Skills Compétences Canada

NUMERACY

SKILLS
COMPETENCES
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National Skilled Trade & Technology Week

November 1-7, 2026

Funded in part by the Government of Canada's Canadian Apprenticeship Strategy

Canada

NATIONAL SKILLED TRADE AND TECHNOLOGY WEEK IN CANADA

WHAT IS IT?

Skills/Compétences Canada (SCC) and its Member Organizations will be promoting and hosting events to raise awareness of skilled trade and technology careers to parents, youth and the general public. This is an opportunity for Canadians to get involved in a "hands-on" way to promote these careers to youth.

This year's theme is numeracy and how it relates to skilled trade and technology occupations

WHEN IS IT HAPPENING?

November, 1 – 7, 2026.

WHY IS IT HAPPENING?

Skills/Compétences Canada and its member organizations plan to facilitate and host skilled trade and technology activities in regions across Canada, engage business and political leaders in discussions about the importance of these careers to our country and focus attention on these careers. This annual week of celebration of skilled trade and technology careers serves as an opportunity for those currently working or training in these fields to showcase their professions.

WHERE IS IT HAPPENING?

Activities are being held throughout Canada during the week.

HOW TO PARTICIPATE?

Individuals or groups may participate through their local SCC office activities, or organizations can host their own events to promote skilled trade and technology careers under the banner of National Skilled Trade and Technology Week in Canada.

Various SCC offices are hosting events that include: presentations, skilled trade obstacle courses, and cardboard boat races.

If you would like to host an event and be added to the SCC website, please email your event details by October 11 to Michèle Rogerson at micheler@skillscanada.com.

WHO TO CONTACT?

SCC organizations and many others in Canada will be hosting events during the week. To learn more details about what is happening from your area, contact your local SCC office. To see a list of SCC offices, go to: **www.skillscompetencescanada.com/en/provinces-territories/**

The SCC National Secretariat is focused on the national promotion of all the events that are being held under the umbrella of National Skilled Trade and Technology Week.

WHAT TO DO WHEN IT IS OVER?

Contact your local SCC office and let us know how it went, how it could be better and what you think we can improve for next year. This step is very important for SCC. Our goal is to deliver a quality week of fun, informative, and educational events.

MEMBER ORGANIZATIONS

BC / AB / SK / MB / ON / QC / NB / NS / PE / NL / YK / NWT / NU

Skills Compétences Canada

WHY DO WE NEED SKILLS FOR SUCCESS?

Skills for Success are the skills needed to participate and thrive in learning, work and life. The Skills for Success model is for all Canadians who need to improve their foundational and transferable skills.

WHAT ARE SKILLS FOR SUCCESS?

Skills for Success, include skills that are foundational for building other skills and knowledge and important for effective social interaction. These skills overlap and interact with each other, and with other technical and life skills. They are inclusive and can be adapted to different contexts.

Skills for Success are for everyone – employers, workers, training providers, students, governments, and communities.

SKILLS FOR SUCCESS AND THE TRADES

A good level of Skills for Success means you will understand and remember concepts introduced in technical training. The level of skills required for most trades is as high or higher that it is for many office jobs.

WHAT SKILLS MAKE UP THE SKILLS FOR SUCCESS?

Numeracy / Communication / Collaboration / Creativity & Innovation / Reading / Writing / Problem Solving / Adaptability / Digital

HOW DO WE GET TO KNOW OUR SKILLS FOR SUCCESS?

There are many fun ways to test your students' Skills for Success. The following activities can be a group activity and works best with teams of four. Create your own point system or make it a race against time! May the best Skills for Success win!

WHAT CHANGES WERE MADE TO THE PREVIOUS MODEL?

- The addition of two new skills: **Adaptability** – which integrates continuous learning – and **Creativity and Innovation**
- Document Use integrated in **Reading**, **Writing** and **Numeracy**
- Oral communication is now **Communication** and includes broader concepts, such as non-verbal communication
- Working with others is now **Collaboration** to reflect a broader scope, which contains inclusivity and respect for diversity
- Thinking skills, which includes critical thinking and decision-making, is now **Problem Solving**

WHAT IS +1?

The +1 represents the technical skills necessary for skilled trade and technology careers. Technical skills relate to expertise someone possesses that assist in the completion of a job or task. In general, these are abilities acquired through practice and learning. Most skilled trades require the hands-on ability to apply math, science and/or trade-specific expertise to a particular problem or challenge. Tradespeople not only need to be able to diagnose and understand the scope of a problem, but also apply practical, mechanical, or technical skills to its solution, using the tools of trade to carry out tangible work.


ADAPTABILITY


COLLABORATION


COMMUNICATION


CREATIVITY & INNOVATION


DIGITAL


NUMERACY


PROBLEM SOLVING


READING


WRITING

Skills Compétences Canada

TEST YOUR STUDENTS' SKILLS FOR SUCCESS KNOWLEDGE!

Discover how much your students really know about the updated Skills for Success model and the skilled trades. This fun and interactive quiz can be used to spark a dynamic discussion about skilled trades. Good luck and have fun!

1. **The Essential Skills model has been updated! The new model is called Skills for Success. How many skills make up the updated model?**
   a. 12
   b. 6
   c. 9
   d. 2

2. **Which of the following skills is NO LONGER part of Skills for Success for the workplace?**
   a. Writing
   b. Communication
   c. Continuous Learning
   d. Adaptability

3. **Skills for Success are skills that:**
   a. People need for work, learning, and life
   b. People need to get to work
   c. People need just for school
   d. People use once in while

TEST YOUR SKILLS FOR SUCCESS KNOWLEDGE!

4. **Skills for Success provide:**
   a. Helpful skill development
   b. The foundation for learning all other skills
   c. A good base for learning
   d. All of the above
   e. None of the above

5. **Numeracy includes interpreting equipment gauges, clocks and flags.**
   TRUE or FALSE

6. **Which career involves Creativity & Innovation skills?**
   a. Fashion technology
   b. Automotive technology
   c. Bricklayers
   d. All of the above

7. **Collaboration is:**
   a. An important transferable skill
   b. Overrated
   c. Not important for plumbers
   d. Not used in the trades

ABOUT APPRENTICESHIP, EDUCATION, AND EMPLOYMENT

8. **What percentage of your earnings is directly related to your Skills for Success?**
   a. 1%
   b. 7%
   c. 28%
   d. 0%

9. **Apprentices with the Skills for Success for their trade are 8 times more likely to pass their technical exam.**
   TRUE or FALSE

10. **With proficiency in your Skills for Success, you will understand and remember**
    a. How to get to your class
    b. Concepts introduced during technical training
    c. Your professor's name
    d. Why you find math difficult

11. **The level of Skills required for most skilled trade and technology jobs is relatively low.**
    TRUE or FALSE

12. **Good Skills for Success are linked to better performance leading to:**
    a. Better quality of work
    b. Higher productivity
    c. Employee retention
    d. All of the above

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1. C / 2. C / 3. A / 4. D / 5. True / 6. D / 7. A / 8. C / 9. True / 10. B / 11. False / 12. D

IN-SCHOOL ACTIVITIES

ACTIVITIES TO EXPLORE SKILLED TRADE AND TECHNOLOGY CAREERS

There are many interesting ways to explore skilled trades and apprenticeship with your students. This section includes a number of classroom activities to get your students thinking about the skills and knowledge required to perform a trade. You will also find a number of "Quick Tips" to get you started.

