

Lesson 6: Maintenance and group riding skills

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Bikes are for everyone!

Anyone can ride a bike. However, some students may require additional assistance in the form of modified equipment and differentiated teaching. Suggestions for activity differentiation are provided throughout the lesson plans. Some students may also benefit from learning support aids such as social stories and other resources. If you would like further information on options for equipment modifications, adaptive bicycles and assistive technology, and learning support aids to assist with the delivery of Bike Ed, please email bikeed@transport.vic.gov.au.



SUGGESTED STAGE

While this Unit is designed for Years 7 and 8 (age range 12-15 years), you may choose to use these lessons for a different age range, depending on the development, maturity and existing bike riding experience level of your students.



SUGGESTED DURATION

This is the sixth of nine lessons for Unit 4 – Riding independently.
Suggested lesson duration: 45 minutes.



LEARNING INTENTIONS

- For students to perform basic bike maintenance.
- For students to ride safely in a group of bike riders (in a school setting).



SUCCESS CRITERIA

- Students can safely:
 - Check tyre pressure
 - Adjust seat height to fit individual
 - Clean and oil the chain
 - Change a flat tyre
 - Fix a punctured tube
- Safely ride in single file or two abreast, maintaining safe distances and communicating effectively.



EQUIPMENT

Bicycles, helmets, bags, chain oil, hexagonal (allen) key, bike pump with pressure gauge, and printed maps of upcoming rides.



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CURRICULUM LINKS

The Bike Ed program is designed to support all students by emphasizing the importance of safety and promoting independent travel skills. The Bike Ed program caters for all students and recognizes the need to teach safety and independent travel for all. Acknowledging the diverse needs of learners, we are committed to providing tailored assessment materials for students working at levels below the Foundation stage (A-D curriculum). For more information please email bikeed@transport.vic.gov.au.

CONTENT DESCRIPTORS (Geography)

VC2HG8S02 collect, organise and process information and data from primary and secondary sources, including fieldwork, and using geospatial technologies and digital tools as appropriate.

VC2HG8S03 represent and describe information and data using a range of formats, including maps constructed with geospatial technologies.

(HPE)

VC2HP8M01 refine and transfer movement skills in a variety of movement situations, including indoor, outdoor and aquatic settings.

VC2HP8M02 design and demonstrate how movement strategies can be manipulated to improve movement outcomes.

VC2HP8M03 demonstrate and explain how movement concepts related to effort, space, time, objects and people can be manipulated to improve movement outcomes.

VC2HP8M04 adapt and perform movement sequences in a variety of contexts, demonstrating how the movement elements of time, effort, space, people and objects can enhance performance.

ACHIEVEMENT STANDARD (EXTRACT) (Geography)

By the end of Level 8, students:

- collect, organise, process and represent information and data from primary and secondary sources using geospatial technologies.

(HPE)

By the end of Level 8, students:

- apply and transfer movement skills and movement concepts across a range of situations. They implement and evaluate the effectiveness of movement strategies on movement outcomes. They propose and evaluate strategies designed to promote personal health and wellbeing outcomes.



LEVEL 7 – 8 RUBRIC: BIKE ED

By the end of Level 6	Progressing towards Level 8	By the end of Level 8
Students can identify safety issues in their own and others' bikes, clothing, and equipment, and suggest practical solutions to improve safety.	Students can undertake some of the basics of bike maintenance: · change a flat tyre · check tyre pressure · adjust seat height to fit individual · clean and oil the chain · fix a punctured tube	Students can undertake all of the basics of bike maintenance: · change a flat tyre · check tyre pressure · adjust seat height to fit individual · clean and oil the chain · fix a punctured tube
Students demonstrate successful communication to other riders whilst riding outside of the school (head scan, head checks, hand signals, voice commands).	Students demonstrate successful communication to other riders whilst riding outside of the school (head scan, head checks, hand signals, voice commands) and are beginning to take the lead or serve as role models for others.	Students demonstrate and can lead successful communication to other riders whilst riding outside of the school (head scan, head checks, hand signals, voice commands).

