Chapter 4 CANCO Video Case Transcript

CANCO-1A

[00:00]

Ms. Nac: Uh-hum.

Frank: When you mean 75% can crush, do you mean a 75% decrease in volume or a 25% decrease in volume?

Ms. Nac: Um, look again at your definition for can crush, and then apply 75% to that.

Mary: Does everyone have to do the lab?

Ms. Nac: It's up to you and your company.

Angie: Wait. When you say company, you mean the whole class, right?

Ms. Nac: I answered that question.

Frank: That means our leaders should go up front.

<lots of talking>

Mary: Kim and Jack.

Kim: What?

Angie: Yeah, you guys have to go up there.

Ms. Nac: Okay, so I'm done with all the information that I'm going to share with you. It's up to you guys to get busy now.

Kelly: Kim and Jack…

Mary: Find someone to look up the hot plate information.

Kim: Okay, um, guys I was just thinking that...

CANCO-1B

[00:00]

Jack: Also, but first, um, does anybody have any questions at all that we can, I guess, as a class, discuss about the procedure at all. Does anyone have any questions on the sheets? Clueless?

Kim: Okay, are you guys good? Alright…

Dan: Wait. Did we get the definition of can crush?

Jack: Definition of can crush. It's right there on your paper. It's number one.

Kim: Alright. Okay. So when I was looking up the hot plate thing…

Jack: Um, Ms. Nac, can we erase this?

Ms. Nac: Uh, you can erase the other boards, but not that one.

Kim: Okay. Um. Never leave a lit burner or a hot plate unattended. Okay? This is number 33. And now number 34, always turn the burner or hot plate off when not is use. Um, I'm pretty sure there's no other one, but that was the ones I found so far. Number 33 and 34. Okay. Alright. So last time before when Ms. Gallagher was explaining we had to come up with a control group so I'm thinking so that to appropriately show the difference…so I think when she demonstrated that she used the one where it was just heated up and then put in the water as the control group, alright? So maybe we should do that with three trials showing that there's no difference in volume or anything, and then do three trials using this. Does that make sense?

Jack: That's fine. Um…

Kim: You guys agree with that or no?

Frank: I think that we should find the difference first.

Kim: The difference for these? Yeah.

Dan: We should find the numbers.

<several people talking>

Jack: Are we overall agreeing that the control's gonna be water? We're all fine with that?

Angie: What is the volume of that can?

Kim: 355 mL.

Student: How many?

Kim: 355 mL.

Craig: Couldn't we use the one that she crushed as our control and then change variables from there?

Jack: We might want to do it again. We're gonna do it a couple more times just to make sure the…

Kim: Right.

Jack: Um, now we probably should…Oh, yeah…

Karen: I have a question for the class. Has everyone had this?

Kelly: Wait, what?

Kim: Did everybody look at the sheet that was passed around?

Jack: We should probably start discussing ideas for the other variables that we could use. Obvious ideas…

[02:33]

Angie: Okay, so wait, what did he just say?

Jack: Just different liquids in the tub.

Kim: Okay, Chris.

Chris: The length of time it's on the, uh, hot plate?

Kim: Okay. Yeah.

Craig: The tub water temperature we could think about being lower and higher.

Kim: Right.

[02:57]

Kim: So, now we are going to have to probably volunteer for which variables they want.

Kelly: Wait. Wait. Sorry. Well, the thing about the temperature…of the water in the can is that if it's colder or hotter when we put it in, the amount that turns into a gas, uh that evaporates, or the amount of water left in the can will affect it. I don't know if that matters.

Angie: You, guys, everybody make sure you listen.

Kim: Yeah, did you…did you guys hear, Kelly?

Frank: No.

Kim: Alright, what she said is…depending on the temperature in the can, if it's hotter, it may evaporate more when it's at its boiling point; if it's colder, it could also affect it because it would take a longer time. What do you guys think about that?

Kelly: I don't know if it matters.

Kim: Yeah, but it may not matter, but do you guys still feel that it's not important?

[03:41]

Jack: You may have a good point because ethanol doesn't clean as well.

Frank: But why would you boil ethanol? It would light on fire. It's highly flammable.

Kelly: Well, we'll need to check a Flinn catalog.

Jack: Yeah, we'll have to check with Flinn.

[03:57]

Kim: So one person per group can you raise your hand to volunteer for which variable that you want. Yeah.

Frank: We want tub.

Kim: What, you want tub?

Craig: The temperature of the tub yeah.

[04:12]

Frank: Well, it depends, uh, for #6 <time of can on hot plate> it depends on what temperature and for how long it's on.

Kelly: Okay, I have a question. I know that…

Angie: Wait. Wait.

Jack: Sssshhh.

Kelly: I know that water doesn't change its temperature once it reaches its boiling point, but doesn't the can get hotter and hotter? I don't, I don't know. Does anybody know?

Angie: I think it does.

Kelly: Forever and ever and ever?

Frank: No.

<everyone talking>

Kelly: No. No. No. I'm talking about the can.

Jack: Hey. Hey. Hey. Guys. Easy. Easy.

Jack: I know, but you can raise your hands.

Kelly: 'Cause if it does keep going up, then it might matter.

Frank: The can can't get hotter than the hot plate. Like if the hotplate is at a temperature, it can't get…it can't get…it can't get hotter than what the temperature of the hot plate is.

Kelly: Well, then the amount of time it's on the hot plate would matter.

Mary: Yeah, 'cause…

Kelly: Yeah, 'cause the time it takes to take to reach that hot plate temperature would matter.

Frank: So we don't know whether it's that or…

Kelly: So 6 <time of can on hot plate> is important I guess.

[05:15]

Jack: We have to figure that out to get the results.

Kim: Yeah.

Dan: I think that like what we saw from the demos with no water there was no reaction and with 10 mL of water there was however much crush so don't we pretty much just need to figure out how much more water we need to put in the can to make more crush. So isn't like the most…yeah is the most…in that it kinda makes sense that the water in the tub should be like colder than room temperature and then the bigger the discrepancy between the temperature of the can and the temperature of the water would give more reaction. Shouldn't we just like try to focus…(several people talking at once)…shouldn't we just focus…

Angie: Wait, you guys, let him finish.

Dan: Shouldn't we focus testing on the amount of water in the can and the temperature of the water in the tub versus all these different things?

Craig: That's what we're assuming. We have to test to find out for sure. We'll find that out.

<several students talking>

Kim: You're assuming. You're assuming already and we have to go back and test it. We have to discover that.

Angie: No, it makes sense to us that that's the most…that what you said is the only thing that's gonna make sense, but we don't know.

[06:21]

Frank: Uh, are we gonna like have things available to help us test these variables tomorrow?

Ms. Nac: Uh, it depends on what kinds of things you want.

Frank: Like ice or a different substance.

Ms. Nac: I can give you ice. What do you mean by different substance?

Frank: Uh, to like, put in the tub.

Ms. Nac: Other than…

Frank: Water.

Ms. Nac: What other substance? You would need to tell me before I…

Frank: A cleaning agent, I guess?

Ms. Nac: Like soap? Yes, we have soap.

Frank: Like soap water?

Ms. Nac: Uh-hum.

Frank: Alright, and then, I think we just need ice.

Ms. Nac: Okay.

Frank: Ice.

Dan: Uh, how do we, uh, know when it's at 10?

Ms. Nac: Once you turn this <hot plate> on?

Dan: Yeah.

Ms. Nac: Let this heat up between five and six minutes.

[07:05]

Dan: So if it has to be like in a really pristine clean state, cause half of these <5 and 7> are out. They're water. We're not going to use oil or…

[07:17]

Jack: It didn't crush at all. Kelly. Kelly. Kelly. Put 10 mL of water…

<groups of students talking>

Jack: Um, can you hand this <can> back to the control group?

[07:48]

Mary: You guys, we have three more minutes left.

Kelly: 25 hundred. 25 hundred.

Jack: You guys. Clean up.

Mary: You guys, three minutes.

<students talking>

Jack: Hey, you guys.

Dan: Managers, what are we going to do with our sample cans?

Jack: Sample cans?

Kim: Put them in the back.

Jack: Put them in the back next to our group.

Dan: Shouldn't we label them or something that they are sample cans?

Kelly: In the tub, we decided on 4 L.

Kim: 4 L? Okay.

Angie: You guys, everybody come and sit down we're gonna try and like conclude what we're doing.

[08:25]

Kim: Yeah, there we go. Okay. Guys, when you're doing your lab, you have to remember to do the particulate drawing for your lab, okay? It's very important so that you understand what's going on and also since it's a requirement for your presentation. Okay? Um, also, what happened today was another lab group went with the control group to help them, is that what happened?

Frank: No, we were trying to add something else.

Kelly: No, the control…we were doing an experiment and the burner didn't turn on.

Kim: Oh, okay.

Kelly: I don't know why.

Kim: Alright, let's try to have people focusing on that the next time you do your experiment, okay? Um, I think that should be good. If you have not told me what your variable, what you're gonna be doing with your variable, as of yet, could you please tell me like now, alright? Is that okay? Which means, Frank, did you tell me what you're going to be doing for your variable?

Frank: Yeah, we're doing the temperature of the water in the tub.

Kim: Right, but did you know what temperature?

Frank: We're using, uh, salt water with ice and then we're gonna like measure…

Angie: Wait. You just said temperature.

Jack: You said temperature.

Frank: Yeah, but we're gonna like…

Craig: We don't know how cold it's gonna make it yet.

Frank: Yeah, we don't know how cold it's gonna make it. Salt, water, and ice like gets really cold.

Craig: We don't know how cold that is yet.

Frank: We're gonna do like…we're gonna boil some water and then see the temperature…

Jack: That's fine, but get the temperature before you even do the test.

Mark: And when you do the can, you put the top part in, you don't have to put the whole thing in.

Kim: Right.

Student: That was a given.

Kim: Did everybody else tell me?

Kim: Alright, guys, are we gonna be testing number 7, the substance in tub, do you think that's important?

Angie: I don't think it is.

Kim: Okay.

Jack: You don't think it's important?

Frank: What?

