Name: _____ Date: _____ Class: _____

Hare and Snail Challenges Worksheet Answer Key

1. **Write out the key points to keep in mind as you construct the robot for the Hare Challenge.**

   FASTER – increasing gear ratio, increasing motor power, decreasing robot weight.

   In the Hare Challenge, use the minimal number of parts on the LEGO robot, that is, keep the weight low. One solution is to attach the largest gear (40-tooth) to the motor and the smallest gear (8-tooth) to the wheel. It does not matter what gears are between the 40-tooth and 8-tooth gears since they act as idler gears. Finally, use the maximum power setting on the motor. Expect some trial and error to be necessary.

   If an odd number of gears, the program should direct the robot to go forwards, however, if an even number of gears, the program should direct the robot to go backwards (in order to make the robot go forwards since an even number of gears reverses direction).

2. **Sketch the program you will use for the Hare Challenge.**

   Simply move forward in a straight line with the highest power setting.

3. **Write out the key points to keep in mind as you construct the robot for the Snail Challenge.**

   SLOWER – decreasing gear ratio, decreasing motor power, increasing robot weight.

   In the Snail Challenge, use a heavy LEGO robot, since heavy machines move slowly with the same motor. Then attach the smallest gear (8-tooth) to the motor and the largest gear (40-tooth) to the wheel. It does not matter what gears are between the 8-tooth and 40-tooth gears since they act as idler gears. Finally, use the minimum power setting. Expect some trial and error to be necessary.

   If an odd number of gears, the program should direct the robot to go forwards, however, if an even number of gears, the program should direct the robot to go backwards (in order to make the robot go forwards since an even number of gears reverses direction).

4. **Sketch the program you will use for the Snail Challenge.**

   Simply move forward in a straight line with the lowest power setting.