Continued overleaf.



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LEVEL 7 – 8 RUBRIC: BIKE ED (Continued)

By the end of Level 6	Progressing towards Level 8	By the end of Level 8
Students obey all road safety rules whilst riding outside the school (Keep to the left side of the road, leave at least 1 metre space from the parked cars, give way to the right, obeys all traffic signals and signs).	Students obey all road safety rules whilst riding outside the school (Keep to the left side of the road, leave at least 1 metre space from the parked cars, give way to the right, obeys all traffic signals and signs) and are beginning to take the lead or serve as role models for others.	Students lead others in adherence to all road safety rules, instructions and norms whilst riding outside the school (Keep to the left side of the road, leave at least 1 metre space from the parked cars, give way to the right, obeys all traffic signals and signs).
Students obey all road safety instructions and norms whilst riding outside the school (follows all instructions from the teacher ride in single file and does not overtake unless instructed, maintains safe space between riders of two bike lengths).	Students obey all road safety instructions and norms whilst riding outside the school (follows all instructions from the teacher ride in single file and does not overtake unless instructed, maintains safe space between riders of two bike lengths) and serve as role models for others.	Students lead others in obeying all road safety instructions and norms whilst riding outside the school (follows all instructions from the teacher ride in single file and does not overtake unless instructed, maintains safe space between riders of two bike lengths).
Students can identify and mitigate hazards in a community setting with assistance. Students can plan a safe travel route using a range of technologies and information (with teacher oversight)	Students can plan a safe travel route using various geospatial technologies and information (with teacher oversight) based on current conditions, hazards and the environment.	Students can plan several safe travel routes alternatives using various geospatial technologies and information (with teacher oversight), choosing the best and safest route based on current conditions, hazards and the environment.

Tuning in activity. Bike maintenance videos.

Approx. 5 minutes

Resource Requirements

Laptops/tablets, at least one per group.

Safety

N/A.

Activities & Differentiation

In groups of 2 or 3, students search for a good bike maintenance video that shows one of:

- Checking tyre pressure.
- Adjusting seat height.
- Cleaning and oiling the chain.
- Changing a flat tyre.
- Fixing a punctured tube.

Teaching Points

Suggest Park Tools videos, or videos by other reputable brands.

Key Questions

- Why do we need to maintain our bike?
- So that it works better, and costs less as parts will last longer.
 - Having the correct air pressure in the tyres will make



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Each group shares key learnings from their chosen video with the class.

- it easier to ride, and reduce the chance of a flat tyre.
 - Fixing a punctured tube is better for the environment.
- Why do we need to know how to change the seat height?
- Having the correct seat height can maximise efficiency and reduce likelihood of injury.

Activity 1. Bike maintenance.

Approx. 20 minutes

Resource Requirements

Bikes (approximately one between two-three students), rags, chain oil, hexagonal (allen) key, bike pump with pressure gauge.

Protective gear for students: Gloves, glasses, masks.

Safety

- Ensure that students are careful with their hands near chains and gears, which can be sharp.
- Fingers can get caught under bike tyres.
- Use ground sheets to prevent oil from getting on the ground and surfaces, making them slippery.

Activities & Differentiation

Set up the students so that there is one bike between 2 or 3 students. Find an open area that can get dirty, since there will be oil. If not, place towels under the bikes to protect the ground from oil.

Cleaning the bike

- Using the rag, wipe down the surfaces of the bike to remove dirt and grime.
- This is important to protect the bike from long term damage, since the bike has many moving parts that will be damaged by debris.