Kim: The substance in the tub if you don't think it's important. Okay. So we're not gonna do that, right? Alright. Guys, we also added some things for the hot plate, alright? <Bell rings.> We'll…someone will write it down and we'll…

Tara: I worked so hard writing that!

Jack: We'll get together before next class. Hey, groups, research about…

<Ms. Nac turns off the lights.>

Student: Wow, she turned the lights out on us!

Student: Louder, Jack.

Jack: Research about the, uh, how to clean a can.

CANCO-2

[00:00]

Jack: Hey, you guys. Guys, listen up real quick. Um, everyone, everyone knows, everyone basically knows what they are doing today in the lab. If you don't know or if you haven't turned in your variables to Kim in your little notebook, do that right now.

Kim: Alright, I think that everybody else has done it.

Jack: Are you sure everyone's done it?

Kim: Right.

Jack: But just in case they don't, they can get to work and then afterwards we're gonna come back with like 10 minutes to go and to review over how to write a lab report.

Kim: And we have to talk about our presentations.

Jack: Alright, get to work.

Dan: We have to do our variables and then come together and go over it together.

Kim: That's what we just said.

Dan: No, but then you just said, "Just do your variables and we'll start the lab report."

Kim: Right.

Dan: Yeah, but we need to actually get the answer.

Kim: Afterwards.

Dan: You didn't explain it very well.

Jack: Whatever.

Kim: Let's go. Let's go.

[01:02]

Frank: Kim, do we need to test our var<iable>, like, like control again?

Kim: No.

Frank: In our group?

Kim: You're fine. Just go with your variable.

Ms. Nac: Here you go.

Kim: Alright, Ms. Gallagher, we did some research on…

Ms. Nac: …is not here, but I can help.

Kim: Oh, Ms. Nac. We did some research on what we can put for substance in the can to see if it could crush better. We came up with Coke, soap…

Lynn: Dishwashing soap.

Kim: Dishwashing soap, and vinegar.

Lynn: Not dishwashing soap. Hand, liquid soap.

Ms. Nac: If there's any liquid soap back there, you're welcome to use that. What was the other?

Kim: Vinegar and Coke. 'Cause Coke is okay because it's normally found in the can.

Ms. Nac: Well, that is not a typical lab substance. You would need to have brought that on your own.

Kim: Okay.

Ms. Nac: Um, and…

Kim: That's just the research booklet.

Ms. Nac: Vinegar.

Kim: Or acetic acid.

Ms. Nac: Okay, are you aware of what concentration of acetic acid vinegar is and to what temperature you're allowed to heat it?

Ms. Nac: Yes.

Frank: Do you have the ice slash salt slash thermometers we asked you for?

Ms. Nac: Um, the thermometers are…should be back there. I need an empty bin for the ice. If you bring me an empty bin, I'll fill it with ice. And yes, I have the salt.

Debbie: Ms. Nac?

Ms. Nac: Yes.

Debbie: Is five minutes too long to keep a can on the hot plate?

Ms. Nac: Is how long?

Debbie: Five minutes.

Ms. Nac: No.

Frank: Ms. Nac?

Ms. Nac: Okay. I'll be right back.

Lynn: Concentration greater than 3%. Greater than 3% and 3.0 molar. And the toxicological information.

Kim: Looks fine.

Lynn: It doesn't say like how…

Kim: Why don't we…did she just disappear?

Lynn: Well, what are we going to do for the Coke?

Kim: Uh, do we need to use Coke? Do you think Coke will make a difference? I don't think so. We don't need to use Coke.

Lynn: But don't we need three?

Dan: Where'd Ms. Nac go?

Kim: She just walked out of the room.

Dan: Oh, great.

Kim: What's your question?

Dan: My question is, "Do the outlets…?"

Sandy: Wait, we got it to work.

Dan: We got it to work. I answered my question.

Kim: Alright, excellent!

Dan: Thanks for all your help.

[04:33]

Ms. Nac: Okay, and what are you guys doing? Like what is this?

Craig: Oh, we're testing different temperatures of the water in the tub, versus the amount of crush.

Ms. Nac: And how are you guys accomplishing that? Are you going colder than and hotter than the control?

Craig: We're going colder. We're going two colder and two hotter. We're gonna use as cold as we can go with the tap, and then with ice water, and then go as hot as we can with the tap, and then with boiling water.

Ms. Nac: Okay, when you put the beaker that you're probably gonna heat your water with, make sure that the outside is all dry, so if you put it on the hot plate it will start jumping and break. So make sure the outside is dry.

Kelly: Um, I have a question.

Ms. Nac: Yeah?

[05:17]

Jack: You guys, listen up real quick. Um, each can says that it's 3…is this hot?...each can says that it's 355 mL, but that is gonna be wrong because that 355 milliliters is where this line is right here.

Kim: And that's not really how…

Jack: And yeah, but after your can's crushed, you're not gonna to fill it up to right there, you're gonna fill it up to the top. So it's 365 milliliters.

Student: No, it's, wait…it's more than 365…

<several students talking>

Jack: It's about 365 or 367.

Kim: So when you do the volume, keep that in mind.

Craig: How do we know when this is hot enough?

Jack: Be ready to change your data.

Craig: How do we know when this is hot enough?

Jack: When you feel it. Put your hand over it. That's hot. Wow!

Craig: A little warm?

Jack: Huh?

Craig: A little warm?

Maria: Wait, did you put water in there?

Craig: Yeah, there's water in here. Can I go? Everybody ready?

Maria: Uuuuhhhhh.

Mark: Are you boiling it?

Craig: What?

Mark: Are you boiling it?

Maria: Wait. Wait. Wait. No!

Craig: I'm putting this on for a minute and a half. I'm going.

Frank: Is there water is there?

Craig: Yes.

Frank: Alright. Did you time?

Craig: Yep, started it.

Maria: Maybe we shouldn't put the water in before…

[06:23]

Craig: Five, four, three, two, one. Get outta of the way of the water. Get outta of the way of the water.

Maria: Craig, what'd ya do that for? You're not supposed to do that!

Craig: You just told me not to pour it in there.

Mark: No, you're supposed to just dump it in.

Craig: No, why would you dump it…?

Maria: Yeah, you're supposed to just dump it in.

Craig: It's fine.

Maria: No!

Frank: We can write that down.

Mark: It didn't crush at all.

Frank: It didn't?

Mark: All the other ones just crushed [a lot].

Mark: Just do it again.

Frank: Yeah. That'll be our error 'cause we get 21 cans. So that was our error.

Craig: We'll see if that was our error. We don't know yet.

[07:04]

Craig: Five, four, three, two, one.

Mark: See? See look what happened.

Frank: Damn.

Mark: How much more on drugs?

Craig: That was awesome.

Mark: It like scared you. You were like…you let go of it.

Frank: I'm doing the next one. I'm doing the next one.

Maria: Wait. Don't we have to measure how much volume?

Frank: No, now we gotta measure…and then uh…

Maria: How about we do all of these?

Frank: We're gonna do. Our chart's gonna be the, uh…

Mark: Like this. Like this.

[08:45]

Dan: Ms. Nac?

Ms. Nac: Uh-hum.

Dan: When the can crushed, it crushed a hole in itself. So, the water's not staying in so we can't figure out the displacement. Should we retest it or find some way to plug it?

Ms. Nac: Um, that's up to you and your group. Either one of those scenarios is do-able. If you decide to do the second one, that's your engineering problem.

Dan: So we have to figure out what to plug it with?

Ms. Nac: Uh-hum.

Dan: Hey guys? Guys. We should…

[09:17]

Mark: You subtract that. 375 from what we got. Then you get the percent of how much crushed.

Maria: Okay.

Frank: Dude, how long's the water been on?

Craig: It's been, like, 45 seconds.

Craig: That filled to the top? It doesn't look like it's filled to the top. You need it, like, to the top. All the way.

Mark: It is.

Nick: It is.

Craig: You could still put more water in there.

Nick: There's some water outside.

Frank: We'll keep our dead cans right here.

Nick, Craig, and Mark: Oooooohhhh.

Craig: Okay, pour it into a bigger one. You wanna do our next one?

Frank: No. That was our mess-up, dude.

Craig: Yeah, I know.

Maria: Yeah, we still need it.

Craig: You wanna do this? You have, like, five seconds.

Nick: I'll do the next one.

<sound of can crushing>

Frank: Yeah!!

Maria: Wait. How are we supposed to measure the can crush?

Frank: We fill it with water.

[10:31]

Craig: Hold up, everybody. We're goin' again.

Maria: Oohh!

Frank: Yeah!

Dan: Let me see that!

Craig: That was money.

Mark: Dude, that was a nice one.

Dan: Good form!

Mark: Yeah, you gotta put it in fast.

Tom: How are you guys putting it in?

Frank: Just straight.

Patrick: Straight or turned over?

Frank: Straight.

Patrick: Where did you guys get the ice?

Kelly: That should have been a variable how we put it in.

Mary: No, because if you don't put it in upside down the experiment doesn't work.

[11:15]

Nick: Is there water in there?

Kim: Alright, guys? Everybody should start finishing up their labs, 'cause we need to talk about what we got, alright?

Mark: Yeah, sure.

Nick: Yo, everyone, grab one.

Frank: We spent way too much time yesterday.

[11:34]

Frank: Because we want to finish. We have to do other like variables.

<sounds of cans crushing>

Kelly: Okay, the smell of vinegar is gross.

Kim: Is this vinegar or dishwashing?

[12:16]

Jack: Guys, don't move the hot plate when you're cleaning it up, too.

Kelly: Do you want us to put the hot plate back on the shelf?

Ms. Nac: <shakes head no>

Kim: Can you please turn off the hot plate?

<groups talking>

[12:39]

Jack: Hey, you guys. You can use the last 10 minutes as long…if you need it…as long as you have a representative in the front of the room.

Nick: 169. Yo, 169.

Frank: Alright.

Mark: Take the water out!

[12:53]

Frank: 187.

Nick: And I mean 258.

Jack: Hey guys, at least one person from each group. Yeah, listen up. Let's go. Let's go. At least one person from each group.

Kim: So, clean up, guys.

Jack: One person from each group.

Frank: Mark, you're the representative.

Kim: Yeah, decide within your group who's going to be the representative while everybody cleans up and finishes their trials.

