



Basic lego engineering using gears & EV3 - Creating amusement park rides

Grade level(s) I use with: 5th - 8th

Lesson Overview: This started as an exercise with my Lego Robotics teams and I found it really effective to get students thinking not only about coding but about how to use gears to shift the simple circular motion of an EV3 motor in both direction and speed using gears. So I've started using it with all my classes as part of their EV3 unit - they love getting lego figures to whip around in various motions and I find they are much more willing to experiment with all sorts of gears to accomplish the motions that they are looking for. Be forewarned that you are going to see some pretty sadistic "rides" that slam legos all over the place but in the end no one is going to get hurt :-)

Materials and equipment I use: I do this right in the beginning when I am introducing EV3 coding since the actual code is usually very simple - lots of basic "drive motor A" with occasional playing with speed and direction. I have a huge bin with lego gears and all shapes / sizes as well as lots of various link axles - those combined with basic building blocks, an EV3 block and

at least one basic motor per group should work. I do have some students who prefer to create hand-driven “rides” since they are a bit easier to control and I don’t worry about whether they don’t use coding at all - that will come later when I give them a bot.

Here is a video of our latest efforts - this was during a summer Lego Robotics camp and students worked on these for about an hour. <https://youtu.be/105a2dSeA-0>

I share this video with students who are in need of inspiration - it has some pretty awesome gearing motion ideas and I’m sure you can see these seeding the creations in the camp. <https://www.youtube.com/watch?v=iOJ1OF1VXaQ>