QUICK TIPS

- Invite a skilled tradesperson to your classroom to talk about their profession. Tradespeople can be found through:
  - Local businesses
  - Trade associations
  - Labor groups
  - Community colleges
- Contact your local Skills/Compétences Canada office. Their staff would be happy to help you organize a classroom presentation about skilled trades and technology for your students.
- Organize a field trip for your students to a Skills Competition in your region. These exciting Olympicstyle Skills Competitions showcase students' technical and leadership skills. Students participate in practical challenges designed to test skills required in technology and trade occupations. For more information, contact the Skills/Compétences Canada office nearest you.
- Assign a research project on a skilled trade. Start by dividing your class into groups. Have each group select a trade they are most interested in. Have them write down their initial perceptions and knowledge of their chosen trade.
- Then have each group research their trade to identify:
  - Duties involved.
  - Education and skills needed to perform the trade.
  - Wage and the number of hours generally worked.
  - Work environment.
- Finally, have each group make a presentation on their trade to the class. Make sure they talk about their initial perceptions and how they are different from the reality of the trade.

THE SKILLS FOR SUCCESS

TRADE LINK: UNDERSTANDING OF SKILLS FOR SUCCESS AS THE FOUNDATION OF ALL THE ACTIVITIES

TEACHER BACKGROUND

Duration: 30-60 minute lesson
Grade: Elementary School, Grades 8-10
Group size: individual
Setting: Classroom

RATIONALE:

To introduce students to the concepts of Skills for Success (SfS), to give them an opportunity to learn about the levels of Skills for Success and how they see them in the context of their own lives.

METHOD:

At the end of this lesson, students will:

- Know and explain the 9 Skills for Success;
- Understand and identify the complexity levels of Skills for Success;
- Identify the key Skills for Success found in different courses;
- Illustrate one Skill for Success and the levels found in it to a small group of peers (and/or the whole class).

MATERIALS:

- PPT of the 9 Skills for Success icons with no words, PPT of the 9 Skills for Success icons with words.
- Deck of cards

GETTING STARTED: (TEACHER INFORMATION)

The original literacy skills – the three R's (reading, 'riting and 'rithmetic) – allow an individual to survive. These are still largely considered to be the minimum skills required for individuals to secure employment that provides food, shelter and the basic necessities.

For the workforce of today and tomorrow, more skills are required on top of those original three. While proficiency in prose literacy (the reading part of the '3 R's') learned in school is a highly desirable skill for becoming an educated, informed individual, having that skill does not necessarily mean that the person can read and understand a blueprint, data sheet or technical instruction manual at work. It takes more to be successful in the workplace and in society overall.

Skills for Success are the foundational skills you use to carry out your work tasks and they're the building blocks you use to learn new ones. The importance of – and need for – employees to have appropriate levels of workplace Skills for Success is clear and strong.

All nine Skills for Success are used in different combinations, in different applications, in every occupation.

Workplace Skills for Success are described and categorized according to the tasks performed in a specific occupation or workplace process. They are measured according to levels of complexity on a scale of 1 to 5, with Level 1 being "basic tasks" and Level 5 being "advanced tasks." A complexity level is often assigned to each task performed by a worker in a specific job.

For example, a bricklayer and a travel agent both need the workplace Skills for Success of writing to effectively do their jobs. The specific form and complexity of writing, however, is different for each of these occupations. The "levels" scale takes into account the length and purpose of writing, as well as the style, structure and content of what is being written, preparation time, familiarity of content, degree of professional risk and narrowness of subject range.

ACTIVITY:

1. In small groups, students will be shown a PowerPoint slide of icons of the 9 Skills for Success and work together to figure out the names of the Skills for Success based on the visual. Give students between 2-4 minutes to figure out the SfS.
2. Continuing in small groups, have students define each of the SfS once they know the names of them. The definitions can be presented to other groups to see if everyone has a similar understanding of what the 9 Skills for Success are.
3. Understanding Complexity Activity[1]

   Step 1: Shuffle the cards in the deck

   Step 2: Find the ace Ask: how long did it take you to find the card? Was this task easy or difficult? This is an example of a Level 1 task – to find the card, you had to 'locate' it.

   Step 3: Put the ace back in the deck and shuffle the cards.

   Step 4: Find all the aces in the deck Ask: How long did it take you to find the cards? Was this task easy or difficult? This is an example of a Level 2 task. To find the cards, you had to 'locate' the first ace, then cycle through the deck to find the next one and so on. This task likely took you a bit longer than the previous task so was just a little more difficult.

   Step 5: Put the aces back into the deck and shuffle the cards.

   Step 6: Final all the diamonds and put them in order from lowest to highest. Ask: How long did it take you to find the cards? How did you know what order to put them in? Was this task easy or difficult? This is an example of a Level 3 task – you had to cycle through the cards, then put them in order and decide if aces were high or low. This likely took you longer than the other tasks and you had to have some background information (numerical order).

   Step 7: Put all the cards back in the deck and shuffle again.

   Step 8: Think of 3 different card games. Show the winning hand for each card game. Ask: How long did it take you to find the cards? Was this task easy or difficult? This is an example of a Level 4 task – you had to cycle through to locate all the cards, then you had to rely on previous knowledge of card games and integrate this information to show what the top hands look like.

THE SKILLS FOR SUCCESS

(CONTINUED)

Step 9: Put the cards back into the deck and shuffle one last time.

Step 10: Create a completely original card game that no one has ever played before. It must be completely original!

Ask: Is this task easy or difficult? How long would it take you to complete this task?

This is an example of a Level 5 task – you have to locate, cycle, integrate, rely on previous knowledge and know, based on all of these, generate a completely new game.

4. In 4 -6 small groups, give each group a subject area (Math, Science, Geography, Social Studies, Learning Basketball, English, Cooking class). Ask students to give examples of the 9 Skills for Success in each of the subject areas, ask them to take one of the Skills for Success and describe the levels that would be found in that Skills for Success.
5. Students can present to the class – an example of Communication.

BRANCHING OUT:

1. Have students do the card game activity in pairs or in a triad. Have students invent another example of showing the levels of Skills for Success. Have students give examples of how many Skills for Success they have used so far in the last hour/day/week. Although we don't name the Skills for Success all the time, they will be aware of what Skills for Success at work look like in their lives.
2. Have students self-evaluate – they can describe the Skills for Success they are using in their own life and how often they use Levels 3 and 4. What would they need to do to be more proficient at those higher levels? This activity can be part of a social studies activity or a math activity.

INFORMATION BITE:

16.6% of Canadians were at Level 1: location – this means they are able to locate a single piece of information but they may struggle with more difficult tasks such as reading instructions on a form or a bottle of medicine.

25.6% of Canadians were at Level 2: Cycling. This means they may be able to locate and cycle to find multiple pieces of information but may struggle when asked to integrate information. They may have a challenge at work if something requires several steps in order to be solved.

35.1% of Canadians were at Level 3. This is the level most often required for success in work, learning and life. Individuals who are able to integrate information tend to be able to solve problems and learn new skills on their own.

22.7% of Canadians were at Levels 4 & 5. These levels are often combined. That is because they both require previous knowledge and an ability to generate new ideas or concepts. It is sometimes difficult to distinguish between a Level 4 and 5 task.

(Results from the International Adult Literacy Survey IALS data collected from 1994-98 from 23 participating countries).

BAKER'S DOZEN

TRADE LINK: BAKING

TEACHER BACKGROUND

Duration: Two 60-minute classes, possibly more depending on the depth of the activity

Grades: Middle school, ideally grades 9-10 math, entrepreneurship, Baking/Cooking (formerly Home Economics class)

Group size: small groups of 2 – 3

Setting: Indoors (classroom)

RATIONALE:

Independent bakery owners prepare breads, rolls, muffins, pies, pastries, cakes and cookies for their patrons. They may also prepare items for special events (i.e. catering). Students will learn that bakery owners must keep on top of their supplies for catered events and only order what they need, so as not to have too much left over. An extension of this activity is to discuss entrepreneurship/small business ownership with students. It is important to understand budgeting, profit/loss information and estimation when preparing food for large numbers of people.