Mark: You're the representative.

Maria: No!

Nick: You are.

Maria: No!

Nick: Yeah. You're a junior.

[13:21]

Maria: What's the fifth one?

Frank: That one. So what do we have so far? What do we have so far?

Maria: 169.

Nick: 169 point zero. <169.0>

Maria: 258

Nick: 258 point zero. <258.0>

Maria: 187

Frank: 258? Two fifty what?

Nick: No, here, here.

Maria: 258 point zero. 187 point zero. 185 point zero.

Nick: 185.

Jack: Hey, is one person from each group here?

Maria: No way.

Craig: Get up there. Take your stuff and go!

Frank: Mark, you're our representative.

Mark: No, I'm not.

Frank: Yeah, I've got to finish doing this.

Craig: Dude, it doesn't matter. We can do it.

Mark: Just go up there.

Craig: This middle one doesn't matter.

Frank: Alright. Fine. Fine. Fine.

Craig: Go up there.

[13:55]

Kim: Uh, Ms. Nac, do you know, is there a specific way that you want the cans to be disposed of?

Ms. Nac: That's up to you and your company. If no one is going to recycle them, then they need to be thrown in the garbage can.

Kim: Okay.

[14:14]

Kim: Is there a representative from each group here?

Students: Yes. Yeah.

Kim: Alright, what we're gonna do is we're gonna ask you your best result and what was your variable, okay? So, um, we're going to start with Lynn over here. So, alright, Lynn.

Lynn: Vinegar.

Kim: Yeah. And what was your best displacement?

Lynn: Uh, 73 mL.

Kim: Okay, Mary.

Kelly: What do we need, best or average?

Mary: Amount of water. It was five mL as the best. And do you want the average or our best?

Kim: …what was your average?

Mary: Uh, 73.

Dan: What does the best even accomplish?

Kelly: Shouldn't we write down what her variable was?

Mary: That was the average of the best.

[15:07]

Kim: Does someone want to write?

Kelly: I'll write.

Jack: Also, the thing is that we also need to make a presentation which is Monday. Now what we were thinking is that we have a representative from each group that we do have free, a free day tomorrow; however, it's a Jewish holiday. So if you're willing, to take, you know we could take advantage of that day by having someone that is free tomorrow to work together with the five other representatives from each variable to work on the presentation. Is that a possibility?

Mark: Wait. What?

Jack: A representative from each group works on presentation from each group's presentation; however, tomorrow…you could do it tomorrow, it's a Jewish holiday. So we want to see if that's a possibility that there's a representative that is available tomorrow.

Angie: Jack, if people can't do it tomorrow, can't they do it over the weekend?

Jack: They could do it over the weekend, but we could also just take advantage of this because we have Friday morning free.

[16:07]

Mary: Or like maybe people should like get together and do the presentation. Like is the same person who helps write it, gonna like stand up there and like announce it?

Jack: Yeah. So we need to have someone volunteer.

Kim: Volunteers.

[16:24]

Kim: What was your variable?

Mary: Did they test hotter than 10 on the hot plate?

Kim: You can't…

Student: Wait, if you wanted to crush more…

Kim: Frank, what was your variable?

Frank: The temperature of the water.

Maria: In the tub.

Frank: In the tub.

Kim: What was your average?

Frank: Uh, 85.4.

[16:51]

Jack: When's the proposal due?

Ms. Nac: That's all answered.

Jack: That's all answered in that sheet?

Ms. Nac: Uh-hum.

[17:01]

Kelly: Wait, that doesn't make any sense.

Student: What?

Kelly: Michelle's group says that they…their average displacement was 198.

Mary: Yeah, because they couldn't do 10. They didn't test 10 cause that was up…

Kelly: I don't know. This is so much higher than the other group, I swear.

[17:22]

Jack: A proposal and presentation is due Monday.

Dan: First, we have to dress up, right?

Jack: It's way too hard to split it up.

Frank: Oh, I'm presenting. I want to wear a suit.

Jack: Okay, that's fine.

Kim: Excellent.

Jack: People who are doing the presentation and proposal are just going to have to do it together 'cause basically it's the same information. So I guess we might have two maybe one representative from each group working on this presentation and proposal.

Kim: Okay, who's willing to work on the report?

Kelly: I thought we were all meeting? How about we just meet together and then decide?

[17:57]

Mary: We can meet at my house.

Jack: Meet at your house? Can you write out your number, address, email?

Dan: Social security number. We don't need your blood type.

Kelly: So when are we meeting? I'm so confused.

Jack: Write this down on the board, okay? One representative, this is tomorrow, okay? If you're available, obviously, don't all show up, talk within your group.

Student: What time, Mary?

Jack: Talk back there too.

Mary: What time?

Jack: Whenever, it's up to you.

[18:25]

Kelly: What if no one can go at 2?

Mary: Then we'll change the time. What time can you guys come?

Jack: Just call in the morning.

Student: Can we make an email sheet?

Sandy: We do have one. Before anyone leaves, please put your name and email down. Write it down for me.

Kelly: What is the light gone for?

Mary: You guys, how much earlier are we doing it? How 'bout 11?

Student: Uh, you guys, it'd be easier if you turned the lights back on.

Student: We didn't turn them off.

Student: Can we turn the lights on?

Kim: No, she's locked it. I tried last time.

Jack: You guys, let's go.

Kelly: Can we turn the lights back on, Ms. Nac?

Ms. Nac: Nope.

CANCO-3A

[00:00]

Kim: Alright, I'm going to make an announcement. Alright, guys? Okay, so what we're gonna do is because we really didn't have good communications like getting to each other.

Students: Sssshhh.

Kim: What? Oh, right, sorry.

Dan: Camera on.

Kim: We're gonna pass around a sheet and you're going to put down your email, your cell phone number and your home phone.

Student: Don't forget your name.

Kim: Well, yeah, your name.

<laughter and several students talking>

Kim: So, Mary's gonna start and she's gonna go around during the presentation you can do it.

Dan: I think that's a good idea.

Kim: Yeah.

Mary: Pay attention during the presentation.

Kim: I'm gonna make a Xerox for everyone so that you can put it like in a little folder in the top of your journal so that you will know who's in your group and how to contact them at all times.

[00:46]

<several students talking>

Kim: Should we just set it up?

Jack: Sure.

[01:06]

<Students talking loudly. Kim sends four students to the back to get crushed cans. Dr. M., CanCo representative arrives. Jack greets her at the door.>

Dr. M.: Where would you like me to sit?

Jack: Uhhhh.

Dan: In your desk.

Jack: We'll put you up front.

Dr. M.: Right here?

Jack: Right here.

Dr. M.: Okay.

Craig: Kim. <giving her cans>

Jack: Do have the time that you want the presentation to go for?

Dr. M.: Yeah, I think that was on your…

Students: Fifteen minutes.

[01:58]

Kim: It's because when we sent the PowerPoint to Ms. Gallagher… Ms. Nac…the graphs didn't show up so we wanted you to see the best presentation.

Jack: Uh, Sandy.

Angie: Should I turn off the light?

[02:28]

Jack: Is there a stool?

Kim: Oh, what happened to it?

Kelly: Did it go on standby?

Kim: I think that you may have actually turned off the power.

Kelly: Yeah.

Kim: Sorry to keep you waiting.

Dan: We can go back to our presentation 'cause this doesn't have power.

Kim: Is it alright if we go back?

Mary: Does this count as part…?

Dr. M.: I only have 12 minutes left so whatever you can show me in the next twelve minutes.

Dan: Oh.

Kim: Okay.

Jack: Um, let's…Hey, can you turn on that screen real quick? Okay, you guys, do the presentation and just skip over the rest of the graphs. And we'll get this to work to show the graphs so start the presentation.

Kim: Okay.

[03:18]

Dan: All the way down?

Jack: All the way down, just, er.

Kelly: Just hurry.

Dan: I did.

Jack: Just go. That's fine. Just go.

Lynn: Okay. Our presentation is the *Recommended Robotic System for CanCo*…and is presented by our 4-5B chemistry class.

[03:38]

Lynn: …the effects of when a 375 mL can of pop can do when crushed and cleaned with certain substances or different variables used for…

<backup projector comes on and projects a rectangle of light onto current PowerPoint>

Kim: Uh. <Moves projector so that light is off of the screen. However, the light is now on her fellow presenter, Sandy. Class laughs. Sandy moves projector again.>

Lynn: …based on the control that we were shown and we're trying to find the best possible crush…

[04:04]

Sandy: The variables tested in this experiment were the volume of water in can, temperature of hot plate, amount of time the can is on the hot plate, temperature of the water in the tub, and substance inside the can.

[04:23]

Kim: Alright, so now for the graphs on the other presentation. Oh, gosh <Backup projector has turned off again.> Okay. I think the…

Sandy: If you notice on our data table we found an initial volume. That was the volume of the can. Um, then the final volume. <Dan turns off ceiling-mounted project.>

Kim: We're having some technical issues.

Kelly: Why did we turn that off?

Mark: Why did we turn that off?

Jack: It's fine.

Sandy: Turn it back on. <Dan pushes power button on ceiling-mounted projector.>

Kim: It's okay. Don't worry about it.

Jack: You're fine, Kim, go through and go over the graphs last.

Kim: We're gonna come back to the graphs because we're having some technical issues.

Sandy: We found the initial volume and the final volume by filling the pop can with water and then, um, putting that water…

[05:29]

Kim: And this is because…

Craig: Um, the can is crushed because when you have a regular can that's sealed and let's say 40 particles inside and keep the same pressure on the outside as it is in the inside. Well when we heated up the can, the particles moved around quicker and there was a hole in the top, so some of the particles escaped. So the particles inside were moving faster and had the same pressure on the outside as there was inside. And when we put the can over and put it in the ice water, it slowed down the particles immediately and the particles weren't moving quick enough to keep the same pressure as there was outside so the pressure on the outside became much greater than that on the inside and it crushed the can.

Kim: Okay, are there any questions?

Dr. M.: Um, yeah, I'd like to see these graphs. Is there a way?

Kim: Yeah.

Dr. M.: Do have anything to give me?

