TEAMWORK: THE KEY TO TECHNOLOGY *(page 1 of 2)*

The image of scientists shutting themselves up in their labs to work in isolation on secret projects is for the most part a myth. On a day-to-day basis, scientists, engineers and technicians—such as welders—work as members of teams. Science and technology teams work at many tasks to provide a world to suit people's needs and wants. These tasks include research, design, craftsmanship, finance, manufacturing, management, quality control, marketing and service.

In scientific activity, the team's objective may be simply to gather information to help answer a specific question. In engineering, the objective may be to find a solution to a particular problem. A technical team's objective may to produce a finished product that meets high standards. In all teamwork, the key to success is cooperation and respect for one another's ideas and abilities. Study after study shows that teams come up with better ideas than individuals working along.

APPLYING WHAT YOU KNOW

In this activity, you will work with others as a team. Your team's mission is to plan, organize and carry out investigations to meet the following team objectives: Rank the five model joints constructed in Workshop 6 according to their ability to resist tensile (pulling) stress. (Rank the model with the ability to resist the most stress as #1.) Also rank the models according to their ability to resist compression (pushing) stress. Present your data in an easy to understand format.

Process: *Follow these steps.*

Step One: Think It Through

1. What investigations have you already done that allow you to measure, with reasonable accuracy, an object's resistance to tensile or compression stress?

2. How can you measure differences in ability to resist tensile stress in the model joints?

3. How can you measure differences in ability to resist compression stress in the model joints?

4. What materials will you need to carry out the investigation?

5. What safety equipment should be worn during the investigation? Why?

6. How can you clearly present the data you gather about compression and tensile strengths of the five joints?

Model joints from Workshop 6

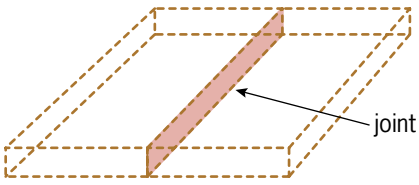

Fig. 1 Butt joint

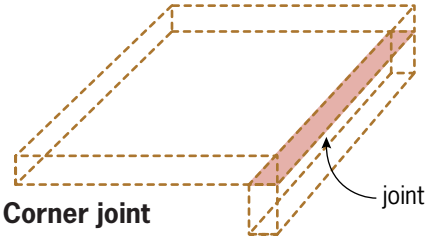

Fig. 2 Corner joint

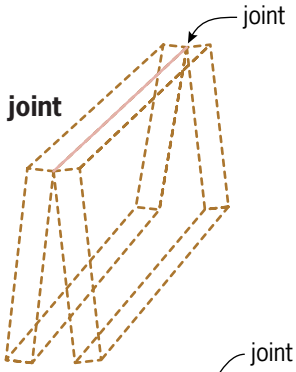

Fig. 3 Edge joint

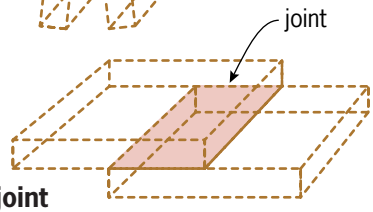

Fig. 4 T joint

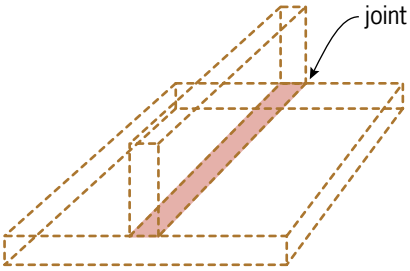

Fig. 5 Lap joint

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Step Two: Predict What Will Happen

1. Of the five joints you constructed, which do you expect to have the greatest resistance to each kind of stress?

   _____

   The least resistance?

   _____

2. Of the five joints you constructed, which do you expect to have similar compression strength?

   _____

   Tensile strength?

   _____

3. Which of the joints, if any do you think will have the same rank in both tests?

   _____

   _____

Step Three: Get Organized

1. What tasks must be performed to meet the team's objectives? (Example: design investigations, gather materials, conduct investigations, record data, analyze data, draw graph, write report clean up)

   _____

2. What roll will each team member play?

   _____

3. What is the project deadline?

   _____

4. How much time will you allow for each task?

   _____

5. Who has responsibility for making sure the team keeps on schedule?

   _____

Step Four: The Process

1. State specific questions that will give you answers to the questions in the team objectives. (Example: How much pulling mass can each joint resist before it breaks?)

   _____

2. Check your investigation plans against these requirements for an accurate investigation:
   - **a.** Items to be tested for various properties should be as similar as possible.
   - **b.** Identical tests must be used to test various items for the same property.
   - **c.** Information gathered must be expressed in terms of quantity or amount.
   - **d.** Measurements must be carefully read and accurately recorded.
3. Carry out your investigation according to team plans, and assignments. Prepare your graphs, reports and so forth.

Step Five: Review Your Work

1. Were your predictions correct? _____

   Why? _____

   _____

2. Did you meet each of the team's objectives? _____

   Why? _____

   _____

3. Did your team work successfully? _____

   Why? _____

   _____

4. If you were assigned a similar objective, what would you do differently?

   _____

   Why? _____

   _____

CONCLUSIONS & INFERENCES

Do you think that your team's ranking of the model joints could be applied to actual joints of the same type? Why? Do you think that the benefits and problems your team experienced were similar to those experienced by actual technology teams? Why?