Cleaning and oiling the chain

- The chain is the link between the rider and the movement of the bike and has many moving parts. It needs to be free of debris and well lubricated to stay functional and make riding easier.
- Optional: Turn the bike upside down.
- Using a rag, lightly hold the chain halfway between the pedals and rear hub. Pull the pedals slowly to rotate the gears and move the chain whilst cleaning with the rag.
- Ensure that, if required, the ground is protected from the oil using a towel or tarp.
- Using bike chain oil, or a multipurpose bike chain lubricant, hold the nozzle directly (5mm) over the chain. Rotate the pedals to move the chain slowly, ensuring that the chain oil seeps into the joints of the chain.

Teaching Points

A maintenance guide is included as part of Unit 4. Have students follow along with the guide as a reference.

It is recommended that teachers leading this activity do a practice run of the maintenance activities to ensure that the session runs smoothly.

Key Questions

Why do we check and maintain our bikes?

- Because they may be unsafe, so we need to check and fix them.

What will happen if the tyres are the wrong pressure?

- Could puncture if too low (edges can pinch) or high (burst).
- Can make it very difficult to ride, or very slow.

Cleaning and oiling the chain



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- Once the chain is oiled, change the gears such that the newly greased chain passes over each of the cogs. This will lubricate those cogs too.
- Hold the rag and pinch the sides of the chain with it to wipe off any excess chain oil. (ideally this should be done after letting the bike sit for a while).

Adjusting the seat

- The bike seat should be set to the correct height. The ideal seat height is such that the rider can sit on the seat whilst touching the ground with their tiptoes. Less confident or beginner riders may wish to have their seat lower until they build up confidence, however, should be aware that this will affect their pedaling efficiency and power, and may lead to a knee injury on longer, hilly rides.
- To adjust the seat, pull the quick release lever to loosen.
- If there is no quick release, use a hexagonal key or adjustable spanner to loosen the seat post.
- Then adjust the seat to the correct height and tighten the seat release whilst ensuring that the seat is straight.
- Make sure that the “minimum insertion point” of the seat post has not been reached or exceeded – this is marked on the seat post with small vertical notches, and/or may be labeled as such. Going beyond this point may damage the frame of the bike and/or cause injury.

Checking tyre pressure

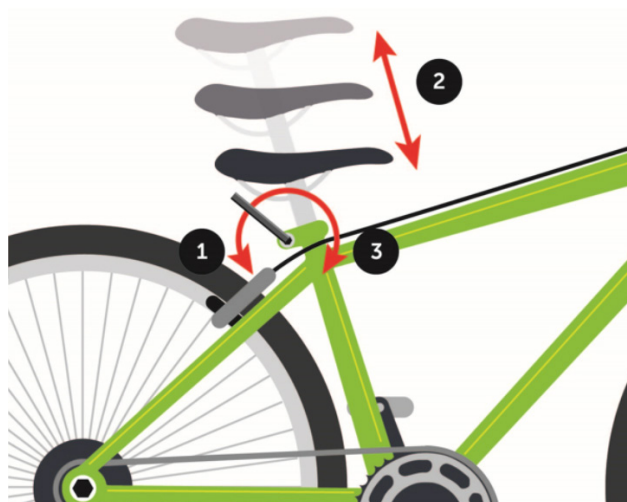
Tyres will slowly lose pressure over time, so will need more air pumped into them every few weeks.

- Check the side of the tyre to see what the recommended pressure is.
- Attach the pump to the tyre nozzle.
- Check the pressure using the gauge.
- Use the pump to add more air until the pressure is correct.

Modifications

- Consider using older students to help with this activity, especially if they show an interest in hands on activities.

Adjusting the seat



Checking tyre pressure



Progressions

- Students who complete this quickly may be used to help other students
- Encourage students who have an interest in bike mechanics to research and learn about other adjustments and repairs via YouTube - the Park Tools channel has very informative and industry-standard content.



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Safety Checks.

Approx. 5 minutes

Resource Requirements

Bicycles (at least one per two students), helmets (one per student), helmet fit guide, and ABCD check guide.

