

## Handout: No Valve in Vain

### Key Terms:

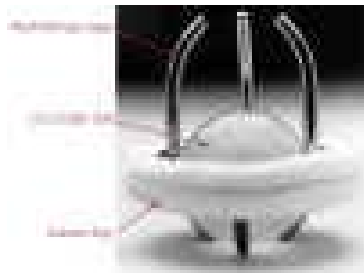
- prosthetic devices
- biomedical
- vascular system
- valve
- biocompatibility
- veins
- capillaries
- arteries

### Questions to be answered by end of lesson and activity:

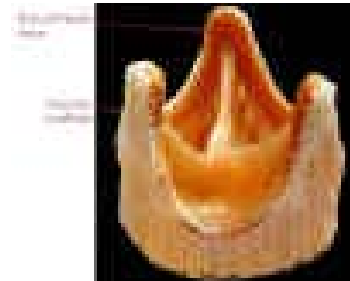
1. What is a valve?
2. Where have you noticed valves in the world around you?
3. Where do you think valves might be found in the human body?
4. What might happen if these valves do not function?



Examples of Prosthetic Valves Used to Replace Damaged Heart Valves



Mechanical Caged Ball Prosthetic Valve



Bioprosthetic Pig Valve

### **Making a Valve Procedure:**

1. View images of real prosthetic valves passed around by the teacher, and make sure you understand how they work.
2. Spend some time examining the given materials and brainstorm a couple of different designs you could create with these materials.
3. Choose the best design and experiment with designing a one-way valve that allows water to flow through it one way, but not the other way
4. Test your valve with the help of the teacher by timing how long it takes equal amounts of water to flow through in each direction
5. If your valve does not work exactly the way you had planned, take a little time to redesign and fix your valve.