

GRADE 6

UNIT: Math - Data Management; Social Studies - Interaction - Pre-contact Indigenous Peoples of the Americas (Time: pre-1500); Science - Energy in Our Lives (enrichment)
THEME: Human Face of Mathematics - Mathematics in Aboriginal Culture

EQUIPMENT

- atlatl and dart
- pylon (or other easily seen target that cannot damage or be damaged by the dart)
- measuring tape
- coloured tape
- distance chart
- stop watch
- calculator
- computers with a spreadsheet program

PREREQUISITE KNOWLEDGE:

Math - Data Management

D-8 Create classifications for data collected

D-9 Display data using

1. histograms, line graphs (broken)
2. frequency diagrams, tally
3. circle graphs (fractional)

D-10 Discuss and determine the most suitable method(s) to display data

D-11 Use computer software to assist in the organization and display of data

D-15 determine, from a set of data, the

1. mean (average)
 2. range, median, mode
- calculating speed ($v=d/t$)

LEARNING OUTCOMES:

Math - Data Management

D-1 Acquire data through

2. experiments
3. observation
4. published information

D-2 Recognize that the data collected are affected by

1. the nature of the sample
2. the method of collection
3. the sample size
4. biases

D-3 Discuss factors that may distort the results of data collected; e.g.: gender, ethnic, socio-economic, age

D-13 Discuss the reasonableness of data and results

D-14 Discuss, interpret, and ascribe meaning to the organized data

Social Studies - Interaction

Pre-contact Indigenous Peoples of the Americas (pre-1500)

Locate and gather information from various sources to organize and share on the following topics:

Indigenous peoples of the Americas developed distinctive and diverse cultures.

- Arctic - Inuit
- Newfoundland - Beothuk
- Northeastern region - Huron, Algonquian (Micmac, Shawnee), Iroquois (Mohawk Oneida, Cayuga)
- Mississippi/Ohio River Basins - Hopewell, Adena (The Temple Mound Builders)
- Southeastern U.S.A - Cherokee, Creek, Choctaw, Natchez, Caddo, Delaware
- Mexico - Anasazi, Aztec, Toltec, Olmec, Zapotec, Maya
- Brazil - Indians of the Amazon (Kayapo, Atroari, Caraja, Mura, Omagua)
- Caribbean - Arawak
- Argentina - Araucanian Indians

The lifestyles of Indigenous peoples were influenced by:

- the available resources
- the climate and the land
- interactions with other peoples

Teacher Set Up

1. Using the coloured tape, mark off a throw line. Make sure there is ample space for students to throw the dart.
2. About 10 metres from the throw line, place a pylon so the students have something to aim at. you may have to adjust target placement depending on your students.

Culminating Activity

Student Instructions

Background Information

1. Research how the resources, climate, land and interactions with other peoples effected various pre-contact indigenous groups.
2. Discover which groups used the atlatl and if so what it looked like.
3. Research the origins of the atlatl specifically as it relates to the Aztecs daily life.
4. Research should answer the following questions and back up with evidence.:
 - a) What regions of the world has the atlatl been used?
 - b) How does the atlatl and dart vary by region and how has it varied over time?
 - c) What design do you feel is the most effective?
 - d) Why were the Aztecs conquered by the Spanish?
 - e) Where is the atlatl used today?

Part 1: Maximum Distance & Speed

5. Decide on 3 or 4 students from the class to throw. Record the distance and time traveled for each length.

6. From the line, each person throws the dart 5 times without using the atlatl, aiming at the pylon.
7. Measure each throw from the line to see how far the dart traveled.
8. Record the distance and time the dart traveled for each person.
9. Repeat steps 6-8 with the atlatl.

Part 2: Physical Characteristics of Thrower

10. Measure the height of each thrower and their arm length.

Data Analysis

1. Calculate the speed for each throw
2. Determine which the maximum distance with and without the atlatl for each thrower.
3. Determine the maximum speed ($v=d/t$) for each thrower
4. Compare the results with and without atlatl using a spreadsheet and choosing an appropriate graph type
5. Determine whether the dart went farther and faster with or without the use of the atlatl. Think of some ideas why.
6. Answer the following questions:
 - a) How does the physical attributes of the person throwing the atlatl effect the experiment?
 - b) Is there a relationship between physical attributes, maximum distance thrown and speed? If so, what?
 - c) What other factors would effect the experiment?
 - d) Explain why the type of graph used is appropriate for the data.
 - e) Discuss how the experiment could be changed to have more accurate results.