Safety

- If using a class set of helmets, ensure that the helmets have been cleaned for hygiene.
- Dropping the bike should only be from a very small height (approx. 5-10cm).
- Ensure bike seats are at the appropriate height for the student.

Activities & Differentiation

Helmet & clothing check

Reminder from the teacher how to correctly put on helmet and check that they are wearing correct clothes.

- Two finger check (above eyebrow, under chin strap and forming a 'V' at the ear) and tighten the dial.
- Clothing is brightly coloured, for good visibility.
- Long pants are close fitting at the base, so stop it catching in the chain.
- Shoes are sturdy, close toed and non-slip, for stopping and protection.
- Students will put on their own helmets.

** For suggestions regarding safety considerations and how to adapt the helmet and clothing safety check to accommodate students with specific religious or cultural clothing, please email bikeed@transport.vic.gov.au.*

ABCD bicycle check

Each student completes a check of their bicycle, as led by the teacher. Use ABCD check guide. The ABCD check is as follows:

- A. Is there air in the tyres? Squeeze the tyre walls.
- B. Do the brakes work? Squeeze each brake whilst lightly pushing the bike.
- C. Does the chain move smoothly? Inspect the chain and move the pedals.
- D. Is anything loose on the bike? Check with a very small drop (whilst still holding on to the bike).
- E. You may also choose to add "E" for handlebar Ends: check that the end caps at the ends of the handlebars are not missing or damaged, as the hollow pipe of the handlebar can cause injury in a fall.

Attitude check

Try your best, have fun, respect others.

Teaching Points

We must always wear a helmet when on a bike because it protects our head and our very important brain.

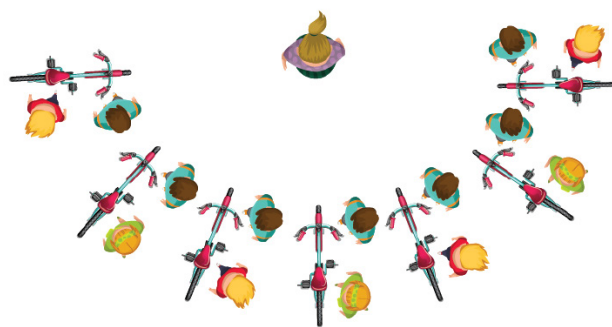
Just as important, is for the helmet to be fitted correctly, otherwise it won't work properly.

If we aren't dressed properly then we can't be seen easily, so someone might run into us.

We must check the bike before we ride. If the bike has a problem, then it might be unsafe to ride on.

Key Questions

- Why do we wear a helmet?
- What are the best ways to make sure that cars and other riders can see you?
- Why do we do a bike check before we ride?



Activity 2. Signaling and voice commands.

Approx. 5 minutes

Resource Requirements

Bicycles (at least one per two students) and helmets (one per student), cones.

Activities & Differentiation

Bring class together for instruction on key signals. See teaching points for details.

In an open area, riders will follow in single file. The movements will be dictated by the leader and signals/commands repeated by all group members.

- Begin with a predictable path, such as around the outside of a rectangular area (such as a basketball court).
- Then progress to move randomly around the area, with left and right turns, as well as stops.

Modifications

- If the space is confined, the group sizes can be limited, or the group split in multiple groups.
- If students are less confident, the activity can commence with smaller groups and then progress later into larger groups.
- Students who are not yet able to balance and pedal can still participate in this activity using a balance bike (refer to additional resources).

