

## **Lesson Plan: LEGO Mindstorms NXT Robotics**

**Subject:** Robotics/Computer Science

**Length of lesson:** 210 minutes (1 hour in the morning, 2.5 hours in the afternoon)

**Concept or Skill Focus:** Learning and understanding the functionality of robots and drag and drop code.

**Goal:** To become familiar with LEGO NXT Mindstorms robots, sensors, and programming language

### **Objectives/Outcomes:**

- To understand the basic functionalities and movement of the NXT robot
- To become acquainted with NXT sensors such as color, ultrasonic, and touch sensors
- To become familiar with NXT drag and drop programming language
- To learn the significance of teamwork and cooperation

### **Materials**

- Computers/laptops with the LEGO Mindstorms software
- NXT robot kits
- Connections
- Black/blue/white tape
- Smartboard/whiteboard

### **Activities and Timeline (Introduction, Middle, Conclusion)**

#### **Introduction (first 45 minutes)**

- Introduction to robotics, parts of an NXT robot, basics of drag and drop language
- Build robots (in groups of 2-3, preferably no more than 1 person with experience in each group)
- Begin programming the robots to create basic shapes with loops

#### **Middle (1.5 hours after lunch)**

- Introduce sensors (touch, ultrasonic, then color) and conditionals
- Bump into walls with touch
- Follow lines with color

#### **Conclusion (second 1.5 hours)**

- Continue challenges from middle portion
- Adjust code, use sensors, and add to robots to prepare for Battlebots
- Compete in Battlebots

#### **Possibilities for Advanced Groups**

- Follow walls with ultrasonic