Kim: Um, well, it is in our proposal and…

Dr. M.: I don't have a proposal.

Kim: It's right here.

Jack: Kim, show her the computer.

Kim: Yeah, so, um.

Dr. M.: So is this the proposal?

Kim: Uh-hum.

Dr. M.: Or is this the presentation?

Kim: That's the proposal.

Dr. M.: Okay.

[06:44]

Dr. M.: Let me ask a few questions. For each of…you said you tested five variables, right? Five? Okay. Could you tell me what the results were for each variable? Let's say the volume of the water in the can.

Kim: Okay. Well that was in our data with our charts so we're gonna…<Lynn clicks Smartboard to get back to slide that contains the data chart.>

[07:17]

Lynn: Okay, so, for the "amount of water in the can," we started out with 375 mL of water and then the final volume that we ended up with was 87, 66, 65, 73. So then when we calculated the can crush, we had those four averages. And then when we figured out the percent of can crush, it was all above 75% which was exactly what CanCo asked for. They asked for at least 75% can crush. So based on the amount of water put in the can, we have the highest percentage, or we met the requirements for the CanCo 75% can crush so that was our result for the amount of water in the can.

Dr. M.: Well, wait, how much water?

Kim: 5.0 mL.

Dr. M.: Okay, so did you test any other volumes?

Kim: Yeah, we did, but, um, that group went too high and so when they went back up they got lower numbers because it did not make any greater crush.

Dr. M.: So what you're sharing in this data table…

Lynn: The greatest crush.

Dr. M.: That's the greatest average?

Lynn: The greatest average crush for each variable.

Dr. M.: Okay.

[08:36]

Dr. M.: When you were talking about the pictures, with the particles moving faster and slower and all that, what substance were you referring to? What were those particles?

Craig: Air. Air particles.

Kim: You mean in the can, right? Except for the pictures that had steam.

Sandy: It was water.

Dr. M.: Okay, wait, you guys, just said three things. He said "air." You said "water." You said "water vapor." So somebody tell me what's going on in this can.

Kim: Well, I was just saying that the particles in the can were water in the pictures rather than air.

Dr. M.: Okay, and then what happened?

[09:16]

Sandy: Um, it's being heated and particles are moving really, really fast.

Dr. M.: What particles?

Sandy: The air and the water particles are moving very quickly.

Craig: So it's steam…the vapor particles.

Sandy: And when the can is put into the tub of room-temperature water, um, the water in the tub is a lot cooler than the temperature of the can so the particles are cooled down and they move slower. And when the particles move slower, there's less pressure on…there's more pressure in the air surrounding the can than inside the can so the pressure causes the can to like crush.

Dr. M.: Okay. So you're talking about air particles and water vapor particles. Can you tell me if you've ever seen or done an example where you just heated up air particles and flipped it into the water?

Kim: Yes, we did. That was the control.

Sandy: When your representative, um, Mrs. Nac, came in, she showed us an example of that and there was no, there was 0% can crush. There's no can crush.

Dr. M.: So why is it that there's a difference? If you cool down the air particles and it didn't crush, what's going on here that makes you talk about pressure differences? You're not making sense.

Kim: Because when the water is upon the hot plate, it's also evaporating, so there's steam inside coming out in the can, so air particles are escaping the can, so when we put it in the tub of water, there's less particles. See the particles inside it, they can't keep its shape because they are slowing down and so that's why it crushes in because the particles inside the can help keep its shape.

Dr. M.: So fewer air particles…

Kim: Not moving as fast.

Sandy: When the can is being heated, when water boils, after it's been on the hot plate for a minute and a half or when it starts to boil, and, um, steam comes off. But even though it's water…the water is in the form of a gas, they're still water particles. And those water particles, they heat up the air particles that are in the can as well.

Dr. M.: And then these are the graphs that weren't in the presentation?

Kim: Right.

[11:52]

Dr. M.: Alright, is there anything else that anyone wants to add or tell me before I go?

Kim: Thank you for coming.

[12:08]

Dr. M.: Okay, great. I will be in touch. Thank you very much.

Craig: You're welcome.

<Students start to clap as Dr. M. walks out of the room.>

Kelly: Everybody breathe.

Sandy: Aaaaaaaahhhhhhhhh!

<lots of students talking>

Jack: That was fine.

Patrick: Alright, next time when she's out of the room and getting prepared in the hall, we could have figured out the projector.

[12:41]

Ms. Gallagher: Hi, guys.

Student: Hi.

Ms. Gallagher: Have a seat.

Frank: Oh, hi, Ms. Gallagher.

Ms. Gallagher: Hi.

Kelly: Where have you been? We missed you.

Ms. Gallagher: I've been grading papers.

Craig: The whole time like for the last two classes?

Ms. Gallagher: Okay, guys, have a seat. Take out your journal, your calculator, a writing utensil. Put everything else away.

[13:15]

Ms. Gallagher: Okay, this is an individual quiz that means you're doing this by yourself, but it says at the top you may use your journal and your calculator as resources. And this is a timed quiz. You have 15 minutes to complete it. So read through the questions and budget your time accordingly. When you're finished, bring me your quiz up front and keep silent 'til I tell you all quizzes are in.

CANCO-3B

[00:00]

Jack: Community Task. Your community task is to make a can crush 75% by volume using the process described in the CanCo lab. The catch is that the can must contain 100 mL of tap water. You only have one opportunity. No manual crushing allowed. Once your community chooses the conditions for the other variables in the can crushing apparatus, alert Ms. Gallagher that you are ready. Ms. Gallagher will then randomly pick three representatives from your community to do the following. Once the representatives are chosen, no one else may speak until called upon. Explain what conditions your community chose for each variable. Show community lab data that supports these choices. Explain why your community believes these conditions will make the can crush. After these explanations, Ms. Gallagher will pick two representatives to do the can crushing test at the front demonstration desk. These representatives will also measure the amount of can crush and report this to Ms. Gallagher. As a community, record your response to number 1. Then draw a three-series particulate drawing of the results from the above scenario. Good planning.

Kim: Yes, Mary?

Mary: Okay, my group did the amount of water in the can and even 50 mL didn't crush at all so I think that we should leave it on there for a long time so then most of the water will be…

Jack: Time is a factor. I mean time is a factor. We have…

Frank: Just hurry up and then leave it on…

Jack: We have 33 minutes. Okay, so at 50 mL it didn't…it had barely any can crush?

Mary: None.

Jack: None?

Patrick: We have to boil the water off.

Mary: 'Cause we only left it on for a minute or two.

Chris: But then it didn't make any difference.

Jack: So we have to think about that. Um, had some really good points. We should boil the water off.

Chris: It doesn't matter. I filled the can up like three-fourths of the way and I left it on there for like six minutes or something…

Mary: And it didn't work.

Chris: Yeah, it did, but all this smoke was coming off.

Mary: We have to wait till lots of it comes off…

Jack: Yeah, Tom.

Tom: Yeah, well, I think we were given this time so that we have time to, uh, boil it off so that it evaporates so we got to start early.

Jack: Well, yeah, we should…well, no, we only have one opportunity so we obviously have to make it. We'll leave enough time. We'll leave about 15 minutes of time just in case we need to boil it for that long. Um, basically, um, 75% is also the key as well. We actually have a set percentage. We can't just throw it on there. So we have to think about what we got for 75%.

Angie: Does it have to be at least 75% or exactly 75%?

Jack: Um, it says, "Your community task is to make a can crush 75% by volume using the process described in the CanCo lab."

Angie: So it should be 75.

[02:38]

Frank: I think, uh, if we just use our variable which was, uh, like salt in ice water at .06 degrees Celsius.

Chris: But we don't have salt and ice water.

Frank: Ms. Gallagher, can we get salt and ice water?

Ms. Gallagher: <no verbal response>

Patrick: Using only the materials used. There is no ice or salt.

<lots of students talking>

Angie: You guys, it's only those materials <pointing to the front demonstration desk>.

Kim: No, I think it's for the demonstration for the class.

Angie: It says on the front lab table.

Jack: Alright, which we have...we have these huge ones. Are these 2 L? This is 2000 mL.

[03:21]

Sandy: I was just going to say that, um, I think that we should leave it on the heater for 15 minutes because if you set up a proportion to the control you do 10 mL over 90 seconds equals 100 mL over *x* amount of seconds, and it equals 900 seconds, which is 15 minutes.

Dan: Hey!

Jack: Can you write that equation up here?

Kim: Sandy, that's awesome!

Jack: So, 15 minutes?

Chris: But it didn't work for that equation. Yeah, but that was the control. It worked best for 5 mL over two minutes.

Angie: Yeah, I know, but we can't do 5, we have to do the 100.

Chris: I know, but she was comparing it.

Debbie: Didn't we use a proportion last time and…?

Jack: We used a proportion last time…

Kelly: 'Cause that wasn't linear…

Kim: But the difference is at least we had a reason for doing it. So we still got full points, it's just our communication skills on how to get there, that's all. Yes, Lynn?

Lynn: Mary's group tested…what'd you guys test?

Kathy: Water.

Lynn: The amount of water in the can. They tested 5 mL. So we could figure out how much it would take to heat up.

Angie: They're saying instead of comparing it to 10 mL, which was the control, we should compare it to 5 mL which was like 'cause gave us the highest percentage of can crush.

Kim: Why wouldn't we compare it to the best can crush from the amount of water in the can which was 5 mL versus 10 for the control?

Jack: Alright, does anyone…explain this again. Explain this one more time so people do understand what they're doing.

Angie: Okay, everybody listen 'cause everyone has to know this. Instead of comparing, cause Sandy's using the 10 mL which was our control, the group behind me was saying that we should do it compared to 5 mL because 5 mL gave us like 80% can crush…not 80, but it was like 77 or something. So instead of comparing it to 10, we should compare it to 5 because like that gave us like the most can crush.

Jack: But also, our group did the amount of time on. Once it started to getting to a certain point; however, this is more water, but once it got to certain points, it stopped working as well but this is a different amount of water.

Kelly: Then how long are we going to keep it on?

Jack: So, we should…I think that's a good…huh?

Kim: …this is for 10 mL …

Jack: But this is for 10 mL so I think that's a valid point is that we had it for 5 mL which is 77%. It's the closest possible. Can we do this again for 5 mL?

