



Archery Engineers Post-visit

Classroom Activities

Brief Synopsis

During Archery Engineers class at Eagle Bluff, students got to experience first hand how the design of a bow and arrow affects the speed of the arrow. In this post-visit activity students will break into groups of two and receive a specific archery situation. By reflecting on what they learned at Eagle Bluff they must decide what combination of factor on an arrow will be best for their scenario.

Ages: Designed for 5th—8th grade

Time Considerations: 30 minutes

Materials:

- Scrap paper, pencils
- Worksheet 1 (Archery Scenarios)
- Worksheet 2 (Equipment guide)

Vocabulary: fletching, range, arrow shaft, drag

Outcomes:

1. Students will be able to list the parts of a bow and arrow that can be modified depending on the type of shooting being done.
2. Students will work with a partner to analyze an archery situation and choose the right equipment for that activity.
3. Students will share their choices with the class.

Minnesota Academic Standards:

Science: 6.1.2.1.2, 6.1.2.1.4, 7.1.1.2.4

Language Arts: 5.2.4.4, 5.8.1.1, 5.10.4.4, 6.5.4.4, 6.9.1.1, 6.9.4.4

March 2015

Set-up

- Print out 1 copy of “Worksheet 1” and cut out number into strips to give to the groups.
- Print out a copy of “Worksheet 2” for each group.
- Set out the scrap paper.

Activity :

Procedures:

1. Have students brainstorm the parts of the arrow and bow that can be modify depending on the type of shooting being done. Examples could include:
 - Fletching: shape, material, length, turn & amount
 - Shaft material, diameter, & length
 - Tip- size, shape, material, number of blades (Broadheads vs. field tip)
 - Arrow rest type (flipper rest, drop away, whisker biscuit)
 - Bow type (long bow, recurve, compound)
 - Bow draw weight
2. Break the students into to groups of two. Give each group their specific hunting scenario (strips of paper from worksheet 1). Define any foreign vocabulary.
3. Once the group has their specific hunting scenario, they must decide what equipment to choose using the knowledge they gained in Archery Engineers class at Eagle Bluff and Worksheet 2. Students should focus on what they can change on the arrows not the bows (assume you are using a compound bow set at a 45 lbs. draw weight). Groups should use scrap paper to either draw or list the specific parts on the arrow that they would use in their situation. Give students 10-15 minutes to work.

Discussion

Once the groups are finished have them present their scenario and equipment choices to the class. Do their classmates agree with their choices? Use the teacher answer key (on the back) to use as a guideline for discussions.



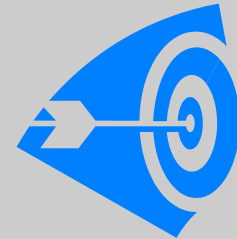
Teacher Answer Key

NOTE: This key serves as a guideline. Ultimately, there could be many good choices for arrow components based on the experience level of the archer and personal preferences.

- 1. Sport shooting at a target 100 feet from where you are standing on the ground.**
 - Carbon shaft (light to fly farther without so much drop), 3 vanes any shape but with a straight fletching configuration, field tip, & drop away rest
- 2. Hunting bear at a range of 30 feet from an elevated tree stand.**
 - Aluminum shaft (heavy with deep penetration) , 3 vanes any shape with a left or right fletching configuration, Broadhead & with a whisker biscuit
- 3. Hunting flying ducks at a range of 40 feet from the ground.**
 - Carbon or wood shaft, many fletchings (help the arrow not go as far so you can find it again), Broahead (judo or fixed blade), with a flipper rest
- 4. Hunting squirrels at a range of 20 feet from the ground.**
 - Carbon or wood shaft, plastic vanes with a right or left fletching configuration, judo Broadhead, with any arrow rest
- 5. Sport shooting at drifting balloons (15 feet in the air) from 20 feet away on the ground.**
 - Carbon or wood shafts, many fletchings (help the arrow not go as far so you can find it again), field tip, with a whisker biscuit
- 6. Hunting fish from a dock 5 feet above the water.**
 - Fiberglass shaft, no fletchings (if the arrow had some, it would divert the arrow as it moved through the water), Broadhead made specifically for bowfishing, whisker biscuit.
- 7. Hunting deer at a range of 25 feet from an elevated tree stand.**
 - Aluminum shaft (heavy with deep penetration) , 3 vanes any shape with a left or right fletching configuration, Broadhead & any arrow rest
- 8. Sport shooting at a target 30 feet from where you are standing on the ground.**
 - Any shaft , 3 vanes any shape but with right offset fletching configuration, field tip, & drop away rest
- 9. Hunting rabbits at a range of 15 feet from the ground.**
 - Any shaft , 3 vanes any shape but with right offset fletching configuration, judo broad head, & flipper or drop away rest
- 10. Sport shooting a fake deer target at a range of 70 feet from an elevated tree stand.**
 - Aluminum shaft (heavy with deep penetration) , 3 vanes any shape with a straight fletching arrangement, field tip & any arrow rest

