Botball Lesson Plan

Title: Navigating with the CBC camera

Concept / Topic to Teach: Using the camera

Standards Addressed:

Goal:
By the end of this activity, students will be able to track colored objects using the CBC camera.

Anticipatory Set:
This is important because Botball game objects are typically colored and may similar items with different colors may swap places each round. Being able to determine which colored game piece is where is very important to a highly successful robot.

Time Required:
Required Materials: Computer with KISS-IDE, Demo bot, download cable

Activity Procedure:
1. Open KISS-IDE
   a. Target: CBCv2
   b. New Program
2. Watch both videos
3. Try it out

Assessment:
Using the mock up game board with starting box, coke can (or other vividly colored object), and black duct tape line that leads to a finishing box.
Students will:
1. Begin with their robot in the starting box.
2. Turn towards the can using the color camera
3. Push the can into the finishing box (line following may be helpful)

Extension Activities:
Have the students use the same code, as above, but start the robot an inch, then 2 and so on from their original starting position. Does the robot still find the can and move it to the finishing box?
Repeat with code that does not use the camera (or tophat sensors).
Move the can an inch from its original position each time.
Which is more reliable when everything does not start in the perfect location?
Using sensors or only using mtp?

Camera Handout

Color models
Set the color range for each color model using the CBC "Vision" screen.
The highlighted areas are the colors that match the currently selected color model.
The green bounding box is what the CBC considers to be the "Blob"

Blobs are ranked in order of their size. 0 is the largest, followed by 1, and so on.

Programming
track_x(color model, blob) – Returns the x (left to right) value of the center of the blob
track_y(color model, blob) – Returns the y (top to bottom) value of the center of the blob
track_update() – Updates the photo that the CBC analyzes for track_x and all other camera functions

Refer to the help manual found in the help tab of KISS-IDE for additional functions.