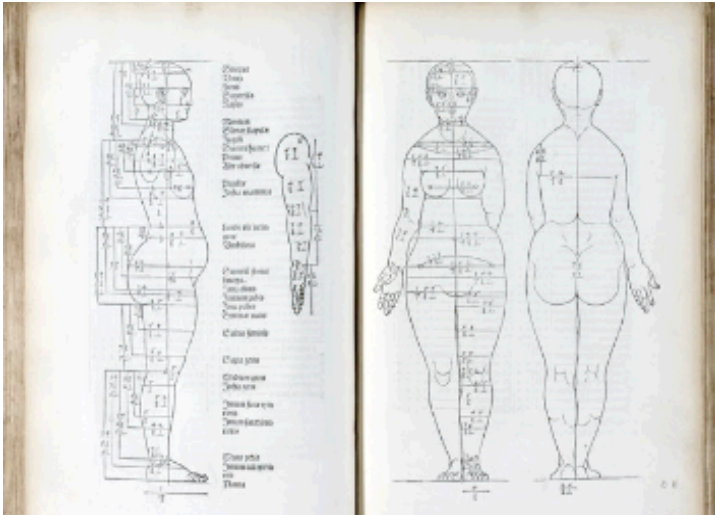


ANATOMY ACTS

The body, proportion and simple ratio



One of the most famous and popular artists of the Northern Renaissance, Dürer made highly detailed drawings and paintings of a range of subjects including animals, plants and landscapes. He thought that art must be based upon science, particularly mathematics, because it is exact and logical. The diagram shows how he linked these ideas to the human figure.

fig 1

Rationale

- From early on in the history of figure drawing, artists recognised relationships between the sizes of various body parts and used the constancy of relative dimensions as rules of thumb to help them produce images which appeared natural and lifelike. Durer's image above would have been used as a teaching aid to help apprentice artists.

Learning Outcomes

- Standard Grade Biology - problem solving skills: calculating proportions, simple ratios and percentages.
- Intermediate One Biology: - problem solving skills: simple ratios

Objectives

- To investigate the constancy in body proportions between individuals inspired by Durer's famous study
- To use the concept of simple ratio in a practical biological context.

Aims

- To teach the calculation of simple ratio and explore proportion through measurement of body parts.

Resources

- Downloaded images from the Anatomy Acts exhibition on laminated paper in colour and on OHP film and/or powerpoint
- Rulers, measuring tapes, calculators
- A visit to the exhibition (optional but desirable)

Outputs

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- A table of dimensions from a number of different images with calculated ratios and simple ratios;
- A table of dimensions from class members with calculated ratios and simple ratios.

Anatomy Acts exhibition	Head Size	Body Size	Ratio	Simple ratio
 <p>Cleomene's Roman Orator http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=103 <i>fig 2</i></p>	8mm	56mm	8/56	1-7
 <p>De Humani corporis http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=18 <i>fig 3</i></p>	8mm	56mm	8/56	1-7

Pupil	Head Size	Body Size	Ratio	Simple ratio
Robert				
Jane				

Procedure

- Introduce the concept of body proportions and ratios through Durer's image
- Diagram of the proportions of a woman from Alberti Dureri Clarissimi pictorius et Geometrae de Symetria partium in rectis formis humanorum, 1534 and also De Vinci's Vitruvian Man. Either a visit to the exhibition, OHPs or powerpoint. The images are easily taken from the web.

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• Issue laminated images downloaded from the Anatomy Acts website and printed in colour, whole body images, skeletons, and diagrams are fine. The following exhibits may be good examples:

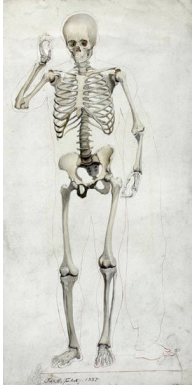


fig 4

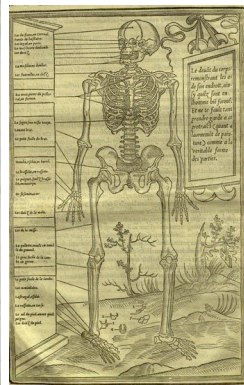


fig 5



fig 6

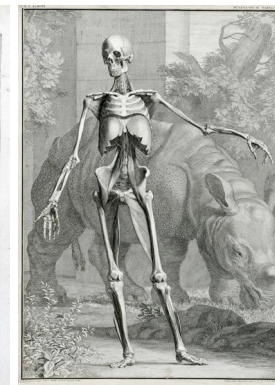


fig 7

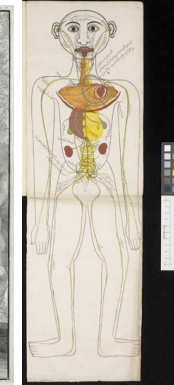


fig 8

fig 4. <http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=103>

fig 5. <http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=10>

fig 6. <http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=12>

fig 7. <http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=35>

fig 8. <http://www.anatomyacts.co.uk/exhibition/object.asp?objectnum=56>

- As it is proportion that is important and ratio, the size of the image is not directly of interest. A4 images will be sufficient to allow accurate measurement in mm.
- Encourage pupils to use their discretion in rounding - some discussion of accuracy and rounding may be appropriate here.
- When around five images have been measured, look to gather a general conclusion on the ratio of head to total body size. Is there some constancy?
- Working in pairs, with one recording and one measuring, ask each pair to measure five students. Should they be of the same sex? opportunities for discussion here and maybe even a comparison between the sexes.
- The results should be recorded in a separate table.
- The simple ratios of head to total body size may differ from those collected from the art works. The proportionality of the body varies from infancy to adulthood.
- Extension work could involve investigating the ratios of head to body size in fetuses and babies at different stages of development.

