Archery Post-visit

Classroom Activities

Brief Synopsis

Archery technology is always changing. Students will look at how archery has changed over time and compare early archery equipment to modern equipment. Student will also have to opportunity to figure out how fast the arrows they shot at Eagle Bluff were moving.

Ages: Designed for 4th—6th grade

Time Considerations:
Activity 1: one hour
Activity 2: 30 minutes

Materials:
Activity 1
- Archery: Then and Now worksheet
- Internet access
- Pencils
- Paper

Activity 2
- The Need for Speed worksheet
- Calculator
- Pencil

Vocabulary: draw weight, velocity, miles per hour, feet per second

Outcomes:
1. Students will determine the speed of an arrow in feet per second and miles per hour.
2. Students will determine how fast they can run in feet per second and miles per hour.
3. Students will research a specific time period to determine how archery was used and what the equipment was made of.

Minnesota Academic Standards:
Science: Math: 5.II.D, 7.1.D, 9-12.I.D
Language Arts: 5.I.A, 8.I.B
Physical Education: 5.1

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Activity 1: Archery: Then and Now

Background: The bow and arrow has been used for thousands of years for hunting for food, war and recreation. The equipment has changed over the years making the arrow fly faster, farther and more accurately. Looking at the history of how and why the bow and arrow have been used gives us a greater appreciation for it. Students will take a closer look at specific civilizations throughout history to examine what role archery played and compare how it changed over time.

Procedures:
1. Hand out "Archery: Then and Now" worksheet to students.
2. Assign or have students pick the civilization for their research.
3. Give students time to research and answer questions on the worksheet.
4. Have students present their findings to the class.

Activity 2: The Need for Speed!

Background: Technology has allowed arrows to fly faster, further and more accurately then ever**.** Students will learn how to calculate the speed of the arrows they shot at Eagle Bluff. They will compare the speed of the arrows shot from different distances and different draw weights (force in pounds to pull the bow back).

Procedures:
1. Hand out "The Need For Speed" worksheet.
2. Have students work individually or in small groups to complete worksheet.
3. Correct worksheet.
4. Compare results of the different draw weights and distances.

Optional Activities:

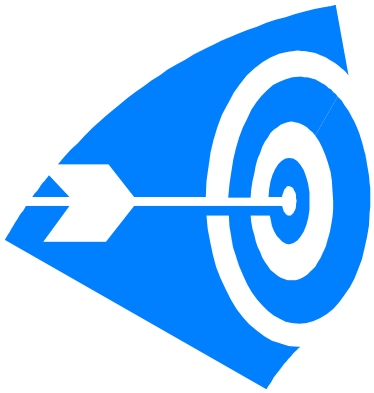
Activity 1:
- Have students draw pictures of the archery equipment of the time period they are researching.
- Construct an archery timeline to see how the equipment has changed over history.
- Students can research other civilizations to find out how archery is used.

Activity 2:
- Time students while they run a given distance so they can figure out how fast they can run.

Archery: Then and Now

Pick one on the following civilizations to research:

Egyptian
Mesopotamia
China
Roman Empire
Middle Ages
Native Americans
Archery in the 1900s
Archery Today



Answer the following questions:

1. _____ used archery for:
   -
   -
   -
   -

2. Draw or list the type of bow(s) used?

3. What was the bow made of? How about the arrows?
   -

4. What other interesting information did you discover?

The Need for Speed

Using the equation Velocity= Distance/Time you can figure out how fast something is moving. Look at the following example, then complete the worksheet on the next page.

Velocity (feet / second) = $\frac{\text{distance (feet)}}{\text{Time (seconds)}}$

Example:

Distance= 100 feet
Time= 5 seconds
Velocity =?

Velocity= $\frac{\text{100 feet}}{\text{5 seconds}}$ ⟶ **Velocity = 20 feet per second**

Now use the equation below to change feet per second (ft/sec) to miles per hour (m/h)

To go from ft/sec to m/h: $\frac{\mathbf{Z}\text{ feet}}{\text{1 second}} \times \frac{\text{60 seconds}}{\text{1minute}} \times \frac{\text{60 minutes}}{\text{1 hour}} \times \frac{\text{1 mile}}{\text{5280 feet}} = \frac{\mathbf{Z}\text{ miles}}{\text{hour}}$

Example: $\frac{\text{20 feet}}{\text{1 second}} \times \frac{\text{60 seconds}}{\text{1 minute}} \times \frac{\text{60minutes}}{\text{1 hour}} \times \frac{\text{1 mile}}{\text{5280 feet}} = 13.6$ **m/h**

The Need for Speed

To figure out the speed of the arrows you shot in class use the following worksheet. Show your work on a scratch piece of paper.

$$\text{Velocity} = \frac{(d)\ \text{feet}}{(t)\ \text{seconds}}$$

15 pound draw weight

Distance from target (d)	Time to get to target (t)	Speed (feet/second)	Speed (miles/hour)
15 feet	.373 seconds		
30 feet	.391 seconds		
45 feet	.496 seconds		
60 feet	.710 seconds		

20 pound draw weight

Distance from target (d)	Time to get to target (t)	Speed (feet/second)	Speed (miles/hour)
15 feet	.193 seconds		
30 feet	.223 seconds		
45 feet	.316 seconds		
60 feet	.429 seconds		

The Need for Speed

ANSWER SHEET

15 pound draw weight

15 feet	.373 seconds	40.2 ft/sec	27 mph
30 feet	.391 seconds	76.7 ft/sec	52 mph
45 feet	.496 seconds	90.7 ft/sec	61 mph
60 feet	.710 seconds	84.5 ft/sec	57 mph

20 pound draw weight

15 feet	.193 seconds	77.7 ft/sec	53 mph
30 feet	.223seconds	134.5 ft/sec	92 mph
45 feet	.316 seconds	142.4 ft/sec	97 mph
60 feet	.429 seconds	139.8 ft/sec	95mph