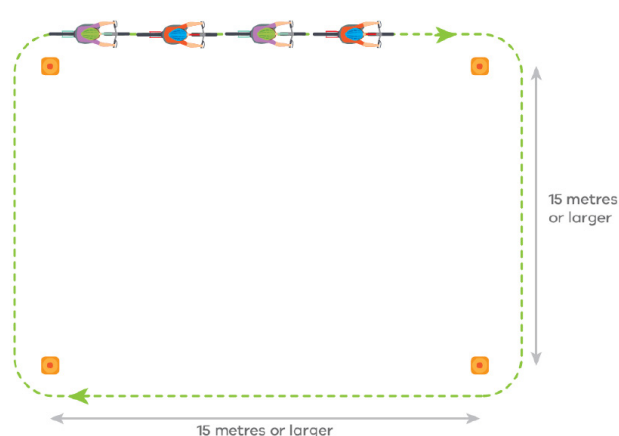
For students who are struggling or nervous about taking a hand off the handlebars to signal, suggest that they follow this process. Once they can ride for at least 10 metres completing the task, they can move to the next step.

1. Start by simply loosening the grip with the signaling hand, to feel how the balance needs to shift.
 2. Take the hand off the grip completely but hover it approx. 5-10cm above the grip.
 3. Take the hand off the grip and place it on the knee on the same side.
 4. Take the hand off and move it very slowly outwards away from the body.
 5. Progress to a full signal.
- *Note that the first 3 steps have the hand in line with the body, so that the balance point is not disrupted by moving the arm sideways. Explain this to students so they understand the importance of moving the arm out slowly, until they are very comfortable with the process.*

Safety

- Maintain at least a bicycle length between each other when in single file.
- Smooth braking to prevent collisions.

Activity Setup



Teaching Points

The signals are:

- Right: right arm extended horizontally.
- Left: left arm extended horizontally

Voice commands accompany these: 'Turning Right', 'Turning Left', "Slowing", and 'Stopping'. These are passed from the leader to the tail of the group, as the signal and command are repeated by each group member until everyone knows.

One of the most important parts of being a safe bike rider is being predictable to other road users.

When riding as a group, everyone needs to behave predictably to ensure that other road users can maintain a safe distance.

Signaling provides other road users and group members with information, allowing your future movements to be known and conducted safely.

Key Questions

Why is it so important to signal what we are doing on the road?

- Predictable for our group members and other road users.

Why should we leave a bike length gap between riders?



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Progressions

- Include hand signals and voice calls that need to be passed back along the group – such as hand signals for turning, and calls for “slowing”, “stopping”, or pointing out obstacles (pot-holes, posts, speed humps, sticks, rocks, dogs, potential car doors, etc).
- Students may lead the activity once they have gained confidence, calling out the commands and signals.

- Because it takes time to react to signals, voice commands and braking, so we need a margin of safety.

What challenges did you find when doing the activity?

- Hard to hear? Need to be assertive with our commands.

Activity 3. Moving into pairs and single file.

Approx. 5 minutes

Resource Requirements

Bicycles (at least one per two students) and helmets (one per student), cones.

Safety

- Maintain at least a bicycle length between each other when in single file.
- Smooth braking to prevent collisions.

Activities & Differentiation

Provide instruction about riding in pairs as a group and riding in single file. We need to know how to do both and how to switch between them.

“Double up!”

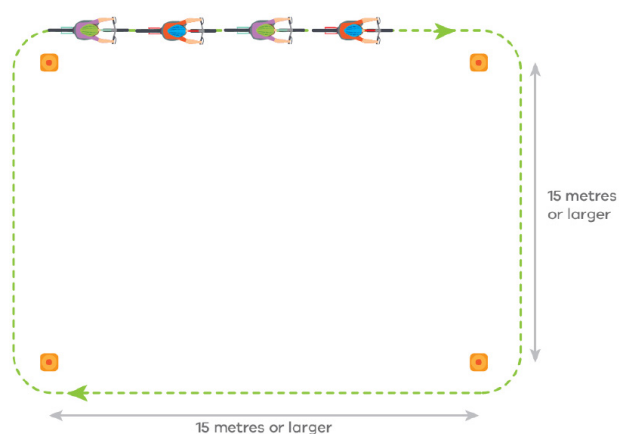
When you hear the command “Double up!”, bike riders will move from single file into pairs. The process:

