**Models of the heart**

**Levels:** 5-6  
**NoS achievement aims:** Communicating in science   
**Contextual strands:** Living world   
**Topic:** Sports studies

**Rationale**

The human heart moves blood around the body.

Different types of models can be used to explain different aspects of science knowledge about heart structure and function. Simple diagrams can be drawn after the dissection of, for example, a sheep’s heart, but models of more complicated features of heart function are generated from existing science knowledge.

**What you need**

* Different types of models of the heart - 3 diagrams in folder

**Focus**

* How does the heart move blood around the body?
* What is the function of the right side of the heart? The left side?
* Do all animals have four-chamber hearts?
* Why is the heart located near the lungs, and protected by bones (ribs and breastbone)?
* How many ways can we represent the heart and the way it functions? (All representations, including diagrams, are models.)
* Why is it more useful to have a range of models, rather than just one?

**Exploration**

1. Show the models to the students.
2. Have them share their ideas for each mode; of what is in the model (relates to the key idea that the model is trying to convey), what has been left out, and why.
3. Get them to decide, with reasons, which model most clearly shows each of the following features of the heart:
   * The heart lies very close to the lungs.
   * The heart pumps blood through the circulatory system.
   * Mammals have a four-chambered heart consisting of two atria and two ventricles.
   * The right and left sides of the mammalian heart are completely separate from each other, so there is no mixing of oxygenated and deoxygenated blood.
   * Oxygenated blood enters the heart from the pulmonary veins through the left atrium, passes to the left ventricle, and leaves the heart through the aorta.
   * Deoxygenated blood enters the right atrium, is pumped through the right ventricle to the pulmonary artery which conveys it to the lungs for oxygenation.
   * The surface of the heart is constantly moving as it beats.
   * There are valves inside the heart, between the chambers.

**Reflection**

* How might scientists have first found out about how a heart works?
* When we think of models of the heart now, we think of it as a pump. Has it always been thought of as a pump? Why/why not? (Pumps were not invented until the Middle Ages.)
* Why did Aristotle, who lived 2000 years ago, think of the heart as a ‘fiery furnace’?
* Would you be able to understand how the heart works only by doing a dissection, if you didn’t have a scientist’s model in your mind?
* How do different models give you different insights into how the heart works?
* Why are some models made to look like the actual object, and others are more stylised? For example, why are doctors’ models made as visually similar to the object itself as possible? (To cater for the different knowledge and level of understanding of the viewer; a very realistic model makes it easier for doctors, with highly developed knowledge, to explain heart-related matters to patients.)

**Activity resources**

Stylised model

Position

Internal Structure