

8.3F Activity: Testing Chain and Sprocket- Fundamental

Name:

Class/Period:

Date:

Question Sheet

Question 1 What is the gear ratio for a 40T to 40T sprocket and chain drive?

Question 2 If the driver sprocket is turning in a clockwise (CW) direction, which way is the driven sprocket turning?

Question 3 What is the gear ratio of a 10-tooth to 40-tooth sprocket and chain drive?

Question 4 Would this drive train result in an increase in speed or an increase in torque?

Question 5 What gear ratio is produced by replacing the 10T sprocket with a 24T sprocket?

Question 6 Is the 15T sprocket effective?

Question 7 Is the 24T sprocket effective? In which position?

Question 8 In which position does the 40T sprocket function most effectively?

Question 9 How many turns did the center sprockets turn?

Question 10 How many turns did the upper right sprocket turn?

Question 11 In what kind of drive train would you find sprockets daisy chained together?

Question 12 Would it be possible to drive all three axes along the diagonal with gears?

8.5 Activity: Building the Tumblebot

Name:

Class/Period:

Date:

Question Sheet

Question 1 Why is it called the Tumblebot?

Question 2 Why do you think the Tumblebot uses omni wheels?

Question 3 Why does the Tumblebot use chain and sprocket instead of gears?

Question 4 If you used gears instead of chain and sprocket how would the robots design change?

Question 5 What attributes of the Tumblebot do you like?

Question 6 What attributes of the Tumblebot do you dislike?

8.7 Activity: Program the Tumblebot Drivetrain

Name:

Class/Period:

Date:

Question Sheet

Question 1 Which direction (forward or backward) does the left side of the robot go when its PWM value is 255? How about the right side?

Question 2 How does the chain affect the direction of each side of the drive train?

Question 3 Why do you think the Tumblebot uses omni wheels?

8.9F Activity: Writing an Arcade Function - Fundamental

Name:

Class/Period:

Date:

Question Sheet

Question 1 Why do you define local variables at the beginning of a function?

Question 2 Why are semicolons required?

Question 3 What would happen if the values of the left and right motors were not limited to values between -127 and 127 ?

Question 4 Did your 2 motor arcade function work as expected?

Question 5 What would you change if you wanted to use the left joystick on the transmitter instead of the right one?

8.11 (Activity): Introduction to Freeze Tag

Name:

Class/Period:

Date:

Question Sheet

Question 1 Why use an interrupt for the bumper switch instead of a digital input?

Question 2 What does "break" do in a case statement?

Question 3 Why do you need case 2 in the switch statement in this activity?

Question 4 What does state++ mean in C code?

Question 5 Two robots collide head on and both turn off. What happened?
