KICKSTART YOUR CAREER JOURNEY: A FIRST-YEAR SCIENCE STUDENT GUIDE

UNIVERSITY OF WATERLOO | FACULTY OF SCIENCE

WHOSE LAND ARE WE ON?

The University of Waterloo acknowledges that much of our work takes place on the traditional territory of the Neutral, Anishinaabeg and Haudenosaunee peoples. Our main campus is situated on the Haldimand Tract, the land granted to the Six Nations that includes six miles on each side of the Grand River. Our active work toward reconciliation takes place across our campuses through research, learning, teaching, and community building, and is co-ordinated within the Office of Indigenous Relations.

Have you checked out INDG 201?

Why are we hosting this session?

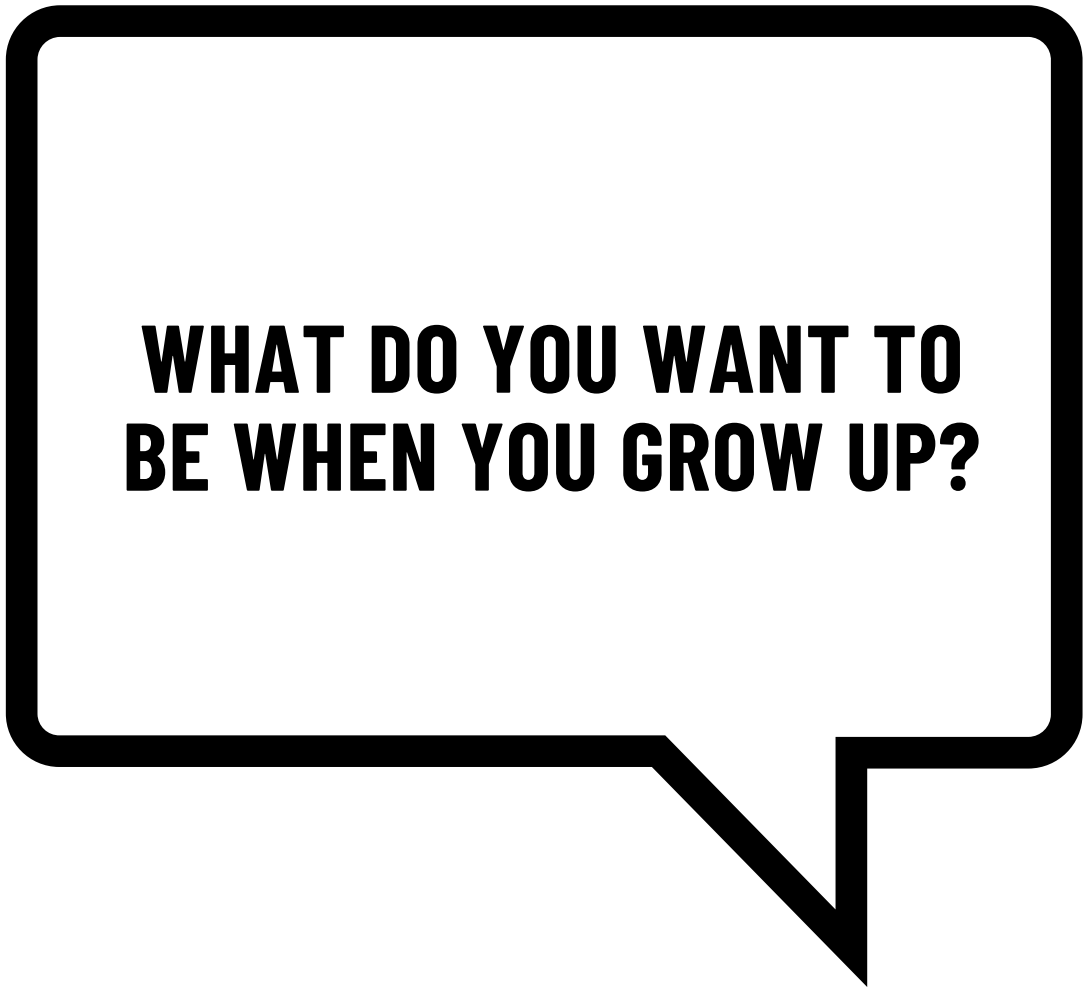
- To help you kickstart your career this summer!
- To help you identify the skills you're developing in your degree
- To share experiential education opportunities
- To answer your questions (post-session breakout conversations)

