Pathfinder Honour:
Trainer's Notes

Cycling 1

Instructions to Trainers / Instructors of this Honour

Thankyou for being involved with this Honour. These notes have been developed to assist in teaching / instructing this honour. We recognise that there is much more information available and we are grateful that you should share your expertise.

Please remember that Honours are designed to develop our Pathfinders in many ways; their interests, their knowledge and their relationship with their Saviour and Creator. Your enthusiasm and creativity will have a huge impact on those doing the honour.

To complete an Honour, the following (where applicable) must be completed satisfactorily:

- Physical and Practical Requirements.
- Honour Workbook.
- Honour Assessment Sheet. *(On SPD Honour Website but Leader's level access is required)*

Additional Reference Material

http://en.wikipedia.org/wiki/Bicycle

http://en.wikipedia.org/wiki/Category:Bicycle_parts

Acknowledgements

http://en.wikibooks.org/wiki/Adventist_Youth_Honors_Answer_Book/Recreation/Cycling
Much useful information was obtained from the above site. Please refer to acknowledgements of this site and other sites within the following text. Please be aware that the content of these sources is beyond the control of the SPD.

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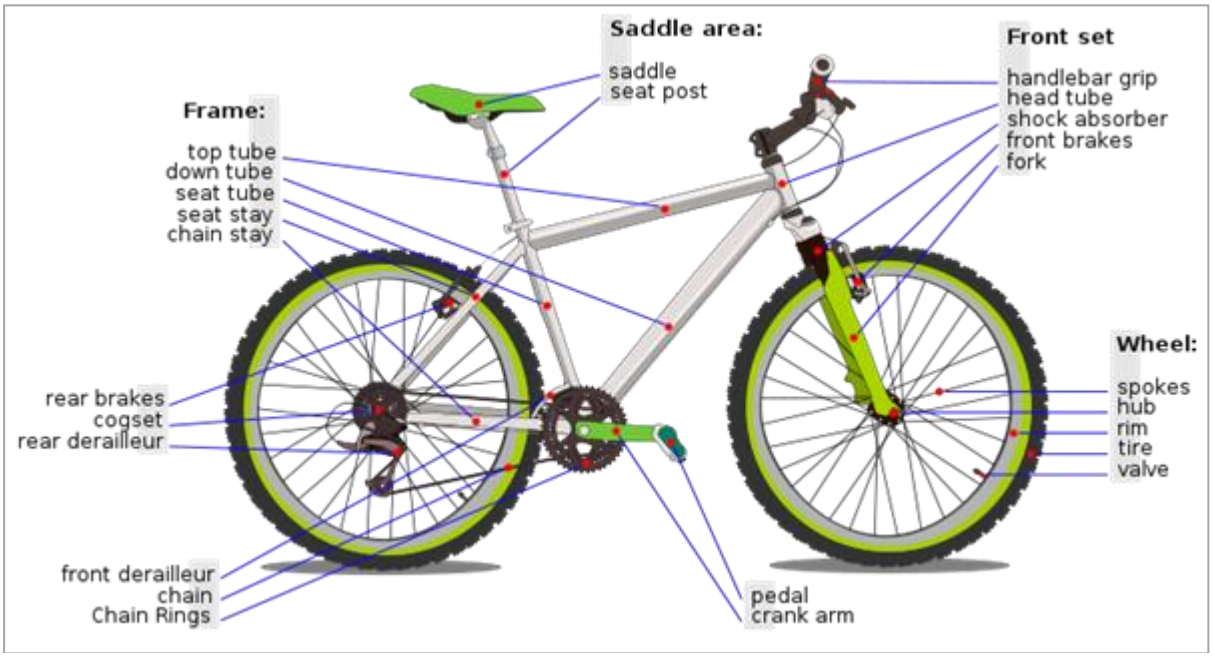
REQUIREMENT 1: Know by name and explain the purpose of the various parts of a bicycle.