METHOD:

For this activity, students will be asked to order enough materials for a catered event. Students will have the opportunity to plan and schedule appropriate time for completion of a large catering order. They will have to work with budgets, supplies, space and time in order to produce the goods necessary to make the client happy and create the highest possible profit margins by ordering supplies in advance from wholesale (i.e. Costco, online ordering, local grocery store).

If there is an actual school event going on, have students carry this out with the teacher who is involved in the planning and ordering. Once this activity is completed, students could plan a birthday party, or a family celebration to understand how much food is needed and what costs are associated with ordering and making food for a large group. When students are given examples that can be practically used in their lives, this is a perfect example of applying Skills for Success learned in the classroom to a practical life example.

STUDENTS WILL:

Identify and create lists of items needed for the event;

Work in small groups to compile lists, plan orders, use spreadsheets or some organizational program;

Develop and understanding of what is required in food preparation and budgeting;

Develop a budget using their numeracy skills;

Create timelines, deliverables and plans to carry out the activity.

MATERIALS:

- Computer with internet access
- Calculator
- Conversion charts
- Supply lists
- Magazines
- Flyers

GETTING STARTED:

Baking is something that many people do, but much fewer do professionally. It is one thing to buy supplies to make an individual loaf of bread or a cake. However, what does it take to order enough to cater and entire event and still come out with a profit? The goal of this exercise is to prepare a supplies list, with associated costs (estimates), for all of the materials needed to supply a catered event.

THE ACTIVITY (SKILLS FOR SUCCESS):

Students are given the following details to carry out this assignment:

A caterer is asked to provide 30 loafs of bread, 90 dinner rolls, 12 pies, 15 cakes and 200 cookies for an event in two weeks' time. This order needs to be in to suppliers by next week to ensure it is filled in time for the event.

1. Students will find recipes that will help to fill the order (online research and recipes). (Reading and Digital)
2. Present the menu of bread and desserts for the event to the client (teacher). (Communication)
3. Students will calculate the materials needed to fill the order (remind students that the client doesn't want 12 apple pies, 15 chocolate cakes and 200 chocolate chip cookies) they will have to diversify the order. (Problem Solving)
4. Determine how much it will cost to purchase materials by giving them local flyers to look through. (Numeracy – Calculation)
5. Determine how much will be charged per loaf of bread, pie, cake, cookie, etc. to ensure that there is a profit margin of at least 30% before starting. (Numeracy – Estimation)
6. Determine how long it will take to prepare all of the items in time for the event. What is the ideal start time if there are 2 ovens? (Numeracy – Scheduling)

BAKER'S DOZEN
(CONTINUED)

BRANCHING OUT:

1. If facilities and budget are available, have the class fill an order such as this for consumption by the school, hospital or elders residence.
2. Younger students could have a price list of each item and need to bake as much as they can with a particular budget.
3. This activity could become about more than just baking – in small groups, students could plan a small event and organize details about invitations, set up time, decorations required as well as the planning of the food ordering and preparing.

INFORMATION BITE:

Bakers are not only required to follow recipes, but in many instances to also create them. They first prepare the dough or batter by using tools and equipment such as cake rounds, pastry papers, and an assortment of cooking and mixing utensils, and then cook them at precise temperatures for a specific amount of time. They also make icing or frosting for the many desserts that need it, and then apply it with a piping bag in intricate designs.

WHAT ABOUT SKILLS FOR SUCCESS?

Reliability, sensible time-management skills, and the ability to work under pressure are all desirable traits in a baker. You also need basic analytical and organizational capabilities, and to be able to read recipes, follow directions and schedule production. Interpersonal communication skills are necessary in order to deal effectively and politely with staff and customers. Since you handle food for a large portion of the day, personal hygiene must always be taken seriously. The Skills for Success of reading, numeracy and communication are key to being a successful baker.

DECONSTRUCT TO CONSTRUCT!

TRADE LINK: CABINET MAKING

TEACHER BACKGROUND

Duration: two 45-minute classes
Group Size: 2
Setting: Classroom

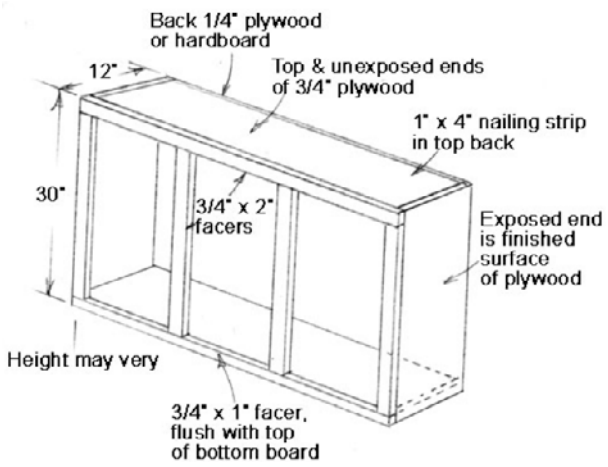
RATIONALE:

Cabinetmaking involves more than simply designing, building, and repairing cabinets. It encompasses working with a variety of structures such as doors, windows and window frames, and all types of furniture. Cabinetmakers use many types of materials in this work, including veneer, fiberboard, particleboard, hardboard, plywood, adhesives, abrasives, hardware and metal fastenings. Students will have the opportunity to work backwards in creating a blueprint for a cabinet located within the classroom or somewhere in the school.

METHOD:

This activity will test students' knowledge of deconstructing a piece of furniture or cabinetry to create the blueprint for the piece that they select. Working backwards will take a keen eye and ensure that students pay attention to the detail necessary to ensure that a cabinet maker would be able to construct their woodworking piece from their produced plans. Learners will receive a few samples of deconstructed blueprints similar to the example below. The teacher could also bring in blueprints found online or for Ikea products. Instructors will go over their expectations and the level of detail required, based on the class and pre-existing knowledge of the students.

Students must work together to ensure that no details are missed in deconstructing the cupboard. They must ensure that measurements are precise and that their model accurately reflects what a cabinetmaker would need to build or use to build his finished product.



MATERIALS:

- Computer with internet access (in case research is necessary)
- Blueprints from ikea or other online blueprints found.
- If possible, a deconstructed cabinet that can be sourced
- Measuring tape
- Graph paper
- Pencils

GETTING STARTED:

Take a look around. Identify how many cabinets; desks or other pieces of furniture are inside this classroom. Do you ever wonder who makes all of these items and products? Most people don't, but cabinetmakers and woodworkers create products for people worldwide. It could be industrially manufactured, made in someone's wood shop or made "the old fashioned" way by Mennonite communities for example. Today, you'll have the opportunity to help a cabinetmaker by deconstructing a piece of furniture and drawing a blueprint for them to follow in creating their work of art.

THE ACTIVITY (SKILLS FOR SUCCESS:

1. Have students look around the class and discuss what they would need to create a blueprint for a cabinetmaker. (Creativity & Innovation, Collaboration)
2. Study and determine the key components in creating a blue print, based on the materials provided by the teacher. (Writing)
3. Determine a list of materials that could or would be needed to create a cabinet of this nature from start to finish. Conduct online research to assist in determining common materials needed for particular tasks. Look for the type of work that would work best, the handle placement, hinges, drawers, etc. (Problem Solving)
4. Students will take measurements of everything needed to construct the piece of furniture. Information that is not found should be derived from measurements taken. (Numeracy).
5. Have students price out a rough estimate for constructing this piece of furniture, based on their knowledge from the blueprint. (Numeracy)

DECONSTRUCT TO CONSTRUCT!