Agenda

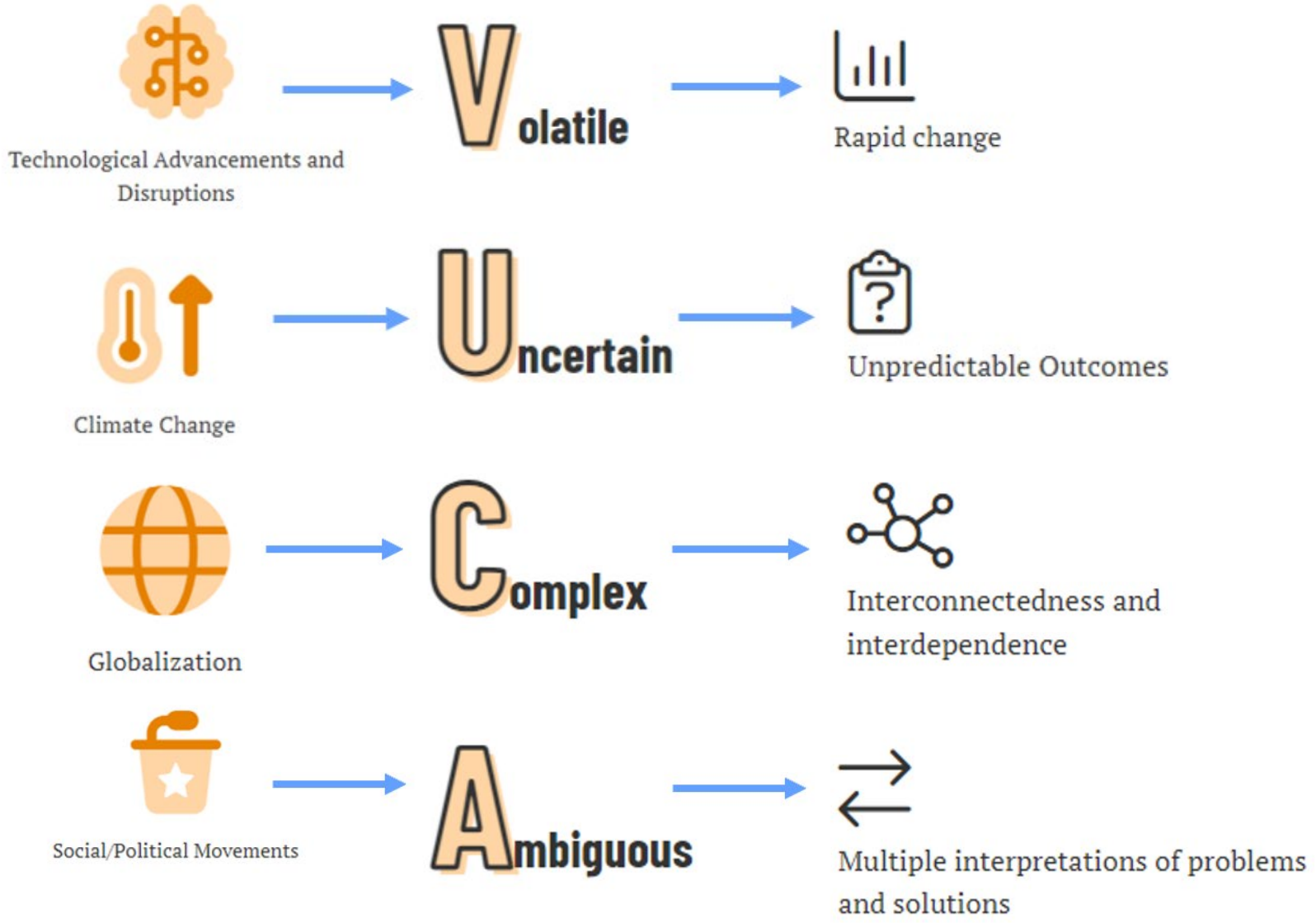
- The future of work
  - Hear how upper-year students and a recent alum are navigating it
- Skills identification & articulation
  - Sue explains how your Chem120L skills can translate to a resume
- Experiential learning opportunities
- Q & A