Teacher Tips

- Check-in with the groups as they work on their scenarios. Make sure they are thinking about where their target is located (in the air, on the ground, underwater). They should also be considering where they (the shooter) are located; if they are in a tree they will have to shoot down on their target.



Additional Resources

<http://www.3riversarchery.com/smallgame.asp>

Information on small game hunting

http://www.huntersfriend.com/arrow_rest_selection_guide/arrow_rest_selection_guide.html

Descriptions of different arrow rests and their pros and cons.

http://www.huntersfriend.com/_help_popups/arrows-whatsthis5.htm

Descriptions of the different fletching types and their pros and cons.



Archery Scenarios (one for each group)

1. Sport shooting at a target 100 feet from where you are standing on the ground.
2. Hunting bear at a range of 30 feet from an elevated tree stand.
3. Hunting flying ducks at a range of 40 feet from the ground.
4. Hunting squirrels at a range of 20 feet from the ground.
5. Sport shooting at drifting balloons (15 feet in the air) from 20 feet away on the ground.
6. Hunting fish from a dock 5 feet above the water.
7. Hunting deer at a range of 25 feet from an elevated tree stand.
8. Sport shooting at a target 30 feet from where you are standing on the ground.
9. Hunting rabbits at a range of 15 feet from the ground.
10. Sport shooting a fake deer target at a range of 70 feet from an elevated tree stand.

Fletching

Material:

- Plastic: durable, inexpensive
- Feathers: very light, delicate

Shape:



Amount:



3 or 4



many

Turn Configuration:

LEFT HELICAL



Pros

- Best broadhead stabilization.
- Most consistent arrow flight.
- Increased overall accuracy.
- Arrow corrects attitude.

Cons

- Notable loss of arrow velocity.
- Fletching clearance more problematic.
- LH rotation loosens tips.

LEFT OFFSET



Pros

- Better broadhead stabilization.
- Minimal air resistance in flight.
- Works with most arrow rests.
- Stable flight to moderate distance.

Cons

- Some fletching clearance issues.
- Some loss of arrow velocity.
- LH rotation loosens tips.

STRAIGHT



Pros

- Fastest flying vane configuration.
- Least amount of air resistance.
- Works with any arrow rest.
- Minimal fletching clearance problem.

Cons

- Less stable at long distances.
- Less stabilization for broadheads.
- Best used in a well-tuned bow.

RIGHT OFFSET



Pros

- Better broadhead stabilization.
- Minimal air resistance in flight.
- Works with most arrow rests.
- Stable flight to moderate distance.

Cons

- Some fletching clearance issues.
- Some loss of arrow velocity.

MOST POPULAR CHOICE

RIGHT HELICAL



Pros

- Best broadhead stabilization.
- Most consistent arrow flight.
- Increased overall accuracy.
- Arrow corrects attitude.

Cons

- Notable loss of arrow velocity.
- Fletching clearance more problematic.

Shaft

Material:

- Carbon—light, durable
- Aluminum—heavy—good penetration, inexpensive
- Wood—quiet, weight is variable depending on what type of wood it is
- Fiberglass—not common, extremely strong (good for fishing)

Tip



Field Tip
(sport or practice shooting)



Arrowheads
(ancient stone hunting tips)



Fixed Blade



Removable Blade



Expandable Blade



JUDO



Fish

Broadheads
(Modern hunting)

Arrow Rest Type



Flipper Rest

- Medium drag— some contact is made with the arrow/ fletchings
- Arrow can fall off the rest before shooting
- Inexpensive



Drop Away Rest

- Large fletchings can pass by without touching the rest
- Low drag— no contact with fletchings
- Expensive
- Arrow can fall off the rest before shooting



Whisker Biscuit (Containment Rest)

- Arrow cannot fall out (ready to shoot at any time)
- Good for new shooters
- High Drag— slows down the arrow