Chris: But then didn't we do it for two minutes also instead of 1.5?

Kelly: Guys, then that's 30 minutes because 150 divided by 5.

Sandy: It's 30 minutes.

Jack: Let's just do it then for 15 minutes then.

Angie: Let's just do the 10. Sorry.

Jack: Alright, now, let's figure out because the problem last time is that people were just like, you know, saying like, "Oh, no, I thought about something different," and they didn't speak up. So this is your chance if you do have objections or you do not understand this equation or you have a different idea, this is the time.

Kim: Alright, we good?

Jack: Tom, anything?

Kim: So does everybody understand why we're using…

Frank: So we have to explain it to Ms. Gallagher and then she's gonna pick people, but we gotta get that pop can and like start it boiling *now*.

Kelly: So, wait, what do we have to know, 15 minutes, that's all?

Tom: Wait, why 15 minutes instead of 30?

Mark: It's too long.

<many students talking at once>

Angie: You guys, everybody listen.

Jack: Dan, Dan, or no.

Kim: Tom?

Jack: No. No. I was going to say Dan explain it to Tom, but let's get this clear. Um, the reason why we're not using 30 minutes is because one we don't have enough time for that so this <pointing to equation on the board> will get us as close as we can possibly get to the 75% can crush.

Frank: Okay. Let's go on that!

Kim: Angie.

Angie: Um, can you…are we using all the control conditions…like are we using water?

Sandy: Are we allowed to change the temperature of the water in the tub?

Mark: No.

Angie: Can you guys just tell everyone the variables because I think some people don't even know all the variables. Like just the control part.

Kim: The control part.

Angie: All the parts that we need to test so if she calls on someone randomly they'll know what they're testing.

Kim: Okay, so basically what we're changing from the control is instead of 10 mL of water we're changing it to a hundred mL of water. Alright, we're also changing the amount of time it's gonna be on there and we actually have to start that soon or we won't have enough time to do it. So that's what we're changing.

Jack: Where are the tongs? Oh, they're right there.

Kim: Alright so…

<many students talking at once>

Angie: You guys, listen. You guys, listen.

Jack: The temperature of the tub is 25 degrees Celsius…okay, which is room temperature.

Dan: It's the control, except it's 15 minutes instead of a minute thirty.

Jack: Does everyone understand that?

Frank: And how to explain it!

Jack: Okay, but please don't be afraid 'cause she's gonna call on one of you so don't be afraid if you have any questions. Anybody?

Kelly: You have to show community lab data that supports it. Is that the only lab data that we have—the equation?

Tom: Do we have to draw particulate drawings?

Jack: We have particulate drawings.

Sandy: If it doesn't work, please don't be mad at me.

Jack: Are ready to go?

Kim: Ready?

Students: Yes.

Jack: Okay, Ms. Gallagher, um, we're ready to explain what we're gonna do.

Ms. Gallagher: Okay, uh, Patrick, tell me number 1.

Patrick: What do you mean number 1?

Kim: Number 1 on the worksheet. Explain what conditions your community chose for each variable.

Patrick: Oh, um, we are boiling the water for 15 minutes with 100 mL water…

Jack: Speak to her.

Patrick: Um, and this is because in proportion to the control.

Ms. Gallagher: Just tell me what conditions you've chosen for each variable for this test.

Patrick: Um, we've got, uh, a 100 mL water in the can, 15 minutes on the hot plate.

Ms. Gallagher: Okay, anything else?

Ms. Gallagher: Okay, Frank, number 2. Will you show the lab data that supports these choices?

Frank: Uh, we have a proportion that relates how long we're gonna heat it up to the control and the <pointing to the board>…

Ms. Gallagher: Okay, with the 10 mils over what does that say?

Frank: 1.5 minutes.

Ms. Gallagher: Kathy, number 3.

Kathy: Um, well, um, kinda says like the control and we got, um…wait, we're timing, uh…um…we, oh, okay, we think it's gonna crush the right amount because…I don't know how to explain it…

Angie: Just figure out an answer.

Kathy: Because we have a 100 mL …

Ms. Gallagher: Okay.

Kathy: We, um, the control was 10 mL so we think it's gonna work because we're changing the time to a longer time so that enough of the water evaporates and it crushes greater.

Ms. Gallagher: Okay, anything else?

Jack: Are you asking that to the class?

Ms. Gallagher: Just Kathy.

Ms. Gallagher: Okay, Adam and Craig. You perform the lab.

Patrick: Goggles!

[11:34]

Jack: Yeah, you guys, no one talk.

Dan: What are the rules for doing this?

Ms. Gallagher: You can talk now.

Kelly: To them?

Ms. Gallagher: You weren't to talk while they were answering.

Dan: Can they ask questions to us and vice versa?

Ms. Gallagher: You can talk, but you weren't supposed to talk when the other three people were speaking.

Mary: Guys, is the hot plate already on?

Jack: Yeah.

Dan: Can we talk back and forth?

Ms. Gallagher: I've answered that question.

Kelly: Yeah.

Jack: Use the dropper.

Mary: You guys better hurry because we only have like 16 minutes left.

Chris: Is the hot plate already heated up?

Craig: Yeah.

Kim: So, Adam, why don't you fill the can with water?

Adam: Is that the water for the can?

Craig: Yeah, that's it right there.

Adam: So what are you doing?

Craig: They want me to…

Angie: That's a 100 mL, right?

Craig: Yeah.

Angie: Wait, do you have the 15 minutes set?

Jack: Yeah, yeah, just go, just go. We're running out of time.

Mary: Because you gotta also measure the second it's done…quickly fill it up.

[13:14]

Kim: Guys, okay, last class, um, Ms. Gallagher gave us a class assessment thing that we could go over with ourselves. So we're gonna go over it like right now. So you know this is about your accuracy, safety, and community. Accuracy was on time, we still have to do that. Did we follow instructions? I think we talked when we weren't supposed to.

Students: Yeah.

Kim: So we need to work…I know we want to help each other out and we want to have a really good grade but we have to learn to restrain ourselves.

Kelly: Was it in our instructions that we weren't supposed to talk? Oh, yeah, it says "no one else may speak until called upon."

Kim: …answering questions, but we did, including myself, so yeah, Patrick?

Patrick: I think next time we should like underline the important stuff.

Kim: That's a good idea.

Craig: Next time if you get a question be sure to answer… <inaudible>.

Kim: Okay, and also is your answer correct? Well, we don't know that yet. Safety? Goggles? Yeah, we did a really good job on safety. We made sure that things were clear. I think we did…as usual, on safety, we don't have to wash our hands yet. So, you know, extra points. Okay, so how did it go and was everyone involved individually in this? So, do you guys feel that everyone understood what was going on? Did you know the variables, alright?

Jack: The key is: Could you do it just by yourself?

Kim: Yeah. Do you feel if Ms. Gallagher called on you, could you be able to do it right?

[14:41]

Angie: How much time is left on the thing?

Craig: About 13 and a quarter.

Jack: We're gonna have literally three minutes to do everything.

Frank: A lot can happen in three minutes.

[14:58]

<Students talking at front demonstration desk about measuring the volume of can after it crushes. Ms. Gallagher locks the front right door and walks around the room looking at student journals.>

Craig: Well, put it in the big one because that's easier to transfer and then pour it in there. Sometimes there are holes in the can.

Michelle: Do you have the data, Mary?

Jack: Any questions at all?

Patrick: Where are we at in time?

Jack: Huh?

Patrick: What time is it?

Jack: Well, we're gonna end at 15. We have about one.

Frank: Time goes by so fast when you're having fun.

[15:48]

Frank: Dear Lord.

Mary: The time we have is three minutes and five seconds. You guys, don't rush too much.

Craig: What?

Mary: You're gonna have like three minutes afterwards.

Kim: Okay, guys, has everybody put their names and all the stuff on here?

Frank: Time out! Time out! <points to the front as Craig flips the can>

Patrick: Yeah.

Jack: Okay, test it. Test it.

Michelle: Wait, you guys, right when you get the number, tell me.

<laughter>

Dan: Use the dropper. Use the dropper to suck extra water off the top.

Mary: Kim, I'm gonna make one copy and have everyone look over it and make sure it's right and then I'll send it to them.

Kim: That's a good idea.

Angie: Did Craig fill it up all the way?

Kim: Come on, guys!

Kelly: How much would it suck if the can had a hole in it?

Dan: Oh dear.

Mark: That's a lot <referring to the amount of water pouring from the can>.

Patrick: No, but that's…

Mary: Hey, it *crushed*!!!

Angie: You guys, it's fine. Just measure it!

Lynn: Measure it. Measure it!

Angie: You can't just like think about how bad it is!

Craig: It's about 209.

Michelle: What's the number?

Kelly: 209.

Angie: You guys, it's fine.

Craig: 208.

Kelly: 208?

Frank: Actually, that might be good.

Craig: Why isn't this shutting off <referring to water faucet>?

Jack: 'Cause it goes the other way.

Patrick: Hey, um, we still have to do that…

Kim: Mary, do you have the particulate drawing done?

Mary: Yeah.

Kim: Okay.

Craig: Do we need to keep the results?

Michelle: Okay, guys, it was 44.5%.

Craig: Do we need to keep the results here?

Angie: Okay, 44.5%?

Michelle: Yeah.

Jack: Well, write the equation on there too.

Kim: Yeah, we did.

Michelle: Hey, you guys, so are we done with this? Can we hand it in?

Angie: Where's the particulate drawing?

Michelle: Here.

Angie: Did we finish it?

Michelle: Yeah.

Angie: Did you do it?

Michelle: Yeah.

Kelly: Did you finish the particulate drawing?

Lynn: Michelle. Michelle. Is the equation on there?

Michelle: Yes.

Dan: Is the third drawing on there?

Michelle: Yeah.

Kim: Is everything on here?

Michelle: Yeah.

Jack: Clean up.

Dan: You guys got a minute and five.

Kim: Including the answer?

Kelly: Turn it in. Turn it in.

Ms. Gallagher: Is this it?

Kim: All there.

