

# BUILD IT

## Lesson Plan for Final Challenge

### Materials

For each student

- NXT Lessons 6, 7, 8, and 9

For each group

- Mind Storms NXT Base Set
- Custom BUILD IT NXT cable
- Parts from Technology Set and Educational Resource Set
- Three or more propellers
  - The vertical propeller(s) could be the airplane propeller(s) if desired
- Three slow motors
- Optional fourth motor
- 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 (or hand out) remaining NXT Lessons 45 – 60 min (or 10 min)
2. Introduce Final Challenge 10 min  
Rules:
  - Several game balls are prepared.
    - Each ball is a wiffle ball containing a hoop passing through two holes. The hoop may have some float attached to the top to help it to stand up. The ball needs to be weighted with enough pennies to barely sink it.
    - There should be two types of hoops – small hoops and big hoops.
  - The balls are placed in the pool, scattered around randomly.
  - Two goals are set up
    - A large bin gives 1 point for a large-hoop ball and 2 points for a small-hoop ball.
    - A small bin gives 3 points for a large-hoop ball and 6 points for a small-hoop ball.
    - The bins can simply be aluminum baking pans.
  - Each bot starts at the surface.
  - When the teacher says to start, the bot will have 5 minutes to score as many points as possible.
  - More than one ball may be picked up at a time, if the bot is able to.
  - Cable control is minimal – just enough to keep the cable out of the bot's way.
  - Most points scored within 5 minutes wins.
3. Build and testing time. 90 – 120 min
  - Be sure to constantly check on each group to see how the students are progressing. Be ready with any appropriate demos.
4. Conduct challenge. 30 – 45 min
5. Logs, presentations, and review 15 – 30 min
  - Allow time for students to finish final logs.
  - Optional – have a presenter from each group show their bot and discuss what they did.
6. Conduct post-project assessments 20 – 30 min
  - Make sure students fill out bubble sheets with a dark pen or pencil, begin careful to fill in each bubble carefully.
  - Confidence levels: 1 is very low, 3 is so-so, and 5 is certain.
7. Have students fill out post-project surveys. 10 – 15 min