THE FUTURE OF WORK

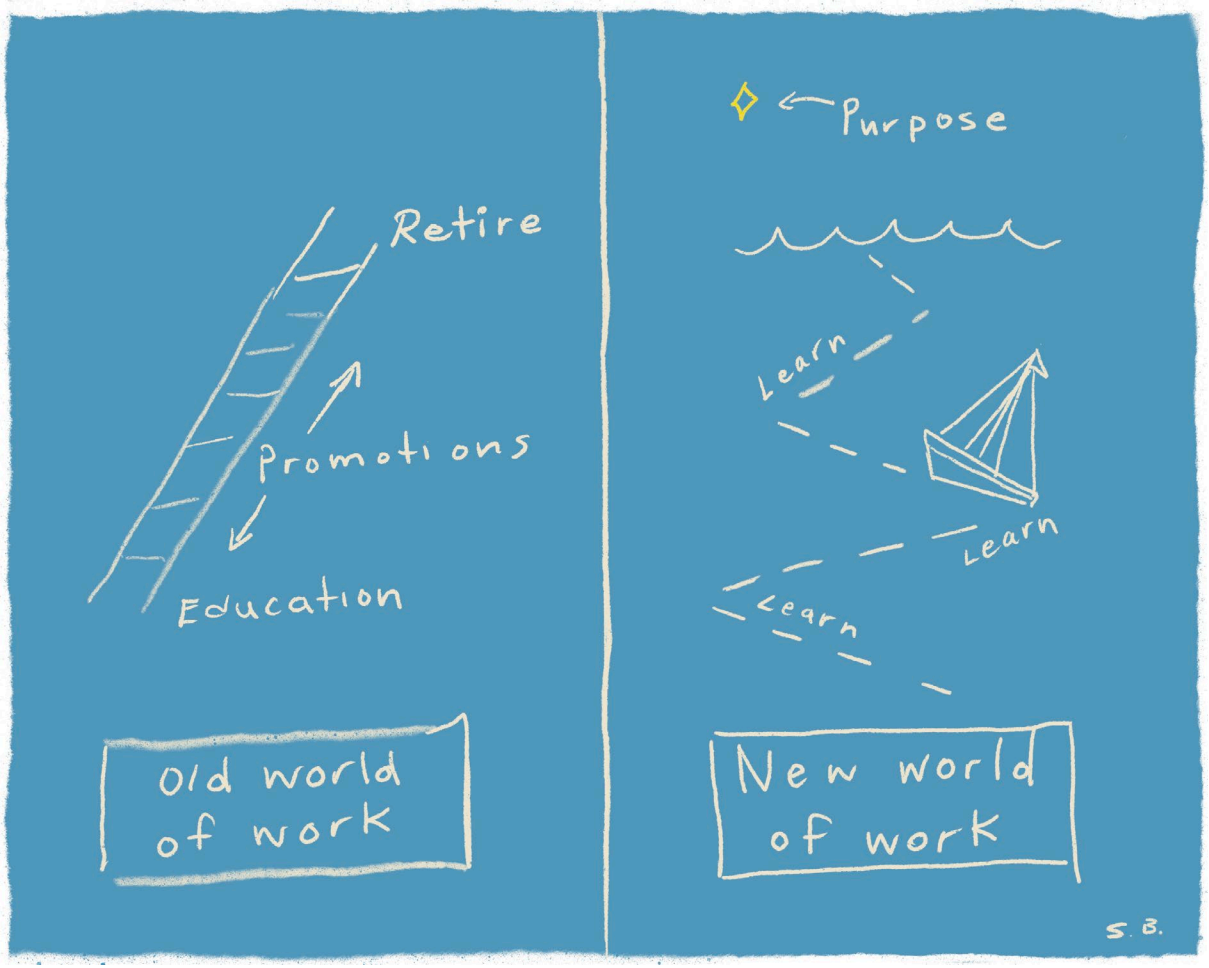
How to navigate the new world of work


WHAT DO YOU WANT TO
BE WHEN YOU GROW UP?

The Future of Work



How do these changes affect you?



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THINKING BEYOND JOB TITLES

Skills, skills, skills!

BY 2027...

25% of jobs will change due to automation

WORLD ECONOMIC FORUM, 2023

~~"What do I want to be?"~~

"What problems do I want to solve?"

&

"What skills do I need to develop?"

What problems do I want to solve?

INVENT NEW BIOTECHNOLOGY

ENGINEER BETTER MEDICINE

PROTECT BIODIVERSITY AND LANDSCAPE

CREATE NEW FOOD AND FOOD SYSTEMS

What skills do I need to develop?

