



BioEYES: Links to the Australian Science Curriculum

BioEYES Australia is an exceptional medium for teaching students in both primary and secondary school about the biological sciences. BioEYES Australia encourages students to explore the science underlying development, reproduction, genetics, habitat and the requirements for life. Students mate their own fish, harvest the embryos, watch them develop and then draw conclusions in regards to an hypothesis they set on the first day of the experiment. In undertaking the BioEYES Australia program, students are exposed to a multitude of learning experiences across the three strands set out by the Australian Science Curriculum. **Table 1** presents *just some*ⁱ examples of how BioEYES Australia covers areas of science understanding, science as a human endeavour and science inquiry skills.

Table 1: Selected examples of links between BioEYES and the Australian Science Curriculum

Foundation Year	Science Understanding	<ul style="list-style-type: none"> Living things have basic needs. BioEYES compares the needs of humans and fish: <ul style="list-style-type: none"> both need oxygen, but extract it in very different ways both need food, but it looks, smells and tastes very different, and is gathered differently. both reproduce, but do so in different manners comparisons are also made between the needs of adult fish and their embryos
	Science as a Human Endeavour	<ul style="list-style-type: none"> Science involves exploring and observing the world using the senses. BioEYES encourages students to: <ul style="list-style-type: none"> observe fish, draw parallels, communicate their findings with their peers
	Science Inquiry Skills	<ul style="list-style-type: none"> Questioning and predicting: <ul style="list-style-type: none"> If embryos get their food from the yolk sac, what will happen to the yolk sac as the embryo develops What would happen if we didn't add nutrients to the water? What will the offspring look like? Planning and conducting: <ul style="list-style-type: none"> Students carry out their own experiment and observe embryonic development under the microscope
Year 2	Science Understanding	<ul style="list-style-type: none"> Living things grow, change and have offspring similar to them-selves. BioEYES investigates: <ul style="list-style-type: none"> growth or humans and fish and changes from birth different characteristics of life stages such as fertilisation, embryonic development, hatching, larvae and adult fish that animals have offspring and that in our case, these arise from a male and female adult fish
	Science as a Human Endeavour	<ul style="list-style-type: none"> Science involves asking questions and describing changes. BioEYES encourages students to: <ul style="list-style-type: none"> observe development and describe what they see formulate questions about how and why their observations are the way they are
	Science Inquiry Skills	<ul style="list-style-type: none"> Questioning and predicting: <ul style="list-style-type: none"> If embryos get their food from the yolk sac, what will happen to the yolk sac as the embryo develops What would happen if we didn't add nutrients to the water? What will the offspring look like? Planning and conducting: <ul style="list-style-type: none"> Students carry out their own experiment and observe embryonic development under the microscope Analysing data and information: <ul style="list-style-type: none"> Students gather information and present in simple graphs
Year 4	Science Understanding	<ul style="list-style-type: none"> Living things have life cycles. Living things depend on each other and the environment to survive. BioEYES investigates: <ul style="list-style-type: none"> difference between relationships of offspring and parents in zebrafish and humans life cycles of zebrafish how nutrients and temperature affect the life-cycles
	Science as a Human Endeavour	<ul style="list-style-type: none"> Science involves making predictions and describing patterns. BioEYES encourages students to: <ul style="list-style-type: none"> make hypotheses observe development and draw conclusions about patterns of pigmentation amongst offspring
	Science Inquiry Skills	<ul style="list-style-type: none"> Questioning and predicting: <ul style="list-style-type: none"> What will determine what the offspring look like? Planning and conducting: <ul style="list-style-type: none"> Students carry out their own experiment and observe embryonic development under the microscope



		<ul style="list-style-type: none"> • Analysing data and information: <ul style="list-style-type: none"> ○ Students gather information and present in simple graphs
Year 8	Science Understanding	<ul style="list-style-type: none"> • Cells are the basic units of living things and have specialised structures and functions. Multicellular organisms contain systems of organs that carry out specialised functions. BioEYES investigates: <ul style="list-style-type: none"> ○ the development of an embryo from two single cells, through to the development of a small group of cells and then eventually an embryo/larvae ○ the development of specialised/differentiated cells from common precursor/stem cells ○ different cells have different function – eg viewing the red blood cells as they circulate through the developing embryo ○ The development of the cardiovascular system, the musculature, vertebrate etc ○ Describing mitosis as cell division for growth and repair
	Science as a Human Endeavour	<ul style="list-style-type: none"> • Science knowledge can develop through collaboration and connecting ideas across the disciplines of science. BioEYES encourages students to: <ul style="list-style-type: none"> ○ understand how advances in technology and scientific understanding has enabled medical science (and in particular regenerative medicine) to develop new therapeutics to repair organs
	Science Inquiry Skills	<ul style="list-style-type: none"> • Questioning and predicting: <ul style="list-style-type: none"> ○ What will determine what the offspring look like? ○ Using their prior knowledge to develop hypotheses • Planning and conducting: <ul style="list-style-type: none"> ○ Students carry out their own experiment and observe embryonic development under the microscope • Analysing data and information: <ul style="list-style-type: none"> ○ Students gather information and present in simple graphs
Year 10	Science Understanding	<ul style="list-style-type: none"> • The transmission of heritable characteristics from one generation to the next involves DNA and genes. BioEYES investigates: <ul style="list-style-type: none"> ○ how DNA is passed from one generation to the other through meiosis and mitosis ○ patterns of inheritance including dominant and recessive characteristics ○ simple mendelian genetics to predict genotype and phenotype
	Science as a Human Endeavour	<ul style="list-style-type: none"> • Scientific understanding, including models and theories are contestable and are refined over time. BioEYES encourages students to: <ul style="list-style-type: none"> ○ appreciate how genetics was first discovered, and early work by Mendel to uncover dominant and recessive traits. • The values and needs of contemporary society can influence the focus of scientific research. BioEYES encourages students to: <ul style="list-style-type: none"> ○ appreciate the ethics behind scientific research and the importance of educating the community to be scientific literate.
	Science Inquiry Skills	<ul style="list-style-type: none"> • Questioning and predicting: <ul style="list-style-type: none"> ○ Using their prior knowledge to develop hypotheses • Planning and conducting: <ul style="list-style-type: none"> ○ Students carry out their own experiment and observe embryonic development under the microscope • Analysing data and information: <ul style="list-style-type: none"> ○ Students gather information and present in simple graphs

ⁱ In the interest of space, it would be impossible to list every direct link between the content covered in the BioEYES Australia program and that set out in the new curriculum.