Swimming

Brief History

Back in Japan 1603, swimming became a statutory sports event in schools. In 1837, the National Swimming Association in London, Britain also started organizing international swimming competitions. While swimming became one of the events in the first modern Olympic Games in 1896, the Federation Internationale De Natation Amateur (FINA) was founded in 1908, the federation was officially renamed World Aquatics in January 2023 It mainly develops swimming, diving, high diving (Men's 22-27M; Women's 18-23M), water polo, artistic swimming, and open water swimming. It also organizes international competitions.

What benefits do you get from swimming?

1. Strengthening the cardiorespiratory function
2. Enhancing brain and nervous system
3. Facilitating body's intake of calcium and phosphate while strengthening the bones and muscles and maintaining body shape

General racing rules

1. When using the one start rule, any swimmer starting before the starting signal has been given, shall be disqualified.
2. In both individual medley events and medley relay events, swimmers cannot use backstroke, breaststroke or butterfly in freestyle.
3. Obstructing other swimmers by swimming across another lane or otherwise interfering shall disqualify the offender.
4. In all events, a swimmer when turning shall make physical contact with the end of the pool.
5. Standing on the bottom shall not disqualify a swimmer, but he shall not walk, move with the aid of the bottom or pull on the lane rope. Offenders shall be disqualified.
6. In individual medley events, swimmer covers the four swimming styles in the following order: Butterfly, Backstroke, Breaststroke and Freestyle.
7. In medley relay events, swimmers cover the four swimming styles in the following order: Backstroke, Breaststroke, Butterfly and Freestyle.
8. Some part of the swimmer must break the surface of the water throughout the race, except it shall be permissible for the swimmer to be completely submerged during the turn and for a distance of not more than 15 metres after the start and each turn. By that point, the head must have broken the surface.

Events

Events	Olympics		World Championship	
Gender	M	F	M	F
50M Butterfly	N/A		✓	✓
100M Butterfly	✓	✓	✓	✓
200M Butterfly	✓	✓	✓	✓
50M Backstroke	N/A		✓	✓
100M Backstroke	✓	✓	✓	✓
200M Backstroke	✓	✓	✓	✓
50M Breaststroke	N/A		✓	✓
100M Breaststroke	✓	✓	✓	✓
200M Breaststroke	✓	✓	✓	✓
50M Freestyle	✓	✓	✓	✓
100M Freestyle	✓	✓	✓	✓
200M Freestyle	✓	✓	✓	✓
400M Freestyle	✓	✓	✓	✓
800M Freestyle	✓	✓	✓	✓
1500M Freestyle	✓	✓	✓	✓
100M I.M. (Short Course Only)	N/A		✓	✓
200M I.M.	✓	✓	✓	✓
400M I.M.	✓	✓	✓	✓
4 x 100M Free Relay	✓	✓	✓	✓
4 x 200M Free Relay	✓	✓	✓	✓
4 x 100M Meldey Relay	✓	✓	✓	✓
4 x 100M Mixed Free Realy	N/A		✓	
4 x 100M Mixed Medley Realy	✓		✓	
Open Water	Olympics		World Championships	
5KM	N/A		✓	✓
10KM	✓	✓	✓	✓
3KM Knockout Sprint	N/A		✓	✓
4 x 1500M Mixed Relay	N/A		✓	

Fluid mechanics

1. When an object submerges in a static state, its floating position is mainly influenced by an object's weight and buoyancy. When the buoyancy is greater than an object's weight, an object will float. When an object's weight is greater than the buoyancy, an object will sink. When an object's weight is equal to the buoyancy, an object will be suspended in the water.

2. Weight is due to gravity. The direction of attractive force created is toward the centre of the earth.
3. Buoyancy is an upward acting force, which is generated by fluid pressure. The magnitude of buoyancy is equal to the weight of fluid which is displaced. This is known as Archimedes' Principle.
4. The density of an object determines whether an object floats or not. If the density of an object is smaller than or equal to the density of the water, an object will float. If the density of an object is greater than the density of the water, an object will sink.
5. Breathing can affect the human body density. When inhaling, the volume of the thoracic cavity will increase. Thus, the body density will decrease, which causes the human body floats. When exhaling, the volume of the thoracic cavity will decrease. Thus, the body density will increase, which causes the human body sink.
6. When breathing, head should not raise too high. The breath should be short and full. After inhaling, breath holding should be maintained for a short period of time. This helps to reduce the loss of buoyant force and increase the amount of oxygen inhaled.
7. According to Newton's third law, the mutual forces of action and reaction between two bodies are equal, opposite and collinear. When swimming, through the backward movement of stroking, kicking and treading, it imposes forces to the water. Thus, due to the water reaction, the human body moves forward.