There are few places on earth where bicycles are not found. As a consequence, the various parts of a bicycle have different names throughout the world.

The *International Standard ISO 8090: Cycles — Terminology (same as: British Standard BS 6102-4)* is used in these notes. Trainers, please use local names as you see fit.

Picture source: http://upload.wikimedia.org/wikipedia/commons/8/8a/Bicycle_diagram-en.svg



Based on: http://en.wikipedia.org/wiki/List_of_bicycle_parts

Starting at the Saddle Area Group at the top of the diagram and proceeding clockwise.

Saddle (ie Seat) Group

- Saddle ie Seat - The part you sit on.
- Seat post- It supports the seat and slides in the seat tube to adjust the seat height

Front Set Group

- Handlebar grips - Grips which are attached to each end of the handlebar.
- Head tube (steering tube) - Section of frame extending downward from top tube to down tube.
- Shock absorber - For bicycles with suspensions, a device that limits the rate at which suspension rebounds after absorbing an impact.
- Front brake - When applied, it stops the front wheel turning.
- Fork – It supports the front wheel.

Wheel Group

- Spokes - Thick wires joining the hub to the rim.
- Hub - Centre part of the wheel containing the bearings and to which the spokes are attached.
- Rim – Part of the wheel on which the tyre is fitted.
- Tire (ie tyre) - Where the rubber meets the road.
- Valve - A device poking out of rim (ie valve stem) used to inflate the tyre.

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Pedal – A 'platform' for the foot to press on and thus provide propulsion.

Crank Arm - The lever extending from the pedal. It transfers power to the chain rings.

Front Derailleur - The mechanism for moving the chain from one cog to another.

Chain - A system of interlinking pins, plates and rollers that transmits power from the pedals etc to the rear wheel.

Chain Rings - Toothed rings that hold the chain. They are attached to the crank.

Rear Brake - Brake on the rear wheel, usually attached to seat stay

Cog set - The set of rear sprockets that attaches to the hub on the rear wheel.

Rear Derailleur - The mechanism for moving the chain from one cog to another.

Frame Group

- Top Tube - The top part of the bicycle frame.
- Down Tube - The section of frame extending downward from the head tube (at the front of the bicycle) to the parts that hold the chain rings / pedals etc.
- Seat Tube - The tube in a bicycle frame running downwards from the seat.
- Seat Stay - Small diameter tubes running from top of the seat tube to rear dropouts (to which the rear wheel axle is attached).
- Chain stay - The pair of tubes that runs from the bottom bracket to the rear dropouts

Other parts not shown on the diagram

- Brake Cable - Cable connecting the brake levers to the brake mechanisms.
- Brake Levers - Levers on the handlebar used to activate the brakes. IMPORTANT. Before you ride, know which lever operates which brake (ie front and rear brakes)
- Cassette (ie cluster) - There are up to 10 sprockets of increasing size attached to a hub housing. This is the part that gives the bicycle the various gears.
- Dropout - Paired slots on a fork or frame at which the axle of the wheel is attached
- Idler pulley- Bottom pulley of the rear derailleur, with spring tension to keep chain tight.
- Nipple - A specialized nut that attaches a spoke to a wheel rim
- Gear Shifters - Shifting mechanisms mounted on each side of the handlebar used to operate the front and rear derailleurs.
- Spindle - An axle around which a pedal rotates. It is threaded at one end to screw into crank arms. Threads may by right-hand or left-hand.
- Wheel hub - The core of a wheel. It contains bearings and, in a traditional wheel, has drilled flanges for attachment of spokes.

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REQUIREMENT 2: Know and practice courtesy and safety rules when cycling. Include the importance of wearing a helmet.

The following notes are adapted from:
http://en.wikibooks.org/wiki/Adventist_Youth_Honors_Answer_Book/Recreation/Cycling

Christian Courtesy
Always remember to be courteous to all road users. Think of others when you 'park' your bike. Is it blocking someone's way, will someone trip over it etc?

