



## Technology Education Senior Years Technology Program

### *Grades 9 to 12 Horticulture Manitoba Technical-Vocational Manitoba Curriculum Framework of Outcomes 2014*

#### Student Learning Outcomes Related to Sustainable Development

(Note that the Horticulture program is comprised of nine courses. The courses are structured using goals, General Learning Outcomes, and Specific Learning Outcomes.)

#### Grade 9

#### 8717 **Exploration of Horticulture (9)** 15S / 15E / 15M 10S / 10E / 10M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

9.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemicals) related to processes, materials, tools, and equipment used in horticulture and landscaping. (A3.7) (D1.2)

9.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 5:** Understand **pest management**.

**GLO 5.1:** Understand the **principles of integrated pest management**.

9.5.1.6 Demonstrate knowledge of the ecological concepts related to IPM.

**Goal 9:** Demonstrate an understanding of **career opportunities** in horticulture and related environmental fields. (GHCP D1)

**GLO 9.1:** Describe **education and career opportunities, and professional organizations** in horticulture and related environmental fields.

9.9.1.1 Describe the structure and scope of horticulture and related environmental fields. (A1.1)

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.2:** Describe the horticulture industry's **sustainability practices and environmental impacts**.

9.11.2.1 Demonstrate knowledge of the environmental impact of various horticultural practices. (D1.3) (A5.2)

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

9.11.3.1 Demonstrate knowledge of the needs of the present world without compromising the ability of future generations to meet their own needs.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

9.12.1.1 Demonstrate knowledge of the ethical and legal expectations related to the horticulture industry.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of **the evolution and technological progression of, and the emerging trends** in horticulture.

9.14.1.1 Describe the evolution and technological progression of, and the emerging trends in the horticulture industry.

Grade 10

8718 **Introduction to Horticulture (10)** 20S / 20E / 20M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

10.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemicals) related to processes, materials, tools, and equipment used in horticulture and landscaping. (A3.7) (D1.2)

10.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 5:** Understand **pest management**.

**GLO 5.1:** Understand the **principles of integrated pest management**.

10.5.1.6 Identify the ecological concepts related to IPM.

**Goal 9:** Demonstrate an understanding of **career opportunities** in horticulture and related environmental fields. (GHCP D1)

**GLO 9.1:** Describe **education and career opportunities, and professional organizations** in horticulture and related environmental fields.

10.9.1.1 Describe the structure and scope of horticulture and related environmental fields. (A1.1)

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

10.11.1.1 Demonstrate knowledge of the concept of sustainability.

**GLO 11.2:** Describe the horticulture industry's **sustainability practices and environmental impacts**.

10.11.2.1 Identify the environmental impact of various horticultural practices.

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

10.11.3.1 Identify the needs of the present world without compromising the ability of future generations to meet their own needs.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

10.12.1.1 Identify the ethical and legal expectations related to the horticulture industry.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of **the evolution and technological progression of, and the emerging trends** in horticulture.

10.14.1.1 Describe the evolution and technological progression of, and the emerging trends in the horticulture industry.

## Grade 11

### 8719 Applied Horticulture (11A) 30S / 30E / 30M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

11A.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemicals) related to processes, materials, tools, and equipment used in horticulture and landscaping. (A3.7) (D1.2)

11A.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 5:** Understand **pest management**.

**GLO 5.1:** Understand the **principles of integrated pest management**.

11A.5.1.6 Describe the ecological concepts related to IPM.

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

11A.11.1.1 Identify the dynamic interrelationship between human health and well-being, and horticulture.

**GLO 11.2:** Describe the horticulture industry's **sustainability practices and environmental impacts**.

11A.11.2.1 Describe the environmental impact of various horticultural practices.

11A.11.2.2 Describe the implications of hand and power tool selection and use on the practice of environmental stewardship. (A4.2)

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

11A.11.3.1 Describe how the needs of the present world can be met without compromising the ability of future generations to meet their own needs.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

11A.12.1.1 Describe the ethical and legal expectations related to the horticulture industry.

