Skills Compétences Canada











CONTEST DESCRIPTION

Mechanical Engineering CAD

SECONDARY / POST-SECONDARY

Skills Compétences Canada
Calgary2027

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1 THE SKILLS FOR SUCCESS FOR CAREERS IN THE SKILLED TRADES AND TECHNOLOGY

The Government of Canada has updated the previous Essential Skills framework to the new Skills for Success model in response to the evolving labour market and changing skill requirements. This model outlines nine fundamental skills Canadians need to thrive in work, education, training, and daily life.

Skills/Compétences Canada aims to highlight the importance of these skills, vital for success in trade and technology careers. Competitors can see how Skills for Success are integrated into contest descriptions, projects, and project documents. Recognizing these skills during the competition helps competitors match tasks with specific skills necessary for success and understand how these skills apply within their trade or technology programs and future careers.

The nine key Skills for Success, validated for workplace success, are:

1. Numeracy
2. Communication
3. Collaboration
4. Adaptability
5. Reading
6. Writing
7. Problem Solving
8. Creativity and Innovation
9. Digital

These Skills for Success are detailed in sections 2.4 and/or 3.2 (to be completed by SCC) of your Contest Description and, if relevant, in your Project and supporting documents.

2 CONTEST INTRODUCTION

2.1 Description of the associated work role(s) or occupation(s)

https://www.skillscompetencescanada.com/en/skill_area/mechanical-cadd/

2.2 Purpose of the Challenge

To evaluate each contestant's preparation for employment in the field of Engineering Design and Drafting using CAD and to recognize outstanding students for excellence & professionalism in their field.

2.3 Duration of contest

12 hours.

2.4 Skills and Knowledge to be tested.

- Use CAD software to produce 3D parametric models.[9]
- Knowledge of how to use design tables to make families of parts and how to make robust models that can leverage these tools.
- Competitors will be required to model parts and assemble parts from physical measurement, drawing files (PDF) and/or model files[5]
- Use measuring instruments.[1]Use CAD software to produce drawings that comply with the ASME Y 14.5M-2018 Standard.[9]
- Dimension and tolerance drawings to industry standards including Geometric Dimensioning and Tolerancing (GD&T).[1]
- Identify and apply surface finish characteristics and annotations used in manufacturing on models and drawings.
- Create photorealistic rendered images of your final project.[9]
- Create animations of mechanical assemblies using the software and output video files of those animations[8,9]
- Competitors must have the ability to develop new product designs which will function properly within an assembly or on their own[7,8]
- Ability to use simple formulas and do basic mechanical calculations.[1]
- Select fasteners and other assembly components as required (pins, keys, snap rings, etc.).[7]
- Knowledge of common structural shapes and how to use them to develop frame assemblies.
- Have knowledge and understanding of designing and producing components for rapid prototype product development (3D printing) using Fused Fillament Fabrication (FFF) [8]
- Prior to the competition, competitors should complete the practice project samples which will be posted on the Skills/ Compétences Canada web site.
- Prior to the competition, the competitor shall create metric and inch B size templates with title a block containing the information provided in the example that will be posted on the Skills/Compétences Canada website, and bring these items for orientation.[5,6,9]

Skills for Success – [1]Numeracy, [5]Reading, [6]Writing, [7]Problem Solving, [8]Creativity and Innovation, [9]Digital

3 CONTEST DESCRIPTION

3.1 List of documents produced and timeline for when competitors have access to the documents on the Skills/Compétences Canada website.

DOCUMENT	DATE OF DISTRIBUTION

Drawing template example PDF files will be provided ahead of the competition.	February 2026
Example project for use as practice. No project specific documents will be provided prior to competition	February 2026

3.2 Tasks that may be performed during the contest.

- 3D modelling using parametric CAD software: parts, assemblies and drawings
- Modelling based on drawings of parts and assemblies[5]
- Part measurment[1]
- Part and assembly design based on given requirements
- Solving design problems and implementing design changes[7,8]
- Calculations for ensuring a part meets requirements
- Assembly from parts[9]
- Parametric Modeling – Family of parts and/or assemblies[7,8,9]
- Rendering[9]
- Animation[8,9]
- Model-based-definition (MBD)
- Design for rapid prototyping (3D Printing)
- Exporting drawings as multi-page 2D[9]
- Design using weldments
- Design using sheet metal
- Surface modelling
- Import a variety of 3D model formats such as; STP (STEP) file[9]
- Export a variety of 3D model formats such as; STL files with proper units and resolution for additive manufacturing, STEP files, 3D PDF, multipage PDF drawing files[9]

Skills for Success - [1]Numeracy, [5]Reading, [6]Writing, [7]Problem Solving, [8]Creativity & Innovation, [9]Digital

4 EQUIPMENT, MATERIAL, CLOTHING

4.1 Equipment and material provided by Skills/Compétences Canada

- Table, chair, internet connection (it could be wired or wireless, be prepared for both) and 120VAC power (minimum of two outlets and 500W per person)

COMPETITORS WILL BE REQUIRED TO USE THE MATERIAL AND EQUIPMENT PROVIDED BY SCC. ALL OTHER MATERIAL AND EQUIPMENT WILL BE REMOVED FROM THE SKILL AREA.