(CONTINUED)

BRANCHING OUT (EXTENSIONS AND VARIATIONS):

1. If available, students may be able to create a 3D model using CAD technology and print out their design. CAD will help them better identify mistakes that they may have made. (Digital)
2. Have students swap blueprints and attempt to build a 3D module using materials found within the classroom (i.e. cardstock, cardboard, etc.). (Reading)
3. Younger learners could determine the process or steps that go into creating a cabinet from start to finish with their teacher or a professional cabinetmaker.

INFORMATION BITE:

They must follow blueprints and designer specifications exactly to construct and repair these wooden articles. Accuracy is imperative, as they regularly need to fit small parts and sub-assemblies together, to precisely make and install cupboards and cases and to operate woodworking machines to cut and form parts. Today sophisticated equipment, basic woodworking machines, and portable power and hand tools are used to perform many of the job functions.

Cabinetmakers must have a broad knowledge of wood, its structures and properties, and an assortment of cabinetry hardware and materials. A worker with training and education could start in production and work their way up to a supervisory or management position in the wood industry, as the skills are transferable to a number of other professions.

CNC MACHINIST/ PRECISION MACHINING

TEACHER BACKGROUND

Duration: Two 45-minute class

Grade: 7 and up. Math class, Careers class, English class

Group size: Individual and pairs

Setting: Indoors

RATIONALE:

Procedure is defined as "an established or official way of doing something." It is well documented that our lives are heavily influenced by routine, or procedures. Students should know how to write and document procedures accurately and effectively. Effective communication in explaining tasks is an important task to have in any industry and precision in these tasks becomes very important in certain trade areas.

METHOD:

In this activity, students will be asked to design a set of procedures that other students can follow to complete some sort of task accurately and effectively, without the supervision of the procedure writer. Using common everyday tasks, students will write procedures on completing a specific task. This could be, tying your shoes, getting dressed, putting on hockey equipment, setting up a computer, etc. The instructor should provide a detailed example of procedures they've written for a task.

Instructors need to be mindful and ensure that they are providing detailed "work procedures," that take into account measurements (time per task and total time), any materials required, what finished product should look like, availability of items, etc.

MATERIALS:

- Paper/notebook
- Sample drawing with lines (i.e. house)
- Ruler
- Protractor
- Pencils

GETTING STARTED:

Procedures help people who are not familiar with a task or chore and give them steps to help them complete it, to the standards that you would like. In this activity, you'll experience writing a few sets of procedures. When you are done, you'll pass them to a fellow student and have them try to re-create or create what you intended.

THE ACTIVITY (SKILLS FOR SUCCESS):

Students are given the following details to carry out this assignment:

1. Have students discuss a number of activities that they do routinely, but they don't really think of how they do it (i.e. putting on their clothes, pouring cereal, etc.). (Communication)
2. Work through an example of a procedure with students. Have a student come up and demonstrate as you walk them through a simple task. (Problem Solving)
3. Have students individually think of a task that they perform and ask them to write out every step to complete it. (Writing)
4. Once complete, students will pair up and switch their procedures and try to complete the task using the procedures documented. (Reading)
5. Students will then be given a picture of a house and asked to describe the procedure in drawing it, to exacting standards (i.e. draw a 9 cm straight line parallel to the bottom of the page; draw two perpendicular lines at 90° angles at each end of the original line that are 9 cm in length, etc. Precise measurements are crucial. (Numeracy)
6. Discuss how this would be important in building or creating tables, chairs, desks, houses, screws, nails, lumber, etc.
7. Discuss with the class what the tasks of a precision machinist are and show the parallels between the tasks that were just done by students and the tasks that precision machinists carry out. Precision machining is what produces a huge number of both large and small objects that we use in daily life. Each intricate piece that makes up an object requires one level or another of a machinist's skills.
8. Teacher information: Precision machining as is demonstrated at a Skills Canada competition used steel plates and not wood, as was used in this activity. In a classroom, it is often easier to show the parallels using materials that are available. If there is a shop and/or access to blueprints and metal/steel plates instead of wood, use this to show students.

BRANCHING OUT:

1. Students could be asked to put together a piece of furniture to demonstrate why accuracy, to the nearest mm is important.
2. Have younger students measure items like desks and chairs to make sure they are all the same size, then have them report on their findings.

INFORMATION BITE:

Machining is any of various processes in which a piece of raw material is cut into a desired final shape and size by a controlled material-removal process. Machining is a part of the manufacture of many metal products, but it can also be used on materials such as wood, plastic, ceramic, and composites.

Precision Machinists use many machine tools, such as lathes, milling machines, grinders, and drill presses, to produce precision metal / non-metal parts. These parts must be made to exacting standards, and the machinist uses precision measuring instruments to ensure accuracy and that the parts meet quality guidelines. A machinist reads and interprets specifications and blueprints, calculates dimensions and tolerances, lays out their work and marks pieces for machining. Precision machinists often produce small batches or one-of-a-kind items. They use their knowledge of the working properties of metals and their skill with machine tools to plan and carry out the operations needed.

WHAT ABOUT SKILLS FOR SUCCESS?

The job of the precision machinist combines mental ability with manual skills – to develop a project from a blueprint requires careful thought, a thorough understanding of numeracy and the ongoing development of the Skill for Success of problem solving.

HEAVY EQUIPMENT CONSTRUCTION

TRADE LINK: HEAVY EQUIPMENT SERVICE

TEACHER BACKGROUND

Duration: One 45-minute lesson
Grade: Secondary School, Grades 7-9 trades exploration class.
Group size: Pairs
Setting: Classroom

RATIONALE:

Machines have made the construction of mines, buildings, tilling of farms, harvesting of forests and hauling of materials significantly easier throughout the years. Now, with so much innovation, Heavy equipment mechanics are needed to troubleshoot, adjust, overhaul and maintain equipment in each of those fields. Students will be able to identify machines from each industry and provide general facts about their use and operation.

METHOD:

In this activity, students will be asked to design a manual for someone who is going into the heavy equipment mechanic field. The manual will be designed by gathering information about machines in the construction industry (haul trucks, loaders, back-hoes, bull dozers, etc.). Instructors will provide a base of equipment but will require students to search for and add other machines commonly found in those industries.

MATERIALS:

- Computer with internet access
- Machine brochures
- Books about the industry or equipment

GETTING STARTED:

Heavy equipment mechanics are often responsible for handling multiple forms of heavy-machines from different industries or trades. Being responsible for so much equipment is hard. In this activity, you will research machines in the construction industry, figure out how they work and report common problems with them. This will be compiled in a book that will help a new heavy-duty mechanic do their job more effectively.

ACTIVITY (SKILLS FOR SUCCESS:

Students are given the following details to carry out this assignment:

1. Teacher leads a discussion with the class about what types of machines that they know about and have heard about. Write down common answers (dump truck, bulldozer, excavator, back-hoe, etc.) on a piece of paper. Give insight into what each machine does and discuss its importance to the industry. (Reading, Writing, Communication)
2. Bring students attention to the books and information at the front. Have students read information that will be placed into their book. (Reading).
3. Have students research other machines that they can find from other industries (scoop tram – mining; tractor – farming, etc.) (Digital and/or Reading)
4. Have student write a description or purpose of each machine they find, their useful life, common repairs needed, cost, etc. (Writing)
5. Have students compare a piece of equipment that would have been used between 20 and 40 years ago to equipment used now. Keeping up on new equipment in the industry is an important task that would be used by heavy equipment mechanics. (Reading)
6. Lastly, gives students a hypothetical budget of two million dollars and ask what equipment they would buy to start their own construction business. Discuss why they would buy each item and what that means for repairs and maintenance costs. (Numeracy, Problem Solving)

BRANCHING OUT:

1. Younger students can work towards identifying popular machines and their purpose
2. High school students can work on performing cost-analysis of purchasing equipment vs. leasing equipment as well as troubleshooting annual repairs and costs based on business.