Water treading

1. Stand in water about mid-chest depth with both arms extended in front of you about shoulder-width apart
2. Scull with the hands moving in opposite directions at the same time. Sweep out with both hands first, then sweep in with both hands.
3. Change the angle of the hands as you move them through the water
4. Keep your wrists strong
5. Rotate from the elbow
6. Feel the pressure on the hands and forearms

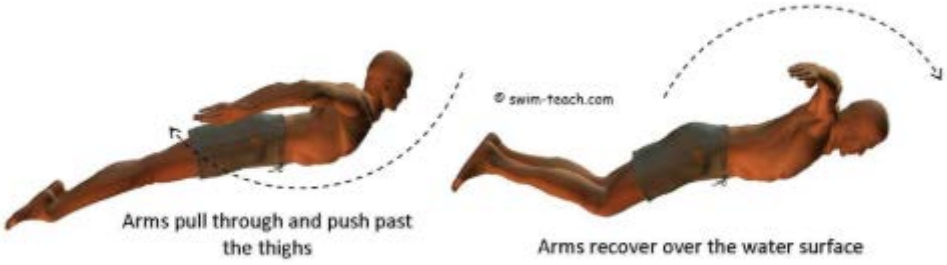
Butterfly

A) Key points for Dolphin kick

1. Legs stay close together and move in a fluid, whip-like motion.
2. Start the motion from your hips.
3. Whole body moving like a wave.
4. Two kicks per arm cycle.
5. One when your arms are pulling.
6. One during the recovery when your arms come over the water.

B) Arm stroke

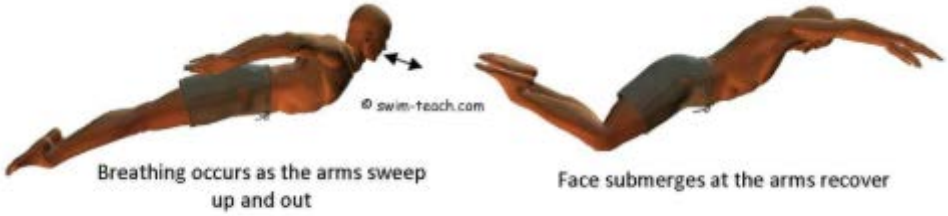
1. Pull – Both hands enter the water shoulder-width apart and sweep outwards.
2. Push – Scoop inward and then push back.
3. Recovery – Arms recover over the water surface.



Butterfly stroke arm movements

C) Breathing

1. Lift your chin just enough during the arm recovery.
2. Get your face back in the water after the breathing.



Butterfly stroke breathing technique

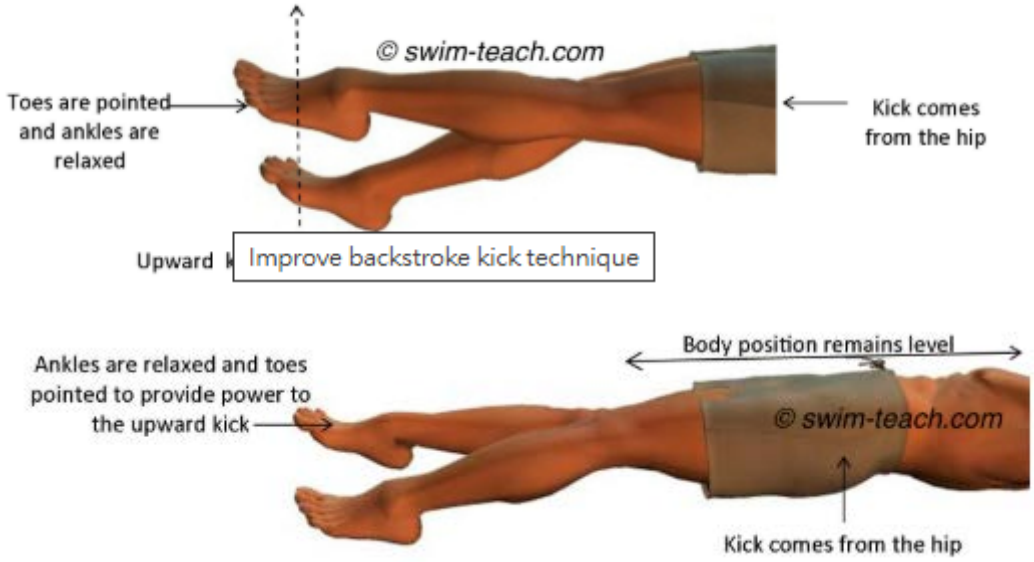
D) Rules abstract

1. The body shall be kept on the breast.
2. Both arms shall be brought forward simultaneously over the water and brought backward simultaneously under the water through-out the race.
3. All up and down movements of the legs must be simultaneous. The legs or the feet need not be on the same level, but they shall not alternate in relation to each other. A breaststroke kicking movement is not permitted
4. At each turn and at the finish of the race, the touch shall be made with both hands separated and simultaneously, at, above or below the water surface.

