

Children's Bicycles and Bicycle Safety

A Primer



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Introduction: Cycling for childs

Bikes are the real wonders of early childhood for almost all childs. Their charms lure the childs the most. They want to be on wheels to expand the limits of their exploration. On a bicycle, they experience a novel, different and exhilarating sense of freedom and comfort. They can visit more distant places, which seem too difficult for them to visit on foot. Encouraging childs to use bike makes them more active outdoors and they get familiar to the neighborhood as well. They can reach their desired places and friends faster.

The good bike is the one your child likes. childs are normally attracted to the look and feel of the bike instead of its practicality. If the bike has the safety features, that you would like it to have, the only thing left is looks. If it is approved by your child, you are lucky fellow. Try not to forget that if your child likes the design of the bike, he or she is more likely to develop the habit of riding. It will make your child stronger and more active.

Now there are several brands in the market. Some of the well-known brands of bikes are Disney, Halfords, Raleigh Bikes, Mattel, Mongoose and others. The prices of these brands range from \$30 to several hundred. There are various themes and characters painted on the bikes. The objective is to make them interesting and likeable docile toys for the childs.

There are different bikes for different age groups. General categories include 12 to 24 months, 2-4 years, 4-7 years, 8-11 years and 12-14 years. Bikes are also gender specific. Most of the bikes cost less than sixty pounds; therefore, every child can easily have one.

Biking riding entails different risks specifically for childs if appropriate safety measures are not taken. Therefore, many accessories come with the bikes for the safety of your child. It is strongly recommended that you purchase safeguards and hamlet and also advise your child to comply to the safety rules, so that your child should remain safe during accidents. Never go for any used or second hand helmet, as its previous history is unknown and it may not survive even a minor crash.

Chapter-1

Types of Safe Bikes for Children

Types of childs' Bikes

Bike is the symbol of prestige for all childs. They want to show them off among friends and relatives. When purchasing a bike for your child, try to keep in mind what your child expects from his bike. As childs grow, their needs change and so does their choices of bikes. Here is the list of childs' bikes that like when going up the ladder to teenage.

Tricycle:

Tricycles are used by the parents as a first step to teach their childs the basics of biking. The child learns how to sit, how to paddle and how to change the direction. Children should not be permitted to take their tricycles outdoors. It is very effective to familiarize them with the safety rules and techniques. To buy a helmet at the time of purchasing a tricycle is a very good idea. The child will develop the concept of always using a helmet when riding a bike.

Training Wheel Cycles:

From tricycles, a child moves to training wheel cycles before actually starting to ride a bike. It is a safety measure added in to make your child's change from tricycle to bicycle safer. It helps your child master the skills of balance, steer and speed before he rides an actual bike. Move the training wheels upwards as you see you child getting familiar with them and finally remove them to let your child have the first free ride of his life.

Scooters:

They also aid in mastering the basic techniques of biking like training wheels. Try to get your child one, if he is taking too long in settling without wheels. The child keeps a foot on the scooter and pushes it with the other that is usually on the ground. Scooters help a child master the skills of steer and balance. Brakes can be an extra icing on the cake.

Two-Wheeled:

A two-wheeled bike or bicycle is the ultimate goal pursued by the child and his parents. It provides the true entertainment of biking. A child can be able to use a bicycle from 6 to 12 years of his age; however, we strongly recommend you not to let your child go out on road unless he is 10. He may be a good rider but can lack a mature response to unusual situations. Keep telling him the safety measures and rules that he has to observe while on the road. Your persistent focus on safety will help your child develop an adherence to it. He must also know the rules and regulations of bicycling before he gets out on his maiden ride.

Throughout the various phases of teaching cycling to your child, pay special attention to make him familiar with the safety kit for cycling: helmet, footwear, gloves, knee and elbow pads etc. Moreover, provide him training to handle critical situations and make him well aware of the laws of bicycling. Parents' constant encouragement and interest speed up the learning process of their child.

Chapter-2

Getting a Matching Bike for Your Child

Match the Bicycle to the Child

The moment children start walking, they naturally begin looking to explore the world around them. Playing with ride-on toys comes as the best option for them to fulfill their appetite for fun and enjoyment. You can start by giving them four-wheeler or tricycles as a first step to their way to learning bicycling.

The natural tendencies of the children are usually same, while their physical fitness may be different. You should be smart enough to choose the toy that suits the physical capability of your child.

Tricycles

Children normally learn to ride a tricycle by the age of one and a half to two years. Tricycles have three wheels, steering, pedals and a seat. Some may also come with accessories such as a horn, lights, a basket, an umbrella and an extra back seat. They are available in different sizes and should be selected keeping in mind the age, size and physical ability of your child. Tricycles should be used indoors on leveled surfaces such as closed courtyard or driveway.