INFORMATION BITE:

In general, heavy equipment mechanics are employed by specialized repair shops and organizations that own or lease heavy equipment used in the construction, mining, forestry, material handling, landscaping, land clearing, agriculture, and transportation industries. Heavy equipment mechanics must interpret work orders and technical manuals, write service reports, keep equipment cleaned, lubricated, and maintained, diagnose faults or malfunctions, adjust equipment and repair or replace defective parts, components, or systems, test repaired equipment for proper performance, and ensure that the work done meets manufacturers' specifications and legislated regulations.

WHAT ABOUT SKILLS FOR SUCCESS?

With these kinds of skills worked into the day-to-day activities, reading is a very important essential skill for heavy equipment mechanics to possess.

As technology changes, a successful heavy equipment mechanic is required to review new research and information to be up-to-date on advancements and new trends in the industry. The ability to conduct research and review documents is an important Skill for Success to have mastered.

WHAT DO YOU PROPOSE?

TRADE LINK: LANDSCAPE GARDENING

TEACHER BACKGROUND

Duration: Four 45-minute classes
Grade: 7-10, math class, science class in botany unit.
Group size: 2 – 3 per group
Setting: Classroom

RATIONALE:

Landscape gardeners provide services to many people and organizations around the world. Students should have the opportunity to explore landscape gardening as well as the process that landscape gardeners must go through to secure work. Student will be able to determine what is involved in creating a beautiful space for all to see.

METHOD:

In this activity, students will be asked to write a proposal to design a landscape at the school. The teacher will provide a designated space within the school setting in which to construct a school garden. Dimensions of the space will be provided. The teacher can make suggestions as to what MUST go into the garden, but also allow students to make it their own. Research will be required in determining prices for materials, labour, etc.

Students will be required to develop three main components to a successful bid. They will submit a drawing of the proposed layout, a budget and a detailed description of what their process will be in creating the garden. This will ensure that all is equal when "submitting" their bids.

For schools that do not have gardens or environments where outdoor gardens exist, have students create either an indoor garden or turn this into an activity where students investigate provincial/territorial/national parks and understand the planning required in creating a park.

MATERIALS:

- Computer with internet access;
- Books on landscape gardening;
- Books on indoor plant gardening;
- A request for proposals.

GETTING STARTED:

Landscape gardening may be something that you see in your city or town or it may be something you have seen in movies or on TV. In this activity, you explore what it takes to plan and cost the construction of a garden.

THE ACTIVITY (SKILLS FOR SUCCESS):

Students are given the following details to carry out this assignment:

1. In the group, create a plan to research the cost of certain plants, how big they will grow, and what conditions they need to grow. Teachers will lead this discussion and brainstorm different kinds of plants/flowers to be planted, and different things to keep in mind when planning a garden. (Collaboration)
2. Design a sketch of the space where you will build the garden, based on the dimensions of the garden. Determine where you would like to place certain plants. (Creativity & Innovation, Numeracy)
3. Estimate how much soil you will need to fill your new garden, assume that you don't have any soil there currently. (Numeracy – Estimation)
4. Create a budget for all of the materials you need to construct your garden. This includes price for soil, plants, structures, etc. (Numeracy – Budgeting)
5. Determine how much you will cost per hour or day and how long you think it will take you to complete the garden. Who will do what jobs, etc. (Problem Solving, Numeracy)
6. Use Word processing software and a garden design website to create a digital version of your vision and also to write out your proposal. (Digital, Writing)
7. Present your proposal to the "client" (teacher). (Communication)

BRANCHING OUT (EXTENSIONS AND VARIATIONS):

1. Give younger students pre-set prices for plants and the size for the plants and have them design their own garden.
2. Have students design and indoor classroom garden or greenhouse.
3. Create difference sizes or gardens or give students more freedom for their own space, but perform the same "RFP" exercise.

INFORMATION BITE:

Landscape gardening involves the art and science of the selection and culturing of plants, and the arrangement of landscape structures using materials such as soil, wood, stone and concrete. Combinations of all of these constitute the built landscape, where additional expertise in the care and ongoing maintenance of plants is employed.

WHAT ABOUT SKILLS FOR SUCCESS?

From the planning and layout of the landscape project, through building and finally maintenance, the specialized expertise found in this trade area draws on creativity and innnovation and problem solving. With new plants, pests, materials, and techniques continually being introduced, and with ever-increasing global aspects of the landscape industry, continued advancement of knowledge and capability is required of the landscape gardener which includes the Skills for Success of Reading, Adaptability, and Creativity & Innovation. No one solution to a landscape problem or opportunity is ever sufficient – a great deal of creativity and understanding for alternatives is necessary. Knowledge of botanical and common plant names, plant biology and species culture, climate zones, soils and fertility, water and nutrients, and related requirements, are very basic requirements. Materials and construction knowledge that include numeracy is essential to creating functional, sustainable, and safe landscapes are critical.

MUCH MORE THAN A SHEET OF PAPER!

TRADE LINK: SHEET METAL WORKER

TEACHER BACKGROUND

Duration: Two 45-minute classes
Group size: Groups of 4
Grade: Grades 7-9.
Setting: Indoors

RATIONALE:

Sheet metal is used to make a number of items that we use and rely on every day. It forms our air conditioning and heating systems, garbage cans, creative art pieces, tool and lunch boxes, and a variety of other items. Students at this level will learn what it is like to fabricate sheet metal items, using cardboard or Bristol board. Begin by brainstorming where sheet metal is seen – in the classroom, the school, in homes, outside etc.

METHOD:

In this activity, students will be asked to construct a tool box using Bristol board or card board. Using materials provided by the teacher, students will follow instructions to build a tool box, with handle, using instructions similar to work that would be done with sheet metal. Students will have a specifications sheet for their tool box.

The challenge in this exercise is that students must plan to use their "sheet metal" effectively. Students will have a stock piece of Bristol board (22" x 28"). They must create their entire tool box out of this piece, with as little material remaining as possible.

MATERIALS:

- Bristol board or cardboard (22" x 28")
- Scissors (pair for everyone)
- Metal fasteners

GETTING STARTED:

Sheet metal is used for to make a number of household items, one of which is a tool box. Using Bristol board, which is similar to sheet metal, you will explore the construction of a tool box.

THE ACTIVITY (SKILLS FOR SUCCESS):

Teachers: refer to http://www.auntannie.com/BoxesBags/ShirtBox/Pattern/ for a pattern to share with students to make their tool box. (Digital, Numeracy)

OR:

For older students, do not provide a pattern for the design of the toolbox, have students create their own blueprint first and then test their measurements out.

1. Students are given the following details to carry out this activity:
2. Print out the instructions found in the link above or have students access the link directly on their own computers. Have students read instruction or "manual" to building their tool box found on site above. (Digital, Reading)
3. Students will lay out their tool box plan on their piece of Bristol board. Students will make measurements, calculate the space needed and determine their process. (Numeracy – Calculation and Measurement)
4. Call students together after all have laid out their tool boxes, have them (in groups) discuss the specifications, show how they laid it out, discuss how they will make their cuts and whether efficiencies can be realized (i.e. cut one piece instead of 3 and fold). (Communication). IMPORTANT: Make sure all students leave room for fasteners to put box together.
5. Have students cut out their toolbox schematic and assemble it all together. (Collaboration)

BRANCHING OUT:

1. Try using actual sheet metal if high school has the proper tools that would allow for this activity to take place.
2. Modify the task depending on the grade level. Higher grades might make more complex sheet metal items, where lower grades might make something like a pinwheel.