Backstroke

A) Leg kick

1. Generate force: Start from the hips, then transfer to the thighs, calves, ankles, and finally to the soles of the feet.
2. Direction of movement: Keep your legs straight, alternately kicking up and pressing down.
3. Kick amplitude: The kick amplitude should be between 1 and 2 feet below the water surface to avoid kicking air and wasting energy.
4. Leg position: When kicking, your knees should not be above water and should remain streamlined.
5. Kick rhythm: Kick hard and fast when you kick up, and relax and slow when you press down.
6. How to kick: Kick the soles of your feet outwards, use force when pressing down, and relax when kicking up.

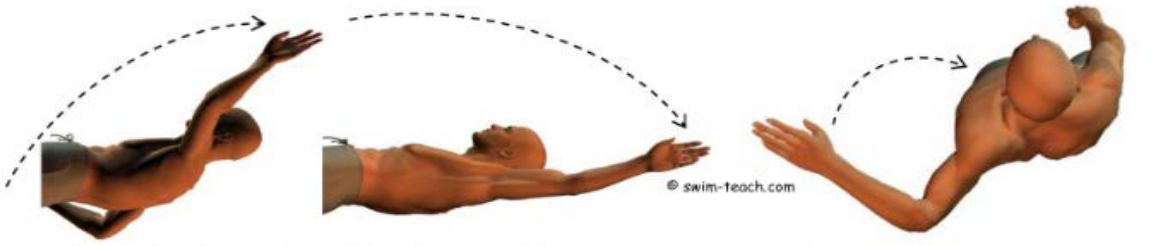


B) Arm stroke

1. Entry – with little finger entering first, palm facing out and the arm close to shoulder line.
2. Downward sweep - Palm should always face the direction of travel. Shoulders roll and elbow bends slightly when the arm sweeps downwards and outwards

3. Upwards sweep - Hand sweeps inline with shoulder, palm changes pitch to sweep upwards and inwards. Elbow bends to 90 degrees and point to the bottom.

4. Second downward sweep - Arm sweeps inwards towards the thigh and palm faces downwards. Bent arm action is completed with the arm fully extended and the hand pushing downwards to counter balance the shoulder roll.



Arm exits the water and brushes past the ear, entering the water little finger first

Arm is bent as it pulls through and straightens as it pulls to the thigh

5. Recovery – Thumb or the back of the hand should exit the water first. Shoulders roll again with the shoulder of the recovering arm rolling upwards. Arm rotates through 180 degrees over the shoulder and palm is turned outwards during recovery to ensure that the hand enters the water with little finger first.

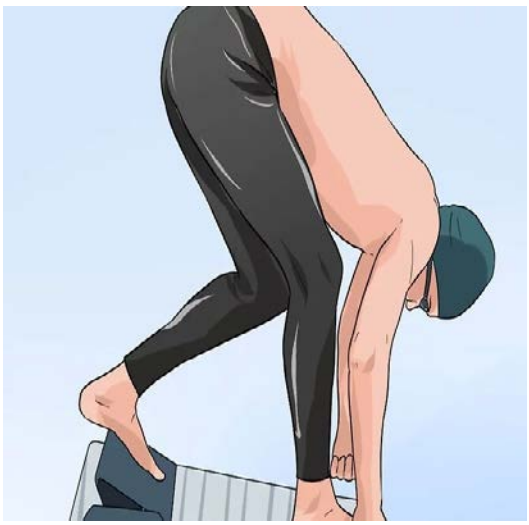
C) Breathing

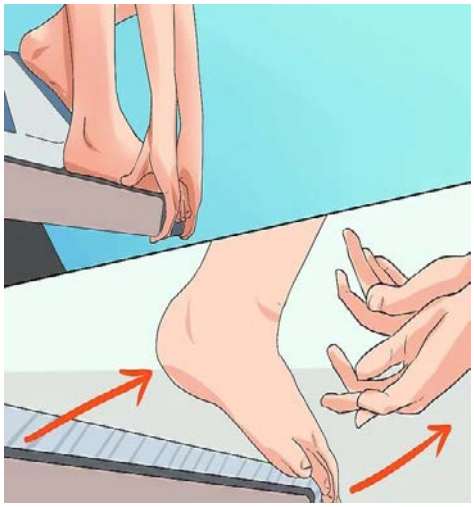
1. In time with the recovery of arm over the water surface.
2. Inhaling with one arm recovery and exhaling with the other.