Ms. Gallagher: Okay, great. Thank you. Alright, we're done. Make sure you keep up with your reading and your packet. We'll talk about this stuff next class.

CANCO-4A

[00:00]

Ms. Gallagher: Okay, so here we go. You guys do want your journals out, because I'm going to have you do some journal reflection, and I'm wanting you to record some of this information so that it will be helpful for you for next time. There is a lot of feedback, so you've done a lot of work as a class and individually over the last few days, so yes, you're going to get feedback about all of it; about the lab, about the lab report, about the presentation, about the individual quiz, and about the class assessment. Now we'll get through what we can today of what I was able to look at. Whatever we don't get done today, we'll finish up next time. Alright, so, uh, CanCo Feedback.

[00:55]

Ms. Gallagher: So I need you to write right now in your journals, because I am going to collect them next week. And I've actually asked you to write quite a few things in there, so there have been journal reflections about outside-of-class stuff, or about journal reflections I've read to you, and about things that you've done as a class, so I am going to look at those things, so try to make sure that you've completed your thoughts. For today, I want you to think about working in the community in this group, in reference to these three questions. Number one: What part of the lab planning and implementation was the most constructive and the most frustrating?

Kim: Do you want us to write down the questions?

Ms. Gallagher: You don't have to write down the question, just the answer. Number two: What part of the lab write-up, the proposal, the formal thing that you turned in that was the most constructive in terms of working in a group, and the most frustrating? And number three: What part of the presentation, the verbalizing of the stuff that you did to Dr. McMurry was the most constructive and the most frustrating? Go ahead and write down your initial thoughts, three things: lab, write-up, presentation.

[02:20]

Jack: Towards finishing the lab proposal when it got to like straight hour nine, peoples' feelings were still optimistic about finishing this up.

Ms. Gallagher: Okay, so the frustrating part would be that there was an hour nine.

Jack: There was an hour nine, but the constructive part was that people stayed optimistic and it was still possible.

Kim: I have to agree. It was really frustrating that the projector was working perfectly before, and I guess I must have moved the lightbulb or something.

Ms. Gallagher: Whose projector was it?

Kim: It was mine. We tested it the night before, and we tested it the morning of, and then it was working fine. And I guess it just didn't work.

Lynn: Well for the lab report, we all had a party at Kim's house, and it was really nice that her family let us go there and everything. And the fact that the people who were willing to come and work on it, there were like 12 or 13 of us. And the fact that people had to go or something, they immediately came back after whatever they had to do, and so without that, we probably would have never finished. So it was really nice for the people, who, you know, they were putting in the time and effort, even though they had other things.

Ms. Gallagher: That was nice that you had a home base.

Kelly: I thought it was really awesome how people could stay at Kim's house. The frustrating part was that we have such a big class that there's only so many people that not all of us could meet there together, because people had things to do over the weekend. People have other involvements. Things that they're involved in. I thought it was frustrating how not everyone could be directly involved.

Ms. Gallagher: How many other people agree with that? Of course, you have time commitments and it's hard to figure out okay, whose house is available, because mine wouldn't be for 13 students. And then if that time works for that house, other people might not be able to make it. From taking that to the next step, how many people got to see the lab report before it was turned in? So there's something that could change, right? Even if you couldn't be there, you might be able to see it beforehand, if you work out the system for that. Tom, what were you going to say?

[04:59]

Frank: Make sure we did the lab right. Then it was really frustrating, because we ran out of time, because we spent an entire day just talking about variables, and we could have been testing.

Kim: I think it's kind of frustrating that we were the only class that had a shortened schedule, so that was also a difficulty that we had to work around. But I think we rose to the challenge. I mean definitely communication could be better and we could work out a better system to do that.

Ms. Gallagher: Did anyone from your class come in extra?

Angie: I felt like applying the feedback that you gave us last time. People actually looked back in their journals and they were like, "Oh, well she told us we should do this, we should do that." Like the last group test, we didn't even come together and summarize what we had been doing. And the class managers worked really well and we did a really good job talking about what we were doing before we were doing it, and then doing it and then coming back together.

Ms. Gallagher: Good, yeah.

[06:01]

Jack: I thought it was extremely frustrating at the end. It was frustrating that Miss Nac kept turning off the light at the end. The reason was…I understand the reason. But we were still at the end, we were still trying to get everyone's numbers and everyone to meet at a certain place, and then class ended and we couldn't even do that, so I was extremely worried that people were just not going to come or know where to go, because no one had any numbers or anything like that. But afterwards, we did end up solving the problem.

Ms. Gallagher: So you solved it.

Jack: We solved it.

Ms. Gallagher: So you took your frustration and did something constructive with it.

Sandy: Another constructive thing, the people that got up at Kim's house, we really tried to make an effort to include everybody in the class. We called every person. So I think there was good communication.

Ms. Gallagher: Do you have a method that might not take as long as the phone to get in touch with people?

Sandy: Now we do. We have an email list now.

Michelle: I also thought the part about meeting up was constructive, because two or three people would work on one part, which helped, because we had different people from different variables helping to work on the conclusion, which all added up because we didn't know a lot of things individually.

Ms. Gallagher: This helps me, because the information you shared, a lot of it took place outside of this room. A lot of what you just talked about took place outside of the room, so it does help me to get that information. But just so you know, if you didn't share, if there were other frustrating things that you were experiencing, please put that in your journal, especially if it was something that occurred outside of class, because then I might be able to address it. I will see your journals, I will look at those things, and I do want to be able to address some of those frustrations that you're experiencing that we can't fix in class.

[08:07]

Ms. Gallagher: Anything else you guys want to share about these questions so far? I will look at your journals. Okay, this is what I typed up about what was in the room. And again, these are just random notes, whenever I happened to be at the computer. This might refresh your memory, too, of what went on. Day 1: Jack and Kim got up in front to help organize. Kim told everyone to find hot plate info in journals. Jack wrote down the info about the hot plate on the board. My concern is that you still haven't found the information that you need to find to get back in the lab, plus the information that was written on the board wasn't verbalized.

[08:42]

Ms. Gallagher: I wonder how many people copied it down. Safety for the second day: The desks were moved. Goggles were put on. Journals were still weak. Like I mentioned, this needs improving. And cleanup was great, except for lab number two. There was a thermometer out, salt all over the balance. There was a journal left there and a graduated cylinder not replaced. This was the lab table where Frank was, which is kind of strange, because he always asks for that brush to clean up the balance, so I don't know why the balance was left, without him back there I guess it doesn't get cleaned. But the rest of the room looked great. So from day one to day two, you did a better job of that stuff. So that was just a quick reminder of kind of what was going on in the room those first two days. Is that how you remember it?

Students: Yeah.

Ms. Gallagher: A lot of my notes talked about organization, too, your group discussions, so we're on a similar path.

Dan: When you talk about cleanup, uh, not cleanup, safety, you mentioned journals both times. What does that have to do with safety? Is that like writing down stuff?

Ms. Gallagher: The safety information in your journal gives you an immediate response to an accident that might occur in the back. And also, whatever is going on in the room, if you're keeping track of it in your journal as you go, you'll know what's going on in your lab table, as opposed to just trying to remember "who did what so far?" Okay, three more things that I'd like you to focus on real quickly. Number four: Individually, what did you do in order to master the content of the chemistry stuff that you were doing and to help the community? So just bullet points for number four, write down; I spent this amount of time on doing homework each day or whatever. What did you do as an individual to master the content, and what did you do to help the group? Number five: what needs to happen for your community to grow? Do you have any suggestions? And number six: anything in general you want to add, because my first five questions are kind of guiding, but you might have something you want to focus on yourself in terms of the idea of these class assessments and class labs. So write down anything that you can think of. Take a few minutes to do four, five, and six real quick. And then we'll keep talking.

Dan: Are four and five bullet points?

Ms. Gallagher: Sure.

[11:01]

Lynn: Getting together at Kim's house, there was at least someone from each group. I know Michelle was saying that she didn't think her information was efficient until we found, like as we were going through everything, that it happened to be very important. She ended up being able to apply what she had done when she thought there was nothing. It was the same with other people. People didn't really understand what they were doing. They just did their variable. Everybody there kind of understood what everybody else was doing. So everybody felt like they learned more.

Ms. Gallagher: And that content piece is very important. Remember we talked about the balance that you want to find behind this stuff. You need to at least make sure that information that you're studying, that you understand it so that you can share it with other people, so that when you do get together, putting it together, the entire thing will make sense.

Angie: This is kind of sad, but we don't even know everyone's names. There are people in this class we don't know everyone's names. I really think we could work on getting to know everyone's name.

Kelly: Can we play the name game?

Ms. Gallagher: Can you play the name game? Yes, maybe, if you teach it to me.

Kelly: Oh, really?

Ms. Gallagher: Let's see how fast I can get through this. But that's a very good point. I was one of those people who never talked in class in front of everybody, not once the entire time through high school. In the small groups or in labs, I talked. I was really comfortable with that, but I would never raise my hand and ask a question or answer a question, ever. So I know there are people out there that feel that way, and that's okay, just as long as they're somehow made to feel comfortable in those small groups and that the information they're sharing somehow gets heard. So yeah, getting to know each other's names is the first step in making people feel important. That's why when I trade groups, I say, "Make sure everyone in your group knows your first name. Introduce yourselves." And yes, you will be trading groups every unit, so hopefully, as the year progresses, you will get a chance to work with different people. Okay, anything else you want to share about number five?

Sandy: I think that everyone should do a better job of making sure that they have all the information in their journal.

Ms. Gallagher: Okay, journals, journals, journals. Yes, I'm going to talk about that. I agree.

[13:43]

Ms. Gallagher: Yeah, that's a good trigger.

Kim: It's gotten a lot better, but when we first got up there, towards the end of the lab, people would come up and ask questions, but they weren't always considerate of people who were already there, who I was talking to and Jack was talking to and so it would interrupt. And there would be two conversations and it was pretty difficult to accomplish that.

Ms. Gallagher: Yeah, common courtesy.

