

How Science Works: Homology - Teachers' Notes

Class 10 11	Set 1 2 3 4 5 6 Mixed Ability	No. in Class B: G: SEN: EAL:	Staff
<p><u>Learning Outcome(s)</u></p> <p>Pupils should learn:</p> <ul style="list-style-type: none"> ▪ How explanations of many phenomena can be developed using scientific theories, models and ideas. ▪ To [...] develop an argument and draw a conclusion, using scientific and technical language. ▪ How uncertainties in scientific knowledge and scientific ideas change over time and about the role of the scientific community in validating these changes. <p><u>Context and Starter</u></p> <p>See: Homology: Where does the evidence lead?</p> <p>This activity involves a short reading session on developmental homology, followed by the opportunity to redesign an annotated drawing which contains deliberate mistakes. Producing a new annotated drawing requires pupils to actively engage in data selection and data extraction from the information provided. Pupils may discuss their drawings in small groups afterward.</p> <p>Volunteers to hand out the sheets. Allow 2 minutes silent reading time and 10-15 minutes to complete the annotated drawing. Then, referring to the questions, invite peer discussion with a 'tell each other' strategy. When appropriate, ask for clear responses from named pairs of pupils.</p> <p><u>Main Activity</u></p> <ul style="list-style-type: none"> ▪ Pupils consolidate their answers by writing in the spaces provided on the sheet. Ask them to answer in as much detail as possible. <p><u>Transition</u></p> <ul style="list-style-type: none"> ▪ Organise the pupils into groups of 3-4 learners. Hand round or project the concept cartoon: 'Structural Homology'. If given as handouts, allow one per pupil to stick into their books. Explain they are going to be given 10 minutes to discuss this cartoon in their groups. <p><u>Second activity</u></p> <ul style="list-style-type: none"> ▪ Try to spend one minute sitting with each group in the class and offer some original thoughts. Elicit a response to the cartoon from each group. Which scientist do they agree with and why? Do they agree with more than one? Ask them to carefully write their thoughts down under an appropriate title. <p><u>Plenary</u></p> <ul style="list-style-type: none"> ▪ Round up the discussion. Ask three or four people to read out their written thoughts to the whole class. Offer feedback – drawing on Plato's 'eternal forms', Darwin's common ancestry, Thompson's structuralism and more recent epigenetic attractors / supra-cellular memories. Set homework and ask the pupils to pack away. 		<p>Date: Day:</p> <p>Period Length: 50 min</p> <p><u>Key Vocabulary</u></p> <ul style="list-style-type: none"> ▪ Homology ▪ Pentadactyl limb ▪ Embryo ▪ Vertebrates ▪ Common ancestry ▪ Pharyngeal pouches <p><u>Resources</u></p> <ul style="list-style-type: none"> ▪ Data projector ▪ Worksheets ▪ Concept cartoons ▪ Glue ▪ Laptop/Desktop PC <p><u>Differentiation</u></p> <ul style="list-style-type: none"> ▪ Ask more able pupils to research D'Arcy Thompson and his Structuralism / Formalism. ▪ Ask less able pupils to design a news report exposing Ernst Haeckel's scientific fraud. <p><u>LSA Deployment</u></p> <ul style="list-style-type: none"> ▪ Can discuss with pupils what they should write down about the cartoon ▪ Can help pupils reason out the similarities between different organisms 	
<p><u>Homework</u> – In 250 of your own words, research William Bateson (1894) and his understanding of homology.</p> <p><u>Homework Due in</u> – Set appropriate date.</p>			