Bicycles

Bicycles with training wheels or scooters can be introduced at next level, once the children have mastered the riding of a tricycle. Children, depending upon their physical abilities, may start on riding a bicycle with training wheels from the age of three. Most children completely master this skill by the age of 10 to 12. Bicycles, like tricycles, also come in different sizes and specifications that you can select to match the physique, needs and liking of your child. You can also add or remove training wheels.

The different sizes of the bicycles are:

12 Inch Bike

This is generally for the children ranging 3 to 4 years and their average inseam size is between 14 to 17 inches. By this age, children can handle the skills such as balancing, paddling and steering. Mostly this bike is without brakes, as the fingers of child's are not strong enough to apply the force needed for pulling the brake levers. The actual height of the bike may vary from 30 to 35 inches. This bike normally has the training wheels with it.

16 Inch Bike

When your child reaches 4 to 6 years of his age and his average inseam size is around 16 to 20 inches, you can try one of these bikes. It is approximately 35 to 40 inches high. It still has the option for training wheels, if a child does not feel comfortable riding a bike without them. You can also choose between a coaster and brakes.

18 Inch Bike

When the child reaches 20 to 24 inches of his inseam measurement and 6 to 9 years of his age, this bike suits him. The height of the bike is usually between 40 to 45 inches.

20 Inch Bike

A twenty-inch bike is a good choice for children whose average inseam measurement is 22 to 25 inches and age is 7 to 10 years. It has additional features too, like five speed or more gears.

24 Inch Bike

This is the ultimate bike that every child dreams to have one day. Mostly older child's use it. The children of 9 to 12 years of age and having 24 to 28 inches of inseam enjoy riding this size of bike until they choose some other means of personal transport. The height of the bike is 53 to 65 inches.

Children below six may have mastered the skill of riding a bicycle, but still they are not able to understand the traffic rules for bicycling. Therefore, they may put their lives at risk if they ride unsupervised. We strongly recommend not letting your child have the liberty of supervision-free riding unless he or she fully understands the rules and dangers involved in bicycling.

Chapter-3

Safety Rules and Equipment

Safety rules are always important to know and follow to prevent traffic hazards. Bicycle riders are always at risk if face any other moving vehicle on the road. Especially they have weight disadvantage against the rest of the vehicles, which leaves them at risk of receiving serious injuries in case of any accident.

A bicycle rider should keep in mind the following points regarding safety equipment that he can use to ensure his safety on road.

- 1- **Helmet:** It is the most important safety measure that should never be compromised at any cost by any rider of any age. Helmet is designed to safeguard the skull in case of any accident. Skull is fragile and any injury to it may prove fatal for human being. Helmet is not heavy. It can sometimes even aid you ride faster.
- 2- **Gloves:** When riders fall: our body reflexes naturally move our hands forward to safe our face. Therefore, in almost all crashes, hands get serious road burn some way or the other. If a rider is wearing gloves, his hands will be safe from getting bruised. Gloves also help us operate levers and handle bars without getting repetitive strain injury [RSI] over long rides.
- 3- **Mouth Guard:** Mouth guard does the same for our mouth as does the helmet for our skull. In almost all dangerous sports, the athletes use mouth guards to avoid their teeth or mouth being hurt. Now mouth guards come with central vents, allowing the user to breath and spit through the mouth.
- 4- **Body Armor:** Body armor or apparel is designed to minimize the effect of any direct hit by spreading it across the body. There is a strip right above the spinal cord for its protection. Shin, knee and elbow guards also add protection to joints. They act like cushions coming between the skin and the road surface.
- 5- **Flags, Lights And Reflectors:** They all are used as visual aids to increase your road presence for other drivers. The drivers tend not to see [or they are unable to see] what they do not expect on road. Bicycle riders are mostly the victims of invisibility over roads. Using flags of bright colors, lights and reflectors on bicycle seats, jerseys, spoke and pedals increase your presence on road and the other drivers have less chances of not noticing you.

Some Rules

Moreover, try to make your child understand to ride the bicycle with the traffic after he has mastered the riding. Going against the traffic will simply increase the speed and momentum of crash resulting in fatal consequences. For example, if a bicycle rider is going on 25 kilometers per hour speed and a car is coming at 60 kilometers per hour, the speed, if they crash head on, will be 85 kilometers and if the bicycle is hit from the back, the speed will be 35 kilometers. Therefore, it is always safe to be with the traffic than against it.