Jack: We were definitely getting more respect than I thought we were going to get, so…

Ms. Gallagher: Yeah. I didn't notice anything glaring, or that would have been the first thing I would have brought up. But certainly, working as a class is hard when there's this many people, so you do want to try to listen to one another. And here's when the challenge comes. In terms of rude, or interruptions, or people not listening, it typically happens when time runs out. Everybody has something to say in the last five minutes, and nobody has anything to say in the

first five minutes. That is human nature. You feel panic. You feel the intense pressure of that time stopping and you just have to talk. So what do you do with that? That's the challenge. That's what I'm looking for, to see that each time, that part of it improves. All right, let me go through some of the stuff that I saw, and you write down anything that you think might be helpful for you and your group next time, whether it's a small group project or an entire class project. All of this stuff, you've either heard once already, so I'm going to say it a second time and never say it again, or it'll be new stuff that you'll want to apply to our next project. In terms of what I saw in lab, safety; every time, whether it's a physical reaction using pretty safe materials like this lab was, or chemicals, you want to make sure that any precautions about equipment and chemicals; those are recorded in your journal. Every journal needs to have that information recorded. Your records in terms of keeping track of that safety information and what to do in case of, so if this chemical spills, what do I do, or if a beaker breaks, what do I do. That information needs to be recorded, as well; not just the precautions, but what to do in case of an accident.

[16:05]

Ms. Gallagher: Your hypotheses; we've spent time just with an initial activity in this room, walking around as gas particles in the hallway, and we wrote a hypothesis for that before we went out there. Certainly, if you were responsible for testing a variable, you should have thought about; what do I think is going to happen?, because if I get to that point, then I will at least be able to design tests that help me answer or prove that point. So certainly, you should have had a hypothesis, if not for all of them, for your variable if you were testing, written before you started. Looking at your data; do you have enough data points so that it is valid, that what you're going to conclude actually makes sense? The design of each individual group's experiment does matter, and we talked about this after the last lab with the Chem Concoctions. When you decide which trials, which tests you're going to run, in order to figure out your variable, did you put some extremes on there? Sometimes you don't have that option. Sometimes either the equipment or the chemicals I'm letting you use won't allow you to go too extreme, but whatever extremes you can do, you should do. So did you do 300 mL of water in the can, or 100 milliliters of water in the can, or did you time it for 30 minutes? And if not, what was the reason for not doing it? Certainly, there might be a justifiable reason not to do those extremes, but you should have at least thought those through. And then as you did different tests, if you saw that there was a drastic change between two of your numbers, did you test between them to see what the pattern might be between those tests? So the design of your experiment does matter. I'm going to be looking for better designs next time. And homework; a lot of times during these class things that last more than one day, I'll just put "You know." That doesn't mean you don't have homework. That means you know what your homework should be, so you should be doing something as an individual to understand what's going on better, and for the good of your group. There's something that you should be doing. Turn to the experimentation. There's always something that you could be looking at or doing. Your data analysis; as soon as you finish testing a variable, if that happens to be the type of lab that you're doing, you want to go through and analyze it. First of all, do the results that you're getting match what our hypothesis was, and if not, why not? You want to analyze those numbers using a graph. That's the information that's worth looking at.

Your data table is kind of for you. Certainly, you include that in a formal lab write-up, but nobody is really going to care about what your data table looks like. If you're going to give results to somebody, share results with someone, then you want to have a graph that analyzes what was going on. And if your graph doesn't make sense, then you need to go back and redesign and redo something. So for these, it should have been a percent crushed versus your variable, percent crush on the *y* axis, variable on the *x* axis.

CANCO-4B

[00:00]

Ms. Gallagher: All right, so to stop me from talking for a minute, I want you to look at this question and talk in your group for about 60 seconds in terms of content, and these models and what was going on in lab. I want to check to see that you have a visual in your head that makes sense. So number one: Don't look up anything, just picture it. With 10 mils of water in a can, the hotplate on 10 and heating it for 20 minutes, what would the results be? Talk in your group. See what you think and then I'm going to ask you for your thoughts.

Frank: The water would boil off.

[00:57]

<small group discussions>

Dan: Wait, do you want us to draw it out?

Ms. Gallagher: No, just talk.

Dan: Well, all the water's gonna be gone.

Kelly: Yeah, definitely. Couldn't the…? If the can's aluminum, couldn't it be like really…what's the thing?

Sandy: The thing?

Kelly: Melting.

Sandy: I don't know. I think all the water would evaporate.

Kelly: I don't think that it will start melting, but it will get really, really hot.

Sandy: So by then, after 20 minutes, there will be no more water left.

Robert: Yeah.

Kelly: But then there are still air particles that are moving fast inside the can.

Robert: Yeah, it's kinda like when she did the can with no water in it.

Dan: So it probably wouldn't crush.

Kelly: Yeah, it probably wouldn't crush. Good thinking, guys.

<class discussion>

Ms. Gallagher: Okay, what do you think? Raise your hand if you have an idea. Two people. I'm calling on everybody else then. An idea. I heard you guys talking back there. You have to have an idea.

Frank: Nick.

Ms. Gallagher: Nick.

Nick: What? No.

Ms. Gallagher: Yeah, tell me what do you think would happen?

Nick: I think nothing will happen.

Ms. Gallagher: Okay, why? So I flip the can and nothing happens, why?

Nick: The water boils off.

Ms. Gallagher: The water boils off. So 20 minutes, does everyone in the room think would be long enough to get rid of all that water?

Students: Yeah.

Ms. Gallagher: Where would it go?

Dan: Into the air.

Ms. Gallagher: Into the room, so phase change, liquid water, gaseous water went into the room. Why doesn't it crush then?

Jack: Because there's just nothing to even counter the balance. I mean there's all the particles on the outside and there's absolutely nothing on the inside.

Dan: Because once all the water's gone, it's like the first can that was done in our demo.

Ms. Gallagher: Okay. What happened with that?

Dan: Nothing.

Ms. Gallagher: Why?

Dan: Because of the water…there's no water.

Ms. Gallagher: Right. That's a great analogy. What does the water have to do with it, Patrick?

Patrick: It just has more particles moving inside the can along with the air. So there's like greater like…

Ms. Gallagher: Okay. It has more particles of water. Wait, say that again.

Patrick: Water and air, there's just like more particles than air.

Ms. Gallagher: Is there anything in the can when I heat that water for 20 minutes?

Kelly: Air.

Ms. Gallagher: Yeah, there's air in there. Certainly, there's air in there at that point. Keep going.

Craig: The water particles heat up the air particles. But when all the water particles escape, the new air particles come in, so they're not as hot. So then they don't get to slow down as much when we put it in the tub of water.

Ms. Gallagher: Okay, keep those thoughts. I'm not going to answer them yet. Now tell me what you think for this question. With 100 mL of water in a can, the hot plate on 10 and heated for two minutes, what happens? Don't even talk to your group about it. Tell me what happens.

Frank: Nothing.

Ms. Gallagher: Why?

Frank: I don't think it's enough time for the water to boil. And I think even if it was and you put it upside down, it wouldn't be enough time for the water to rush out. The air would be putting pressure on water, instead of on an empty can, so it would take longer for the 100 mL of water to come out of the can. Instead of just like an instant. It'd have to pour out.

Ms. Gallagher: Okay. Keep going. Jack?

Jack: There's also not enough particles on the outside, like around the can. There's more particles inside pushing against it, so there's not enough particles pushing into the can.

Ms. Gallagher: Certainly, those 100 mils might be helpful in keeping the shape of the can. Yeah.

Lynn: Well, when we actually tested it, the time with 15 minutes, 100 mL, and nothing, like we asked like all the time, and they were like "nothing was happening."

Ms. Gallagher: Okay. What do you want in the can right before you flip it into the water in order to get it to crush? What particles?

Dan: Water vapor particles?

Ms. Gallagher: Why do you want water vapor particles in the can? Not air and not liquid water. You want water vapor. Why?

Robert: Cause, um, air vapor, when it goes into the water, the water's not cold enough to turn it into like a liquid, while the water turns into a liquid.

Ms. Gallagher: Okay, stop there.

Angie: Wait, I didn't hear that.

Ms. Gallagher: Stop there. He said something about if we had air in the can and we flipped it into this water, this cold water, even ice water for all I care, it's not cold enough to make that air become liquid air. So somebody take that, 'cause you've got it, so I don't want you to talk anymore for right now. Take that and apply it to what you said you want in the can. You said you wanted water vapor. Why? What happens to it when you flip it into the water?

Dan: Um, it becomes water again.

Ms. Gallagher: It becomes what phase of?

Dan: Liquid water again.

Ms. Gallagher: It becomes liquid water again.

Dan: It slows down.

Ms. Gallagher: What space will that take up in comparison to…? What? Say it.

Sandy: Less space.

Ms. Gallagher: Less. Okay, everybody picture liquid water in a can versus water vapor in a can. Which one's filling the can more?

Students: Liquid water. Water vapor.

Ms. Gallagher: The water vapor. Now if I have water vapor filling the can, I flip it into colder water, and I change that water vapor into liquid, how much space will it take up?

Kim: A lot less.

Ms. Gallagher: A lot less. What's left?

Students: Air. Water vapor. Nothing. Air and Water.

Ms. Gallagher: Nothing. There's nothing left. What would it be in there applying pressure on the inside of the can? Nothing. So what does the outside of the can do?

Kim: It crushes it.

Ms. Gallagher: Questions. Some of you have it clicked. I can tell just by looking at you. And others are like what is she talking about? Yeah.

Lynn: Well, what happens when like 'cause our group was testing different substances, so something changes to like with vinegar?

Ms. Gallagher: Did you boil the vinegar?

Lynn: Well we had it on for like a minute and a half.

Ms. Gallagher: Certainly, there were water vapor particles from that vinegar coming off, so that would change. I want to know what the key is, then. What's the key to the crushing?

Kelly: Water vapor.

Ms. Gallagher: Something more.

Craig: The volume of the water vapor in the can and how fast it turns to liquid water.

Ms. Gallagher: Okay, so it's gas to liquid. Phase change. That's the key that we took water vapor and changed its phase so that the space it took up drastically changed. What temperature do you need to make sure that water is in the pan? It has to be under what?

Dan: Room.

Kim: Room temperature.

Robert: 100 degrees Celsius.

