



## CONTEST DESCRIPTION

<b>Competition Date</b>	Tuesday, April 9 <sup>th</sup> 2024
<b>Competition location</b>	Westisle Composite High School
<b>Trade Number</b>	16
<b>Trade Name</b>	Electronics
<b>Level</b>	Secondary

### 1. INTRODUCTION

#### 1.1 Purpose of the Challenge.

To recognize students professionalism and excellence in the field of electronic technology; to evaluate each contestant's work place skills and their level of readiness for employment in the electronics industry.

#### 1.2 Duration of contest.

6 Hours

8:30 – 9:30	Theory Test
9:35 – 10:10	Electronic Documentation
10:30 – 11:15	Fault Finding
11:15 – 12:00pm	Project Costing
12:45 – 2:00	Prototyping
2:15 – 3:30	Assembly Project

#### 1.3 Skills and Knowledge to be tested.

Basic Electronic principals, components and circuitry.

### 2. SKILLS FOR SUCCESS

In response to the evolving labour market and changing skill needs, the Government of Canada has launched the new Skills for Success (former Essential Skills) model defining nine key skills needed by Canadians to participate in work, in education and training, and in modern society more broadly. SCC is currently working with Employment and Social Development Canada (ESDC) to bring awareness of the importance of these skills that are crucial for success in Trade and Technology careers.

Part of this ongoing initiative requires the integration and identification of the Skills for Success in contest descriptions, projects, and project documents.



The following 9 skills have been identified and validated as key skills for success for the workplace in the legend below:

Numeracy, Communication, Collaboration, Adaptability, Reading, Writing, Problem Solving, Creativity and Innovation, Digital

### **3. CONTEST DESCRIPTION**

A question sheet will be supplied. The competitor will show all answers and calculations on this sheet. This is a timed competition; all contestants must stop writing when the allotted time has expired.

Questions will encompass some or all of the topics below:

Basic Electronic Principals:

- Resistors
- Resistor Networks
- RC Time Constants
- LRC Circuit Calculations
- Basic AC and DC Theory

Electronic Components

The properties, characteristics and application (in elementary circuits) of the following components (both in fixed and variable forms).

- Resistors
- Capacitors
- Coils, Transformers
- Diodes (Rectifier, Zener, Light Emitting, Capacitive)
- Transistors (Bipolar, FET & Unijunction)
- Thyristors (SCR, Triac)

Amplifiers:

- Single stage amplifier characteristics, calculations and measurements of voltage and dB's
- Operational stage amplifier characteristics and calculations

Circuits:

- Comparitors



- Sine wave oscillators (RC, Quartz, LC)
- Differentiator
- Integrator

#### Digital Electronics:

- Basic logic gates (AND, NOT, OR, NAND, NOR, XOR) and their truth tables
- Analyzing logic circuits with basic logic gates and creating their truth tables
- Synthesising logic gates with other logic gates (E.G.: substitute two NAND for AND)
- Digital wave from analysis
- Simplify logic circuits using Boolean Algebra or Karnaugh Mapping
- Latches and Flip – Flops
- Shift Register, Counter and Divider circuits

#### **Electronic Documentation**

Interpretation of **Electronic Documentation** will be examined by the competitor's ability to answer questions based on supplied documentation. Understanding and comprehension will be evaluated.

The ability of a competitor to generate documentation suitable for troubleshooting will be evaluated by having the competitor's sketch a comprehensive schematic from a supplied **circuit board**.

#### **Rework Technique**

The competitor's ability to troubleshoot electronic equipment will be evaluated. Pre-built circuits will be provided, and each board will have a fault pre-installed. Each competitor will be asked to troubleshoot one such circuit. The ability to fault find, locate and mathematically prove the defective component or wiring will be evaluated.

#### **Project Costing**

The competitor will locate component part numbers and price.

#### **Prototyping**

To evaluate the competitors ability to build and make operational, a simple electronic design. This portion of the competition will require that a circuit's design be finalized, built and tested. A suitable supply of parts will be provided. Not all parts will be needed to be used.



### **Assembly Project**

Hands on skills, work practices and abilities to follow instructions will be evaluated during the assembly of an electronic kit. The construction of this kit may include all skills relevant to such an activity, i.e. soldering, wiring, crimping, wires wrapping, drilling, punching, gluing, etc.

## **4. EQUIPMENT, MATERIAL, CLOTHING**

**4.1** Each competitor is required to bring the following:

- Calculator
- Pen, pencil, eraser and ruler
- Safety glasses

**4.2** Equipment and material provided by the competition site

- Question and Answer forms
- VOM
- Wire
- Data Sheets for all active components
- Oscilloscope
- Signal Generator
- Digital Multimeter
- Dual Power Supply
- Electronic Components
- Breadboard
- All Specialty Tools (wire – wrap, etc.)
- Hand tools (soldering iron, pliers, cutters, screwdrivers, solder, solder removing tool, awl, knife)

**Tools other than those supplied or listed on this scope document are not permitted**

## **5. SAFETY REQUIREMENTS**

**5.1** List of required personal protective equipment(PPE) provided by competitors

Safety awareness/requirements will be maintained at, at least minimum industry standards at all times. A contestant will not be allowed to compete without the safety equipment noted on this scope document.



- Safety glasses, shoes (covered footwear), pants (covered legs)
- No jewellery on hands or wrists

**Note:** Competitors will not be allowed to compete if the above items are not brought and used

## 6. ASSESSMENT

### 6.1 Point Breakdown

The judges will not confer amongst themselves during the marking.

The judges may question competitors during the marking.

The judges will individually score each competitor's project with a maximum mark of 10.

Each competitor's competition section will be timed when they finish. In the event that there is a tie for placing, the competitor's finish time will be factored in.

Marks:

Perfect(Above every standard) 10

Very Good(Meets every standard) 9

Good(Acceptable overall, many good points) 8

Rather Good(Acceptable overall, some good points) 7

Sufficient(Acceptable overall) 6

Medium(Barely Acceptable overall) 5

Weak(Meets some standards) 4

Insufficient(Close to some standards) 3

Very Bad(Nominal attempt at standards) 2

Zero(Zero standards met) 1

POINT BREAKDOWN	/100
Theory	20
Documentation	10
Rework Technique	15
Project Costing	15
Prototyping	20
Assembly Project	20

## 7. ADDITIONAL INFORMATION

### 7.1 Tie (No ties are allowed)

Ties will be broken by time completed.



## 7.2 Competition rules

Please refer to the competition rules for all general PSC information.

## 8. CONTACT INFORMATION

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