

## Overview of the Atlatl and Dart, and Atlatl Event Management

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Focus of lesson: Overview of atlatl darts and atlatl/dart event management for teachers, scout leaders, etc.

Objectives: Provides an introduction to atlatl and dart use and replication as a way of learning about past technology; introduces “atlatl” and related terms; presents the ideas that traditional technology can be sophisticated in function and difficult to master.

### Terms:

*Atlatl:* Aztec term for spearthrower

*Dart:* spear thrown by a spearthrower

*Dimple:* depression in rear of dart shaft (called nock in diagram below)

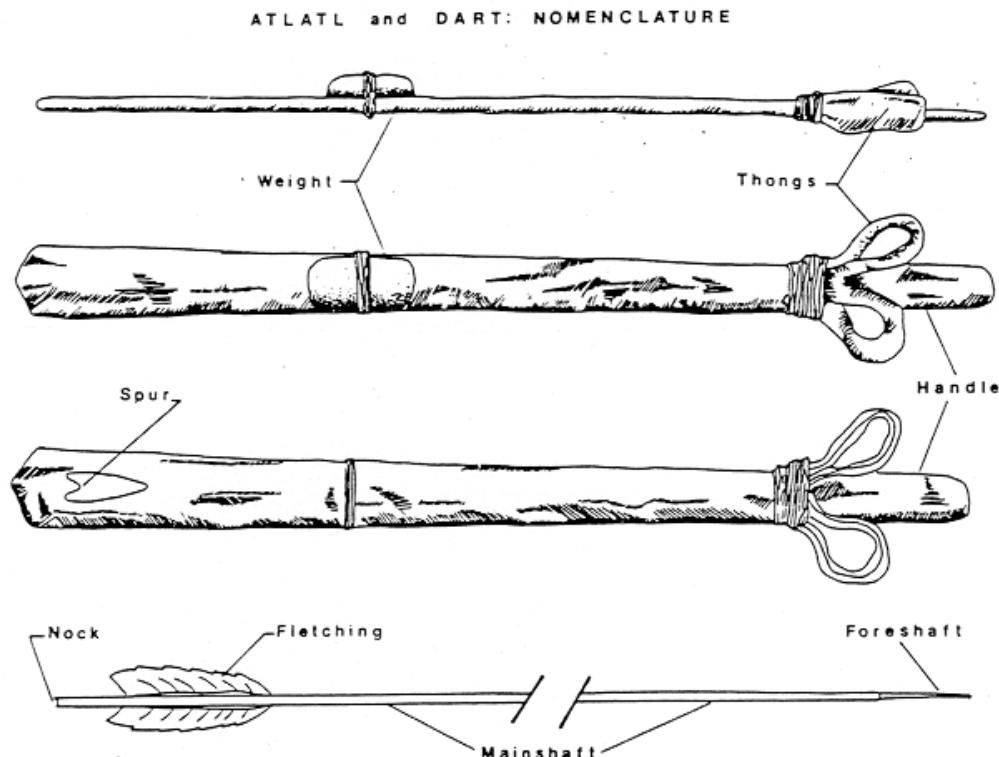
*Fletching:* the split feathers attached to the back (dimpled) end of the dart

*Spur:* hook at rear end of spearthrower that hooks in dimple in the back of a dart and propels it toward the target

*Spine or spine weight:* the stiffness of the dart shaft.

*Scarf joint:* the angled joint used to attach dart shafts together.

*Throwingboard:* board-like spearthrower used by Eskimo and Aleut peoples across Alaska and Canada.



Above is a Basketmaker-style atlatl used prehistorically in the Southwest US.

### **Brief overview of Spearthrower/Atlatl use:**

First evidence of spearthrower use comes from Upper Paleolithic Europe, where Solutrean hunters used the spearthrower and dart to hunt reindeer, horse, and other mammals. Native Americans used the atlatl and dart in the Americas for most of the human occupation of this hemisphere. The bow and arrow replaced the atlatl and dart in most of the Americas late in prehistory, with the atlatl and dart surviving up into historic times because of its use as a symbol of status and its increased penetration over the bow and arrow (Mesoamerica), in places where it was used for hunting sea mammals (the Arctic), and in Australia.

### **The Atlatl:**

The atlatl itself is a lever to magnify force in the later part of the throwing motion. The atlatl is simply a board or rod with a hook or spur at one end and a handle near the other. The hook fits into a dimple in the end of the dart shaft. As part of the throw the atlatl is thrust forward and rotated in an overhand motion, which propels the dart toward the target. Spearthrower styles varied over time and space: during prehistoric times the Basketmaker style atlatl (previous page, with finger loops) was used in the Southwestern U.S., while a shaft with one or two finger holes (below, left) was used in the Southeastern U.S. Arctic throwingboards were shorter and more board-like, usually used from a kayak to propel short seal darts (below, right).