Attributes Employers Seek on a Candidate's Resume

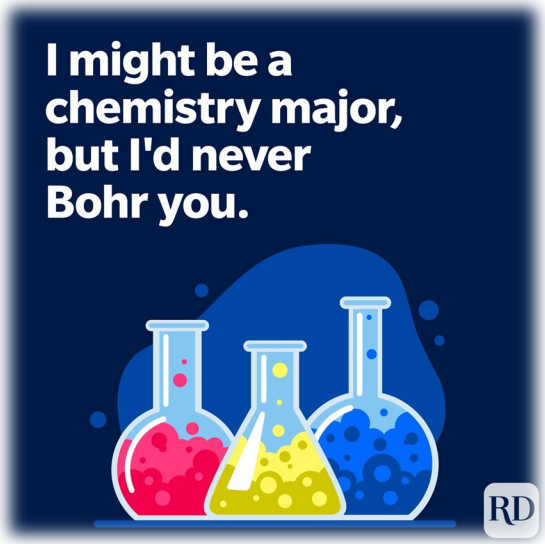
Attribute	% of Respondents	Attribute	% of Respondents
Problem-Solving Skills	88.7%	Interpersonal skills	58.2%
Ability to work in a team	78.9%	Computer skills	54.6%
Communication Skills (written)	72.7%	Leadership	52.1%
Strong work ethic	71.6%	Organizational ability	44.8%
Flexibility/ Adaptability	70.1%	Strategic planning skills	34.5%
Communication skills (verbal)	67.5%	Friendly/outgoing personality	25.8%
Technical skills	67.0%	Creativity	21.6%
Analytic/ quantitative skills	66.0%	Tactfulness	21.1%
Initiative	65.5%	Entrepreneurial skills/risk-taker	18.6%
Detail-oriented	61.3%	Fluency in a foreign language	5.2%

NACE®
National Association of Colleges and Employers

Source: *Job Outlook 2024*, National Association of Colleges and Employers

First-year Science skills

- Can you use specific examples of skills gained in a laboratory class to showcase skills on your resume?
  - Let's answer this question using CHEM 120L as an example
- What the **syllabus** can do for you
- Skills demonstrated by:
  - Preparing for experiment
  - Performing experiment
  - Writing a report



Course syllabus examples:

Course learning objectives:

Upon successful completion of this course, students will be able to:

- Recognize various laboratory techniques, using standard tools and equipment
- Evaluate and follow scientific protocols, and to modify them as required
- Appropriately display, critically assess and draw conclusions from experimental data
- Effectively communicate scientific ideas and support them appropriately
- Identify safety requirements for the chemistry laboratory
- Recognize the extensive applications of chemistry in everyday life

COURSE OBJECTIVES

Upon successful completion of this course, you should be able to:

1. Craft short plays with clear action, developed characters, and precise dialogue
2. Contribute productively to a workshop environment with constructive criticism and positive feedback
3. Apply feedback to your own writing through revision
4. Articulate your choices in the revision process
5. Analyze and discuss the craft of contemporary plays
6. Describe how theater is distinct from other forms of dramatic art

Course Objectives

Briefly, the course's objectives are to help you:

1. Understand the importance of technical communication in your career
2. Develop basic skills and strategies important in technical communication (audience and purpose analysis, organization, style, document design, graphics development, editing, and proofreading)
3. Analyze and evaluate technical and scientific material
4. Synthesize information in technical communication
5. Prepare professional technical documents, in both electronic and print format
6. Integrate information from diverse fields and understand how your own specialization fits in a broader context
7. Collaborate with students from different fields to communicate about topics relevant to several professions.

Learning Objectives

By the end of this course, you should be able to:

1. Describe the integrated new product development process.
2. Apply this process within interdisciplinary teams to design new, user-driven products.
3. Defend the design decisions that you make as well as evaluate the design decisions behind existing products and proposed product concepts.

Skills used when preparing for chem lab:

- Writing EPS:
  - Often wordy instructions reduced down to the basic steps
    - ability to critically assess information and distill out the main points
    - focus / evaluate / interpret / present material concisely

Reaction 1: Copper metal to copper (II) nitrate

You will find a length of copper wire (99.99% pure) and a piece of sandpaper at your workbench, sand the wire to remove any coating that may have been added by the manufacturer to prevent corrosion / oxidation. After sanding, take the wire to the analytical balance room to weigh.