INFORMATION BITE:

Workers in this field fabricate and install a wide variety of construction related items using sheet metal or plastic materials components. The heating, ventilation and air-conditioning systems (HVAC), that control the temperature, humidity and total air quality in residential, commercial, industrial and other buildings by precisely following blueprints, design specifications and manufacturers' instructions. A Sheet Metal worker requires highly specialized and up to date skills to accomplish the various tasks involved in the trade.

WHAT ABOUT SKILLS FOR SUCCESS?

For a successful career in Sheet Metal, you should have an aptitude for electronics and a curiosity about how things work – numeracy and adaptability. You must be courteous and tactful, and have good communication and listening skills for dealing with customers' needs. Good math, computer and problem-solving skills are important assets for working in this profession. Reading is another Skills for Success that is necessary in this trade area.

LIGHTS, CAMERA, ACTION!

TRADE LINK: TV & VIDEO PRODUCTION

TEACHER BACKGROUND

Duration: Four 45 – 60minute classes
Grade: 9-12. Could be part of media unit in English Class
Group Size: 4
Setting: Inside

RATIONALE:

There are many different roles and responsibilities found in the TV and Video Production sector, from boom mic operator to actors and producers/directors. Students should have the opportunity to have some fun and work in the TV and Production world. It is important to understand what goes into the TV shows and newscasts that they watch every day.

METHOD:

In this activity, students will be asked to create a five minute TV show that will be viewed by the teacher, and pending approval, the rest of their classmates. Students will be required to take on many of the roles and responsibilities associated with TV and Video production to yield an end product that is viewer worthy. Students will be encouraged to be creative, but respect the classroom setting and ensure that their show is relevant. All "shows" will be approved by the teacher.

STUDENTS WILL:

- Collaborate in small groups to come up with the concept, script, props, and material list;
- Act and direct in a production of their own making;
- Be exposed to the TV and Video industry and understand the variety of roles and responsibilities found in this industry;
- Create and follow a detailed plan with their classmates.

MATERIALS:

- Camera or camcorder for filming
- Computer with free editing software
- Props and materials

GETTING STARTED:

TV and video production is something that we all enjoy. We watch TV and movies on a consistent basis. In this activity, you are going to experience what it is like to produce and edit a five minute video clip, from brainstorming to production. The goal is to develop a product of a professional quality within the timelines established.

THE ACTIVITY (SKILLS FOR SUCCESS):

Teachers will give students the following details to carry out this activity:

1. In groups, brainstorm and talk about the ideas for a five-minute film. Start by discussing genres or ideas and then move into specifics about what your episode will be about. (Communication).
2. Have the teacher show some examples of movie credits so students understand how many roles are needed to produce a show.
3. After brainstorming, students will determine which idea they will use and begin to develop a script that will be followed during filming. Ideas for scripts can be found online. Be sure to assign roles to each individual and make sure each person has a role in the show. (Digital, Communication)
4. Collect and gather relevant props from home, classroom and other areas of the school.
5. Present or "pitch" your idea to the teacher to receive approval to enter into production by using a storyboard and/or plan of the show. (Communication)
6. With the amount of time remaining, estimate how long it will take to film the short film taking into consideration how long the film is supposed to be and leaving time for editing. (Numeracy – Estimation)
7. Lay out a plan for acting, production, stage hand, etc. Make sure to include everyone at every role. (Creativity & Innovation, Problem Solving)
8. Take turns filling roles while others act the scenes. When producing be conscious of moments where small changes or tweaks can be made to improve the message of quality of the show. (Problem Solving)
9. After filming is complete, collectively use video editing software to put clips together, cut others, use graphic software, etc. (Digital)
10. Show video to instructor.

BRANCHING OUT/ EXTENSIONS:

1. Have students work on different segments of a newscast and piece and entire newscast about the school together.
2. For younger students, allow them to create their own plays.
3. Invite a local actor in to speak to the class about the realities of working in the TV and Video Production field.

INFORMATION BITE:

A career in television and video production offers ample opportunity to move from entry-level positions to a variety of specialties. Newcomers to the business often start out performing duties such as lighting, staging and recording, or operating camera dollies and microphone booms. Mid-level positions include developing and editing film, producing storyboards, and videotaping or audio recording on tape or disc. Experienced and talented individuals may eventually produce, direct or supervise radio and TV programs, films or theatrical performances.

WHAT ABOUT SKILLS FOR SUCCESS?

For a career in television and video production, you must be willing to start small and work your way up. If you are able to pay careful attention to detail and concentrate for long periods of time, and are organized and have the ability to juggle numerous tasks under stressful circumstances you may be suited to this kind of work. Well-developed communication skills are also vital in order to clearly express your concerns and ideas to producers, technical crewmembers and cast members. To succeed you should be creative, aggressive and confident, and capable of working effectively as part of a team. Workers in this field require eye-hand-finger coordination to operate, set up, repair and adjust equipment along with proficient analytical skills for monitoring sound level, quality and timing of sound and picture. Tenacity and perseverance are absolutely essential as you must be motivated to get ahead in this competitive industry.

THROUGH THICK AND THIN

TRADE LINK: CAR PAINTING

TEACHER BACKGROUND

Duration: Two 45-minute classes
Group Size: Individuals
Setting: Outside
Grade: 7 – 9, grade 10 for extension activity

RATIONALE:

Viscosity is the measure of how thick and "sticky" a liquid is. Students should have the opportunity to explore the properties of viscosity through discovery. Students at this level will explore the viscosity of a number of different everyday products and determine the intermolecular interactions within a fluid.

Students will relate this activity to car painting, that is one of the contest areas found in Skills Canada competitions. This is an excellent example of putting Skills for Success to work – if students understand viscosity, they will have a greater chance of understanding one of the important elements that people in the car painting industry must understand and apply in their day-to-day careers.

METHOD:

In this activity, students will be asked to "test" the viscosity of a number of different products and "rank" the viscosity of each to determine the effect that viscosity would have on items, such as painting a car. Students will be responsible for testing viscosity in both hot and cold temperatures. Students will begin by pouring liquid from one cup to another and charting how long it takes the liquid to transfer. Then, students will be asked to drop a marble into each of the cups to view the effect viscosity has. Students will then view a demonstration of viscosity levels after items have been refrigerated. Lastly, students will test viscosity and pipe flow by having them drink edible products through a straw. Students will then be able to determine why viscosity is a factor in painting a car.

MATERIALS:

- Dixie Cups
- Graduated cylinders
- Stopwatch (or use stopwatch function on smartphone or ipod)
- Marbles
- Corn starch
- Water
- Liquid glue
- Nail polish
- Yogurt
- Honey
- Smoothie
- Tarp (something to contain the mess)

GETTING STARTED:

Viscosity is a measure of how thick or "sticky" a liquid is. It is evident by how things are poured and how long those things take to pour. If two cups were sitting on a tabletop, both spilled, which one would you need to clean first? In this activity you will be exploring and charting the viscosity of a number of products. The goal is to determine which one flows fastest and slowest. At the end of the activity, students will know more about density and how the density of fluids impacts different careers, specifically car painting.