Ambidextrous atlatls patterned after prehistoric examples used in Florida. Left example, of Osage, shows the top of the atlatl with spur. Birch example on right shows bottom of atlatl. Knife for scale.



Iñupiat and Yupik patterned throwing boards. Left example is left handed, two on right right-handed. Outer two of "hem-fir" (2"x4" material), center of birch. Note inset spurs of antler. Knife for scale.

### The Dart:

The dart is the most important part of the atlatl/dart system, and must have an appropriate design for the whole system to work correctly. The mechanics of the dart itself are relatively complicated:

- It needs to have a center of balance closer to the tip than the dimpled rear end (with the tip section heavier than the dimple section).
- The tip section should be stiff and the rear section more flexible.
- The rear of the dart should usually be fletched (to cause it to be slower than the tip, and thus fly straight).
- The dart should be moderately flexible.

Beginning dart makers will find that darts made out of young, naturally tapering birch or willow trees will often fly better than single diameter man-made shafts, because the physics are right: natural tree shafts are tapered, giving a heavier forward section and a more flexible rear. The most common problem beginners make is to have dart shafts that are too short and stiff. Too stiff a dart causes “hooking”, because the dart is too stiff to spring away from the atlatl during the throw. In this case the hook stays in contact with the dimple in the rear of the dart for too long, causing the rear of the dart shaft to be forced downward at the end of the throwing motion. Darts that are too stiff may eventually stabilize in flight if throwing for distance, but will over-oscillate and be inaccurate at close and middle ranges.

Willow and birch seem to be the best native Alaskan woods when using slim trees or shoots for shafts, though spruce and aspen will work. Spruce makes an excellent dart wood when machined down from straight-grained lumber. River cane was a material commonly used by prehistoric people in the continental U.S. Modern materials commonly used for darts include wood dowels, river cane and bamboo, as well as aluminum, fiberglass and graphite arrow shafts.

Atlatl darts may be single or multi-piece shafts. Multiple-piece shafts have the ability to couple a dense, stiff material in the front (like birch, bird cherry or oak) with a lighter, more flexible wood in back (like willow shoots or poplar or birch dowels). If the splice for the two woods is forward of center, the weight of the splice helps weight the forward section of the dart. Shafts may be joined by using a scarf joint to glue and bind the two shafts together, or both shafts may be coupled by inserting both into a tube. Hollow materials such as aluminum and fiberglass can be joined by inserts.

Atlatl darts can be constructed or purchased. Information on dart construction can be found on Paleoplanet and other websites. Make or buy darts six foot or longer and moderately flexible, to help avoid the darts being too stiff and “hooking”, as mentioned above.



Foreshaft-mainshaft juncture using a scarf joint. Joint is glued with pine pitch or superglue, then wrapped with sinew/pseudo-sinew or string. Birch foreshafts on left, willow main shafts on right.



Foreshaft-mainshaft joint using brass tubing. Shafts on right each slide inside tube on left, making a “take-down dart.



#### Dart Points:

Dart points (like those above) may be constructed from traditional materials like stone or antler, or made from modern materials (composite steel and copper point, steel archery field point).

#### Fletching:

Fletching (generally feathers tied/glued on the back of the dart) is used to slow the back down and keep it tracking in line behind the point as it flies through the air. Very long darts with the right balance and flexibility will fly fine without fletching. Fletching can be tangential, with the whole feather tied flat on the dart, or radial, with half feathers that had been split down the center and tied quill-down on the shaft, with the feather radiating out from the shaft.

### **Conducting an atlatl and dart event:**

Usually these events start with the presenter demonstrating how to throw a dart with an atlatl, then giving the audience an opportunity to try. **Safety is of utmost importance.** An atlatl range should be run with similar safety considerations as would an archery or pistol range, with a person functioning as range officer, watching and advising each member of the public as they throw. The thrower should be monitored at all times: the range officer should not be distracted talking to others while someone is throwing.

The target should be sufficient to stop darts, with the backstop large enough to catch darts that miss the target. Be aware that poorly-thrown darts may glance off the edge of the backstop and travel at right angles to the target. No one is allowed downrange while someone is throwing.



Groups of adults and kids should be handled differently. Usually when working with kids you have a group (school group, museum activity, etc.) that you have to keep together and hold their attention. **Keep any explanation short and**

**get them throwing.** Try to keep kid groups small (ten or less) for each demonstrator/range officer. Cycle the kids through, letting them throw at least two darts, then have them get their darts from the target and bring them back for the next person. By throwing two darts they get to practice on the second throw what they learned on the first. To enjoy the experience, they **must** have enough time for each kid to try throwing at least one set, and preferably cycle through to throw multiple times. Young kids (less than 8 years old) have limited coordination, and will have a hard time holding the dart on the atlatl. This is not a problem if you have light weight equipment, very small groups and lots of time, otherwise it may be best to limit throwers to ages eight and up.