Legal Requirements
Cyclists must adhere to all legal requirements pertaining to the place where they are cycling. Know these before you hop on your bike.

Importance of wearing a helmet
A cycling helmet (ie bike helmet) is an item of protective gear designed to provide maximum protection to the cyclist's head. The reality is that a 'proper' helmet is much stronger and more robust than a human head. Wearing an approved helmet is now compulsory in many countries.

Extensive design and testing procedures are required by certifying bodies before approval-for-sale is given. In Australia and New Zealand, standards are specified by the standard *AS/NZS 1927:1998 Pedal bicycles - Safety requirements.*

Common Sense Things
Many of the following are already legal requirements in some areas. Because of the importance of safety we have included them.

- Be alert at all times. Don't be distracted by iPods, headphones, mobile phones and the like. Watch where you're going and be constantly on the lookout for hazards.
- Wear an approved bicycle helmet and other safety gear. The helmet may save your life and reflective gear makes you more visible to motorists. Always remember that the smallest vehicle is at least 10 times bigger than you are.
- Wear suitable clothing. Loose trousers can get caught in the chain. Unsuitable footwear can easily slip off the pedals.
- Always ride with the traffic flow. Motorists are not looking for cyclists riding on the wrong side of the road.
- Observe stop signs, signals and basic right-of-way rules. Bicycle riders on public streets and roads have the same rights and responsibilities as car and heavy-vehicle drivers. Cyclists are part of the normal traffic flow and are entitled to share the road with other drivers. Like drivers, cyclists must yield to pedestrians.
- Keep clear of the door zone. Someone may open the door of their vehicle just as you approach. The resultant crash will hurt you more than the door. Try to ride a door's width away from parked cars. If you have to ride in the door zone, ride very slowly.
- Use clear hand signals. Hand signals tell motorists and other cyclists what you intend to do. Signalling is a matter of law, of courtesy and of self-protection. See Requirement 3b.

- Keep both hands ready to brake. You may not stop in time if you brake one-handed. Also, if only the front wheel locks up, you could be launched over the handlebars. Allow extra distance for stopping in the rain, in heavy fog or on slippery surfaces.
- Ride a well maintained and equipped bike. Keep your bike in good working order. Do a quick visual check before you ride. Set the seat to the correct height. For safety and efficiency, outfit it with a bell, rear-view mirror, lights and reflector. Carry a water bottle, bike pump and patch kit.
- Don't weave between stopped cars. Don't ride in and out between parked cars unless they are far apart. Motorists may not see you when you try to move back into traffic.
- Follow lane markings. Make left and right turns in the same way that cars do, using the same turn lanes.
- Don't show off. Your 'catastrophes' or 'stacks' may provide a degree of entertainment for others, but you carry the injuries.

REQUIREMENT 3: Describe and demonstrate the following important parts of cycling:

a. Hydrating

Because cycling is an activity that may need a lot of energy, a cyclist can easily lose a lot of body fluids, particularly through sweating. This is especially true for hot climates. It is necessary to ensure you hydrate well before, during and after cycling.

Water is the best fluid for hydrating your body for mild exercise or for shorter periods; say up to half an hour in mild climates.

For prolonged or extreme exercise it may be necessary to use an energy drink which replaces body salts. Consult your doctor or qualified practitioners for recommendations.

b. Hand signals commonly used when cycling with others

Left or right turn:
Holding your arm down, hold your hand horizontally and point in the direction intended to turn.

Stop or braking:
Hold your fist up with your elbow in a right angle. An open handed sign is also acceptable.

Pothole or stone or miscellaneous articles:
Point down and out slightly for a moment as you approach it.

Gravel or puddle:
Holding your hand palm down at your side, waiver your hand from side to side in a short quick motion.

To merge because of an upcoming obstacle such as a parked car, traffic island:
As you approach, point downwards and then open your hand and merge it to the centre of your back.