Chapter-4

Helmet And Safety

Helmets are like hats, as they come in various sizes, shapes and colors. Different manufacturers provide different sizes. Bicycle Helmet Safety Institute [BHSI] has compiled a comprehensive list of helmet sizes made by various manufacturers.

Size:

First thing to see in the helmet is its size. Try a helmet that fits best on your child's head. Make sure that the helmet does not rock side to side once it sits flat on your head. Helmets have sizing pads. Use the sizing pads to get the best possible fitting. Some helmets come with universal fitting ring instead of pads. Adjust the ring to the size of the head of your child. You may remove the padding from the helmet, if your child's head grows. The best fitting is which is secure and comfortable at the same time.

Position:

Once you are done with size, the next is its position. The helmet should fit level on your child's head and a little lower on your forehead. To get the best possible position, it should be a finger or two above eyebrows on the forehead.

Buckles:

Centre the buckles under the chin. Most helmets come with adjustable chin straps. You can shorten or lengthen the strap to get the buckles at the right position.

Side Straps:

Adjust the slider on both sides to form a "V" shape, under and slightly in front of the ears. Lock the sliders if possible.

Chin Strap:

Do not forget to ensure that your child buckle up chin strap. The strap should fit snugly across the face, allowing not more than one or two fingers to fit into it.

Final Checklist:

Once you are done with the above-mentioned steps, go for a final fitting check for your child's helmet. Open his mouth wide. The helmet should move with his mouth coming in front of the forehead. If it does not, tighten chin strap.

If the helmet rocks back more than two fingers above the eyebrows, unbuckle and tighten the back strap by adjusting the slider. You may also need to adjust the chin strap. After doing the adjustments, try again to see it fits or not.

Does your helmet rocks forwards into your eyes? If yes, do the same adjustments as told in the previous step. After adjusting the back strap and chin strap test the helmet again.

Finally you must keep in mind that the helmet should not be either too loose or too tight on your child's head. It should be tight enough not to fall and loose enough to keep you comfortable. If the helmet is not comfortable, you will not be able to wear it for long rides. The child may eventually stop wearing it too, which is very dangerous decision for any rider.

Chapter-5

Seats and Childs' Safety

Seats are crucial from the child's safety point of view. Both front and rear-mounted seats for children are available in various designs of child's bikes. They are designed to hold and bear the children of various weights. To know the weight limit you must read the manufacturer's instruction manual. The common weight limit is 44 pounds.

Front-mounted seats are widely used in Europe and Asia. They provide much more stability and maneuverability to the rider. The rider's weight is on the front tire. Moreover, the child has better chances of communication with his parents or fellow riders. Another advantage of front-mounted seat is that it is easier for parents to get their child on and off the bike, as the child is in the front. However, there is a unique risk associated with the front-mounted seats and that is that if a child throws something that jams the front wheel, it can flip both the rider and the bike over. This risk can be minimized by assuring that the child does not carry anything that can jam the front wheel.

Rear-mounted seats are also much popular especially in America. The rear-mounted seats should meet the standards of American Society for Testing and Materials [ASTM]. In rear-mounted seats, the weight of the rider is on rear tires. Technically more dangers are involved in rear-mounted seats as compared to the front-mounted ones. The children can bruise their hands and arms, as there is no protection of handlebars available in case of any crash. If the rider leans backwards and he is a bit heavy too, the bike can toss him down.

There are certain precautions that the parents and the riders must take to ensure their safety. Parents should never let their child ride a bike without wearing helmet. Parents must read the instruction manual provided by the seat manufacturer and should try to make their child understand the instructions as much as he can.

Use the seat straps as instructed by the manufacturer. When riding, make sure that your child is not wearing anything that can get caught in the tires such as strings, loose laces, ties, etc. Do not forget to have the routine check of your child's bike, as it is a machine, so it must be handled like the other machines. Bike's brakes, tire pressure, grease, chain oil and other nut bolts must be checked before taken out to ride on.

If the parents and the child consider the safety measures and try to follow them, the chance of accidents and other unwanted events will become rare.

Chapter-6

Safety Measures for Childs' Biking

Riding a bicycle is always a great fun during childhood. It gives children an opportunity to consume their energy in a better and more effective way than other exercises. It also develops a sense of freedom in children and they seem to like riding the most. However, it is the duty of the parents to educate their children about road safety to avoid any mishaps. If the parents invest some of their time to teach their children some of the important safety rules, both the parents and the children will enjoy bicycling to its fullest without being hurt.

Following are a few important measures to be undertaken before or during a bicycle ride.