Ms. Gallagher: It has to be under 100, because that's the boiling point of water. So anything colder would change it then, back from vapor to liquid. What temperature? What would we have to put in the pan to make air condense?

Tom: Zero.

Ms. Gallagher: I'm talking about liquid air. What is air mostly made of?

Sandy: Nitrogen.

Ms. Gallagher: Nitrogen. What would I have to have in that pan in order to get my air to condense?

Frank: Oh, liquid nitrogen.

Ms. Gallagher: Liquid nitrogen or something colder. Okay? I need to make it so that sample changes from gas to liquid. So that's the key. Yeah.

Angie: I don't understand how there's nothing in the can. How can there be nothing?

Ms. Gallagher: Okay, if you spent the time to get your liquid water that was in your can and air particles above it to boil, what will those now new vapor particles do to the air?

Angie: Push them out.

Ms. Gallagher: Push them out of the can. So what's filling your can?

Angie: Water vapor.

Ms. Gallagher: Water vapor particles. I immediately flip that and close the container, because as soon as I put that in the water, I've pretty much put a lid on my container, right? I'm changing that can that's filled with water vapor into liquid water.

Angie: So then the water vapor gets turned to liquid water and then all the water pours out?

Jack: No that space of the water vapor…

Ms. Gallagher: Okay, before that step. Let's talk before that step. You just said all the water vapor particles turn into liquid. What's left in the rest of the can now?

Angie: Nothing.

Ms. Gallagher: Nothing.

Student: What about air?

Ms. Gallagher: Because if the air particles were pushed out, I've got water vapor being changed into liquid water. What might you have seen then, because the outside air pressure was pushing on your can? What else did it push on in the bin?

Dan: Water.

Ms. Gallagher: Water. And where did that water go?

Dan: Up.

Ms. Gallagher: Back into the can. So when you lifted it up, you may have seen a lot of water pour out, because it was trying to fill that space, too.

Angie: So right when you take it out of like…the hole in the can coming out, like you take it out of the water, does it get filled with air particles again or is there still nothing?

Ms. Gallagher: Sure.

Dan: So this all happens instantaneously?

Jack: Yeah, it's all…

Ms. Gallagher: And like I'm just talking to you, like about 10 pictures in a row, something happened like that. <snap> Like every little thing I was talking about just now, that all happens like that. <snap>

Kelly: Could you explain the part where the pressure pushes on the water?

Ms. Gallagher: Well, atmospheric pressure is pushing on everything, right? So if I have a bin of water out, there's particles of air pushing down on that water. Correct?

Kelly: <affirmative nod>

Ms. Gallagher: When I flip that can, because of the temperature of the water, I change that water vapor into liquid water. The air particles are pushing on the can and there's nothing pushing back, so that's why it crushes. The air particles are also pushing on the water in the bin and they've found a space to go, up in the can.

Lynn: But that's only the case if you flip it directly down because I remember the first can I did, I didn't realize it had to be down so I just like stuck it in there on the side.

Ms. Gallagher: Well, even if I took the can right off the hotplate and put the bottom into the pan, do you think the water vapor particles would have changed into liquid water?

Students: No.

Robert: Yeah.

Ms. Gallagher: Yeah, yeah, the temperature was still low enough to change my vapor into liquid. But what immediately followed?

Students: Air.

Ms. Gallagher: Air.

Kelly: So it wouldn't crush as much.

Ms. Gallagher: It wouldn't crush.

Kelly: Oh, it wouldn't crush at all?

Ms. Gallagher: It probably wouldn't crush at all, because air followed that water vapor immediately.

Nick: Do you have to use water?

Ms. Gallagher: No.

Nick: So ethanol, like?

Mark: So the more water vapor, the greater the crush?

Ms. Gallagher: The more you fill your can with entirely water vapor, the more the crush.

Frank: How come the air pressure is pushing down on the water? Isn't there atmospheric pressure pushing in all directions?

Ms. Gallagher: Mm hmm.

Frank: So why is it just pushing down and up into the can?

Ms. Gallagher: It's pushing it in all directions, you're right, but we had it in a bin that had three sides covered.

Frank: But isn't it pushing on the bin, too?

Ms. Gallagher: Mm hmm.

Frank: So why does it just go down?

Ms. Gallagher: It doesn't. That was my description of telling you how that water got in there. Atmospheric pressure's pushing in all directions, but as soon as that can had nothing filling its space, it was being displaced by the water that had air pressure pushing on it itself.

Frank: Oh, oh, okay.

Ms. Gallagher: All right, so let's move onto the next step. That's a piece you want to write yourself right now to revisit. We just talked about what made the cans crush, why we did that lab, so you want to make sure you revisit that piece. This next question has to do more with what was new, because these two labs were pretty similar, the Chem Concoctions lab and this lab, in that you isolated a variable and tested it and shared your results.

[14:11]

Ms. Gallagher: I'm going to start flying through, so write quickly. Time constraint; yeah, that's always going to exist. You're always gonna to feel like you need more time. Who doesn't? That's life, deal with it. I'm wanting to see what you can come up with in the time that you get. That's what matters. You'll always feel the time constraint. You always want to make sure that your presentation has an overall picture, like what is it that we're trying to communicate here, and make sure that that umbrella is communicated right upfront, and then share the details, and then come back to the big picture. That's a good presentation. And your slides, we talked about those, make sure that we can read them, make sure there's not too many words on them, things like that. This actually has the wrong heading at the top. That should still say "presentation." All of these things are things that I saw from company to company. If you did them, keep doing them. If you didn't, know that there's somebody out there doing it. So with competition, it matters. Dress; yes, everybody dressed up in one class, the greeter at the door, waiting for Dr. McMurry to shake his or her hand. The room arrangement, desks were moved around so that it was an actual presentation room and a chair picked out. Business cards were made. Name tags were made, food and drink provided, appropriate sales pitch. And a robotic system plan was included, meaning there were architectural designs, electricity was calculated, the robotic designs and the idea of a conveyer belt that heated while the cans moved, things like that. You want to know out there that some people are thinking outside the box, making sure that those little details are done, because it's a competition, so keep those things in mind.

[16:44]

Ms. Gallagher: Overall scores: these were the things that were typed on your project sheet, so this should come as no surprise. Those three things were right there in your journal the whole time. So 10 points for each of those areas. Let me find my sheet. The safety part; yeah, we needed some work on our journals and we needed some work on the cleanup part, so 8 ½ out of 10. The community part was great. You guys need to keep that up. Most of your comments at the beginning of class were positive. That says something. If you have frustrations, let's try to work those out, so that things keep going in a positive direction. The community report, the actual lab report, that's the second one up there. Not the presentation, but the actual hardcopy report looked great. The data for some of the tests was a little off, meaning you wanted to test some of the in-between numbers. If you need to find time, do that. You know, ask to come in at lunch or whatever or before school. The graphs looked good. You guys actually had percent crush versus your variable and had some pattern on your graphs. Even though they weren't on your presentation, they were in your report, so they looked good. Keep that up, so 9 ½ out of 10 on the community part, the community report card. Presentation; you guys had some glitches. There were some problems, so organization, the professional atmosphere, the visual aids that didn't show up, and then the accuracy of information. The graphs, had they been there, would have been good, but those things cost you, so 7 ½ out of 10. So adding those up, I think it's 25.5 out of 30 for everybody.

Kelly: That's a B.

Ms. Gallagher: 8 ½, 9 ½, and 7 ½. So there's where fell with the overall score, which unfortunately, did not get you to contract this time.

Kelly: Who got it?

Ms. Gallagher: I can't tell you. Shoot for it for next time.

Frank: Ask somebody in another class.

[19:00]

Ms. Gallagher: And then where's the silence? Remember we said once its read; take a minute to absorb it. Take a minute to let the managers think. So you need to make sure you build in that silence piece. As soon as something is read, silence. Planning is the key, of course. You want to make sure that what you've planned seems to make sense for everybody and then move on. Homework is important. You want to make sure people are doing homework. You'll always need more time, and record everything. It could come to a situation where a question might say, "Everyone except Patrick, put journals away. Using Patrick's journal, what was the answer to number two on the first class assessment?"

<laughter>

Ms. Gallagher: That would be really mean, but I like those questions.

Kelly: Oh my gosh.

[20:07]

Ms. Gallagher: And then the last part is probably the most important. Be comfortable with confusion. I am not going to ask you to do a class assessment or a class lab that you can do right away. That has no point. It's going to be challenging, not only in content, I hope, but in the fact that you have to organize as a class to get it done. So know going into it that I'm trying to confuse you, and I want to see what you can do in order to get through it, actually get an answer that makes sense. So be comfortable with the fact that there is going to be confusion at the beginning. Quotes; real quick, "Uh oh, it's got a hole in it, guys," which happened in more than one class. "No more rolling around for me," which somebody was sitting on this chair, rolling around the room. "Miss G., I know you're not here, but I think some people should be excommunicated from lab," and then the person walked away. "Gary, get your goggles on. You could be impeached for less." Remember these are all classes put together. "Rough day at CanCo, honey," and then they just went on with this role-playing, like he had just gotten home and blah, blah, blah. "She said it was about how we work together, not whether we got the right answer." No, I didn't. I said find a balance. I want you to get the right answer, but I want you to do it having fun and being nice, so find a balance. This was a conversation, "Oh, my gosh!" "What? What happened?" "Oh, my gosh!" more panicked. "What?" "I just learned something," was the response. I actually like that one. Next one: "Oh wow, that's so profesh." "Profesh?" "Yeah, I like to abrev." "We've organized class, typed up the procedure, made sure everyone's doing their jobs, and now we're putting the presentation together. And what is it that you're doing?" "I'm giving you reassurance that you're doing a great job." Yikes! "I really don't think I'm going to make it through junior year alive," was one comment. "What's her name?" "It's some ridiculous name like Sac." "It's Nac, you fools, you know, 'can' backwards. Have you guys even been in the room the last couple of days? Pay attention." After they walked away, the other two people kept talking, "Nac is even more ridiculous than Sac." Follow-up stuff in your journal—actually, we'll stop there, because I'm running out of time. This other stuff is the class assessment you did at the end, and the quizzes and stuff, so we'll talk about those next time.