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REQUIREMENT 4: Describe and demonstrate how to:

a. Make a quick check of a bicycle before riding it

Make it a habit to do a quick check of your bicycle before riding it, especially if it hasn't been ridden for some time. It only takes a few seconds once a routine is established. There are many routines. Here's just one:

- Before you hop on your bike. Do a quick test of tyre pressure (tap each tyre with your hand. If air pressure is very low, it makes a dull 'thud'). Cast your eye over the bike to see if everything is OK. Look for any loose or damaged components of the bicycle; for example reflectors / lights, wheels, tyres etc.
- When you hop on your bike and before you ride off. Check the operation of brake levers and parts such as seat, handlebars etc for security.

b. Set the saddle (ie seat) height to match the rider's body size.

Correct saddle height is one of the essentials of pleasurable bike riding. If the saddle is too low, the leg muscles are not working efficiently. If too high, the legs are overstretched and the body is constantly waggling in the saddle from side to side.

A simple method of setting saddle height is:

- First adjust the saddle angle. It should be level or very slightly nose-up, no more than 2mm at the nose.
- Make sure the bicycle is stable in the upright position by placing it beside a wall or, better still - on a stand or have someone hold it firmly.
- Put on your cycling footwear, mount the bicycle and sit comfortably.
- Place your heels on the pedals and pedal backwards slowly without rocking your pelvis (very important). Adjust the seat height so the gap between pedal and heel at bottom-dead-centre is between zero and 10 mm.

c. Check the condition of tyres and inflate them to the correct pressure.

Check the condition of tyre rubber. Replace if worn, perished or damaged.

Check tyre pressures regularly. Running on low air pressure requires more pedalling energy. It reduces the life of tyres and makes tyres more susceptible to punctures. Reputable manufacturers put the recommended air pressure on the sides of their tyres. Modern bicycle tyre pressure can be as high as 600 to 800 kilopascals (90 to 110 psi).

d. Check brake condition / operation and make necessary adjustments.

Brake blocks (ie pads) should have more than 5mm of brake material beyond the metal bracket. Brake blocks should be as close as possible to the wheel rim (or brake disc) without touching. Each wheel should turn freely when it spun by hand.

Ensure brake blocks are parallel to the wheel rim, not at an angle.

Ensure the inner brake cables moves freely in their outer cables.

Replace broken brake levers immediately.

Always do a short road test prior to cycling adventures.

e. Check chain adjustment and operation of gears

Check that indexing of gears puts the chain cleanly on sprockets. If the gears are making a clunking or grinding sound, they will need adjustment.

Note. The adjustment of derailleurs is beyond the scope of this honour.

f. Lubricate bearings and other moving parts

The chain should be kept moist with lubricant at all times.

Brake callipers need a drop of lubricant periodically.

If bearings are sluggish or rough when rotating, grease should be applied to bearings.

Note. Modern bicycle lubricants are formulated to give minimum friction and dust attraction. Common oils will lubricate but they may also attract dirt and dust.

g. Preserve and protect a bicycle from the elements.

This is common sense and is a great way to save your hard-earned cash.

Keep your bike under cover. Do not expose it to sun or weather for prolonged periods.

Do not leave your bike where it could be run over.

REQUIREMENT 5: Demonstrate how to repair a punctured bicycle tyre.

Tools needed: tyre patch kit - patches, adhesive / cement, sandpaper or roughening tool, tyre levers

Picture: http://upload.wikimedia.org/wikipedia/commons/a/a7/Puncture-repaire-kit.jpg

Step 1: Try to identify where the hole / leak is

Try to identify the reason for the flat tyre first.

- Check the tyre valve for damage or leaks. A time honoured method is to remove the valve cap and place a small amount of spittle over the valve. Bubbles indicate a faulty valve.
- Make a visual inspection of the tyre, looking for foreign bodies such as screws or other sharp objects.

