

## Cycling: Case scenario

Using Motor Learning, Cognition, and Task-Oriented Principles to Help Max Learn to Cycle

In the case example, Max is 9 years old and has not yet learned to ride his bicycle. His parents report that they have tried many times to teach him how to ride his bike without success. Max really wants to learn to ride his bike and it is also his family's goal as they like to go on family bike riding outings on the weekend. Max is very fearful of riding his bike and he is also embarrassed as he knows that most kids his age can do this easily.

When you ask Max to clarify what exactly he wants to do, he responds, "Ride my bike to the park". When you question him further, you learn that his goal is to "Go to the park with his neighborhood friends, riding a two-wheeled bike".

The first step is to get Max to think about all of the component parts of bike riding. You need to know what knowledge of the task he has already. You can ask him, "What do you need to be able to do to ride a two-wheeler?" He may need some prompting, to watch someone else ride, to look at YouTube videos or to watch you ride. He should identify that he will need to:

- Get on and off the bike
- Steer
- Balance
- Pedal
- Stop

Next, you want to ensure that Max has access to an appropriate-sized bicycle with brakes and that the pedals can be removed. Children often hurt themselves when they pedal so it is easier to learn without them. It also makes it easier to break the task down into 'sub-tasks'. The seat height should be low enough that Max can easily touch the ground with both feet when seated on the bike. Once the equipment is adjusted, and he has his bike helmet on correctly, head to the park/schoolyard/cul-de-sac – wherever there is a quiet, relatively flat, paved surface free from obstacles.

Now ask Max to show you how he gets on his bike. You may need to hold the bike steady for him. When Max gets on his bike, from the left side, you notice that he tries first to lift his left leg. Then, while he swings his right leg over the crossbar, he bends his left knee, flexes his trunk and his head, looking at his feet. You ask him if you can videotape him while he gets on his bike and you ask him to try again. You demonstrate to Max how you would mount his bike, you then show him the video of him trying to mount his bike and you ask him to identify the differences. Max is quite good at picking up and explaining the differences in postures and movements at the knees and trunk. When he mounts his bike the second time, he does it much more easily.

Now that he is on the bike, you need to reassure Max that you will be sharing the "jobs" with him. He will only have to concentrate on learning one thing at a time. You will do the other three things, so starting with steering; you will hold the seat so you are in charge of balance, pedaling (providing power) and stopping. All he has to concentrate on is holding the handlebars and steering. You will

likely need to help him discover the idea of looking ahead rather than down at the ground. Have him discover a strategy about looking ahead to a distant object. You may also see that he tends to flex his trunk and you may need to help him recall that the strategy of ‘staying up tall’ worked for getting on the bike, so maybe it will work for riding as well. If he is very fearful, you may need to have him just walk the bike as he learns to steer. Question him about how much force it takes to turn the wheel (very little) and the importance of doing it smoothly rather than jerking the wheel suddenly.

Once he is more comfortable with steering, move on to stopping. Now you are each doing two sub-tasks. You are providing power and balance, he is steering and stopping. Here you can also guide Max to discover the idea of putting his feet down on the ground once his body tips to increase his confidence. With the bike seat fairly low, this is usually quite simple to master.

Next up is balance. As he becomes more confident, he will be more comfortable with some speed and you can gradually release the seat and run alongside. When he has mastered these steps, then it is time to put the pedals back on and he can provide the power.

When he starts to pedal, you notice that he has very stiff leg movements and that he co-contracts his quadriceps and hamstring muscles simultaneously. Often, when he pushes with one leg, the other one is not pulling, impeding him from making a smooth pedaling motion. You suggest to Max to try one more thing today: you will provide him with verbal cues (i.e. "left" or "right") and when he hears your instructions, he needs to focus only on pushing with that foot, letting the other leg relax. After practicing for a couple of minutes, Max is able to perform several full strokes in a row. Some strokes are jerky, but he is able to do it! He is tired as he has a lot to remember - to ‘stay tall’, ‘look ahead’, ‘pull-push’, ‘steer lightly’ - but he is really proud of himself – and so are his parents!

You recommend that Max and his parents practice cycling every day, when the weather allows it. Max's parents have been active participants in the process, so they understand the steps, the teaching strategies, the verbal cues, and reminders. They have traded places with you during your session, so you had an opportunity to coach them on how to carry over the strategies at home. You give Max's parents a handout of "Tips for Cycling", available on *CanChild's* website ([www.canchild.ca](http://www.canchild.ca)).

When you meet again with Max, two weeks later, Max has a surprise for you: he can cycle! His movements are still a bit jerky, he has excess trunk movements, and he sometimes loses his balance and has to put one foot on the ground, but he cycles independently! In addition to sharing his excitement, you give him some feedback to improve how he performs the activity. You also provide him and his parents with ideas on how to grade the intensity for the next weeks (e.g., going for longer distances to increase endurance, incorporate riding on small inclines, practicing cycling in busier environments with a few more obstacles) and you encourage them to include cycling in their weekly activity to remain fit. Max is excited to bike to the park with his neighborhood friends, and is really pleased to be able to bike to school and participate with his class in their year-end cycling activity.

Max asked you if you couldn't also help him to learn swimming. You ask him if there are any strategies that helped him to learn to ride his bike that might also help in swimming....