

# Get it Write

## Student Worksheet:

### Engineering Teamwork and Planning

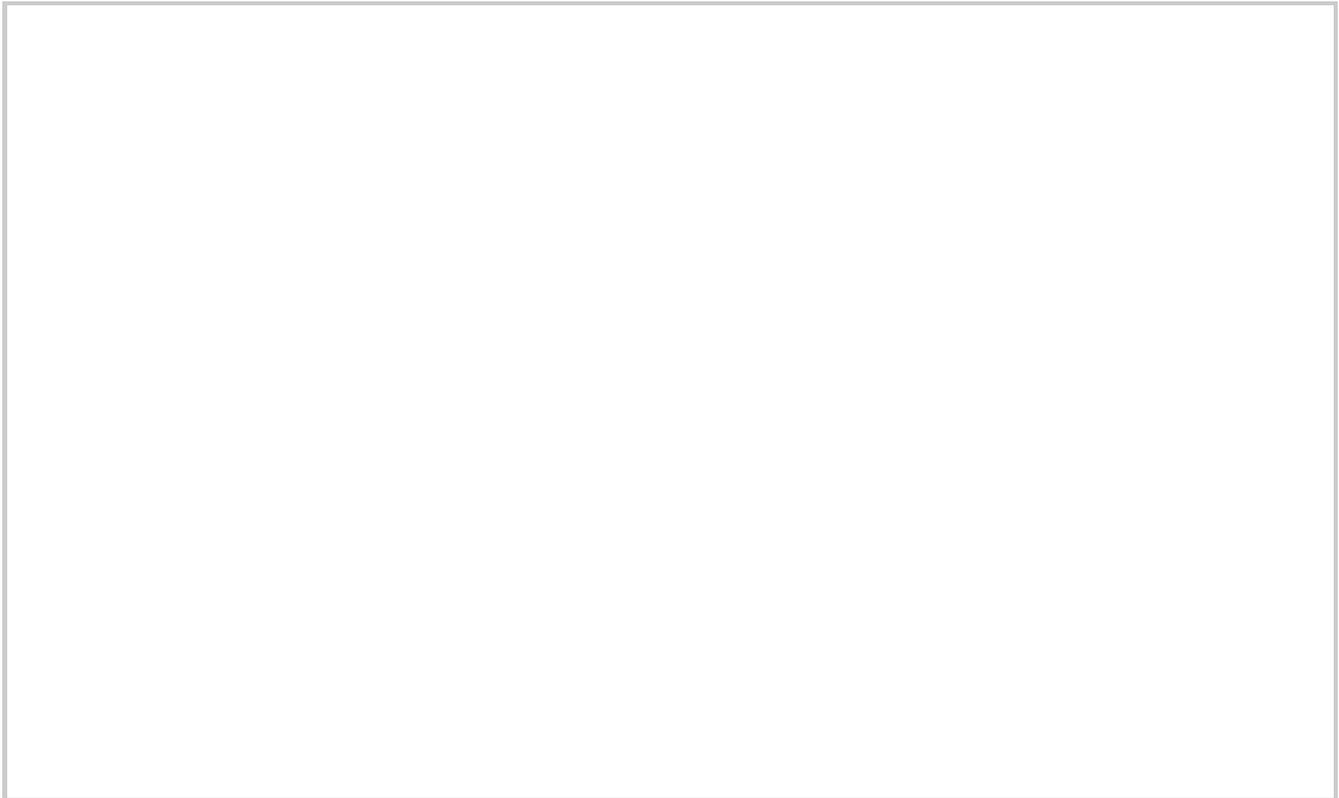
You are part of a team of engineers given the challenge of developing a writing instrument out of everyday materials that can deliver a controlled flow of ink (well, actually washable liquid water color). You'll consider the challenge as a team, read about how different pen styles have been engineered over the years, and come up with your own design. Hint: you may need to engineer your "ink" as well, to change its viscosity.

### Research Phase

Read the materials provided to you by your teacher. Consider how modern and older pen designs operate and think how you would develop your own working pen using the materials that have been provided to you.

### Planning and Design Phase

In the space below or on a separate piece of paper, draw a detailed diagram showing the plan for your pen, including the materials you plan to use.



Materials you will need:



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### **Presentation Phase**

Present your ideas, drawings, and plan for your pen to the class, and listen to the ideas the other teams have come up with.

### **Construction and Testing Phase**

Build your pen, and test it. You may need to adjust your design during this phase to reach your goal. You may also trade or use materials that other teams do not need....or ask your teacher for additional supplies. You should be able to write the letter "A" clearly on a piece of paper with your instrument.

### **Reflection**

Complete the reflection questions below and then share your experiences with the class:

1. How similar was your original pen design to the actual pen your team built?
2. If you found you needed to make changes during the construction phase, describe what happened that caused your design to adjust during manufacturing.
3. Which pen engineered by another team made was the most effective? What made this pen work the best?
4. Do you think that this activity was more rewarding to do as a team, or would you have preferred to work alone on it? Why?
5. If you could have used one additional material (tape, glue, wood sticks, foil -- as examples) which would you choose and why?
6. Did you change the viscosity of the fluid you used for your "ink?" If so, what did you do, and what impact do you think it had on how your team met the challenge?
7. Do you think your team could get a patent for you pen design? Why? Why not?