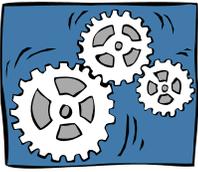# LEGO ROBOTICS DAY CAMP

Leading Questions during Can Do & Challenge Phases

- ❖ What are you trying to do?
- ❖ What other ways could you do this? What other ways could this be accomplished?
- ❖ How does that work?
- ❖ Are there trade-offs?   What are they?
- ❖ What could go wrong? What makes doing it this way hard? How could you make it easier?
- ❖ What do you need to know to make this work? What tests could you make or do so that you know what you need to?
- ❖ Where does the robot expect to start? (Initial conditions; assumptions)
- ❖ Does the robot expect to have its {arm, pusher, basket ...) in a certain position or place when you start?
- ❖ What is the robot looking for/ expecting? Is that what you want it to look for?
- ❖ How does the robot know when to {turn, stop, start, ...}?
- ❖ How does the robot know where to {turn, stop, start, ...}?
- ❖ What can we use on the board/table/playing field to show the robot {where, when} to {turn, stop, start, reach, ...}?
- ❖ Does the program expect/ assume the robot to go {fast, slow, forward, backward, straight, ...}?
- ❖ Are the motors going the direction the program expects? Do you need to change the orientation of the wires? (Motor polarity)
- ❖ Is the program talking to the same ports that have wires connected to them on the robot?
- ❖ How do you know you have the right value? How much is too much?   How much is too little?   (Bracket parameters)
- ❖ Is it too {wide, narrow, long, wobbly, fast, slow, ...}?   Could you change that?
- ❖ If you change this one thing about the robot, what else has to change?   Will that affect your program?   How?
- ❖ How can you make the robot turn {more tightly, faster, slower, a specific amount/distance, right, left, ...}
- ❖ How can you make the robot go {faster, slower, forward, back, ...}?
- ❖ How can you make the robot find the {landmark, wall, line, ...}?
- ❖ What's the smallest change you can make to test this?
- ❖ What are you testing? Is that one thing or more than one? How could you test less?   (May not be possible)
- ❖ How many times have you tested?   Is it enough? (Rule of thumb – test at least three times/ repeats)
- ❖ Did the program get changed?   (Notice passive phrasing so as not to seem blaming.)
- ❖ Did the robot get changed?

Leading Questions during Can Do & Challenge Phases

- ❖ Did something happen to change the _____?
- ❖ Does everything that used to work well still work well?   (Regression testing)
- ❖ Do you need to make something (a jig, a device) to help you {line up, position, set, ...} the {robot, arm, pusher, ...}?
- ❖ What if you push instead of pull?
- ❖ What other way could you do this task? What other way could you solve this problem?   Push, pull, drop, lift, approach from the {front, top, side, back, ...}, sweep, backhand, ...?
- ❖ Have you asked your teammates what they think? Do they have suggestions?
- ❖ Has someone else on the team written a program with this icon?   How does that program work?
- ❖ Have you turned on Context Help?
- ❖ Can you think of a tool or device that makes an action that would help you? Scissors? Hook? Bulldozer? Lever? Crane?   ...
- ❖ What do you think the problem is? Why?   Can this problem be split into parts?   What are they?
- ❖ What did you last change?   What was last changed?
- ❖ What does this do?   How?
- ❖ Do you need to take a break?
- ❖ Take a deep breath.   Let it out slowly.   Are you ready to try again?   Would you feel better if one of your teammates helped you?
- ❖ Can you talk to {teammate} about it? Maybe {she, he} has some ideas.   Who else might have some good ideas?   Is there a {book, website, ...} where you could look for some more ideas?
- ❖ Try listening as if you just walked in to the room for the first time.   Try explaining this problem to me as if I as {a guest who just came in, a space alien, another coach, a judge, ...}.   Try listening with a fresh pair of ears.
- ❖ How would you explain this problem to your {science teacher, Mom, Dad, another PA (program aide), mentor, coach, ...}?
- ❖ Tell me what this program is supposed to do, step by step.   Slow down and let me catch up.