THE ACTIVITY (SKILLS FOR SUCCESS):

The teacher will decide what method is more appropriate for their class. Discuss with the class what viscosity is, why it matters for different careers. Discuss the car painting skilled trade with students so they understand what this trade entails.

There are a couple of ways to measure viscosity of liquids. One way is by measuring the amount of time it takes marble or steel balls to fall given distances through the liquids. The other way is to calculate the density of the fluid in question. The teacher should determine what method is best to use with their particular class. (Numeracy – Measurement)

TO FIND THE DENSITY OF A FLUID:

1. Have each group choose a fluid to measure the viscosity of (or assign each group a fluid).
2. Have students calculate the density of the fluid.
   - Weigh the empty graduated cylinder.
   - Fill the cylinder with fluid, and record the volume.
   - Weigh the full graduated cylinder. Subtract the weight of the empty graduated cylinder to determine the weight of the fluid.
   - The density of the fluid is the weight over the volume.

$$Pf = \frac{weight\ of\ fluid\ [kg]}{volume\ of\ fluid\ [cm^3]}$$

Note: 1 cm3=1 ml.

THROUGH THICK AND THIN

(CONTINUED)

DAY 1:

Students are given the following details to carry out this activity:

1. Watch Mythbusters clip on viscosity – https://www.youtube.com/watch?v=V4TEqb-728k
2. Discuss with the teacher viscosity and which liquids students think will flow slowest and fastest.
3. Set-up area and pour liquids into Dixie cups and set them up for inspection.
4. Pour liquids from one Dixie cup to another and time how long it takes to transfer all of the liquid from one to the other. (Numeracy)
5. Make sure Dixie cups are at the same level and drop a marble from a foot in the air into each of the fluids. Determine how much splatter was created on the side of the cup, did any spill over? Record the number of "drops" on the side or outside the cup. (Numeracy)
6. Use the edible items and time how long it takes you to drink the variety of items through a straw.
7. If using the optional method to calculate density, teachers will set up graduated cylinders, scales, measured fluids and give students directions on how to carry out finding density. (Numeracy)

DAY 2:

1. Collect data from each test and chart results obtained by each of the students. (Numeracy)
2. Discuss how viscosity would affect painting a house, car, etc. Would the viscosity make any difference on the end product? (Communication)
3. Chart viscosity information in a digital form for record keeping purposes. (Digital)
4. If the teacher chooses to use this as a formal lab report, have students write up their findings of density. As an application, have them include how this fits in with the car painting trade. (Writing)

BRANCHING OUT:

1. Older students should be able to calculate viscosity using the appropriate formulas and make accurate predictions based on information.
2. Younger students can watch a demonstration and work together to determine what affect viscosity has one everything.

INFORMATION BITE:

A career in car painting involves cleaning and preparing panels for paint applications. Car painters are required to mix and apply undercoats and clear coats as well as refinish plastic substrates. They perform the prepping and painting of objects on steel body panels. In addition they remove surface paint defects on automotive parts. In these cases, they perform a colour tinting to a blendable match. Car painters use a variety of equipment including sanders, blow guns, painting tools, spray guns and polishers.

WHAT ABOUT SKILLS FOR SUCCESS?

The Skills for Success that are most in use in this trade are numeracy, thinking, and document use. As car painters are mixing together different substances and these must be mixed in certain ratios, is it very important that they have a very good grasp of numeracy. Car painters working with different equipment need to know the best equipment to use for different project and must plan their time accordingly. Using reading and collaboration are other Skills for Success that will be important in this trade. This career also requires good communication and interpersonal skills as car painters are in contact with customers to determine requirements and cost estimates.

ROBOTICS UNPLUGGED

TRADE LINK: ROBOTICS

TEACHER BACKGROUND

Duration: One 45-60 minute class in science and/or math

Grade: Elementary Grades 4-6, Middle School, Grade 9

Group size: Pairs and Individual

Setting: Indoors (classroom and computer lab)

RATIONALE:

Robotics has becoming increasingly popular in the past decade and we are now seeing major international robotics competitions occur around the world. Skills Canada runs Robotics as one of their areas of competition, groups of 4 students build a robot that has to perform some specific task like throwing balls into a basket or building some sort of structure. Programming is what makes those robots do the actions that we tell it to. Some robots are programmed to perform a task at the same speed for an entire day; others are programmed to listen to a remote control being operated by a human.

METHOD:

In this activity, students will learn about programming and will be able to play a game that allows them to program a 'robot' using easy to use programming steps. The goal is to recognize that sometimes fairly complex programming is needed to have a robot conduct simple tasks. That is why we program a robot once and let it perform tasks on its own.

The Skills for Success found in each of the tasks in this activity are found in parentheses.

STUDENTS WILL:

- Compile lists of activities that can be carried out by robots and understand the use of these activities in the daily lives of people;
- Understand some key fundamentals in programming;
- Understand that in order to do a small task, often fairly complex programming is needed;
- Work with others to give directions;
- Become aware of how important precise oral communication is; and
- Create symbols the represent programming tasks.

MATERIALS:

1. Computer lab with internet access for the games.

GETTING STARTED:

Teacher information: Programming requires that the user give precise and specific instructions to their robot in order for it to respond appropriately and complete any tasks. In this activity, students all have the opportunity to be the programmer as well as the robot. They'll be able to see and get a feel for what it is like to program.

Before starting the activity, have students brainstorm all the robots in their lives – where are the obvious robots, where are the hidden robots? So much of our worlds are automated now – a discussion about this automation and about how it impacts our lives is a good start to this lesson.

This discussion leads into the careers of people who are doing the programming of computers – 'speaking' to robots is different than speaking to humans – there is a language that people can learn to program robots to carry out the activities that we want them to do.

THE ACTIVITY (SKILLS FOR SUCCESS):

Students are given the following details to carry out this assignment:

1. Have students pair up – one is the programmer and one is the robot. Have the programmer tell the robot the steps to perform in completing the tasks. The robot will take everything literally and only perform what is required of them. (Collaboration, Communication, and Problem Solving)
   a. Walking to the corner of the room
   b. Getting a drink of water
   c. Throwing something in the garbage
   d. Writing their name on the chalk board
2. Discuss with students their difficulty or ease in performing the tasks, did anything hang them up when they were explaining how to do something? (Communication)
3. Have students play a Light-Bot game at the following site: http://armorgames.com/play/2205/light-bot. Students will have a better understand of what programming entails. (Digital).
4. Have all students write programming instructions for a common task that everyone performs every day. (Writing).
5. After students have done this activity, have them brainstorm in groups some symbols they could use in giving explanations – for example, the command 'step forward with your right foot' can have a symbol to go along with it. After students have written down their 'programming' in words, have them figure out symbols to go along with the words. Being able to understand that these symbols are the basis of code takes this lesson to a higher level of understanding and application. (Reading, Creativity & Innovation).

ROBOTICS UNPLUGGED

(CONTINUED)

BRANCHING OUT:

1. If available, the Lego Robotics program teaches students a lot about programming robots that they built to perform simple tasks. (http://www.firstlegoleague.org/)
2. Younger students could eliminate the online game and discover programming by only performing the first part of the activity. Explaining a task in exact detail is a difficult thing to do – students will quickly learn the sort of precision required for someone to perform even a simple task.
3. Older users could benefit from beginning to learn about programming by building or creating their own computer related games.

INFORMATION BITE:

Due to improvements in computers and the increasing use of robots, companies must now be able to access and apply these emerging technologies in the design and manufacture of products to remain competitive. The ability to prove that the basic design works, called rapid prototyping, and concurrent engineering, the process in which a design is evaluated and modified by a team, are two of the new methods that industry uses to reduce the time and cost of bringing new products to market.

