Brightwater Site

Mathematics in Nature

Brightwater provides Math teachers and their students with opportunities to extend their curricular learning by engaging in meaningful Mathematical explorations of the natural environment based on hands-on experiences. Experiences can range from ½ to a full day and are based from the Potash Corp Eco-Science and Indigenous Learning Centre on the SPS Brightwater Site.

There are 2 Brightwater sites adjacent to one another and located approximately 14 kilometers south of Saskatoon, on a 1/4 section of prairie grassland. The Middle Years multi-day programming is based from 100 acres at The Salvation Army's Beaver Creek Camp and the High School programming is based from the adjacent 60 acres owned by Saskatoon Public Schools. All school groups have access to entire trail system that spans the 2 Brightwater sites.

Brightwater Programming is based on the exploration of Native Prairie landscapes and honours Indigenous Ways of Knowing. The sites are host to a collection of aquatic and terrestrial ecosystems that include three lush fresh-water springs, forested riparian habitats along the meandering Brightwater Creek, native prairie grasslands and dry-topped sand dunes. The rich variety of native plants and animals are integral to the learning opportunities of Brightwater experiences. Best Place educational experiences are supported throughout the area, along trails, at creek dipping sites, and within several habitat enhancement areas. An extensive network of trails enables students and teachers to explore the ecology of this natural area.

Applicable Math Curricular Outcomes:

Grade 9	Grade 10	Grade 11	Grade 12
Statistics and Probability	Expand and apply understanding of relations and functions Workplace and Apprenticeship Mathematics 10(WA)	Foundations of Mathematics Workplace and Apprenticeship Mathematics 20 (WA)	Workplace and Apprenticeship Mathematics 30(WA)
SP9.1 Demonstrate understanding of the effect of: ◦bias ◦use of language ◦ethics ◦cost ◦time and timing ◦privacy ◦cultural sensitivity and ◦population or sample on data collection. [C, PS, R, T]	FP10.6 ◦ relating data, graphs, and situations ◦ analyzing and interpreting ◦ distinguishing between relations and functions. [C, CN, R, T, V]	FM20.1 Demonstrate understanding of the mathematics involved in an historical event or an area of interest. [C, CN, ME, PS, R, T, V]	WA30.8 Extend and apply understanding of linear relations including: patterns and trends graphs tables of values equations interpolation and extrapolation problem solving. [CN, PS, R, T, V]
SP9.2 Demonstrate an understanding of the collection, display, and analysis of data through a project. [C, PS, R, T, V]	FP10.6 Expand and apply understanding of relations and functions including: ◦ r data, graphs, and situations ◦ analyzing and interpreting ◦ distinguishing between relations and functions. [C, CN, R, T, V]	FM20.6 Demonstrate an understanding of normal distribution, including standard deviation and z-scores. [CN, PS, T, V]	WA30.11 Extend and apply understanding of probability. [C, CN, PS, R]

SP9.3 Demonstrate an understanding of the role of probability in society. [C, CN, R, T]	WA10.5 Demonstrate using concrete and pictorial models, and symbolic representations, understanding of area of 2-D shapes and surface area of 3-D objects including units in SI and Imperial systems of measurement. [CN, ME, PS, R, T, V]	FM20.7 Demonstrate understanding of the interpretation of statistical data, including: intervals ◦ confidence levels ◦ margin of error. [C, CN, R]	
SP9.4 Research and present how First Nations and Métis peoples, past and present, envision, represent, and make use of probability and statistics.	WA10.9 Demonstrate understanding of angles including: ◦ drawing and sketching ◦ replicating and constructing ◦ bisecting ◦ relating to parallel, perpendicular, and transversal lines ◦ solving problems. [C, ME, PS, T, V]	WA20.3 Extend and apply understanding of surface area, volume, and capacity using concrete and pictorial models and symbolic representations (SI or imperial units of measurement). [C,CN,ME,PS,V]	
		WA20.5 Extend and apply understanding of 3-D objects including: ◦ top, bottom, and side views ◦ exploded views ◦ component parts ◦ scale diagrams. [CN, R, T, V]	

Possible Brightwater Features for Mathematical Considerations:

Plant Associations:

- Plant Biodiversity within a given area
- Areas of Invasive plant species domination over native plant species
- Aspen bluff size, frequency and % of the area
- Jack Pine repopulation

Aquatic Associations:

- Comparisons of Biodiversity and populations of aquatic invertebrates and vertebrates in the Brightwater creek and natural springs in relation to the physical properties of the water

Animal Associations:

- Calculations of carrying capacity for a variety of wildlife
- Evidence of wildlife; beaver, deer, snowshoe hare, ground squirrel, least chipmunk, porcupine, short tailed weasel, coyote, fox, skunk, racoon, grouse, woodpecker, song birds, raptors, garter snake, leopard frog, wood frog

Human Associations:

- Evidence of Past Cultures use of the land
  - Mapping of artifacts
- Recent land use patterns
  - First Nations seasonal camps
  - Agricultural land use