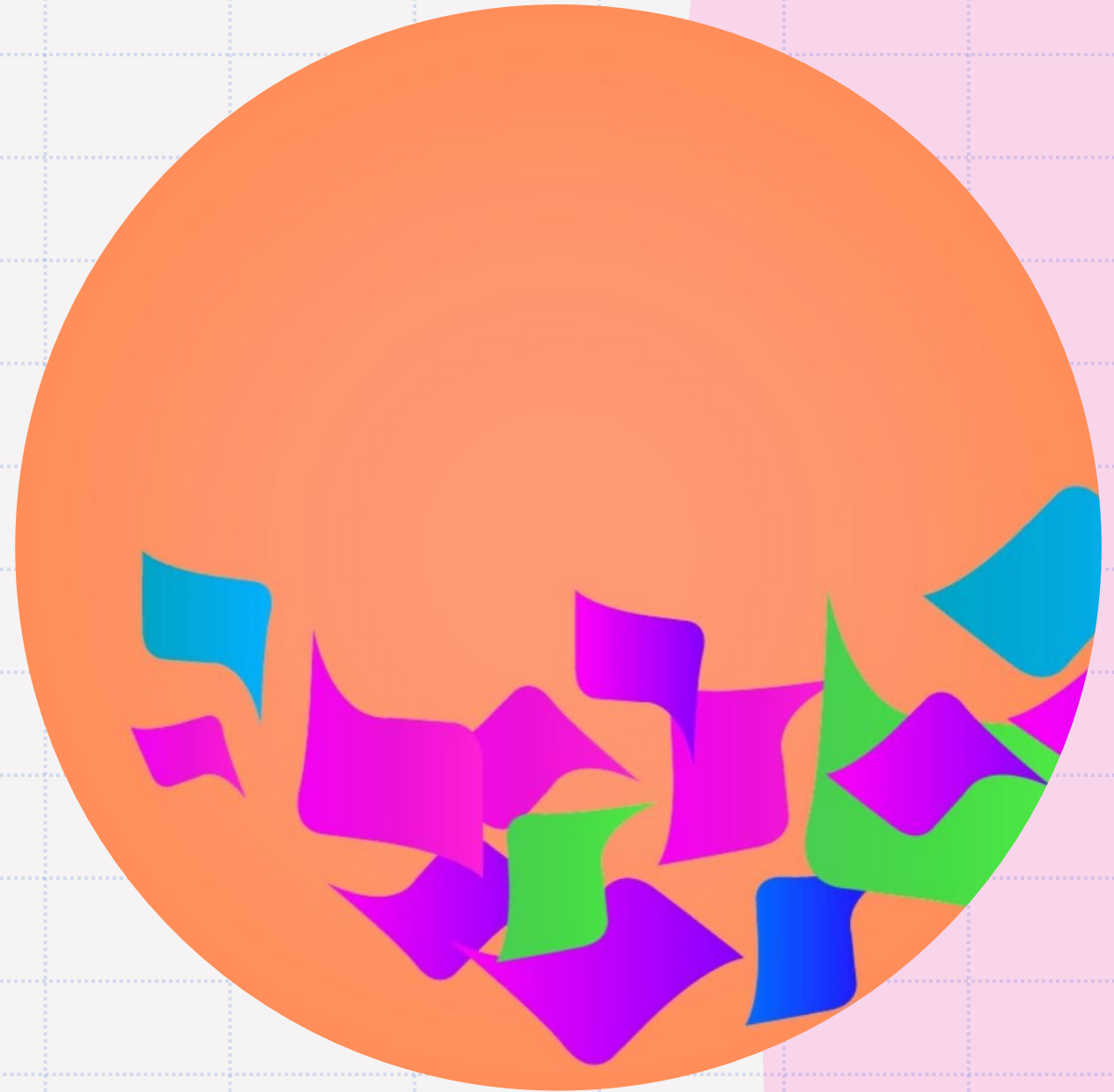


# Robotics Alliance Project Design Guide

Assigned Reading & Reflection  
Questions

Set #2



# Reading Assignment #2



Section 3 (pages 31-56)



