Exploring Robotics: Unit 1 - Transportation

Standard 1: STCO.06.02: Understand and apply tools, materials and processes of technology.
Standard 2: ITPR.02.01 Utilize software development processes and methodology.
Standard 3: ITPR.02.01.a Demonstrate Problem analysis for a given software problem.
Standard 4: ITPR.02.02 Create design specifications of a computer application.

Knowledge (what do you want them to be able to KNOW at the end of the unit):

Engineering Design:
- **Students will be able to describe the engineering design process.**
- **Students will be able to discuss why engineers use the engineering design process.**

Skills (what do you want them to BE ABLE TO DO at the end of the unit):

Building:
- **Students will be able to construct a two-motor LEGO® MINDSTORMS® robot.**

Programming:
- **Students will be able to use the Motor Control VI for movement and stopping.**
- **Students will be able to use the Wait for Time VI for controlling timing.**

Essential Question(s):
What is the Engineering Design Process?
How do you make a robot move autonomously?

Key words/vocab:
autonomous vehicle: a vehicle that operates independently of continual input from the user
block diagram: a part of the LabVIEW for LEGO MINDSTORMS program where code is written by wiring together graphical representations of functions and VIs
code: a series of commands that tells the robot what to do
compile: translate the code into a language that the processor can understand
direct mode: a programming mode in which the NXT Brick is connected to the computer via USB or Bluetooth®, and the program executes on the computer
download: load the compiled program onto the NXT Brick
engineering design process: a guideline that engineers follow to ensure that their product is designed efficiently and effectively
front panel: the part of the LabVIEW for LEGO MINDSTORMS program where a user interface can be placed
prototype: a model of a design on which tests can be performed to evaluate whether the design should be used for the final product
remote mode: a programming mode in which the NXT Brick does not need to be connected to the computer, and the downloaded program executes on the NXT Brick
Virtual Instrument (VI): a LabVIEW for LEGO MINDSTORMS program

WICOR Strategy: **Collaboration - Students will work in small, collaborative groups to complete all the tasks** **Inquiry - Students will identify, brainstorm, and solve a problem**	
Unit Performance Assessment: **1. Unit 1 Quiz: multiple choice, short answer, vocabulary** **2. Group presentation of programming solutions and final robot build**	**Formative Assessments (daily/weekly):** **1. Engineering notebook** **2. Writing prompts/discussions** **3. Exit tickets**