GRADE 9
UNIT: Math - Ratio and Proportion; Social Studies - Relationships with the Environment
THEME: Human Face of Mathematics - Mathematics in Aboriginal Culture

EQUIPMENT
- Internet
- atlatl and dart of various lengths (For example 0.5m, 1 m, 1.5 m, 2 m)
- measuring tape
- coloured tape
- stop watch
- distance chart
- calculator
- computers with a spreadsheet program

PREREQUISITE KNOWLEDGE:
Math - Ratio and Proportion
R-1 solve word problems involving rates and ratios
R-8 compare ratios and rates
-calculate velocity

LEARNING OUTCOMES:

Math - Ratio and Proportion
R-4 construct ratios and rates from real-life examples

Social Studies - Relationships with the Environment
- Know the traditional worldview of Aboriginal peoples with regards to the environment.
- Compare various world views of Canadians in general with regard to the environment.
- Compare Aboriginal peoples' traditional views toward the environment with current attitudes on local or global environmental issues.
- Know scientific and technological components of cultures:
  - shelter
  - tools
  - crafts
  - transportation
  - clothing
  - weapons

Teacher Set Up
1. Using the coloured tape, mark off a throw line.
2. Divide the class into groups of no less than 4. For each group you will need one student to throw the dart, one student to measure the distance thrown, one student to time the flight of the dart and another to record the data. One student from each group will throw the dart for the sake of consistency.
3. Give each student a distance and time chart.

Student Instructions

Background Information

1. Research the weapons of the Aboriginal people pre and post contact.
2. Describe the effect on the animal population and Aboriginal way of life when each weapon was introduced.

Speed of the Dart

1. After your teacher demonstrates how to use the atlatl, create a hypotheses on which length of dart they think will travel the fastest.
2. Record the distance and time traveled for each length.
3. Time the dart from the time it leaves the atlatl until it lands on the ground.
4. Throw the shortest dart about 5 times each as far as possible, not crossing the line.
5. Measure each throw from the line to see how far the dart traveled.
6. Repeat for each length of dart.

Data Analysis

1. Calculate the speed for each throw
2. Determine which length of dart traveled the fastest.
3. Compare your results to your hypotheses.
4. Represent data graphically from a spreadsheet by choosing the appropriate graph type. Justify the type of graph you used.
5. Determine which dart length had traveled the fastest.
6. As a group answer the following questions:
   a) How does the physical attributes of the person throwing the atlatl effect the experiment?
   b) What other factors would effect the experiment?
   c) How could the results differ for different people throwing the dart?

Closure

7. As a class, form conjectures as why different groups may have had different results and how the experiment could be changed to have more accurate results.
8. Discuss the following quote:

   "The atlatl and dart is truly the natural weapon system of the human race. When humans used the atlatl, we were in balance with nature. We didn't take more from the environment than what the environment could replace itself." - Dr William Robert Perkins, Atlatl researcher