ANATOMY ACTS

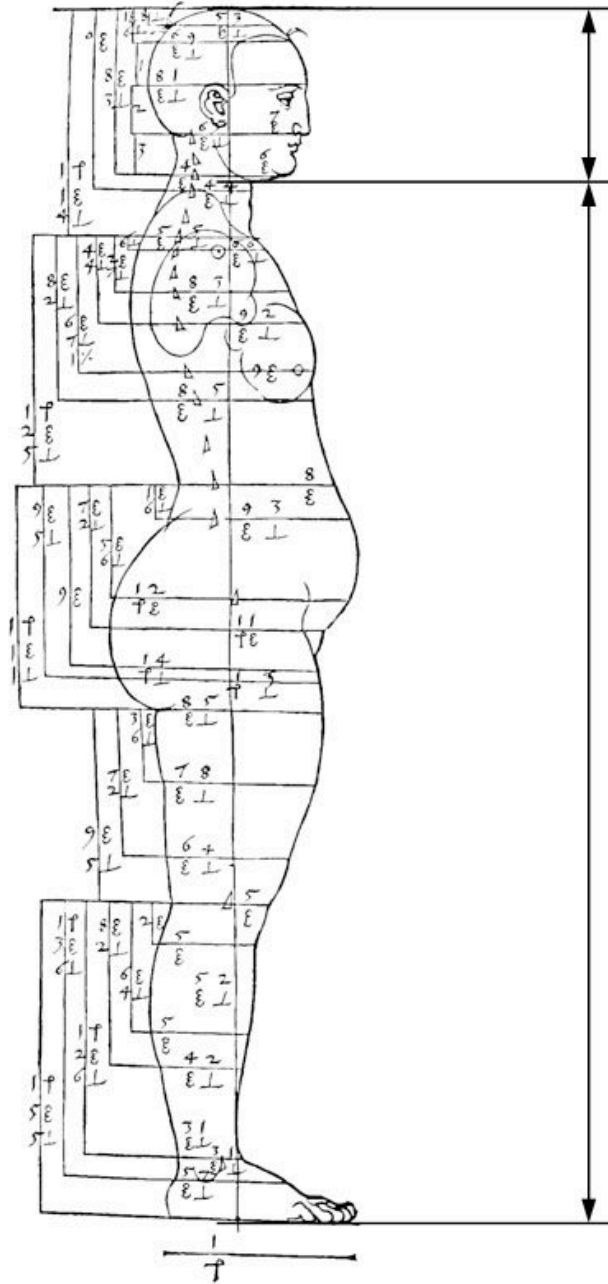


fig 1 - detail

ANATOMY ACTS

fig 1. Anatomy Acts Object Guide No.6

**Diagram of the proportions of a woman from Alberti Dureri
*Clarissimi pictorius et Geometræ de Symetria partium in rectis
formis humanorum corporum, Nuremberg, 1534***

Albrecht Dürer (1471-1528)

Royal Scottish Academy

fig 2, 4. Anatomy Acts Object Guide No.103

**Anatomical study of a skeleton within the outline of Cleomene's
Roman orator, 1887**

John Henderson Tarbet (d. 1938)

Royal Scottish Academy

fig 3. Anatomy Acts Object Guide No.18

De Humani Corporis Fabrica libri septem, Venice, 1568

Andreas Vesalius (1514-1564)

Special Collections, University of St Andrews, Sim QM21.V2

fig 5. Anatomy Acts Object Guide No.10

La Dissection des Parties du Corps Humain, French edition, 1546

Charles Estienne (1504-1564)

Special Collections, University of St Andrews, FP.B46CE

fig 6. Anatomy Acts Object Guide No.12

Anatomia del corpo humano, Rome, 1560

Juan de Valverde de Hamusco (c.1525 - c.1588)

Glasgow University Library, Special Collections, Dk.2.9

fig 7. Anatomy Acts Object Guide No.35

**Male Muscle-man and Dutch rhinoceros, for Bernard Siegfried
Albinus, *Tabulae sceleti et musculorum corporis humani, Leiden,
Musculorum Tabula IV, 1747***

Jan Wandelaar (1697-1759)

Royal Scottish Academy

fig 8. Anatomy Acts Object Guide No.56

**Tashrih-i Mansuri: The Anatomy of Mansur of Shiraz, (early 19th
century copy of late 14th - early 15th century treatise)**

Anon.

University of Edinburgh Library, Special Collections, OR.MS416. F.96V.

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