**Pair Programming Guide**

**Discussion**

Innovation can occur when people work together or independently. People working collaboratively can often achieve more than individuals working alone. Learning to collaborate effectively includes drawing on diverse perspectives, skills, and the backgrounds of peers to address complex and open-ended problems. In this activity, you will be ***pair programming*** with a partner to create a program.

**Make a Plan**

Get a link to the programming exercise from your teacher. With your partner, read the exercise description. When you feel that you understand the problem, make a plan with your partner.

1. Explain your understanding of the problem to your partner. What is the exercise asking you to do? Does your partner agree? (If there is a conflict between you and your partner’s understanding of the problem, reread the exercise description and discuss. Come to an agreement before moving on.)
2. Describe how you plan to divide your work (it helps to break the large problem down into solvable subproblems!)
3. Who will be responsible for completing which pieces?

**Implement Your Plan**

* Choose roles!
  + When pair programming, one person will be the *driver*, and one person will be the *navigator*.
    - The *driver* types out the code, focusing on the details of implementing the current goal.
    - The *navigator* observes the code being written, points out any immediate quick fixes, and thinks about the big picture.
  + Agree on one person to start as the driver, and one person to start as the navigator. *You should switch roles every 15 minutes, or as it makes sense with your current objective.*
* Set goals!
  + Agree on one tiny goal to achieve at a time. Something you can solve in less than 15 minutes. State the goal out loud to your partner to clarify the goal and ensure you both know what you are working on *right now*.
* Support your partner!
  + When you’re the driver, complete the tiny goal quickly, ignoring larger issues. Trust the navigator to be your safety net.
  + When you’re the navigator, stay focused and read the code your partner is writing. Bring up errors and code that you find unreadable right away. Jot down larger issues that you will tackle later, so that the driver can stay focused on the current tiny goal.
* Talk a lot!
  + Say what you are about to do, ask for an implementation idea, ask for a better way to solve the current problem, bring up alternative ideas, point out possible situations that the code doesn't cover, suggest clearer names for variables and functions, suggest ways to implement the code in smaller steps.
  + “Does that look right?” “What’s next?” “What would you do?” “Here’s what I would do...”
  + Continually ask for input from your partner. You should facilitate contributions from your partner and make sure they are appreciated.
* Resolve conflicts!
  + It’s okay if you and your partner disagree! Take the time to let both sides make their case. Discuss the pros and cons of each side and come to an agreement on what should be done.
  + It’s okay to ask for help, you and your partner are not alone! If you cannot come to an agreement, ask a classmate or your teacher to hear both sides and facilitate a compromise.
* Celebrate!
  + Take time to celebrate as you complete goals and overcome problems. Make sure to tell your partner when they’ve done a good job!

**Reflection**

1. What smaller problems did you solve as you developed a solution to the large problem?
2. What is one conflict that you and your partner encountered? How did you resolve this conflict?

1. Provide three pieces of feedback to your partner:
   1. What is one thing you enjoyed about working with your partner?
   2. What is one way in which your partner can improve?
   3. What is one thing you learned from your partner?

Pair programming tips sourced from <http://www.wikihow.com/Pair-Program>