11A.12.1.2 Describe pertinent legislation pertaining to the horticulture industry. (A3.14, A3.4)

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of **the evolution and technological progression of, and the emerging trends** in horticulture.

11.14.1.1 Describe the evolution and technological progression of, and the emerging trends in the horticulture industry.

## 8733 Introduction to Landscape Maintenance and Construction (11B) 30S / 30E / 30M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

11B.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemicals) related to processes, materials, tools, and equipment used in horticulture and landscaping. (A3.7) (D1.2)

11B.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 5:** Understand **pest management**.

**GLO 5.1:** Understand the **principles of integrated pest management**.

11B.5.1.3 Practise integrated pest management in an outdoor environment.

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

11B.11.1.1 Describe the dynamic interrelationship between human health and well-being, and horticulture.

**GLO 11.2:** Describe the horticulture industry's **sustainability practices and environmental impacts**.

11B.11.2.1 Describe the dynamic interrelationship between the environment and the economy.

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

11B.11.3.1 Discuss practices which promote long-term business success.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

11B.12.1.1 Describe the ethical and legal expectations related to the landscaping industry.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of **the evolution and technological progression of, and the emerging trends** in horticulture.

11B.14.1.1 Describe the evolution and technological progression of, and the emerging trends in the landscaping industry.



8734 **Introduction to Greenhouse Maintenance and Production (11C) 30S / 30E / 30M**

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

11C.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemicals) related to processes, materials, tools, and equipment used in horticulture and landscaping. (A3.7) (D1.2)

11C.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials Information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 5:** Understand **pest management**.

**GLO 5.1:** Understand the **principles of integrated pest management**.

11C.5.1.3 Practise integrated pest management in a greenhouse.

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

11C.11.3.1 Identify the dynamic interrelationship between the environment and the economy.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

11C.12.1.1 Describe the ethical and legal expectations related to the greenhouse industry.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of **the evolution and technological progression of, and the emerging trends** in horticulture.

11C.14.1.1 Describe the evolution and technological progression of, and the emerging trends in the greenhouse industry.

Grade 12

8764 **Advanced Horticulture (12A)** 40S / 40E / 40M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

12A.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemical) related to processes, materials, tools, and equipment used in horticulture and landscaping areas. (A3.7) (D1.2)

12A.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 2:** Demonstrate the safe and appropriate **maintenance, management, and operation of equipment, tools, consumables, and materials.** (GHCP B3)

**GLO 2.2:** Demonstrate the safe **operation of horticultural tools and equipment.** (GHCP C1)

12A.2.1.4 Describe the procedures and equipment used to store, dispose of, and transport fertilizers. (D1.8)

**Goal 5:** Understand **pest management.**

**GLO 5.1:** Understand the **principles of integrated pest management.**

12A.5.1.6 Describe the ecological concepts related to IPM.

**Goal 9:** Demonstrate an understanding of **career opportunities** in horticulture and related environmental fields. (GHCP D1)

**GLO 9.1:** Describe **education and career opportunities, and professional organizations** in horticulture and related environmental fields.

12A.9.1.1 Describe education and career opportunities and professional organizations in horticulture and related environmental fields.

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.2:** Describe the horticulture **industry's sustainability practices and environmental impacts.**

12A.11.2.1 Describe sustainability practices and the environmental impacts of horticulture (e.g., xeriscaping, water gardens).

12A.11.2.2 Describe the implications of soil management on the practice of environmental stewardship. (A9.2)

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

12A.12.1.1 Demonstrate awareness of legislation controlling the use of horticultural products.

12A.12.1.2 Discuss ethical considerations regarding the disposal of hazardous products.

12A.12.1.3 Interpret codes and regulations pertaining to fertilizers. (D1.5)

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of **the evolution and technological progression of, and the emerging trends** in horticulture.