- The first rider/leader should do a head-check first to make sure it is still safe to move to double file.
- Communicate this to riders behind them. They will call out the words “Double up!” so that people behind can hear them, and this message should be passed back through the group.
- The first, and then every second (alternating) rider will move to the right (into the traffic lane).
- The rider that was behind them will then move up to be on their left.
- Each pair should then move up to close the gap to the pair in front of them.
- Do the process standing in line (single file) first. Number each rider 1, 2, 1, 2, etc. On calling “double up”, each “1” should step to the right, and each “2” should step forward. The group is now in double file.
- Then walk slowly through this same process without bicycles.

“Single file!”

When you hear the command “Single file!”, bike riders will move from pairs into single file. They do this by:

Activity Setup



Teaching Points

Different road environments may require different ways of riding as a group. In quiet streets, riding in pairs as a group may be preferable to keep the group together however, where road/path space is tight, it may be better to be in single file.

Note: It can be safer to be in double file as a group where it would not be safe for a car driver to overtake a single line of riders, such as through roundabouts or queuing at intersections. This also then halves the length of the group and therefore time taken when a car driver does find a safe place to overtake the group.



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- Communicating this to riders behind them. They will call out the words "Single file!" so that people behind can hear them, and this message should be passed back through the group.
- Riders on the left will slow down to create gaps.
- Riders on the right will continue straight and move ahead of the rider that was previously to their left, and then move left into the gap left by that rider.
- As per the previous process (riders numbered 1, 2, etc). On calling "single file", each "1" should step forwards, and then step to the left. The group is now in single file.
- Then walk slowly through this same process without bicycles.

Once students are familiar, do this process slowly on bicycles around a simple and familiar track. The calls should begin with the leader.

- Start with riders in the same order as when they were lined up, and then swap them around so they can experience the difference between the right and left lanes.

Modifications

- If the space is confined, the group sizes can be limited, or the group split in multiple groups.
- If students are less confident, the activity can commence with smaller groups and then progress later into larger groups.

Key Questions

Why is it so important to signal what we are doing on the road?

- Predictable for our group members and other road users.

When would we want to change from single to doubled up riding? And vice versa?

- When there is little road space, we should ride single file. This allows cars to comfortably pass whilst leaving a gap.
- When there is ample road space, doubling up is good because it allows the group to be closer together which makes communication easier.

What challenges did you find when doing the activity?

- Hard to hear? Need to be assertive with our commands.

Progressions

- Students may lead the activity once they have gained confidence, calling out the commands and signals.

Optional. Tortoise game: Slow ride.

Approx. 5 minutes

Resource Requirements

Bicycles (at least one per two students), helmets (one per student) and cones.

Activities & Differentiation

- Line students up along a line, as per diagram, with the finish line 10-15 metres away.
- Riders attempt to be the last rider to cross the finish line by riding as slowly as possible without putting a foot onto the ground.

Modifications

- To ensure everyone gets to participate, if a competition is made out of the activity ensure that

Safety

- Students must maintain at least two bike lengths distance to other bike riders.

Teaching Points

Tips for improving this skill include maintaining good posture, doing half pedals, looking ahead, and not coming to a complete stop.

Key Questions

- Is it easier to ride slowly or at normal speed?
- What tips do you have for other people to help them do the tortoise race?
- Why do we practice slow riding?



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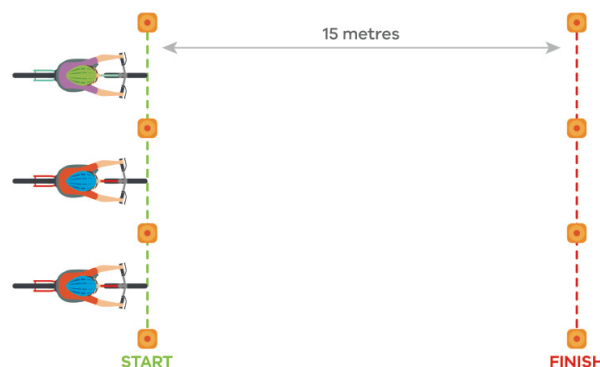
everyone gets to participate and compare their improvement rather than just the most skilled.