All digits displayed on the analytical balances should be recorded (this will give you a mass in grams with 4 decimals, that is, these masses are accurate to 1/10000th of a gram). Record the mass of your copper wire on your data sheet.

Back at your workbench, place the copper wire in a labelled 250 mL beaker so that it sits flat on the bottom of the beaker. This is done so that the entire piece of wire is immersed in the small volume of acid you will add at the next step. (Coiling the wire works well here.)

Take the beaker containing your wire and a 10 mL graduated cylinder to the fume hood. In the fume hood, add 10 mL of concentrated (15.8 M) nitric acid, HNO_3. Once you have added acid to your beaker, place it towards the back of the fume hood and move away from the fume hood to let others begin their reaction as well. The reaction is very easy to observe from several metres away.

Let the nitric acid and the copper wire react in the fume hood while you observe and record a description of this step of the reaction on your data sheet. Do not remove the beaker from the fume hood yet!

After the wire has dissolved, swirl the beaker in the fume hood to remove any gasses trapped in the solution. This may take a while! You may safely remove your beaker from the fume hood when no gas is observed upon swirling and the solution is bright blue. Observe and record a description of this step of the reaction on your data sheet.

- sand and weigh copper wire on analytical balance (4 decimals)
- place wire in 250 mL beaker, in fume hood add 10 mL concentrated nitric acid, record observations throughout
- when vigorous reaction stops, swirl beaker to release trapped gas, don't remove from fume hood until blue

Skills used when preparing for chem lab:

- Writing EPS:
  - Replacing written instructions with images
    - creativity
    - ability to ‘think outside the box”
    - detail oriented
    - able to transfer knowledge

Part A: Preparation of ethanol standards

Obtain 35 mL of 0.150% ethanol standard solution from the carboy at the side bench. You will use this standard solution to prepare a series of diluted samples of known concentration.

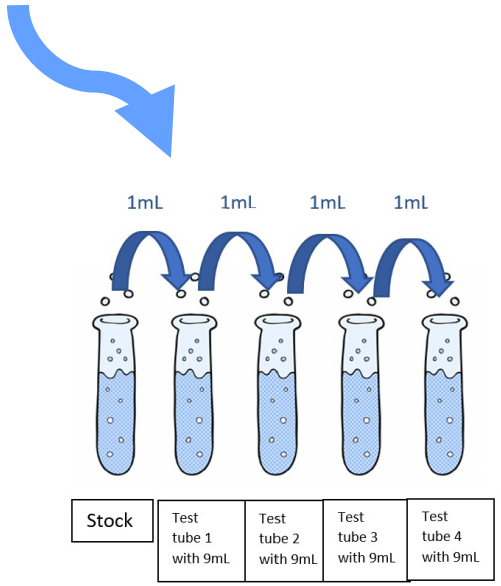
Later when you are calculating the concentration of these standard solutions note that nothing will have a higher ethanol concentration than the standard solution.

Using the two 10 mL Mohr pipettes (one for ethanol and one for deionized water) prepare the following series of ethanol standard solutions in five large test tubes:

	Ethanol (mL)	DI water (mL)
Tube 1	2.00	8.00
Tube 2	4.00	6.00
Tube 3	6.00	4.00
Tube 4	8.00	2.00
Tube 5	10.00	0.00

Note that each test tube contains exactly 10.00 mL of solution; check the volume levels of your test tubes, if they seem unequal, you may want to remake some of these standards. It is important that all volume measurements are accurate.

Mix the contents of each of these tubes by stirring with a glass rod. If you start with the tube of lowest ethanol concentration and work upward you do not need to clean the stirring rod in between tubes.



