| Name: _____	Club or School:_____
Robots Knowledge Survey (Pre)	

Multiple Choice: For each of the following questions, circle the letter of the answer that best answers the question.

1. A robot must be _____ in order to move
   A. controlled by a remote
   B. computerized
   C. programmed
   D. motorized

2. A programming loop does which of the following
   A. Creates a circle
   B. Stops the program code
   C. Performs multiple functions
   D. Repeats a section of program code

3. A computer program consists of _____ that tells the computer to do something
   A. sensors
   B. code
   C. lights
   D. robots

4. What enables a robot to interact with its environment?
   A. Tires
   B. Sensors
   C. LCD panels
   D. Mechanical arms

5. Predict what the robot will do when this program is downloaded and run.
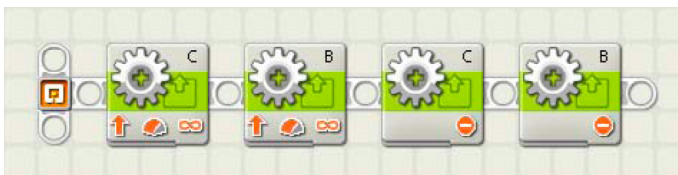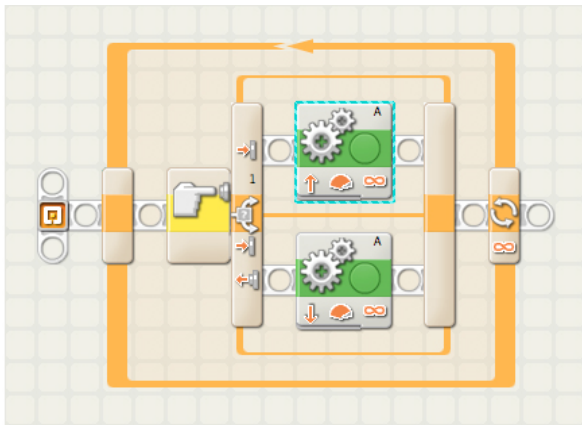

   A. Move forward
   B. Nothing
   C. Move backwards
   D. Turn for 360 degrees

6. What is a computer program?
   A. Computer generated text
   B. The insides of a computer
   C. Instructions written in a language a computer understands
   D. Language a robot can understand

7. Which of the following is a wireless connection?
   A. Bluetooth

  B. RCX
  C. USB
  D. Serial port

8. What is a ratio?
  A. The mathematical relationship between two numbers
  B. Equal to a gallon of water
  C. Equal to ten feet
  D. A sensor on the RCX

9. If a plate is 1/3 as thick as a brick how many plates would you need to equal one brick
  A. 3
  B. 4
  C. 2
  D. 1/3

10. Firmware allows electronic hardware to?
  A. Move forward
  B. Talk to the computer
  C. Understand a software program
  D. Detect changes in light

11. What is pseudocode?
  A. Code that works on any computer
  B. A computer program that works
  C. Code that is written in your own words
  D. A computer program that stops working

12. When programming your robot a switch block is used to _____.
  A. ask a question
  B. stop the program
  C. speed up the program
  D. repeat the code

13. What does the math symbol "<" mean?
  A. Greater than
  B. Less than
  C. Equal to
  D. Equal to or greater than

14. If you had a light sensor reading of 35 for dark and 55 for light what should the threshold value be?

  A. 90
  B. 50
  C. 45
  D. 40

15. Which would be an example of multi-tasking?
  A. Having your robot move forward on a table
  B. Having your robot turn for 2 seconds
  C. Having your robot measure a distance as it identifies an object to lift
  D. Using the light sensor to move forward

16. The "degrees out" reading on the motor block icon works like what on a car?
  A. Speedometer readout

B. Fuel level
C. Steering wheel position
D. Odometer readout

17. What is the primary purpose of gears?
   A. To transfer motion from a light sensor to the motor
   B. To transfer motion from a motor to an axle
   C. To stop the robot
   D. To make the robot move backwards

18. Which ratio of driven-to-driving gear diameter will permit your robot to cover 3 feet the fastest
   A. 6:1
   B. 4:1
   C. 1:1
   D. 1:6

19. Which ratio of driven-to-driving gear diameter has the most torque
   A. 6:1
   B. 4:1
   C. 1:1
   D. 1:6

20. In computer programming what is a "variable" block used for?
   A. To repeat code
   B. To do simultaneous tasks
   C. To store information
   D. To jump around in the program

21. The following code uses two important coding commands (in addition to motor operation blocks) - the first command is a _____ and the second command is a touch sensor _____.