Adult audiences are more patient but offer their own challenges. Adults will usually have continual questions. If possible, have one person available to answer audience questions while the other advises and monitors the thrower. Teenage and adult guys tend to throw too hard, hitting below the target and sometimes damaging darts. Point out that hitting the target is more important than throwing hard.

- Stress to both kids and adults that it is more important to throw smoothly than it is to throw hard.
- Tell and show the importance of follow-through: model a throw, ending with the atlatl (hook end) pointing at the target.

- Explain that the atlatl increases the force of the throw by making the wrist a longer lever. The more emphasis on the wrist motion in the throw, the more efficient (smoother and harder) the throw.
- Reinforce that they want to hold on to the atlatl and use it to throw the dart, not throw both the dart and the atlatl. Check to make sure they are using the smaller two fingers to hold on to the atlatl while the thumb and index or middle finger hold the dart. You can use a leather thong tied to the atlatl, with a slip knot loop on the other end to fasten around their wrist or little finger. Light weight atlatls and soft ground cut down on damage to thrown atlatls, but it is still best to not use your favorite atlatl for public demonstrations. Use of a Basketmaker style atlatl with finger loops (first page) helps people hold on to the atlatl, but takes longer for many people to figure out how to use than some Arctic throwing board styles. Most Arctic throwing boards are made to fit a person's right hand: when using these styles make sure you have boards that fit both right and left hands and small hands.
- Have people throw using a shift of body weight as they would throw a ball. Accurate throws can be made both with and without taking a step forward.
- Throw at a relatively close target, 8-10 yards away. This gives participants the reinforcement of getting close to or hitting the target, as well as cuts down on dart recovery time.
- Have each thrower retrieve their darts from the target and bring them back for the next person. Remember to tell them when getting their darts to hold against the target with one hand, grab the dart up next to the target with their other hand, and pull the dart out. If darts are hard to extract have them twist as they pull.
- Remind participants that atlatl/dart use is a difficult skill to master, and note that traditional hunters would start practicing with the atlatl and dart when they were young children.
- Targets will vary with the audience and the point type you are using. Kids tend to prefer large targets that fire their imagination like mammoth, but a large carrot has been a favorite too. In south-central Alaska kids can relate to hunting moose and caribou, so consider these. If using metal points on darts it is best to have a cardboard or straw target that will stop the dart. A grassy or lightly wooded hillside behind will catch any darts that miss the target and make the darts easy to find.
- Rubber-ball-tipped darts are required by some groups for safety/legal reasons. These can be used with a standard cardboard or straw target, but are more fun if used with a plywood animal target with the bull's-eye area replaced by a metal gong (see right).



What participants take away from this activity:

Each participant should take home an understanding of what atlatls and darts were and how they functioned. They should also understand that the atlatl and dart system is more complicated than it looks, and that a skill level with atlatl and dart appropriate for hunting takes a **lot** of practice.

Preservation message:

The shape and design of atlatl dart points give archaeologist clues about when and what group of people made the point, as well as where they traveled to find the stone for tool-making. Dry caves and frozen deposits have produced examples of actual atlatls and darts, showing us how their complete tools were made and giving us more clues to how they were used. Experimentation with these tools lets us better understand and appreciate how people lived and hunted in the past. Atlatls and darts give us insight into how and what people hunted in the past. Protect the record of the past.

If you find an artifact, contact an archaeologist. You can find an archaeologist by performing a search on the Internet, or by looking under “archaeology” or “environmental consultants” in the Yellow Pages. Or contact your State Historic Preservation Office (In Alaska, 269-8721).

# Atlatl Competition Range Rules

(Sample)

- 1) Only participants (throwers and Range Officers) will be allowed on the range during the demonstration or contest. Any exceptions (for news media, photographers, etc.) will have to be passed by the Range Officer.
- 2) No throwing when others are down range. The Range Officer will determine when it is appropriate to throw and when it is safe to go down range.
- 3) Darts will be kept in a dart holder or leaned against a table until the individual is ready to throw.
- 4) Throwers will pull their own darts from the target after they throw.
- 5) Darts will be carried back to the firing line vertically with the points down. There will be no running while carrying a dart.
- 6) There will be no rowdy or unruly play with the atlatls or darts.
- 7) The range is limited to atlatl and dart use only. Any demonstration of other weapons (bow and arrow, etc.) may only be done after the atlatl competition and only upon the approval of the Range Officer.
- 8) Pets are not allowed on the range.
- 9) Anyone who does not behave in an appropriate manner while throwing or waiting will be asked to leave.
- 10) The Range Officer's word is law.