Step 2: Remove wheel with flat tyre from bicycle

This is not described here as it is assumed that there are adequate skills to do this. Note. A flat tyre can be repaired without removing the wheel. However that is an advanced procedure and is not covered here.

Step 3: Remove tyre from rim

Ensure that there is no air left in the tyre.

Using tyre levers, carefully lever the tyre free of the rim. To do this, work your way around the rim using two or three tyre levers

Be careful not to pinch or damage the tube.

When the tyre is half off the rim, remove the tube from within the tyre.

Step 4: Inspect tyre and rim for damage

Carefully inspect both inside and outside of the tyre for damage or foreign bodies which may cause further damage.

If the puncture has been caused by glass or other sharp object, ensure that it is completely removed from the tyre.

Repeat this procedure for the rim.

Step 5: Confirm leak

Inflate the tube with low air pressure and listen for air leaking. If you can hear the leak, mark the leak and proceed to repair.

If you cannot hear or feel (by running your cupped hand around the inflated tube) the leak, submerse the tube in water and watch for bubbles.

Once you have found the leak, mark it with chalk or have someone hold the point of the leak while you prepare to repair.

Step 6: Repair leak

Clean thoroughly

Roughen the tube around the area of the leak with the roughing tool which is provided in the kit. Alternatively, use sandpaper. Make sure that the roughened area is greater than the size of the patch.

Apply adhesive to both the tube and the patch.

Wait till adhesive is tacky. Then apply the patch to tube pressing firmly; if possible with a solid object ie. wood or a smooth stone.

It is not necessary to remove the plastic sheath as it forms a barrier between the tube and the tyre / rim. This reduces the chance of sticking the tube to the tyre or rim.

Step 7: Replace tube and tyre on the wheel

Inflate the tube with very low pressure. This helps the tube to retain its form and ensures that it is not twisted.

Carefully insert the valve into the hole in the rim.

Now place the tube over the rim.

Working with your hands, insert the tyre into the rim as much as possible.

When the tyre becomes too hard to insert with your hands, very carefully use tyre levers to lever the tyre onto the rim. Be careful not to pinch the tube between the tyre and the rim.

Step 8: Inflate and check for leaks

Before replacing the wheel, inflate the tyre to a low pressure ie 100 kPa (15 psi).

Working your way around the tyre, bounce the wheel gently on the ground. This allows the tube to settle inside the rim.

Ensure that the tyre is centred on the rim.

Then inflate the tube to full pressure.

Step 9: Replace wheel on bike

Loosen nuts sufficiently to enable the wheel axle to sit in the dropout slots.

Centre the wheel between the forks or chain stay, then tighten the nuts.

REQUIREMENT 6: Plan and participate in a 20 km cycle route, taking into account:

The requirement serves as a practice run for the 'big one' (the 80km ride). It takes into account planning and capabilities of the riders; a great opportunity to develop teamwork.

a. When to do the ride

b. Route to be taken

The ideal route will have the following features:

- Be as safe as possible to take into account the skills and attitudes of the cyclists.
- Not too difficult but still have some challenges.
- Have some interesting features
- Allow the trainer to access the participants for skills, attitude etc.

- Be fun and give a sense of achievement

c. Safety on the road
This is an important consideration. Ensure all risks are identified and managed.

d. Road conditions including traffic, condition of road shoulders, road surface etc
This is another important consideration.

e. Weather
Consider what contingencies need to be taken.

e. Other considerations such as access, other competing events, challenging parts such as steepness.

REQUIREMENT 7: Ride a bicycle 80 kilometres (50 miles) in ten hours or less.

The key elements of this ride have already been discussed in Requirement 6.

REQUIREMENT 8: Discuss a spiritual application from cycling as a team.

Here are some suggestions to get you started:

- Your all heading in the same direction.
- Life has its challenges: uphill and downhill and against the wind. It can be easier if you share the burden of breaking the wind (which is called 'drafting').