

Envisioning the Career Road Ahead – Student Resource

Task 1: Create a Science Career Cluster

What is your ideal career? Create a career cluster of related careers that use similar skills. Why? Because you might shift gears during your lifetime and you want to be able to still move forward with your career. For example, you might train to be a genetics researcher only to find that you are not able to land that type of job. Perhaps your volunteer work with ELL (English language learner) students sparked an interest in becoming a science teacher. All of these have related skills so if you have finished a Bachelor's degree in science, you could complete a teaching degree and continue on. Real career journeys are a winding path. Not reaching the goal you had in Grade 11 does not mean that you have failed. It may mean that your priorities have shifted, or that the market has changed and the outlook for that career is poor. Setting your focus on a related career may make sense at that point.

What is a Career Cluster?

A Career Cluster is a small grouping of careers that are related to each other.

Determine if your work values match the occupation of your choice:

http://www.jobseekersguide.org/US/sites/default/files/work-values-1_3.pdf

Photo credit: <http://tinyurl.com/ycycems6>



Use the self-assessment tool at the above website to determine and rank your work values. For example, if your desire to be well-paid with good benefits outweighs the ability to work independently with little supervision, this may impact your choice of future careers.

Career Cluster Example:

Career #1: Science teacher

Education needed: Bachelor of Science (with one specialty for elementary school and two specialties for high school) and a Bachelor of Education (2 years)

Career #2: Science writer (could be a science journalist or public information officer for a university or college)

Education needed: Degree in Journalism with a broad selection of science courses or degree in Science with a minor in journalism. You may need a graduate degree. Writing for the school and university newspaper or equivalent is a must.

Career #3: Genetics Researcher

Education needed: Depends on the job, could be Bachelor & Masters of Science and PhD in Molecular Biology

Career Cluster (keep this information for Task 3 and/or 4):

Career #1:

Education & experience needed:

Career #2:

Education & experience needed:

Career #3:

Education & experience needed:

Please give properly formatted references. You can use EasyBib or other automated referencing program to help you.

Task 2: Meet the GlycoNet Scientists

Period 1 (0.5 period)

Introduction to GlycoNet & Meet the Scientists

Your teacher will show you the following videos:

- The GlycoNet Story <https://www.youtube.com/watch?v=CQGEGloqTpQ>
- Career Interview with Ryerson's Dr. Warren Wakarchuk, Chair of Biology and Chemistry <http://tinyurl.com/ybrwhjbq>

Homework: Watch Carolyn Bertozzi's Tedx talk (12:27) by the famous Stanford researcher Carolyn Bertozzi, entitled "The sugar coating on your cells is trying to tell you something:" <https://www.youtube.com/watch?v=5HeZaYtfDf8>

Answer the following questions:

1. How do sugars determine your blood type?

2. What type of sugar appears on the surface of cancer cells?

3. How do immune cells protect you?

4. How do cancer cells trick the immune system cells?

5. What strategy is being worked on now to try to beat cancer?

Visit www.glycobiology.weebly.com. Watch Nakita's video (53 seconds) explaining the Wakarchuk lab's main research interests. Everyone in the laboratory, from the second year student to principal investigator, works in some way to contribute to this research (therapeutic proteins).

Questions to ponder:

1. Which diseases could the Wakarchuk lab's research help to treat?
2. What are they hoping to achieve with these modifications of the therapeutic proteins?
3. What is the second area of research that Nakita mentions?
4. Summarize the research strategy that Nakita describes for this second area.

Out of the following six video clips, choose four to view. Answer only the questions that pertain to those videos. Use a pair of online dice to choose.

1) University of Waterloo student Nicole Thompson talks about her work (47s)

- a) What is the main focus of her work?

- b) What does she do with these sugar-tagged proteins?
- c) Where do the enzymes come into play?
- d) Would you consider doing a work/student program in college or university as part of your training and career planning? Why or why not?
- e) What is the most important factor that makes work interesting to you? Is it the context or the day-to-day work itself?

2) University of Toronto Professor Dr. Mark Nitz talks about biofilms (35 s)

- a) What is his area of research?
- b) Why do bacteria like to stick to surfaces?

- c) How can researchers prevent bacteria from sticking?

- d) With all of this talk about bacteria, what department is Dr. Nitz a part of? Is this surprising to you?

3) Tasnim Abukar (Graduate student) – video clip #3 (24 s)

- a) What does Tasnim want to do in the future and why?

- b) What is a pharmaceutical chemist? Research this profession.

4) Dr. Ting Du (Post-doctoral Fellow) Video clip #4 (33 s)

- a) What is a post-doctoral fellow? (research this) What career stage is Dr. Du at?

- b) She mentions adding the O-glycan to the therapeutic protein. What is the reason for doing this?

- c) What is a half-life? What does “in vivo” mean? (research this)

- d) What would be two advantages of the therapeutic proteins staying longer in the blood of a patient?

5) Ray Martinez-Rodriguez (Summer student) Video clip #5 (1:06 min)

- a) How did Ray hear about the Wakarchuk lab?

- b) What intrigued him about the work done in this lab?