D) Rules abstract

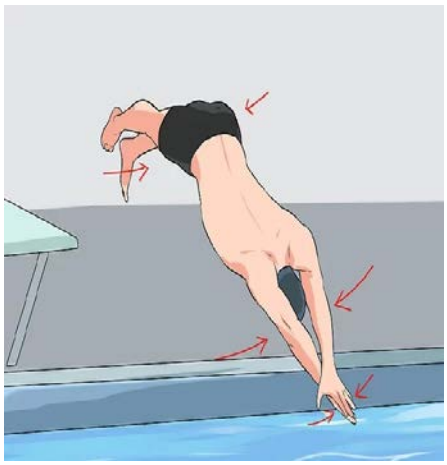
1. The normal position on the back can include a roll movement of the body up to, but not including 90 degrees from horizontal. The position of the head is not relevant.
2. Some part of the swimmer must break the surface of the water throughout the race, except that once some part of the head of the swimmer has passed the 5 metres mark immediately prior to reaching for the finish, the swimmer may be completely submerged. It is also permissible for the swimmer to be completely submerged during the turn, and for a distance of not more than 15 metres after the start and each turn. By that point the head must have broken the surface.
3. When executing the turn there must be a touch of the wall with some part of the swimmer's body. During the turn the shoulders may be turned over the vertical to the breast after which an immediate continuous single arm pull or immediate continuous simultaneous double arm pull may be used to initiate the turn. The swimmer must have returned to the position on the back upon leaving the wall.
4. Upon the finish of the race the swimmer must touch the wall while on the back.

Diving

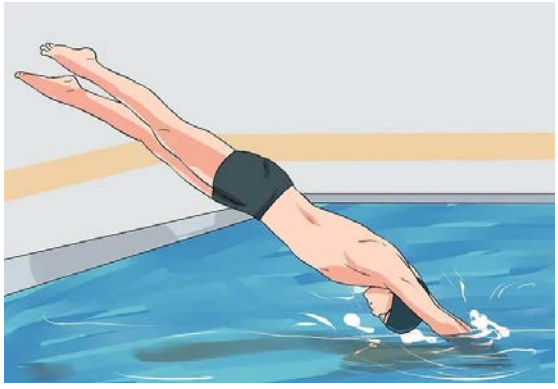


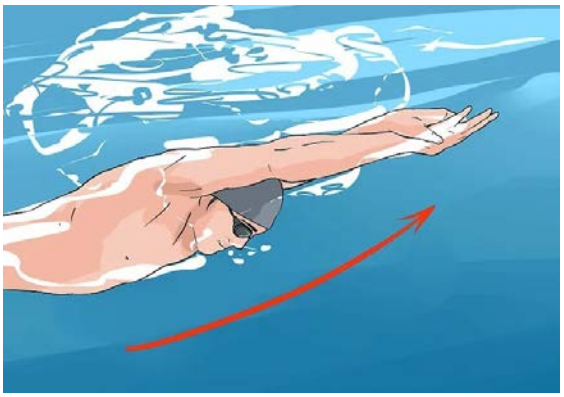


Place one foot in front of the other. It is often recommended that you put your strong leg in the back position, with toes facing straight ahead.



Use the momentum you create by pushing off with your hands to throw your arms forward into this position. Look up slightly as you push off. This will force your body to follow the direction of your head. Look up slightly as you push off. Eyes looking downward and your arms locked straight behind your ears. Keep your body streamline.





Lift your hands and head slightly after you hit the water. You will still be holding the "hands on" streamlined position, start kicking until you are just about to resurface and begin swimming.

Water safety

1. Do not swim in reservoirs, streams, catchwaters, ponds, piers, construction sites or rocky shores with oyster shells.
2. Do not swim in rough waters or areas which have reports of sharks in vicinity.
3. Do not jump into shallow waters or unfamiliar water environment.
4. Do not overrate your skills and physical strength to perform an attempt of rescue if you have not learnt any life-saving skills.
5. Go swimming in pools and beaches attended by qualified lifeguards.
6. Observe the rules and regulations of swimming pools and beaches.
7. Know your swimming skills and physical conditions.
8. Learn to swim and master life-saving skills.

References

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