WHAT ABOUT SKILLS FOR SUCCESS?

To work with robots, it is essential that you are a team-player and have strong interpersonal communication skills, because several employees must co-ordinate their efforts to complete each project. As complex designs are common, you need acute problem-solving and trouble-shooting abilities. To avoid errors, you must be able to pay close attention to detail and follow instructions precisely. Strength in numeracy, specifically in math and physics, mechanical aptitude, and satisfaction in working with your hands are also important.

NO FAULT OF MINE

TRADE LINK: BRICK MASONRY

TEACHER BACKGROUND

Duration: one 45 minute classes
Group Size: 3 – 4
Setting: Classroom

RATIONALE:

Brick masons examine plans prior to starting construction on any new project, whether it is as simple as a brick wall or as complex as a wood burning fireplace, technical specifications must be taken into consideration. Students will have the opportunity to work on creating their own "indestructible" brick pattern and try their hand at creating a blue print or schematic. This lesson focuses primarily on using problem solving, numeracy and reading.

METHOD:

Learners will have to work with "co-workers" to refine a schematic diagram to have no fault lines, in order to create the "strongest" wall in the world. If a masonry pattern is found where every gridline (both horizontal and vertical are spaced at the width of a domino and extend perpendicularly between parallel edges) of the rectangle of at least one other domino. A pattern will be found by considering just one brick and building your "wall" from there without fault lines.

Students must work together to obtain their no fault pattern. Then, once they have found this pattern, they must sketch their diagram and outline their process in finding their no fault wall. Diagrams will need to have a scale that is equivalent to a particular sized brick, when drawing (2D).

MATERIALS:

- Dominoes
- Graph paper
- Pencils
- Diagram of a fault lined brick wall
- Answer diagrams

GETTING STARTED:

Have you ever just sat and stared at a brick wall? No? Well, neither have I! If you have or will, you'll notice that many of the patterns used in the construction of a brick wall are done based on patterns that add strength to the wall by eliminating fault lines. Similar to triangles in the construction of a bridge, every brick has a purpose in building a sturdy wall that will stand the test of time. You'll have a cha chance to build the "perfect," no fault wall that will last well into the future. To do this, you'll need to work in groups to consider a number of different issues that many bricklayers use schematics to ensure the quality and strength of their product. Good luck!

THE ACTIVITY (SKILLS FOR SUCCESS):

1. In groups of 3 or 4, review the diagram with faults to see where you might be able to make improvements on the wall that you will eventually build. (Reading, Problem Solving)
2. Use your dominoes to discuss and work through finding a potential solution by using one brick and building off of it to create a perfect square for your wall. (Problem Solving, Creativity & Innovation)
3. Once your wall is complete, create a diagram/blueprint using the graph paper. Ensure that your blueprint outlines an appropriate scale for the actual size of each brick and any potential. Also, determine the square footage of your wall (Numeracy)
4. Document the process that you use to determine how to create the no fault wall. (Writing)

BRANCHING OUT (EXTENSIONS AND VARIATIONS):

1. High school students may have the opportunity to build walls through a technology or shop class.
2. Some students may be interested in creating their wall using 3-D software – if this is an option, arrange for them to have access to creating the wall digitally.
3. Younger students can eliminate the process writing.
4. You could also have students find as many no fault walls as possible.

INFORMATION BITE:

Masons use an assortment of tools such as trowels to spread mortar, plumb lines and squares to check angles and alignment, and power saws, hammers and chisels to shape materials. These tools are used to build walls, floors, partitions, fireplaces, chimneys and other structures made of brick, pre-cast masonry panels, concrete blocks and other masonry materials. Masons must understand the effects that air, moisture and pressure can have on these structures in order to meet construction safety standards.

TIME IS MONEY!

TRADE LINK: FASHION TECHNOLOGY

TEACHER BACKGROUND

Duration: two 45-minute classes
Group Size: 3 – 4
Setting: Classroom

RATIONALE:

The skills required to work in the clothing and textile industry can lead to various careers in the fashion sector, which also encompasses apparel production, manufacturing, management, marketing, and sales. People who work in the fashion industry have to be interested in the field, creative, have a keen eye for current trends and be flexible enough to change with the industry. In this activity, students will have the opportunity to become aspiring fashion designers (apparel production). In any industry, time really is money. If products don't arrive on time, it affects delivery of your finished products.

METHOD:

In this activity, students are to enter into the world of apparel production. Their responsibility is to purchase materials, on a budget, and ensure that items are procured in a timely manner so that the head designer is able to put together her finished pieces. Learners will receive a list of items that must be procured from areas around the world (fashion designers spare no cost!). All items are required by a specific date within a specified budget.

Students must work together to source items in the various countries and determine prices to see where items fit within their budget, and whether they are able to get them on time. Ideally, students will be given a list of materials (specific fabrics, buttons, thread, jewellery, etc.) from different places. Their job will be to produce a list of the required items; the estimated ship time and overall cost.

Note: teachers should give a materials list that will factor both time and cost. If it arrives quickly it will be more expensive. Budget should force learners to make important decisions

MATERIALS:

- Computer with internet access
- List of items to be sought and location to acquire (local or international)
- "Production schedule" for a head fashion designer
- Catalogues for certain materials

GETTING STARTED:

Today, you can't go anywhere and not see people, places or things that haven't been influenced by certain trends or fashion. If you take a look at what you're wearing or what your friends are wearing and ask yourself, "why are they wearing that?" you're likely to find that it has something to do with something that was seen on TV, a magazine or on the internet. Thanks to the web, the world has become a very small place. Items that were inaccessible are now attainable by the click of a button. So, I'd like everyone to find a few things for a fashion show that I am putting together. Each one of you will have two classes to find all of the items on my list. If you really don't love what is on the list – I encourage you to come up with your own items – just be sure you can get them in time for the fashion show!

THE ACTIVITY (SKILLS FOR SUCCESS):

1. First, have students take a trip around the school to look at and identify where they see trends (i.e. Ugg boots, certain jeans or shirts) that have caught on recently. Have a discussion based on how companies and organizations meet up with increasing demands of heavily purchased products. (supply chain). Teachers: check out this video to help https://www.youtube.com/watch?v=RpszBNu0yYI)
2. Assign each student a group, or let them choose their group. Give them a list of items (grouped to make one outfit) that they must source from countries around the world. Give them a timeframe for when items must be procured. Allow them access to the internet and magazines to do preliminary research on shipping times and cost. (Digital, Reading)
3. Have students begin to produce a schedule for acquiring critical items to the process. Prompt students to consider having items there to keep seamstresses and designers busy with something, so they are not working on all outfits within a short period (Problem Solving, Numeracy)
4. Have students produce a schedule that outlines the material being sought, the foot or yardage purchased, the timeframe for its arrival, the cost of delivery and how they plan to get everything in within the timeframe within their assigned budget. (Numeracy)
5. Have the students discuss their approach and how they communicated throughout the process to ensure no duplicate materials were being ordered and how they checked their budget when multiple individuals were making orders at the same time. (Communication)

BRANCHING OUT (EXTENSIONS AND VARIATIONS):

1. Students could research the production timeline a schedule for a variety of items and undertake a project to establish their own schedule for a particular fashion line.
2. Younger students could order clothing from a catalogue and see how much they can order on a particular budget – complete outfits.

INFORMATION BITE:

Apparel production is a very exacting profession that requires a great deal of creativity. It involves measuring, tracing, cutting, sewing, fitting, adjusting and finishing. These steps are taken according to the specifications provided. Dressmakers can also create their own designs and sketch patterns for garments that are tailor-made for specific clients or sold off the rack in retail stores.