- c) How did he get the job that he has now?

6) Laura Kell, Research Technician video clip #6 (58 s)

As Laura talks about her job, she mentions two main responsibilities. One of them is training and mentoring other team members and assisting them to advance the projects.

- a) Is it surprising to you that a research technician has this job responsibility?

- b) What is the other (research) part of her job?
- c) Laura describes her typical day and says, “Well, there is no typical day.” Does this appeal to you? Would you like a job where there are different things happening day-to-day or something more consistent?
- d) What is TLC (thin layer chromatography)?
- e) What is an enzyme and substrate? Research these two concepts.

Task 3: Interview a Scientist – create a career profile

Find a scientist, conduct an interview, and create a career profile. This will be compiled with others in the class to become a small magazine that can be read by other students. You should come up with at least 6-8 questions. As the interview progresses, there should be thoughtful follow-up questions. Show your teacher your questions and choice of scientist before conducting the interview. The interview must be recorded in some way (video or audio) with the scientist's permission. The person interviewed should not be in your immediate family (parent or sibling).

Date for interview:

Role of scientist:

Name of scientist:

Name of organization:

Scientist contact information:

E-mail:

Phone number:

Signature of Teacher:

Items to hand in:

- Research notes (including questions prepared for the interview and notes taken during and after the interview)
- Career profile (1-2 pages), including an introductory paragraph to orient the reader to your subject and a summary paragraph that includes your personal learning and reactions to the interview
- A copy of the rubric with your self-assessment (make sure that you consult the rubric before you start the assignment)

Rubric for career profile

	Level 1	Level 2	Level 3	Level 4
Research Notes	Limited research notes are included with questions for the scientist, notes taken during the interview or from the recording	Some research notes are included with questions for the scientist, notes taken during the interview or from the recording	Adequate research notes are included with questions for the scientist, notes taken during the interview or from the recording	Extensive research notes are included with questions for the scientist, notes taken during the interview or from the recording
Introduction	Introduction was poorly done and lacked background information	Introduction did introduce the scientist but did not give background information	Introduction did an excellent job of introducing the scientist & giving background information	Introduction did an outstanding job of introducing the scientist & giving background information
Interview	Interview was incomplete or obviously a last minute effort. Not all of the questions are addressed.	Interview had most of the major components, but questions were not followed-up thoughtfully and it did not reflect a meaningful discussion.	Interview was excellent with thoughtful questions and follow-ups. It is obvious that a meaningful discussion occurred.	Interview was outstanding with thoughtful questions and follow-ups. It is obvious that a meaningful discussion occurred.
Summary paragraph	Summary paragraph is not present/incomplete	Summary paragraph summarizes the interview but does not demonstrate student learning	Summary paragraph sums up interview clearly & includes at least 2 major points of learning	Summary paragraph sums up interview succinctly & includes student's reactions & reflections in a critical way
Grammar, editing & organization	Limited evidence of editing (many grammatical and/or spelling errors, writing does not flow well) & little or no organization	Somewhat poor evidence of editing (many grammatical and/or spelling errors, writing does not flow well) & organization	Excellent evidence of editing (few spelling mistakes, the writing flows well) & subtitles	Grammar and editing are perfect, with excellent organization (use of subtitles)

Modified from:

<http://mwagstaff.asp.radford.edu/210class/Career%20Profile%20Assignment%20Rubric.pdf>

Task 4: Adobe Sparks Career Assignment

Create a 5-7 min short video or narrated series of photos about your selected science career using Adobe Sparks or another program of your choice.

Using Adobe Sparks is easy and gives a professional looking product in a short time. Here's a tutorial: <https://spark.adobe.com/about/video>

In your presentation, outline your career cluster of three potential science careers. Your presentation should address the following:

- What kind of courses do you need in high school to qualify for a program in each of these careers?
- What kind of college or university courses do you need to enroll in?
- What is the salary range?
- Advantages/disadvantages of this job?
- Would this job satisfy a person like you? Does it match your personality?
- Describe the working conditions (inside/outside, shift work/flexible hours)
- Is there demand for this kind of job in the future?
- Other areas – your choice

*** Helpful sites**

- <https://www.payscale.com/>
- <http://www.science.ca/>
- <https://www.academicinvest.com/science-careers>
- <https://www.utm.utoronto.ca/careers/career-planning/careers-major>