   A. Move forward, Move backward
   B. Stop, Loop
   C. Switch, Loop
   D. Loop, Switch

22. Collecting information about how far your robot will travel in a given amount of time and using the information to estimate how long it will take the robot to go a given distance is called _____.
    A. A ratio
    B. Pythagoras Theorem
    C. Threshold value
    D. Calibration

23. A farmer in Australia should use _____ latitude and _____ longitude geographic coordinates.
    A. positive, positive
    B. negative, negative
    C. negative, positive
    D. positive, negative

24. What is "geographic latitude"?
    A. Angular coordinate in east-west direction
    B. Angular coordinate in north-south direction
    C. Linear coordinate in east-west direction
    D. Linear coordinate in north-south direction

25. What is the 40 degree 15 min 36 sec latitude coordinate in decimal degrees?
    A. 40.1536
    B. 40.2536
    C. 40.2600
    D. 40.1560

26. What is the distance between points with local coordinates (in meters):
    Point 1 – 30 m Easting and 0 m Northing
    Point 2 – 0 m Easting and 40 m Northing
    A. 50 m
    B. 70 m
    C. 40 m
    D. 0 m

27. When placed 3 ft above ground a camera covers 2 ft x 3 ft area. What area will be covered if the same camera is placed 4.5 ft above ground?
    A. 2 ft x 3 ft
    B. 3 ft x 4.5 ft
    C. 4 ft x 6 ft
    D. 1.33 ft x 2 ft

28. Radio signal travels 300,000 km in 1 s. How long does it take for GPS signal to travel from a satellite located 20 km up in the sky to a received placed on the ground
    A. 0.0667 seconds
    B. 0.000667 seconds
    C. 0.0000667 seconds
    D. 0.000000667 seconds

29. Color image is produced using _____, _____, and _____ light reflectance measurements.
    A. Red, Yellow, Black
    B. Red, Green, Blue
    C. Near-Infrared, Red, Green
    D. Black, White, Grey

30. On a map any object can be represented as _____, _____, or _____.
    A. Point, Band, Area
    B. Polygon, Square, Triangular
    C. Line, Dot, Circle
    D. Line, Polygon, Point

31. Map scale of 1:250,000 means that 1 in on the map corresponds to _____ miles in real world (1 mile = 5280 ft, 1 ft = 12 in).
    A. 3.95
    B. 250
    C. 20,833
    D. 0.25

32. If a robot travels from point A directly to point B 120 ft away in 2 minutes its average speed is _____ ft/s.
    A. 60
    B. 1
    C. 10
    D. 5

35. The diameter of a robot's wheel is 3 cm. What is the radius of the wheel?
    A. 1.0 cm
    B. 1.5 cm
    C. 2.0 cm
    D. 2.5 cm

36. What formula would you use to find the circumference of a robot's wheel?
    A. $C = R/2$
    B. $C = 2R$
    C. $C = 2\pi R$
    D. $C = \pi R^2$

37. The wheel of a robot has a circumference of 31.4 centimeters. How far will the robot travel if the wheels rotate 1080 degrees?
    A. 31.4 cm
    B. 62.8 cm
    C. 94.2 cm
    D. 720 cm

38. A robot's wheel has a diameter of 5 cm. How far will the robot travel if the wheels rotate 720 degrees?
    A. about 10 cm
    B. about 31.4 cm
    C. about 720 cm
    D. about 6.28 cm

39. A robot travels x meters in the first 5 minutes, y meters in the second 5 minutes and z meters in the third 5 minutes. Which of the following expressions represents the average number of meters per 5 minute interval that the robot traveled?
    A. $x + y + z$
    B. $3(x+y+z)$
    C. $3(xyz)$
    D. $(x + y + z)/3$