begin.

To turn while swimming the crawl, the swimmer simply sweeps wide with the arm stroke on the side opposite the turn and reaches out in the direction of the turn with the other arm. When demonstrating this maneuver, the instructor should show how the head, when down in the prone glide position, can be used as a rudder to assist in swimming turns. (A turn when swimming on the back also is accomplished by ruddering with the head and sweeping wide with the arm stroke opposite the turning side.)

11. Jump Entry Into Water

An important part of learning to swim is mastering the skills involved in deepwater entries. Participants should be taught the leaping entry as illustrated and explained in this pamphlet. However, the leaping entry technique cannot be taught until participants have overcome the initial reluctance about jumping into the water.

To teach a simple jump entry, have the participant stand at the pool or dock edge where the water will be chest-deep. He should bend slightly at the knees and hop forward as if trying to land with both feet together on the surface of the water. Arms should be extended forward with the body leaning slightly forward from the waist.

On the first attempt, an instructor should be in the water facing the edge just beyond where the participant will enter the water. As soon as the participant splashes into the water, the instructor makes contact and speaks encouragement. When this initial jump entry can be performed confidently, the instructor should back away several steps and have the participant jump in and immediately begin swimming the crawl stroke. This practice should then progress to slightly deeper water until the participant is ready for the initial jump into water over the head. The water for this practice should be about shoulder-deep on the instructor so that the instructor can stand in the water and have the participant jump and swim toward him or her. (This procedure also counters the dangerous tendency to jump at or near the edge of the pool or dock.) Once the basic "jump and swim" has been mastered, the student should progress to the leaping entry.
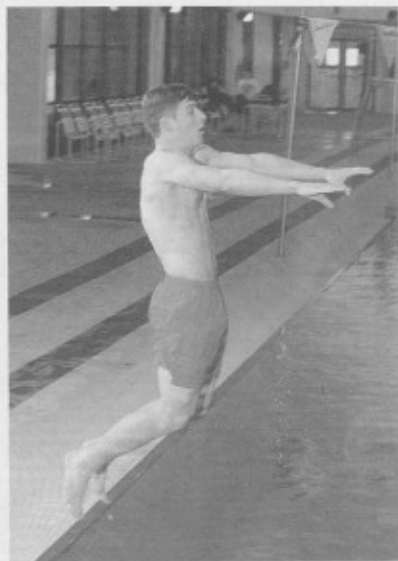
Swimming Is a Lifetime Skill

Learning to swim a variety of strokes will provide relaxation, fun, and physical conditioning that will benefit you the rest of your life. When the skills acquired through proper instruction and practice are adapted to lifesaving techniques, they can save the lives of swimmers themselves, as well as others. And, of course, swimming at a competitive level is always challenging. Best of all, learning this lifetime skill will leave you with a sense of accomplishment and a fun way to relax with your friends!