Rubric for Adobe Sparks Narrated Slideshow

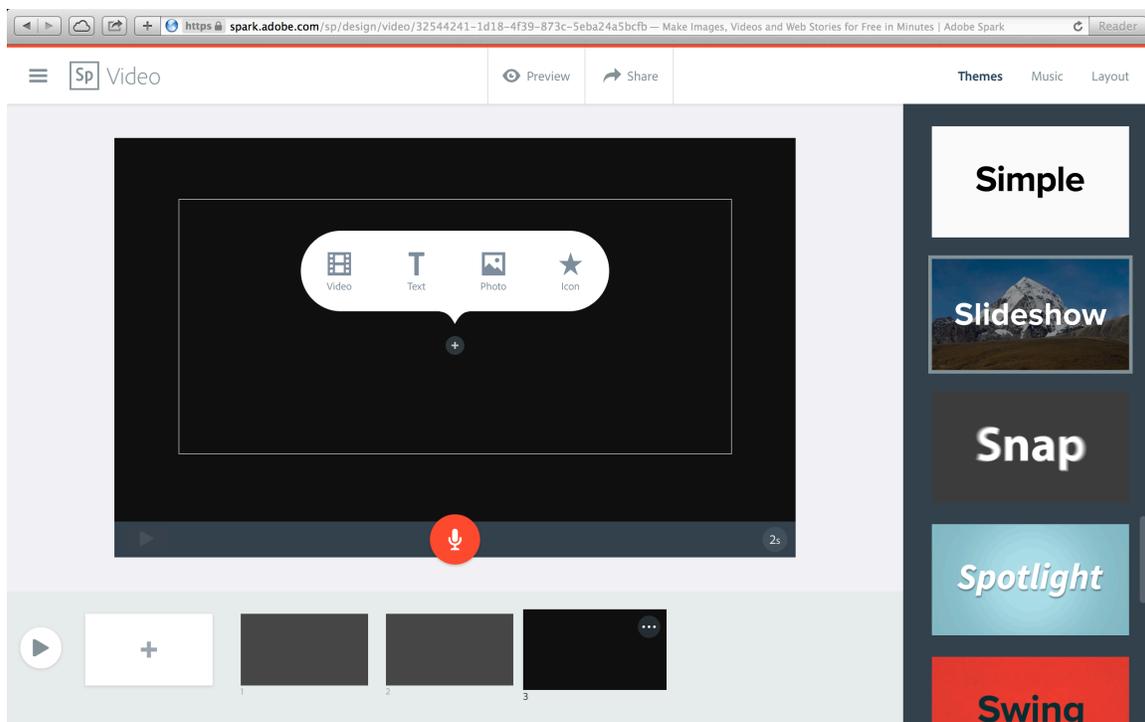
	Level 1	Level 2	Level 3	Level 4
Content	Limited level of understanding of the education, skills and match between aptitude/interest and personality	Some level of understanding of the education, skills and match between aptitude/interest and personality	Excellent level of understanding of the education, skills and match between aptitude/interest and personality	Outstanding level of understanding of the education, skills and match between aptitude/interest and personality
Evidence of Research	Sketchy or incomplete research notes with few quality references (0-2)	Good research notes with some references (3)	Excellent research notes with a number of quality references (3)	Outstanding & thorough research notes with many quality references (5+)
Timing	Presentation was extremely short and provided no depth	Presentation was somewhat short and/or lacked depth	Timing was just right – neither rushed nor stretched out	Timing was excellent and went into an impressive amount of depth w/o losing the viewer
Creativity	Did not make use of any available tools (e.g. graphical overlay/timing/content); little to no creativity apparent	Made limited use of available tools; limited creativity is apparent	Excellent use of graphical overlay & timing. Very good choices led to a creative feel.	Fresh look & feel; outstanding use of graphical overlay & timing. Thoughtful choices led to a creative feel.
Overall Effectiveness	Presented information but did not sufficiently engage the audience	Presented information but was only somewhat engaging	Excellent & engaging presentation, pitched at just the right level for the audience	Outstanding & engaging presentation, pitched at just the right level for the audience
Citations	Zero citations	2-3 citations but with little attention to proper format	3-4 citations with the proper format (APA/MLA)	5 +Citations are available and in the proper format – APA or MLA style

How to create an Adobe Sparks Narrated Slideshow

Adobe Sparks is a good choice for a narrated slide show with voiceovers and music. If you want to make a video with more flexibility, a video editing software program such as Windows Movie Maker or iMovie or Adobe Premiere Elements might be right for you.

Here are some steps to follow to create your own slideshow:

1. Go to <https://spark.adobe.com/> and create an account. Any trouble? Try switching browsers or uninstalling and re-installing the latest flash player.
2. Click on “Get Started Now.” There will be a short “how to” video. Watch it and then click, “Ok, I’m ready” to start on your own project.
3. You can go to “My Projects” if you have some saved projects that you want to work on. Otherwise, Adobe Sparks will ask you if you want to create 1) a video 2) a page or 3) a post. Choose Video. Click on the big “+”(plus) sign.



4. Choose a theme.
5. Along the bottom, you will see a series of slide templates (see above). You just build your slideshow from there.

6. Click on a slide and choose a picture (get it from your computer or you can browse from the Adobe Sparks library).
7. Next you can choose to do a text overlay by clicking on “T.” Any text that you type in will overlay onto the slide.
8. Finally, you can click and hold the microphone button and record what you want to say, creating a voiceover for that slide. Pay attention to the number of seconds, shown on the bottom right corner. That is how much time you have. You can click on the button to alter the amount of time, up to 10 seconds. You can use an external microphone or use the computer’s microphone. Try to eliminate ambient noise. Recording should be done in a closed room, so the voiceovers may need to be done at home or in an empty classroom.
9. You can use the triangle play button to do a preview of your video. Share your link when finished.