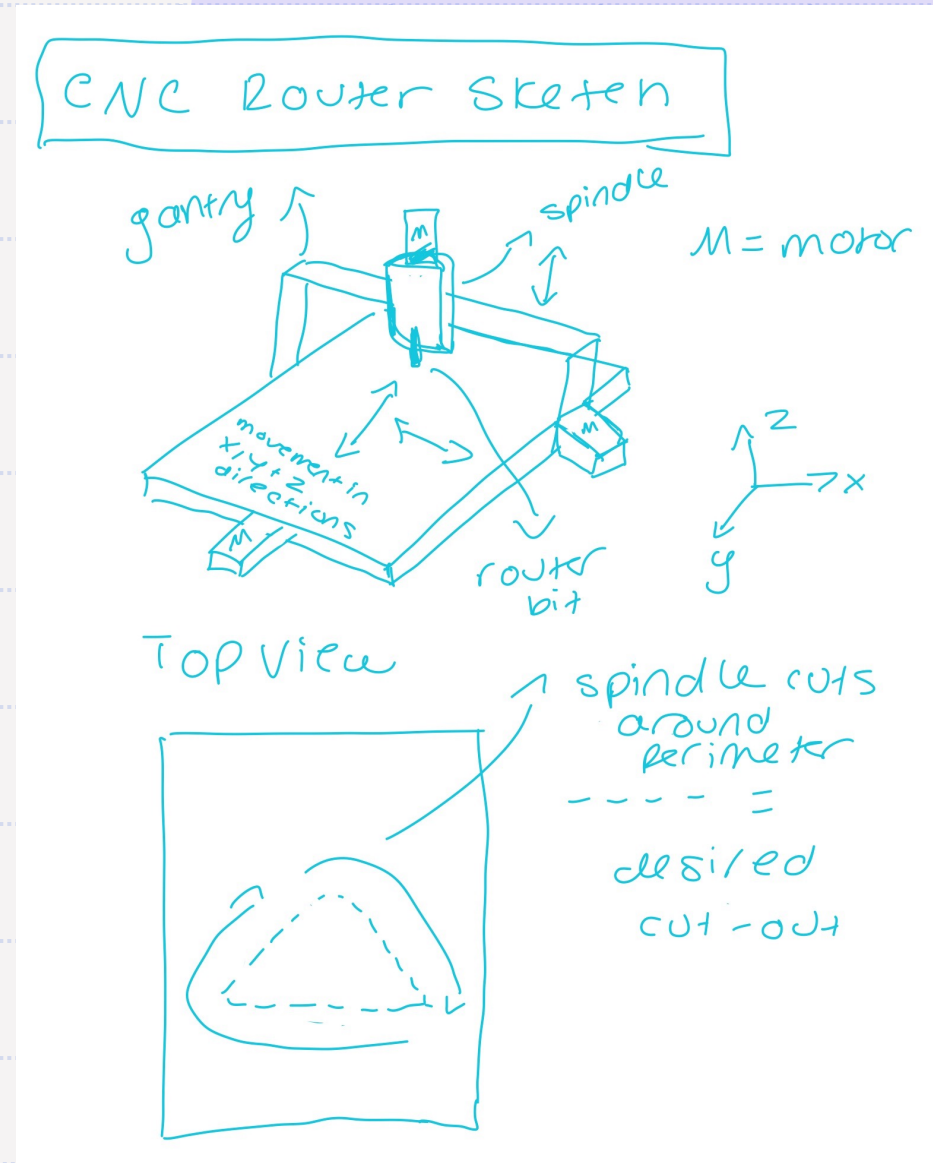
Reflection questions (listed on following slides)



11 questions x 5 points/question =  
55 points

# Question 1: Manufacturing Methods

- Draw hand sketches with labels of how the machines listed below work. An example for the CNC router is provided for you.
- CNC Router
- 3D Printer



**Question 1: INSERT CNC ROUTER  
SKETCH HERE**

**Question 1: INSERT 3D PRINTER  
SKETCH HERE**

# Question 2: Box Tube Construction

Define "box tube construction"

# Question 3: Round Tube Construction

- What is round tube construction and what are the benefits of it?  
What do you think are some of the cons?

# Question 4: Welding

- Describe how welding works. What is TIG welding versus MIG welding (hint, you may need to consult Google!)



# Question 5: Plate & Standoff Construction

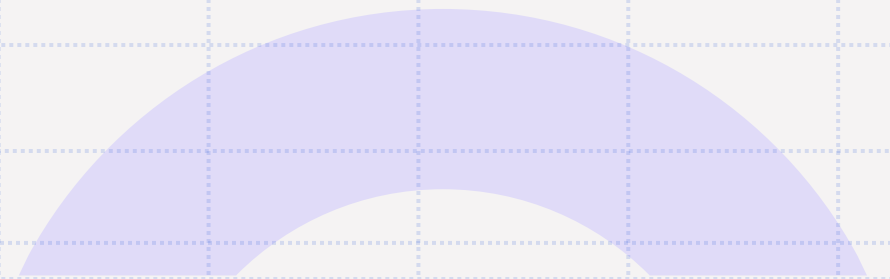
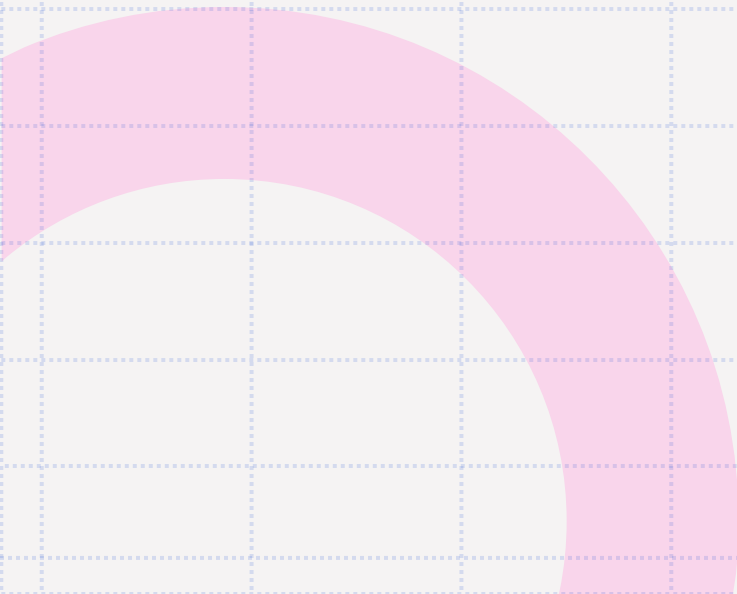
What is plate and standoff construction? Sketch an example assembly by hand.

# Question 6: Standoffs & Spacers

When would you use standoffs and when would you use spacers?

# Question 7: Sheet Metal Bend Radius

Why is the bend radius important when designing for sheet metal?



# Question 8: Shrinking & Stretching

- What is shrinking and stretching in sheet metal? What is the K-factor and what is the formula for calculating K-factor?

# Question 9: 3D Printing

When is 3D printing a useful manufacturing method?

# Question 10: 3D Prints & Threading

- What hardware should be used when threaded holes are needed in a 3D printed part? Link an example of this hardware from McMaster Carr.

# Question 11: Lightning Patterns

List types of lightning patterns and create hand sketches of each style.