Montana Office of Public Instruction — Denise Juneau, State Superintendent — opi.mt.gov	Mathematics Model Teaching Unit Buffalo Runner
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Grade 2: Lesson Duration 1 hour

Established Goals:

Number Sense and Operation Mathematics Content Standard 1: A student, applying reasoning and problem solving, will use number sense and operations to represent numbers in multiple ways, understand relationships among numbers and number systems, make reasonable estimates, and compute fluently within a variety of relevant cultural contexts, including those of Montana American Indians.

- **1.5 Length, Time, and Temperature:** Select and apply appropriate standard units and tools to measure length, time, and temperature within relevant scientific and cultural situations, including those of Montana American Indians.

IEFA Essential Understanding 1: There is great diversity among the 12 tribal Nations of Montana in their languages, cultures, histories and governments. Each Nation has a distinct and unique cultural heritage that contributes to modern Montana.

Understandings:	Essential Questions:
- Each tribe is unique in its culture, language and hunting rituals. (Blackfeet Tribe) - Vocabulary: (Blackfeet language) 　　buffalo jump cliff = piskun 　　buffalo runner = ahwa waki 　　raven = Omuk-may-sto	- What was the job of the buffalo runner? - Why was it important for the buffalo runner to be fast? - What measurement would be best to use to measure how far you can run in 10 seconds?
Students will be able to... - use a stopwatch to measure 10-second intervals. - observe and mark the starting and stopping point of the runner. - measure how fast they can run in 10 sec.	*Students will know...* - the importance of the buffalo runner's job. - how to determine who is the best for the buffalo runner position. - how to measure the distance between two points. - how to start/stop a stopwatch to measure 10 second intervals.

Stage 2 Assessment Evidence

Performance Tasks:
- Observation of students timing, running, and measuring.
- Measurement of student's 10-second run to the nearest foot.

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Other Evidence:
- Compiling of students information and making a class bar graph.

Learning Activities:

1. Read aloud The Buffalo Jump written by Peter Roop and illustrated by Bill Farnsworth.

2. Discuss what units of measurement you would use to measure how far someone can run both long and short distances. If you haven't already measured out the string with one-foot intervals marked, you could have the students do that now. This takes a little longer, but will give them practice measuring in one-foot increments with a ruler and ownership in making their measuring string.

3. Demonstrate how to cooperatively measure distances by laying the 10-foot strings end to end and repeating the process over until you reach your measurement. Also demonstrate how to time the runners. If you don't have a stopwatch you can teach kids how to time by saying: 1--1000, 2—1000, …up to…10--1000.

4. Divide the class into groups of three. They will each take turns being the "runner", "timer", and "referee".

   - Mark off a starting line and have the "runner" line up behind the line.
   - The timer will give a signal to the runner to start and start the time.
   - The referee will follow the runner.
   - When 10 seconds are up the timer says or signals the runner to stop.
   - The referee marks off the spot the runner reached in 10 seconds.
   - The group then works together with their yarn to measure the distance of the runner.
   - The runner then writes down their name and the distance they ran in 10 seconds on a sticky note.
   - Repeat the process until everyone has ran and measured.

5. Collect the sticky notes and use them to make a bar graph on the board. You could extend this activity by showing the class average and/or mode.

6. Discuss who would be a good buffalo runner and why?

Teacher Notes:
Background knowledge: To start the drive a buffalo runner would wear a wolf or buffalo skin as a disguise. The buffalo runner would get the attention of the lead cow and try to lure it closer. The curiosity of the new animal would make the lead cow follow it bringing the herd with her. As the lead cow got closer the buffalo runner would begin to move quickly away. When the buffalo herd moved closer to the cliff, the buffalo runner would discard the calf robe and run or jump to safety. Additional runners circled in the back and sides of the herd to frighten them towards the cliff by shouting, waving arms, and shooting arrows. As the buffalo stampeded towards the cliff they could not stop the momentum and by the time they realized their demise, it was too late.

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Materials/Resources Needed:

Background—(Blackfeet Tribes) Buffalo Tracks- Educational and Scientific Studies from Head-Smashed-In Buffalo Jump: http://history.alberta.ca/headsmashedin/ and
http://history.alberta.ca/headsmashedin/docs/buffalo_tracks.pdf
This website has a virtual 360° view of the Head-Smashed-In Buffalo Jump.

- **The Buffalo Jump**
written by Peter Roop
and illustrated by Bill Farnsworth

- One ten-foot piece of string/yarn per student. Mark off 1-foot intervals with a piece of tape or a marker. This can be done either ahead of time or have students do it.

- One-stop watch or timer (to the second) per group off three. You could also teach students how to count…1-1000, 2-1000, etc.)

- Pack of sticky notes these would work best to make a graph later

- Roll of tape or something to mark where the runner starts and stops

- One pencil per group.

- A large area for running and measuring 50-100 yards.