

Research Presentation Topics

Level 1

1. Guide your classmates through a simple example of how to make an isometric and an orthographic drawing. Give them a way to remember what each one is. Give them an assignment of a separate, simple drawing for them to try at home.
2. What is Bernoulli's principle? How does it apply to bridges and buildings?
3. How can you use a hydraulic system to multiply distance? How do you use it multiply force? How can you use it to create directional change?
4. What happens to the velocity of a pipe when the cross sectional area doubles? What happens when it is halved? What causes resistance in a pipe? How do you minimize resistance?
5. What is the difference between digital and analog signals? What are example of how we use each type of signal to communicate?
6. Explain how fiber optic technologies work. Be sure to include the vocab words critical angle and total internal reflection. What are applications of fiber optic technologies?
7. Describe the manufacturing processes of casting and molding, forming, separating, conditioning, assembling, and finishing.
8. Review how to use a scale to find an actual measurement of a part. Create a worksheet where students must interpret scale with at least 4 problems.

Level 2

9. Describe the advantages of using robotics in the automation of manufacturing processes
10. Explain how information travels through electrical wire, optical fiber, air, and space.
11. What is similar in hydraulic and pneumatic systems? How can they be used? Give several examples of each.
12. How do you measure voltage, current, resistance, and power consumption in a series circuit? In a parallel circuit? What do you use to measure each?
13. Compare and contrast alternating current (AC) and direct current (DC), and give examples of each.

Level 3

14. Identify and explain the steps of the engineering design process. Explain using a specific example.
15. Define the following terms: elasticity, plasticity, R value, density, and strength (as it applies to building material)
16. Define and explain the difference between tension, compression, shear, and torsion.
17. Explain the difference between open and closed fluid systems and give examples of each.
18. Explain the relationship between voltage, current and resistance in Ohm's law and the power equation.