- ≡ Never start a ride without wearing a helmet. A study found that within a short duration of mandatory bicycle helmet law, the death count of children in bicycle related accidents decreased as much as 60 percent.
- ≡ Make your road presence clearer and more visible by wearing bright color clothes.
- ≡ The bike should be of proper size, suiting the rider. If one tries to reach out to handlebars or paddles all the time during a ride, there will be more chances of bad control, which may lead to an accident.
- ≡ Make proper arrangement to avoid chain hazards. If there are any strings and laces attached to you, remove them. Use ankle strips to avoid pant-legs from being caught up in the chain.
- ≡ Before going out for any ride check the brakes, air pressure of the tires and other important parts of the bicycle if they are in good condition.
- ≡ During a ride do not listen to any music or cell phone call [some children may have one]. Listening to music impairs your ability to know what is happening around, which may cause unawareness of something coming or standing, right on your way.
- ≡ Riding at night is dangerous. However, if it is inevitable, do not forget to ask your child to use reflectors on your feet, clothes and bicycle. Make sure that the front and back light of the bike is working.
- ≡ On road, bicycle is also like other vehicles. Therefore, all traffic laws apply on bikes as well. Try to make your child aware of the traffic rule, before you get out to the roads. Obey traffic lights, use hand signals to take turns, take care of the pedestrians, follow road signs and look before turning.
- ≡ Do not ride on handlebars. It impairs your child's ability to steer properly, which may prove fatal sometimes.

- ≡ Children under ten years of age cannot make mature decisions while in the streamline on the road. Therefore, it is better for younger children to ride on sidewalk instead of the main road.

If you keep these simple rules in mind and succeed in teaching your child, you will more likely be out of harm's way and so will be your child.

Chapter-7

How to Purchase a Safe Child's Bike?

Purchasing a bike is always very important; either it is going to be the first bike of the child or an upgrade. The bike should be of an appropriate size. Larger or smaller bikes to the actual size of the child will hamper his ability to steer and control. Properly sized and comfortable bike will ensure your child a safe and full of fun biking experience. For a proper fit, we will recommend you to bring your child with you to purchase a bike instead of surprising him with a new bike that you have purchased.

Following are few steps to follow for parents to choose a safe bike for their child.

- ❖ First parents must know if their child is ready to take a ride on the bike. According to International Bicycle Fund, most children are ready to take the first ride of their life between 4 and 8 years. However, some may be slower in their learning or riding a bike alone. If you see that your child is curious about bicycles or he wishes to ride with friends or calls his tricycles "baby stuff", you must understand that he is ready to ride.
- ❖ Try to purchase the bicycle from a shop where you know that salesmen are more knowledgeable and they can assemble the bike very accurately and safely. Sometimes mega stores offer discounted prices but are not much expert in handling bicycles mechanically which sometimes result in poor quality assembling.
- ❖ Bikes for adults are measured according to their frame sizes, but for children the bikes are measured through wheel diameter. Before purchasing a bike, measure carefully the inseam of your child. According to International Bicycle Fund, children with an inseam of 18 to 22 inches will be fine with 16 inch wheel size. Children having 20 to 25 inches of inseam measurement should select a 20 inch wheel and children with 24 to 28 inches of inseam size will be comfortable with 24 inch wheel.
- ❖ Make sure that the rims are of aluminum and not of steel. Aluminum rims perform better to breaking system in wet conditions.
- ❖ Your child should straddle the bike, standing with both feet on the floor. If the feet are not leveled to the surface or the child has to stand on toes, it shows that the bike is a bit oversized.
- ❖ You must see that your child is not having any problem with pulling the brake levers. If hand brakes are hard for him, you can choose a bike with coaster brakes. Taking a risk over brakes will not be a good idea at all.

- ❖ Ask your child to test ride the bike, before you finalize it. Tell him to ride in circles and test brakes and other parts of the bicycle. You can notice his comfort level while he is busy in having his test ride.
- ❖ Equip your child's bike with a ring bell and tell him to ring it when passing other cyclists or crowded places to avoid collision.
- ❖ Never let your child ride a bike without wearing helmet. Try to buy him the new one. According to a study, all helmets purchased before 1999 should be replaced.
- ❖ Keep in mind that your child needs the exact size of bike according to the age he is currently of. A child might need to have four to five bikes before moving to an adult bike. Therefore, never purchase a larger bike for your child with the expectation that he will grow into it.

Chapter-8

Bicycle Parts

Bicycle is a machine like so many others that we use in our daily life. It is quite ancient one, but still very popular and quite in vogue. It is always better to have knowledge of the parts of any machine, we are using. It gives you a better understanding of the machine with which you feel at home with its maintenance and use.