- Rather than making it a competition against other students, suggest students keep a tally of how many times they touch their foot down, and aim to improve their score on subsequent runs.
- Students who are not yet able to balance and pedal may still participate using a balance bike by pushing off to start and seeing how long they can balance and roll without touching a foot down, and aiming to reduce the number of foot touches per run.

Progressions

- Encourage advanced students to think about their gear selection (if they have gears and understand them), and experiment with what gear selection works best for riding slowly with control.
- Advanced riders may also wish to experiment with standing on the pedals vs sitting on the seat, and note how this affects balance.
- Advanced riders may also be given a 'head-start' by making them start forward of the others (so they don't have as far to ride).

Activity Setup



Optional. Changing the tyre.

Approx. 15 minutes

Resource Requirements

Bikes (approximately one between two to three students), bike pump with pressure gauge, tyre levers, and student reference sheet.

Safety

- Ensure that students are careful with their hands near chains and gears, which can be sharp.
- Fingers can get caught under bike tyres.
- Use ground sheets to prevent oil from getting on the ground and surfaces, making them slippery.

Activities & Differentiation

1. Turn bike upside down
2. Remove wheel
3. Deflate the tyre
4. Remove one side of the tyre from the wheel rim
5. Remove and replace (or fix) the inner tube
6. Fit the tyre back on the wheel rim
7. Inflate the tyre
8. Reattach the wheel to the bike

Modifications

Consider using older students to help with this activity, especially if they show an interest in hands on

Teaching Points

A maintenance guide is included as part of Unit 4. Have students follow along with the guide as a reference.

It is recommended that teachers leading this activity do a practice run of the maintenance activities to ensure that the session runs smoothly.

Encourage students to also learn how to use a puncture repair kit to fix punctured tubes to save money and the environment.

Key Questions

What will happen if we continue riding when we have a flat tyre?



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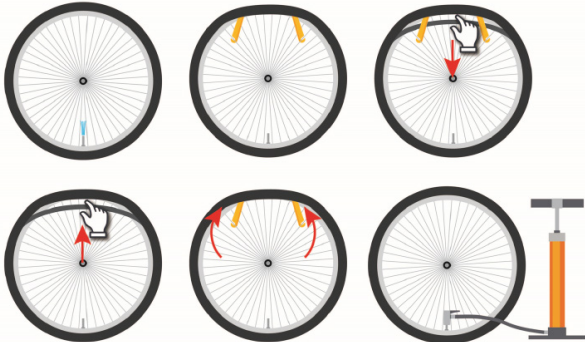
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activities.

Progressions

Students who complete this quickly may be used to help other students.



- It will damage the tyre and rim of the bike, which will be costly to replace.
 - Can make it very difficult and potentially dangerous to ride, or very slow.
- Why should we learn to repair a punctured tube, instead of throwing it away?
- It is better for the environment, and saves money!

Reflection & closure.

Approx. 5 minutes

Resource Requirements

Printed copies of the proposed route map for the next rides.

Safety

N/A.

Activities & Differentiation

Reflect on bike maintenance topics covered today, as well as group riding skills - communication, and moving from single to double file.

Thumbs up/down/sideways: How comfortable are you riding in a group?

Hand out route maps to students in preparation for the upcoming rides.

** Make sure that all permission forms have been returned prior to the rides and that a risk assessment has been undertaken and approved.*

Key Questions

What are the keys to riding in a group?

- Communication,
- Space,
- Predictability.

What are some key tasks required for maintaining your bike in good and safe riding condition?

What are the key steps to replacing a bike tyre? (if this was covered)