4.2 Equipment and material provided by the competitor.

- Competitors must bring their own computer, standalone monitor(s) (two max), and peripherals (3D navigator allowed). Contestant should have administrative rights to the computer and are responsible for the functioning of their own equipment. Your computer setup must have the ability to connect to wired and wireless internet networks.
  - Ensure your computer can adequately run your CAD software of choice, even with large assemblies.
  - The project will be distributed and submitted over the internet. Ensure your computer can connect to both wireless and wired networks.
  - If competitors are bringing a computer or laptop from their school (instead of their personal computer), please ensure that the computer is unlocked so documents and possibly software can be saved/installed to the hard drive and technology support can be provided onsite. This may require access to BIOS settings.
- Legally licensed 3D parametric CAD modeling software.
  - Ensure the softare can function without internet access if connection to site network is interrupted.
- Competitors must ensure a legally obtained version of Microsoft Excel is installed on their computer.
- Calculator.
- Any reference materials (no photocopies, materials may be PDF documents or published books, journals, etc.).
- Pencils, sketching paper.
- Recommended measuring tools can be seen below; however, competitors are welcome to bring additional hand tools if they wish (automated or camera measuring devices are not permitted). Any and/or all tools may be digital and should be capable of measuring in both inch and metric.
- 8” Calipers, digital, dial or vernier.
- Ruler(s).
- Radius gauge set (no limit on size).
- Protractor and/or combination set.
- Squares.
- Thread gauge (or taps/dies or scews/nuts).

4.2.1 Toolboxes Guidelines

One of the objectives of SCC is the sustainability of the Competition. As a result, the toolboxes brought by Competitors will be restricted to the following maximum specifications.

The Competitor toolbox must not exceed 1 m^3 in volume. It can be multiple toolboxes, but the total of all toolboxes must not exceed the maximum volume indicated. There is no exception to this rule. If the Competitor’s toolbox is larger than what is indicated, the

Competitor with the guidance of the NTC, will need to remove items from the toolbox and those items will not be used during the competition. All tools must fit inside one or more toolboxes. Tools outside of a toolbox will not be permitted.

4.3 Required clothing provided by the competitor.

- N/A

5 HEALTH AND SAFETY

5.1 Safety program

SCC has implemented a comprehensive safety program as health and safety is an integral part of our competitions. Our safety program includes guidelines and procedures to make the work environment in each skill area safer.

5.1.1 Safety manual

As part of our program a safety manual has been created to monitor and document health and safety within each skill area. It includes a definite plan of action designed to prevent accidents. The safety manual will be provided for every skill and these instructions must be followed and respected by all participants and officials at the SCNC.

5.1.2 Safety workshop

During orientation, Competitors will participate in a Safety workshop and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety, and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

5.2 List of required personal protective equipment (PPE) provided by Skills/Compétences Canada

- N/A

5.3 List of required personal protective equipment (PPE) provided by the competitor.

- N/A

Note: Competitors who do not have the required protective equipment will not be allowed to participate in the competition

6 ASSESSMENT

6.1 Point breakdown

The competition is divided into four equal parts over the two days. Each is a new task with separate marking.

A typical competition may have the following breakdown for the four tasks.

TASKS	/100
Part Design	25
Part Measurement	25
Assembly & Detail Modeling	25
Design change & Parametric Modeling	25

7 CONTEST SPECIFIC RULES

Contest specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from contest to contest. Any additional contest rules will be reviewed during the competitor orientation.

TOPIC/TASK	CONTEST SPECIFIC RULE
Hardware	Internet access will be provided. May be wired or wireless.
Software	Software must be legally obtained.
Malfunction	If your hardware/software malfunctions you will be provided the equivalent downtime to complete the competition up to a maximum of 15 minutes per competition module.
Use of technology - Music - Internet	Competitors are allowed to listen to music through headphones or earbuds but cannot be connected to any network (cellular or wifi). Internet will be provided for competitors; the purpose is for software function and for access to help documentation. No use of internet for communication with others is permitted.

8 ADDITIONAL INFORMATION

8.1 Interpreter

If a competitor requires the help of an interpreter once onsite during the competition, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service may not be guaranteed.

8.2 Ties

- Tiebreaker #1: The competitor with the highest score in the Day 2 AM task will be declared the winner.
- Tiebreaker #2: The competitor with the highest mark in the Day 1 AM task will be declared the winner.

- Tiebreaker #3: The competitor with the highest mark in the Day 1 PM task will be declared the winner.

8.3 Competition rules

Refer to the competition rules of the Skills Canada National Competition which can be found on our website.

9 NATIONAL TECHNICAL COMMITTEE MEMBERS

MEMBER ORGANIZATION	NAME
Newfoundland and Labrador	
Quebec	Frédéric-José Dhaisne
Ontario	Jeremy Braithwaite- Co-Chair
Manitoba	Nino Caldarola
British Columbia	Michael Christensen
Yukon	David Lister – Chair
Saskatchewan	Carson Gustafson
Alberta	Denis Godin

10 APPENDIX A – GLOSSARY OF TERMS USED IN TRANSLATION

The names for functions in the software are common terms in English, but the name for the equivalent function in the French depends on the software and can lead confusing and unclear terms. If you plan to use the translated documents, it's your responsibility to know what these mean in your software ahead of the competition. These terms are known to vary in translation, however there may be more:

- Shaded view
- Render
- Bill of Materials (BOM)
- Balloon
- Exploded view

The names of 3D model files will be provided in English, treat them as proper nouns. They will be referred to by their file names.

Contact the Skills/Compétences Canada national secretariat for any questions or concerns: Olga Malvine Rwemera (olgamr@skillscanada.com)