All parts of bicycle can be categorized into the following categories.

1. Brake System
2. Drive Train
3. Frame
4. Saddle Area
5. Wheel
6. Others

Here is the detail of each category with its subcategories.

1. Brake System:

Its function is to stop the bike at your desired place. The parts in this system are.

i. Front Brake

It is used to stop the front wheel of the bike and it is situated on the top most side of the front wheel.

ii. Rear Brake

It is there at the top most side of the rear wheel and is used to stop the rear wheel.

iii. Brake Levers

Both front and rear brakes are controlled by levers which are placed at the sides of handle bar.

2. Drive Train:

This system moves the bicycle. The rider pushes the paddles which move a chain and the energy is transferred to wheels causing the bicycle run. The system includes the following parts.

- i. Pedal
Pedal is the part on which the rider places his foot. The push of the rider's foot transmits the energy to wheels through a chain and the bike moves forward.
- ii. Crank Arm
Crank arms are the bars that connect the pedal to the bottom bracket. These crank arms help the whole system run.
- iii. Crank Set
This system drives the drive train. It is the hub of the bottom bracket. Its outer part has teathed edge, over which a chain is placed.
- iv. Chain
It is a series of connected rings. It connects crank set to cog set. When the rider pushes the paddles, it rotates to move the wheels.
- v. Chain Ring
It is a circle shape metal piece which moves the chain to move the wheels.
- vi. Bottom Bracket
It is an important part of the Drive Train. It attaches the both pedals with crank arms. It also holds the crank set and all other related mechanism. It is contained in the bottom bracket shell.
- vii. Bottom Bracket Shell
It is usually the part of the frame. It is a hollow tube which holds the whole system of bottom bracket.
- viii. Cog Set
It is a small wheel with teathed edge to hold the chain like the chain ring. It is placed at the rear wheel around the hub. It not only supports the chain but also makes the rear wheel move when the force is applied through pedals.

ix. Derailleur

It is used to change the gears of the bike. There are two derailleurs: front and rear derailleur. Front derailleur is placed above the crank set and the rear derailleur is located close to cog set.

3. Frame:

The main structure of the bike is called Frame. It is made in the form of tubes to keep the bike light weight. This includes:

i. Top Tube

This is the top most tube. It connects with head tube, seat tube and seat post tube.

ii. Down Tube

This is the down most tube in the structure of the bike. This is connected to head tube and bottom bracket.

iii. Seat Tube

Its upper part connects to top tube, seat stay tube and seat post tube while its down part connects to bottom bracket.

iv. Seat Stay Tube

Its upper part is connected to seat post and the lower part is connected to the cog set.

v. Chain Stay Tube

A pair of chain stay tube supports chain system. It is connected to bottom bracket and cog set.

vi. Front Set

This is the front side of the bicycle. It includes the handle bar and the parts that attach the handle bar to the front wheel. The parts are:

Handle Bar

It is the pair of bars that the rider places his hands on and control the direction of the bike.

Handle Bar Tape

It is the covering of the handle bar to improve the grip.

Bar ends are added to the handle bars to provide additional palm position to the rider.

Bar Plugs

They are added to both ends of handle bar for better finish.

Headset

This is the part that connects the fork of the front wheel to the head tube.

Head Tube/ Fork Tube

It connects headset and handlebars. Top tube and bottom tube are also connected to it.

Fork

It is a pair of fork shaped tubes that hold front wheel.

4. **Saddle Area:**

It consists of saddle and the following parts.

i. Saddle/Seat

Saddle is the place where a rider sits and it is placed on seat post tube.

ii. Seat Post Tube

It holds the saddle. It is connected to top tube, seat stay tube and seat tube.

iii. Seat Rail

It is the metal structure of the saddle.

iv. Seat Covering

It is the cover on the saddle that you can choose suiting to your taste.

5. **Wheel:**

There are two wheels in the bike. Both have different parts in compliance to their functions. The parts in the wheel are:

i. Spoke

It is the wire structure of the wheel connecting the rim and the hub.

ii. Hub

This is the center of the wheels.

iii. Rim

This is the inner most part of the wheel circle. The tire is placed on it.

iv. Tire

It is the outer part of the wheel that touches the ground.

v. Tube

This is the part that is inside the tire. Some new bikes have tubeless tires.

vi. Valve

It checks the air in the tube and keep them inflated.

6. **Others:**

These are the accessories. You can have some according to your liking and needs.

i. Basket

ii. Bell

iii. Bottle Cage

iv. Seat Bag

v. Child Carrier or Seat on an adult bicycle.