How to Get Unstuck: Scene 1

The conservators at the Michael C. Carlos museum in Atlanta, Georgia have a puzzle to solve. A collector of ancient Greek artifacts has sent the museum curator one of his pieces of ceramic pottery to analyze and study. The collector believes that the piece of pottery has been glued together using an adhesive that will damage the pottery. The museum curator has asked the conservator to determine the type of adhesive used on the Greek pottery and allow it to be taken apart again if necessary. A conservator will use the best adhesive to use on the pottery that will not damage the pottery. The conservator must use an adhesive with distinct properties including strength, viscosity, and solubility to ensure that the pottery will be held together.

Example of an ancient pottery piece
Wine Jug
Greece, 620 BC
MCCM Collection
1984.001.003
## How to get unstuck - Adhesives Box Chart

<table>
<thead>
<tr>
<th>Facts – What we know from the scenario, data, or observations</th>
<th>Questions – What we want to ask the characters in the scenario to gather more information (but not things we could look up the answer to)</th>
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<th>Hypothesis – What we think is going on; possible diagnosis; predictions</th>
<th>Learning Issues – What we need to know to address the problem; Questions we could find the answer to in our texts, on the web, from an expert, etc.</th>
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How to Get Unstuck: Scene 2

After reading the information from scene 1 and creating a box chart, the students in Mrs. Watkins’ chemistry class are excited to design an experiment to test adhesives to determine which type of adhesive works well on pottery and also which adhesive can be removed easily without damaging the pottery. During the experiment, a student team accidentally glued their ceramic tile using an unknown adhesive. The students were not sure whether they had used the super glue, the Elmer’s multi-purpose glue, or the plain gelatin to glue their ceramic tile together.

Student 1: Oh no man!

Student 2: What happened?

Student 1: I forgot which glue I was using to glue the tile together.

Student 2: Oh, that is ok.

Student 1: What do you mean that it is ok. I do not know which glue I used.

Student 2: Well, when we do the second part of the experiment, we can figure out which glue you used by testing the different solvents on the glue to see if the glue dissolves.

Student 1: You mean we can unglue the tile by using a chemical.

Student 2: Have you not been paying attention to Mrs. Watkins?

Student 1: I have been sleeping most days.

Student 2: Mrs. Watkins has been discussing solvents, solutes, and solubility all week. We can use that information along with temperature and surface area to determine which glue you put on the tile.

Student 1: Well what are we waiting for! Let's get to un-gluing some tiles!
After conducting the adhesive experiment, the student group discovered that the acetone and ethanol could not dissolve their glue but the hot water worked the best to dissolve the glue they had used on the tile. The cold water also worked to dissolve the glue but was very slow.
Self & Group Evaluations

Name:_____________________________  Teacher:_________________  Period:____

Reflect on how you and your group members did at working as a team. Be specific and be fair. Scores range from “0” (unacceptable), “1” (good), “2” (better), “3” (best), “4” (excellent).
Place a score for yourself and each of your team members. This will only be read by your teacher so please be honest with your evaluation.

SELF (score): ______

What I did well: ________________________________________________________________

What I can improve: _____________________________________________________________

Group Members: (score)  comments

_____________________________  ______  __________________________

_____________________________  ______  __________________________

_____________________________  ______  __________________________

_____________________________  ______  __________________________

What did your group do well? ___________________________________________________

What can your group do to improve your results for next time? (Be very specific)

1. ______________________________________________________________________

2. ______________________________________________________________________

3. ______________________________________________________________________
Grading Rubric for Lab Assessment

Adhesives Lab Group Paper

1. Correct Grammar, Punctuation, and Spelling  ________/20 points

2. Minimum 1 page with 12 Font Times New Roman
   Names and Date in right hand corner  ________/10 points

3. Answers each question and gives data to support (10 pts each) ________/70 points
   a. Which glue was dissolved by water?
   b. Which glue was dissolved by acetone?
   c. Which glue was dissolved by ethanol?
   d. Which glue was not dissolved by any solvent?
   e. Did the temperature of the water speed up or slow down the solubility of the glue?
   f. Notice the difference in the amount of time or success to reverse good and bad joins.
      Do those joins that are uneven, gapped, or stepped respond differently to the solvents
      used to remove the glue? Why is this a factor?
   g. Based upon the team’s findings from scene 2,
      which glue did the students probably use and why?

4. Total points for report  ________/100 points