Skills demonstrated conducting a lab experiment:

- Working with a partner:
  - verbal communication skills
  - teamwork
  - collaboration
- Was your partner a nightmare to work with?
  - patience, tolerance, tact, diplomacy
  - ability to deal with difficult situations / people
  - work well under pressure

Skills demonstrated conducting a lab experiment:

Credit: Ignacio Sparrow

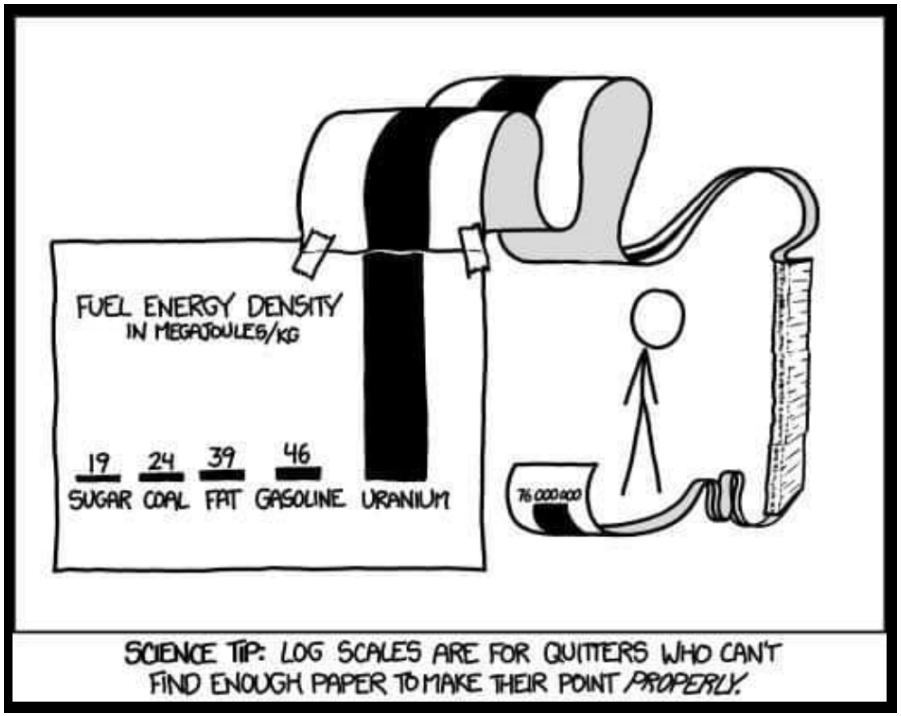
- Are you the planner?
  - leadership
  - instructing others
  - goal setter
- Are you the follower?
  - supportive / team player
  - task oriented
  - cooperative
- Did both partners take the lead together?
  - negotiation

Skills demonstrated in conducting lab experiment:

- Did you manage your time well (complete tasks on time or early?)
  - efficiency, organization, ability to meet deadlines
- Did you encounter a problem which you overcame or fix something when it went wrong?
  - problem solving, trouble-shooting, perseverance
- Did you complete a difficult or complex task?
  - goal oriented, ability to set and achieve goals
- Did you complete several tasks at one time?
  - manage multiple deadlines, multitasking

Skills demonstrated in writing reports:

- Technical skills:
  - word processing, proofreading and editing
  - fluency in specific software applications when creating graphs, tables, images, equations, etc
  - determine methods for appropriate presentation of data



Skills demonstrated in writing reports:

- Soft skills:
  - ability to interpret data and draw conclusions
  - articulate ideas
  - analyze results to solve a problem
  - meet deadlines
  - written communication skills
  - research skills

Skills demonstrated in writing reports:

- Were you able to recognize significant points and differentiate from non-important ones?
  - ability to think critically
  - filter / distill complex material
- Were you able to draw conclusions from the material?
  - interpret and present findings
- Could you identify problems in either the data or the experiment?
  - analyze, troubleshoot, solve problems

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HOW DO YOU DEVELOP NEW SKILLS?

EXPERIMENT!

EXPERIMENT: EXPERIENCES

- **Co-op work terms**
- **EDGE certificate**
- Volunteering/shadowing
- Lab work
- Field courses
- Research opportunities
- Student clubs – SciSoc, WUSA
- Velocity
- iGEM
- Let's Talk Science
- Classroom projects with industry partners
- Program-specific opportunities

EXPERIMENT: CONVERSATIONS

- Talk to someone living the future you are curious about to get their story
- Conversations = informational interviews
- Great way to build your network!

GETTING STARTED CHECKLIST

- ❑ Reflect on what problems you want to solve and what skills you need to develop
- ❑ Explore experiential learning opportunities
  - Summer jobs, student clubs and volunteering
- ❑ Build and connect with your network
- ❑ Reach out to a career advisor for support!
  - Career planning (e.g. Finding your purpose, identifying the problems you want to solve, resumes/cover letters, work search strategies)

What did you think? Let us know!

QUESTIONS?

Looking for more information?

General info

EDGE

Co-op