



Robotics Alliance Project Design Guide

Assigned Reading & Reflection
Questions

Set #3 Part 1

Reading Assignment #3 Part 1



Section 4.1-4.5
(pages 57-75)



Reflection Questions
(listed on following
slides)



5 points per question
x 17 questions = 85
points

Question 1: Brushed and Brushless Motors

- ♦ Find an internet resource that explains the difference between brushed and brushless motors. Describe the differences in your own words. Include the link to your chosen webpage.

Question 2: Motor Specs

- ♦ List and define with units the most useful motor specs.

Question 3: Motors for Mechanisms

- ♦ Which motors are best for intakes? Drivetrains? What are the similar properties of these motors based on use case?

Question 4: Motor Curves

- ♦ Watch the 973 motor curve video. Explain in your own words how a motor curve works. Paste images of the motor curves for a NEO, NEO550, RS775 Pro, CIM and a Falcon 500.
 - ♦ [FRC 973 Motor Curve `Video](#)

Question 5: Torque & Speed

- ♦ Explain the relationship between torque and speed in motors.

Question 6: Torque, Power & Speed

- ♦ When you double the number of motors in a mechanism, what happens to:
 - ♦ Torque
 - ♦ Speed
 - ♦ Power
- ♦ Why?

Question 7: Reduction

- ♦ Define reduction. How can you achieve reduction in a mechanism?

Question 8: Free Speed & Output Speed

- ♦ Create a flowchart for how to convert free speed into output speed with the JVN spreadsheet.

Question 9: VersaPlanetary

- What is a versaplanetary gearbox? Sketch a diagram and label each section of the gearbox.

Question 10: Reduction Stages

- Where should the highest reduction stage go? Why?

Question 11: Versa Vs Ultra VS AM Sport

- ♦ Compare and contrast the versaplanetary, ultraplanetary and AndyMark Sport gearboxes.

Question 12: Servo Motor

- ♦ What is a servo motor? What kinds of mechanisms are they used for?

Question 14: Bearings

- ♦ What are bearings used for? List the different types of bearings and their uses.

Question 15: Bushings

- ♦ What is a bushing? What are their uses cases?

Question 16: Live & Dead Axles

- ♦ What is a live axle? What is a dead axle?

Question 17: Torque Transfer Shafts

- ♦ Fill in the table of torque transfer shaft profiles below.

Type	Sketch of Profile	Common Sizes	Vendor	Description/Use Cases
Hex Shaft				
Thunderhex				
Round Keyed				
D Profile				
Square				