

# BUILD IT

## Lesson Plan for Figure 8 Challenge

### Materials

For each student

- NXT Lesson 4

For each group

- Mind Storms NXT Base Set
- Custom BUILD IT NXT cable
- Parts from Technology Set and Educational Resource Set
- Two or more propellers
- Two slow motors
- Computer with NXT-G software
- USB cable or Bluetooth enabled on computer
- Two towels – one at desk/table to work on robot and one to carry around and wipe robot immediately after testing

### Procedure

1. Go through NXT Lesson 4 30 – 45 min
2. Introduce Figure 8 Challenge 10 min

Rules:

  - Two buoys equally spaced from the end of the pool and each other.
  - Two pieces of tape about 2 feet apart at one end of pool, close to one of the buoys.
  - Bot starts at the edge of the pool, somewhere between the two marks.
  - When teacher says go, bot is released.
  - Bot must go around the first buoy, cross through the middle of the two buoys, around the second, cross the middle again in the opposite direction, around the first buoy once more and back to the start. Should trace out something like a figure 8.
  - Touching buoys is ok, but moving them too much can mean disqualification.
  - Wire control is still important. Now that the bot has two motors and should be able to control its rotation, there should be very little interference from the cable.
  - Fastest time wins.
3. Build and testing time. 90 – 120 min
4. Conduct challenge. 20 – 30 min
5. (Optional) Robot Trade 20 – 40 min
  - Have groups pair up and trade robots to see first-hand how other designs work. If possible, each group should disconnect their controller from their bot and trade controllers as well. They should then test out their bot with the other controller and then test the other bot with their controller. If time permits, allow group pairings to rotate, so that each group can trade with as many other groups as possible.
6. Logs, presentations, and review 15 – 30 min
  - Allow time for students to finish logs.
  - Optional – have a presenter from each group show their bot and discuss what they did.