12A.14.1.1 Describe the evolution and technological progression of, and the emerging trends in horticulture.

8765 **Applied Landscape Maintenance and Construction (12B)** 40S / 40E / 40M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

12B.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemical) related to processes, materials, tools, and equipment used in horticulture and landscaping areas. (A3.7) (D1.2)

12B.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 2:** Demonstrate the safe and appropriate **maintenance, management, and operation of equipment, tools, consumables, and materials.** (GHCP B3)

**GLO 2.2:** Demonstrate the safe **operation of horticultural tools and equipment.** (GHCP C1)

12B.2.2.4 Describe the implications of vehicle, equipment, and machinery selection and use on the practice of environmental stewardship. (A5.2)

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

12B.11.1.1 Discuss the benefits of landscape structures to human health and well-being.

**GLO 11.2:** Describe the horticulture **industry's sustainability practices and environmental impacts.**

12B.11.2.1 Describe sustainability practices and the environmental impacts of landscape structures.

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

12B.11.3.1 Discuss sustainable business practices that pertain to the maintenance and construction of landscape structures.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

12B.12.1.2 Demonstrate awareness of legislation governing the application of potentially hazardous horticultural products.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

12B.14.1.1 Describe the evolution and technological progression of, and the emerging trends in landscape maintenance and construction.

## 8766 **Applied Greenhouse Maintenance and Production (12C)** 40S / 40E / 40M

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

12C.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemical) related to processes, materials, tools, and equipment used in horticulture and landscaping areas. (A3.7) (D1.2)

12C.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

12C.11.1.1 Discuss the benefits of greenhouses, their ambiance, and their produce to human health and well-being.

**GLO 11.2:** Describe the horticulture **industry's sustainability practices and environmental impacts**.

12C.11.2.1 Describe sustainability practices and the environmental impacts of greenhouses. (A9.2)

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

12C.11.3.1 Discuss sustainable business practices that pertain to the maintenance and management of greenhouses.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

12C.14.1.1 Describe the evolution and technological progression of, and the emerging trends in greenhouse maintenance and production.

## **8767 Arboriculture (12D) 40S / 40E / 40M**

**Goal 1:** Describe and apply appropriate **safety and health** practices as they relate to horticulture.

**GLO 1.1:** Create and maintain a **safe work** environment in horticulture.

12D.1.1.2 Identify and report hazards (e.g., electrical safety, ergonomics, material handling, chemical) related to processes, materials, tools, and equipment used in horticulture and landscaping areas. (A3.7) (D1.2)

12D.1.1.13 Demonstrate awareness of the principles of the Workplace Hazardous Materials information Systems (WHMIS) as they apply to the horticulture industry and identify safety requirements as they apply to WHMIS. (A3.11) (TSA 13)

**Goal 11:** Demonstrate awareness of **sustainability** as it pertains to horticulture.

**GLO 11.1:** Describe the impact of **sustainability** on the health and well-being of horticulture workers and their clients, as well as the role of horticulture in society.

12D.11.1.1 Discuss the benefits of trees to human health and well-being.

**GLO 11.2:** Describe the horticulture **industry's sustainability practices and environmental impacts**.

12D.11.2.1 Describe sustainability practices and the environmental impacts of arboriculture.

**GLO 11.3:** Describe **sustainable business practices** within the horticulture industry.

2D.11.3.1 Discuss sustainable business practices that pertain to arboriculture.

**Goal 12:** Demonstrate awareness of the **ethical and legal standards** as they pertain to horticulture.

**GLO 12.1:** Apply the **ethical and legal standards** as they pertain to horticulture.

12D.12.1.1 Demonstrate awareness of legislation governing arborists.

**Goal 14:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

**GLO 14.1:** Demonstrate an understanding of the **evolution and technological progression of, and the emerging trends** in horticulture.

12D.14.1.1 Describe the evolution and technological progression of, and the emerging trends in arboriculture.