

## Archery Physicists Worksheet

Student Name:

Class:

Date:

Welcome to the **Archery Physicists** group. Your job is to decode the physics of archery, while exciting the class during a presentation of your findings about the very cool energy conversions involved in shooting an arrow.

Assign half the members of your group to research and prepare a 2-minute presentation on the physics of "traditional" archery where archers use longbows and recurve bows. Include answers to some of the questions below. Conclude with your ideas on why traditional archery remains a popular sport today (including in the Olympics), despite the evolution of the modern compound bow.

Assign the other half of your group to research and prepare a 2-minute presentation on the physics of the modern compound bow. Include answers to some of the questions below. Conclude with your ideas on why the compound bow caused a resurgence in archery over the past several decades and why it's so popular as a hunting tool today.

Your goal is twofold: 1) present your interesting archery physics research, and, 2) why the physics of archery might make it a relatively easy sport for students to try today.

On a separate sheet of paper or on your computer, develop your presentations that include the above assignment and:

- What is bow "draw weight"? (and what can affect a bow's draw weight?)
- What is the "force-draw" curve of various types of modern bows (longbows, recurves, compounds)? What makes an effective force-draw curve?
- Explain the physics of how a person draws a bow, creates "stored energy", then how the release of that stored energy converts into kinetic energy of an arrow in flight.
- What are some average FPS (feet-per-second) arrow speeds launched from different types of bows? (how can arrow design affect that?)
- What key factors are used to calculate the foot-pounds of energy of a speeding arrow as it hits a target?
- List some things that a modern compound bow is capable of? (a sandbag will stop a bullet but not an arrow)