2. **Employ scientific reasoning to make informed decisions in AFNR systems. Students who demonstrate learning can:**

- 2.01 Design and complete an experiment using the scientific method.

Steps of the Scientific Method
1- Make on observation
2- Ask a question
3- Gather background data
4- Form a hypothesis
5- Test the prediction (gather and analyze data)
6- Draw Conclusions

Steps to the Engineering Design Process
1- Define the problem
2- Ask questions about the problem
3- Imagine ways to solve the problem
4- Plan solutions for the problem
5- Prototype models
6- Test
7- Improve and refine

Scientific method is different from the engineering design process. The engineering design process is typically more common. In the engineering and design process, you create something to solve a problem. Using the prototype, design, and test and refine process can be effective. The scientific method uses a more robust data collection and analysis process designed to control variables except for the one being tested. This allows for more rigorous and repeatable experiments. Using the scientific process, we can move towards knowledge and truth.

- 2.02 Employ scientific measuring skills.

Time- Minutes
Mass- Grams (weight measured in pounds, different than mass)
Volume- Liter, Gallon, Cup
Distance- Meter, Feet, Yards (optional- Chain (forestry), others)
Sound- Decibels
Temperature- Celsius, Fahrenheit, Kelvin
Luminous intensity- candela, Lux, cd

Convert units from metric to standard
Adding time to measurement can get speed- Miles per hour, meters per second

- 2.03 Demonstrate safe and effective use of common laboratory equipment.

The common equipment will measure based on the type of lab. Add to this based on the equipment you have available and what students will do in this class and advanced classes.

Digital Scale- Taking the mass of an item
Measuring Devices- tape measures, rulers etc.
pH Meter-
Microscope-
Thermometers-
Hygrometer
Safety equipment- fire extinguisher, eyewash station, etc.

- 2.04 Analyze, interpret, and report data from research.

Understanding basic statistics to analyze research
- Measures of central tendency- Mean, median, mode
- Measures of dispersion- standard deviation, range, quartiles
- Qualitative vs Quantitative data

Making basic claims from data
Presenting data in a meaningful way
Charts and graphs-
- Bar chart
- Pie chart
- Line graph
- Histogram

- 2.05 Utilize data to make an informed choice concerning AFNR systems.

Using a scientific study or findings from something students have collected, make a claim or informed choice of something related to AFNR.

Example- Would a higher protein feed lead to an increased growth rate for broilers?