

Using bikes in the curriculum

Opportunities in secondary schools



Riding bikes fits naturally within the Health and Physical Education curricula however their impact is not limited to only the health and fitness of students. There are many links to the broader community, as well as bike being a great way to demonstrate key concepts that exist in other subjects. This list is by no means exhaustive but may provide some ideas for teachers.

English

- Explore influence by having students create media campaigns to increase bike riding activity in the school or community, or to improve safety of bike riders directly or by influencing other road users. Look at the methodologies used by the TAC and other agencies around the world to influence behaviour.
- Write an influential letter to the government or local council arguing for a change to a law, policy or infrastructure.
- Identify and evaluate arguments for the compulsory wearing of helmets using articles for each side of the argument.
- Create an instructional pamphlet or document on how to change a tyre on a bicycle, considering the audience, the informational requirements, the layout and the language to be used.

Mathematics

- Bikes can be used to collect measurement data for classes and class projects. For example, data on bike ownership (type, colour, size, etc) or on travel to school (transport mode, days riding etc) can be used to create a data set that can be analysed.
- Use a bike's trip computer to measure the distance around perimeter of a shape (like a circle or oval) to then compare it with other measurements (like the diameter).
- Use data measured on bike trips to determine the relationships between displacement (distance), velocity (speed) and acceleration. Riders can time the bike at different intervals on a journey.



Science

- Explore particle theory through the effects of wind resistance through cycling. By having students experience the wind resistance both as the leader and behind another rider, the presence and effect of particles can be explored.
- Explore the effects of friction as a resisting force by riding with different bikes of different types. Fast racing bikes provide little friction (thin, hard tyres etc) while heavy mountain bikes provide a lot. Inflate or deflate the tyres to explore the difference.
- Show the effect of Newton's Laws by coasting on a bike to demonstrate the friction force slowing the bike down from a constant velocity.
- Use data collected by a bike's trip computer and compare this with other measurements taken (by tape measure or laser) to explore measurement errors and uncertainty.
- Explore the conservation of momentum using bike helmets as an example. Create a 'helmet' to protect a falling egg and link this to how a bike helmet protects your head.
- Use a bike helmet to discuss the brain and the effects of injury on the brain.
- Explore how gears on bikes work. Measure the number of pedals to cover a distance in different gears and compare with the ease of riding.

Humanities

- Explore civics and citizenship by discussing bike laws (such as compulsory helmet use, riding on the footpath or road rules) and what these laws have of different parts of society.
- Discuss the roles of the different levels of government through bike laws and infrastructure. You can look at how a law is made, how they could the participate in the changing of the law, or how the can participate in the provision of infrastructure.
- Explore the role of government by creating a campaign to improve cycling infrastructure around the school. Invite a member of the local council to speak and discuss the information they need, and trade offs they make, when making decisions.
- Explore why cycling is so popular in the Netherlands. Look at what demographic, economic, infrastructure, cultural and physical geographic factors have contributed to that culture. Compare this to your local area to explore the commonalities, differences and opportunities.
- Explore the local geography through mapping a cycling trip. Plot important points along the way by following the course on a map, or create a map after a cycling trip that took in different points of interest.
- Use a mapping app to map a ride that the class does. Use the elevation changes and the plotted route to be able to create a topographic map of the local area.
- Explore transport in poorer countries and how bikes are used as a means of transport. Students can create a campaign to have old bikes fixed and donated to poorer countries.
- Explore the environmental impacts of car use and alternatives. Determine the benefits and challenges of the different transport modes, including bike riding.
- Explore the 'whole of life' impact of a bike, including the sourcing of materials, construction, use and disposal.



Health

- Explore the physiological effects of physical activity as a result of bike riding. Compare the effects from a brief high intensity ride with those from a longer aerobic riding activity. These can include sweating, temperature, heart rate and other effects.
- Explore the long term health benefits of exercise through cycling. What changes does the body undergo over time exposed to the stresses of exercise and how this occurs.
- Create training programs for different types of bike riders. Distinguish between sprinters and long distance riders.
- Investigate the links between riding for health and the effects on emotions.
- Explore how cities and communities can be designed to actively encourage healthier people through the use of pedestrian and cycling infrastructure.
- Investigate how people respond to outside stimuli through the lens of balancing on a bike. Look at how the senses work with each other (sight, touch, balance etc) to be able to control a bike subconsciously.
- Look at the importance of riding bikes in different cultures and different societies, especially how bikes are used differently between different socio-economic groups.

Electives and Extra-curricula

- Bike maintenance can be included as an elective or a component of a technology class. This could involve the ongoing maintenance of the school's collection of bikes or by making donated bike safe for students to ride, adding to the school's bike resources.
- A school bike club could be created with weekly or fortnightly rides after school or during a scheduled elective class.
 - BMX and mountain biking groups could also be included to explore local areas and BMX tracks during this time.
- A fitness club in school could incorporate bike riding as a key plank in developing fitness for teens.

Languages

- Explore the use of bikes in different cultures through foreign language texts.
- Explore the day to day life how a citizen will interact with their local community as a bike ride around their area.

