

MANITOBA ENVIROTHON SOILS AND LAND USE

Outcome Cluster	Code	Manitoba Envirothon Outcomes
Soil as a Resource	S1	Describe the ecological, economic and social benefits of soil.
	S2	Explain why soil is a dynamic and limited resource.
	S3	Describe the different types, origins and deposition methods of soil parent material.
	S4	Name common parent materials in Manitoba.
	S5	Describe the five soil forming factors.
	S6	Describe the four basic soil forming processes (additions, losses, translocations, and transformations).
	S7	Describe factors affecting the health and fertility of soil, including biodiversity, non-native species, pollution, climate change and human activity.
Properties of Soil, Soil Profiles and Soil Identification	S8	Describe physical and chemical properties of soil, including texture, color, structure, CEC, pH, porosity, density.
	S9	Describe the physical, chemical and biological properties of the major soil orders found in Manitoba.
	S10	Explain how the five soil forming factors affect soil properties.
	S11	Relate soil properties to soil limitations.
	S12	Explain how soil properties and other factors affect erosion, salinity and compaction.
	S13	Identify features of a soil profile.
	S14	Define soil profile symbols.
	S15	Determine soil characteristics and limitations from a soil profile, including fertility, water movement, permeability, carbonates.
	S16	Describe how water moves into and through soil and into plants.
	S17	Explain how soil properties affect availability of water to plants.

Outcome Cluster	Code	Manitoba Envirothon Outcomes
	S18	Describe different types of soil water including their availability to plants.
	S19	Name Manitoba's provincial soil and its order.
	S20	Identify soil to sub-group using Canadian System of Soil Classification.
Soil Ecology and Fertility	S21	Describe the soil portion of the water, nitrogen, phosphorus and carbon cycles.
	S22	Explain how these cycles affect soil management.
	S23	Describe different types of soil degradation, including erosion, salinity and compaction.
	S24	Explain why biodiversity in the soil ecosystem is important for plant, environmental and human health.
	S25	Give examples of beneficial soil organisms.
	S26	Explain how the soil ecosystem affects and is affected by soil management.
	S27	List essential plant nutrients.
	S28	Describe how nutrients are held in soil.
	S29	Explain how soil fertility relates to the physical, chemical and biological state of the soil.
	S30	Explain how soil fertility relates to soil properties and limitations.
	S31	Explain how soil properties and limitations affect fertilizer use.
Soil Conservation and Management, Soil Surveys and Land Use	S32	Indicate the geographic and ecosystem distribution of the major soil orders found in Manitoba.
	S33	Discuss the relationship between sustainable development and soil management.
	S34	Explain why soil management is important to agriculture and in addressing issues such as conservation of biodiversity, non-native species, pollution and climate change.
	S35	Describe the role of government in soil management.
	S36	Describe how agriculture in Manitoba is affected by climate change.

Outcome Cluster	Code	Manitoba Envirothon Outcomes
	S37	Describe methods to prevent or reduce soil degradation.
	S38	Compare the impact of different soil conservation practices and land uses on soil health, climate change and sustainability.
	S39	Determine the best land use for a particular parcel of land based on soil knowledge and data.
	S40	Perform tests and calculations to determine physical and chemical properties of soil, including texture, porosity and density.
	S41	Describe the procedure for taking a soil sample and conducting nutrient analysis.
	S42	Describe how Global Information Systems (GIS) are used by agricultural and land use resource managers.
	S43	Explain the section-township-range system.
	S44	Locate information in a variety of sources of soil data, including soil survey reports, soil capability maps and ortho photos.
	S45	Interpret data from a variety of sources of soil data, including soil survey reports, soil capability maps and ortho photos.